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FOREWORD

The Myanmar Academy of Arts and Science (MAAS) was constituted on August-16, 1999 with five Aims and Eight Tasks. These involve four major fields of endeavour, namely:

- (a) Introduction to Modern Methods of Teaching and Learning
- (b) Promotion of Research Activities and Laying Down of Research Guidelines
- (c) Dissemination of Knowledge and Learning
- (d) Production of New Experts and Academics

In pursuance of these endeavours the MAAS has, since the year 2001, held Research Conferences and published research papers in the Journal of the Myanmar Academy of Arts and Science.

At the Research Conference held on 27- 29 December 2021, a total of about (93) research papers were read. These papers have been published in volume XX as follows:

Vol. XX, No.1	Chemistry, Physics, Zoology, Botany, Marine Science and Geology
Vol. XX, No.2	Myanmar, Geography, History, Anthropology and Law
Vol. XX, No.3	Educational Psychology, Curriculum and Methodology

The executive members of Myanmar Academy of Arts and Science had been reconstituted on 4 August 2022, by the Ministry of Education with the Approval of the Government of the Union of Myanmar. The primary mission of the academy is to develop and promote Higher Education in preparing future generations to meet the challenges of the new millennium. The Publication Committee along with the Editorial Board have been formed.

The majority of the papers in these issues represent findings of research conducted by Ph.D. and Master's candidates in partial or total fulfillment of requirement for these degrees. We, the members of MAAS, do appreciate the editing work done by senior professors and scholars of high standing. Accordingly, these papers should prove useful, not only for other candidates for such degrees, but also for all those who are interested in the results of systematic research and inquiry. Due to the outbreak of covid-19 pandemic; a delay in the date of publication might occur.

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INSTRUCTIONS TO AUTHORS

Presentation: Manuscripts (MS) should be typed on one side of quarto or A4 size paper. Typing should be single spaced, with a one-inch margin all around. A CD of the paper should be submitted together with two print-outs. In general, the text should be organized according to the following outline:

- (i) Title
- (ii) Abstract
- (iii) Materials & Methods/ Premises / Hypotheses
- (iv) Results / Findings
- (v) Discussion
- (vi) Summary/ Conclusion
- (vii) Acknowledgements
- (viii) References

The body of the text should be printed in **font size 12**, and those of the Abstract, Acknowledgement and References should be printed in **font size 10**. The relative importance of the **headings** in the text should be indicated as follows:

- | | | |
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| Side Heading | - | Capitals & lower case, not indented (bold – faced) |
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Title. The title should describe the contents of the article adequately and concisely and should be typed in **font size 14**.

Author's name. Capital & lower case. The designation of the first author (where the number of authors is more than two) and the name of the institution where the work was carried out should be given at the bottom of the title page.

Abstract. The main points of the paper, including its findings and conclusions, should be highlighted in the abstract. It is not a summary, and should not contain more than 300 words; if more than 300 words, further publication will not be considered. The entire abstract should be indented and typed in **font size 10**.

Key words: Between 3-7 key words highlighting the main points should be listed below the abstract.

References. References should be presented in alphabetical order, beginning with the surname first for the senior author and surname last for the other authors, followed by the year of publication. Examples of references are given below:

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To a book: Corbet, G.B., & J.E. Hill, (1992) *The mammals of the Indomalayan Region*. Oxford, Oxford University Press.

To a thesis: May Soe Thu (1995) *Taxonomy of Offshore Fishes Caught by Bottom Trawl Operations in Myanmar Waters*. M.Sc. Thesis Zoology Department, Yangon University (Unpublished).

N.B. If the manuscript submitted is from a thesis, its format should be revised to conform to the instructions of the Myanmar Journal of Arts & Science presented here. **Pagination** should commence from the title page except when they are used to identify the affiliated institutions, and cite unpublished material. **Footnotes** should be avoided wherever possible. The MS, including illustrations and references, should not exceed 15 pages for Arts and related subjects and 10 pages for Science in length. Please kindly follow this limit in your final manuscript.

A RELIABILITY GENERALIZATION META-ANALYSIS OF TRADITIONAL AND CYBER BULLYING VICTIMIZATION SCALES*

Hay Man Oo¹, Yar Zar Chit²

Abstract

The main aim of this study was to review the constructs of traditional and cyber bullying victimization scales. A reliability generalization meta-analysis was accomplished to estimate the average reliability of TBVS and CBVS total scores and to search for the characteristics of the studies that can explain the variability among reliability estimates. An exhaustive literature search enabled to select 21 studies (63 independent samples) that reported alpha coefficients with the data at hand for TBVS and CBVS total score and subscales. An acceptable average coefficient alpha was found for the TBVS total score ($\alpha = .75$, 95% CI = .69 - .80) and for CBVS total score ($\alpha = .78$, 95% CI = .76 - .81). Furthermore, the subscales of both TBVS and CBVS were also found to have acceptable average coefficient alpha. Moderator analyses showed a significant statistical relationship with the reliability coefficients with the continuous variables of mean age and gender (male %) and with the substantive characteristics such as sample size. The discussion of the results and suggestions for future studies are described in this study.

Keywords: Meta-analysis, reliability generalization meta-analysis, traditional bullying victimization, cyber bullying victimization

Introduction

Bullying, including cyber bullying, is a worldwide problem and high prevalence among people until now. Generally, there are two types of bullying; traditional and cyber bullying. It is a subset of aggression and can be explained as repeated acts over time and unpleasant behaviour by one or more person directed against a person with direct (traditional) or indirect (cyber) ways. Physical and verbal aggression are direct forms of bullying and indirect bullying primarily consists of relational aggression, which includes social exclusion of victims through the manipulation of social relationships by bullies or injuring the reputation of the victims.

Cyber bullying is one of the indirect ways of bullying and victims of this type of bullying often do not know who is cyber bullying them. Researches have primarily focused on studying bullying and victimization in both children and adolescents. Nowadays, most of people have experienced bullying on social media in various ways. Therefore, it needs to be measured on how they experienced or in which ways they have experienced bullying. Although there were a lot of different tools to assess bullying victimization in various countries, there was no systematically developed bullying victimization scale or inventory in Myanmar. Therefore, this study intends to review the constructs of traditional and cyber bullying victimization scales that are relevant with Myanmar culture via reliability generalization meta-analysis technique.

Purpose of the Study

The main aim of this study is to review the constructs of traditional and cyber bullying victimization scales via Reliability Generalization meta-analysis (RG meta-analysis) technique. The specific objectives of this study are:

- (a) to estimate the average reliability of test scores (for the total scale and subscales), in terms of internal consistency found in the empirical studies that applied each of the tools and reported reliability estimates with the data at hand;

* Best Paper Award Winning Paper in Educational Psychology (2021)

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- (b) to examine the variability among the reliability estimates; and
- (c) to search for substantive and methodological characteristics of the studies that can be statistically associated with the reliability coefficients

Definition of Key Terms

Traditional Bullying Victimization: Traditional bullying victimization is the process of being victimized, when a person is exposed, repeatedly and over time, to negative actions on the part of one or more other persons, and he or she has difficulty in defending himself or herself (Olweus, 1993).

Cyber Bullying Victimization: Cyber bullying victimization is defined as an individual or a group willfully using information and communication involving electronic technologies to facilitate deliberate and repeated harassment or threat to another individual or group by sending or posting cruel text and/or graphics using technological means (Baele, 2007).

Meta-analysis: Meta-analysis is a set of techniques used to combine the results of a number of different reports to create a single, more precise estimate of an effect (Ferrer, 1998).

Reliability Generalization (RG): Reliability generalization (RG) is a method for meta-analysis of reliability coefficients to estimate average score reliability across studies, determine variation in reliability, and identify moderator variables influencing score reliability (Holland, 2015).

Literature Review

The literature review for this RG meta-analysis is based on 21 studies for traditional and cyber bullying victimization scales.

Measurement Tools to Assess Bullying Victimization

There were 10 studies for traditional bullying victimization scale and 11 studies for cyber bullying victimization scale as follows:

Peer Victimization Scale (PVS): consisted of 10 items measured on a four-point Likert scale. It was carried out in Florida with the sample ($n = 64$). The internal consistency of the scale was 0.89 (Williams 2007).

Illinois Bullying Scale (IBS): consisted of 18 items measured on a five-point Likert scale. It was conducted in Lahore & Sargodha with the sample ($n = 536$). The internal consistency of the scale was 0.88 (Shujja & Atta, 2011).

The Forms of Bullying Victimization Scale (FBVS): consisted of 10 items measured on a three-point Likert scale. It was conducted in Australia with the sample ($n = 3496$). The internal consistency of this scale was 0.87 (Shaw et al., 2013).

Multidimensional Peer-Victimization Scale-I (MPVS-I): consisted of 27 items measured on a five-point Likert scale. It was conducted in United States with the sample ($n = 286$). The internal consistency of the scale was 0.95 (Lee, Abell & Holmes, 2015).

Olweus Victim Questionnaire (OVQ): involved 23 items measured on a four-point Likert scale. This study was conducted in Brazil with the sample ($n = 703$). The internal consistency of the questionnaire was 0.85 (Gonçalves et al., 2016).

The Multidimensional Bullying Victimization Scale (MBVS): consisted of 25 items measured on a four-point Likert scale. This study was conducted in Michigan with the sample ($n = 273$). This study demonstrated strong internal consistency $\alpha = 0.93$ (Harbin, 2016).

Bullying, Harassment, and Aggression Receipt Measure (BullyHARM): involved 22 items measured on a four-point Likert scale. It was conducted in Carolina with the sample ($n = 275$). This measure showed a strong internal consistency $\alpha = 0.93$ (Hall, 2016).

Multidimensional Peer-Victimization Scale (MPVS): involved 16 items measured on a three-point Likert scale. It was conducted in Florida with the sample ($n = 385$). The internal consistency of this scale was 0.70 (Joseph & Stockton, 2018).

California Bullying Victimization Scale (CBVS): consisted of 9 items measured on a five-point Likert scale. This study was conducted in California with the sample ($n = 1855$). The internal consistency of the scale is 0.80 (Esteller-Cano et al., 2021).

The Zurich Brief Bullying Scales (ZBBS): consisted of 10 items measured on a six-point Likert scale. It was carried out in Zurich with the sample of ($n = 1304$). The internal consistency of this scale was 0.77 (Murray et al., 2021).

An Aggression Questionnaire (AAQ): consisted of 29 items measured on a five-point Likert scale. This study was conducted in Austin with the sample ($n = 1253$). The internal consistency of the scale was 0.89 (Buss & Perry, 1992).

Cyber Victim Scale (CVS): involved 22 items measured on a five-point Likert scale. This study was conducted in Sakarya with the sample ($n = 404$). The internal consistency of the scale was 0.89 (Çetin, Yaman & Peker, 2011).

Cyberbullying Experience Survey (CES): involved 44 items measured on a six-point Likert scale. It was conducted in Mid-Atlantic area with the sample ($n = 538$). The internal consistency of the scale was 0.63 (Doane et al., 2013).

E-Victimization Scale (E-VS): involved 6 items measured on a seven-point Likert scale. It was conducted in Turkey with the sample ($n = 163$). This scale showed a strong internal consistency $\alpha = 0.96$ (Başaran & Cikrikci, 2015).

Cyber Bullying Victimization Experience Questionnaire (CBVEQ): consisted of 12 items measured on a five-point Likert scale. It was carried out in Greece with the sample ($n = 1097$). The internal consistency of the questionnaire was 0.80 (Antoniadou, Kokkinos & Markos, 2016).

The Greek Cyber Victimization Experience Questionnaire (CVEQ-G): involved 24 items measured on a five-point Likert scale. It was carried out in Greece with the sample ($n = 1097$). The internal consistency of this questionnaire was 0.89 (Antoniadou et al., 2016).

Cybervictimization Questionnaire (CYVIC): consisted of 19 items measured on a four-point Likert scale. This study was carried out in Spain with the sample ($n = 3159$). The internal consistency of the questionnaire was 0.74 (Álvarez-García et al., 2017).

European Cyberbullying Intervention Project Questionnaire (ECIPQ): consisted of 22 items measured on a five-point Likert scale. It was conducted in Spain with the sample ($n = 3830$). The internal consistency of the scale was 0.97 (Herrera-López et al., 2017).

Cyber Bullying Victimization Scale (CBVS): involved 9 items measured on a four-point Likert scale. It was carried out in Malaysia with the sample ($n = 120$). The internal consistency of the scale was 0.86 (Hua, Heng-Hwa & Chong, 2019).

Cyberbullying Victimization Inventory (CVI): consisted of 11 items measured on a four-point Likert scale. It was carried out in Ankara with the sample ($n = 635$). The internal consistency of the inventory was 0.75 (Tanrikulu & Erdur-Baker, 2020).

Cyberbullying Scale (CBS): involved 12 items measured on a five-point Likert scale. It was conducted in Yohyakarta with the sample ($n = 339$). The internal consistency of the scale was 0.71 (Husna, Tentama & Purwadi, 2020).

Reliability Generalization Meta-analysis

Reliability is one of the most important psychometric properties in developing instruments. There are a number of different approaches to estimating the reliability of test scores: (a) temporal stability (test-retest reliability), (b) internal consistency (alpha coefficient), (c) parallel forms, and (d) inter-rater or intra-rater agreement. The methods based on internal consistency and test-retest are the most widely used (Flake et al., 2017). RG meta-analysis allows researchers to characterize the average reliability of scores obtained by a test across multiple studies and situations and estimate the degree of variability in reliability coefficients across different types of measures, samples, and contexts. Furthermore, when reliability coefficients are heterogenous, RG meta-analysis allows the researchers to explore which characteristics of the studies may be statistically related to the reliability estimates (Rodriguez & Maeda, 2006). In this way, it is possible to ascertain which measures tend to produce the most reliable scores for what types of people, and in what contexts.

Method and Procedure

In conducting the RG meta-analysis on each of the scales developed to assess bullying victimization, this study is based on the guidelines for conducting and reporting reliability generalization meta-analyses (REGMA) of Sanchez-Meca et al., (2017), on each of the scales developed to assess bullying victimization.

Selection Criteria of the Studies

The studies had to meet the following inclusion criteria: (a) the study had to be an original, quantitative investigation; (b) it had to assess bullying victimization using measurement instruments; (c) it had to report both the reliability values of total scale and subscales; (d) it had to measure the participants of the age range between 16-19; (e) the paper could be published; and (f) the paper had to be written in English. There were no limits on the date of the study. The following exclusion criterion was applied: the studies that only described the reliability of total scale and not described the reliability of subscales.

Search Strategy

Electronic searches were carried out in the Google Scholar, Research Gate, Academia, PsycInfo, PubMed, JSTOR, ProQuest, and Web of Science databases, using the following terms in all fields: bullying victimi* (i.e., victimization or victimisation), bullying victimization scales, validity and reliability of bullying victimization scales, and questionnaire development for bullying victimization. Furthermore, manual searches of lists of references from the retrieved studies were conducted to identify additional studies that met the selection criteria. In addition, lists of references from previous reviews and meta-analyses were screened to find studies that met the inclusion criteria for the present meta-analysis.

Data Extraction

A protocol for extracting the characteristics of the studies was established and applied to each study. The characteristics coded were as follows: (a) the reliability coefficients of the total scores on the measurement instruments and on each of the subscales; (b) the mean age of the participants on each of the instrument; (c) gender distribution of the sample (% male); (d) sample size; (e) standard deviations of the participants; (f) target population (adolescents); (g) year of the study; and (h) study language.

Reliability Estimates

Given that all the studies reported the alpha coefficient to assess the internal consistency reliability of the measures, the reliability coefficients were taken into account in this meta-analysis. This study conducted 21 studies with eight subscales; three total constructs for traditional bullying victimization and five total constructs for cyber bullying victimization. Thus, they were extracted for the total score and for each subscale of the measurement instruments. In order to normalize their distributions and stabilize their variances, the total reliability coefficients for each subscale were performed. The first source of variability between the proposed RG methods is whether or not to apply a transformation of coefficients. Most RG studies to date have analyzed untransformed coefficients alpha (Bachner & O'Rourke, 2007). In this RG meta-analysis, the data were applied with the untransformed coefficients alpha.

Statistical Analysis

Meta-analyses were conducted for the reliability coefficients obtained from the total scale and for each subscale of each measurement instrument. In all cases, random-effects models were assumed in the statistical calculations (Borenstein, Hedges, Higgins, & Rothstein, 2009). In each meta-analysis, the heterogeneity of the reliability coefficients was investigated by constructing a forest plot and by calculating the Q statistic and the I^2 index. I^2 values about 25%, 50%, and 75% can be interpreted as reflecting low, moderate, and large heterogeneity (Higgins, Thompson, Deeks, & Altman, 2003). When the effect size exhibited heterogeneity, then sub-group analysis and moderator analyses were performed in order to identify the study characteristics statistically associated to the effect size. All statistical analyses were carried out with the programs *Meta-Essentials* (Suurmond, Rhee & Hak, 2017).

Data Analysis and Findings

Selection Process

Figure 1 shows a flow chart of the study screening and selection process. The search strategy produced a total of 64 studies. Only 21 of them reported some type of reliability coefficient. Thus, this RG meta-analysis study included 21 studies. The flow diagram of the study is as follow:

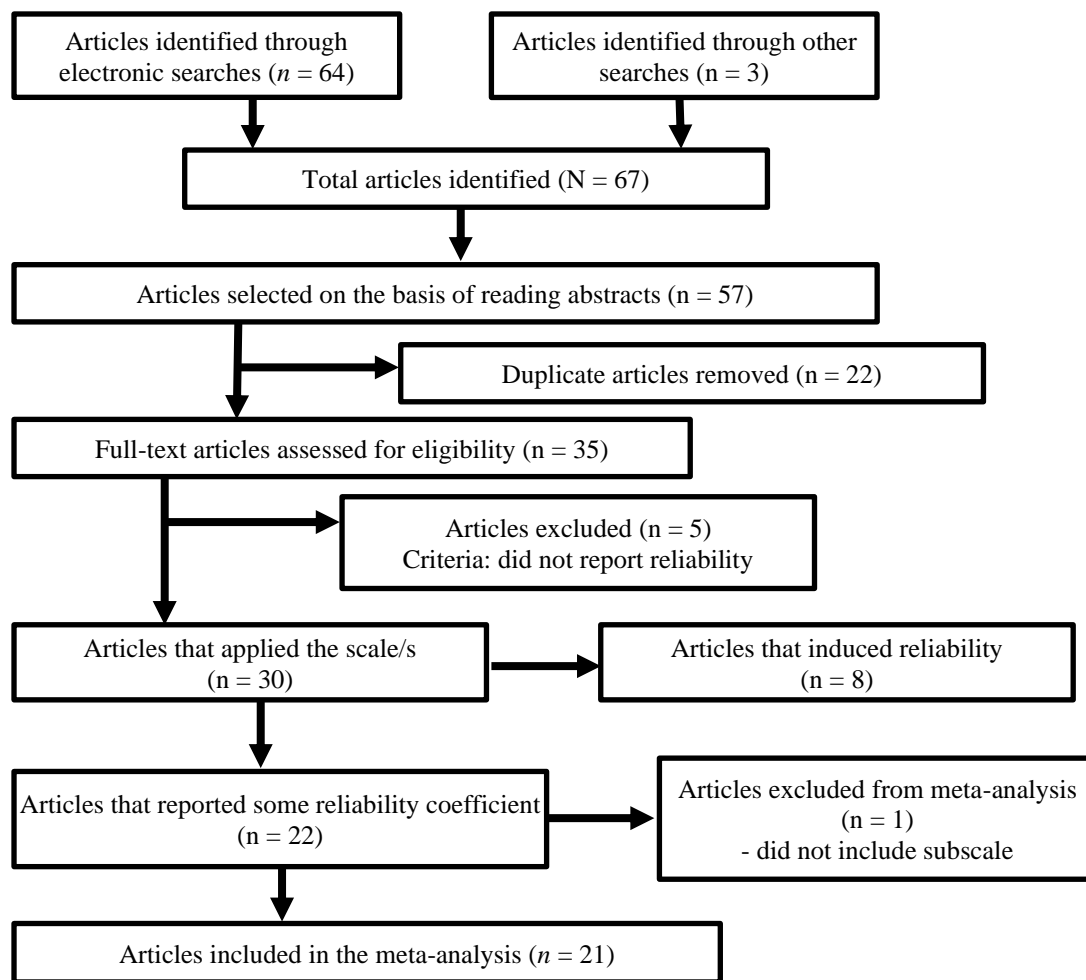


Figure 1 REGEMA Flow Diagram of Study Selecting Process

Mean, Reliability and Heterogeneity

Separate meta-analyses were conducted for each of these measurement instruments' total score reliability and for each of the subscales. In addition, different meta-analyses were performed for alpha coefficients. Table 1 and Figure 2 show the means and their respective confidence limits of coefficient alpha for the purpose of facilitating their interpretation.

Table 1 presents the main summary statistics for the alpha coefficients obtained for the traditional and cyber bullying victimization total scores and for each subscale, and figure 2 displays a forest plot of the alpha coefficients for the TBVS and CBVS total scores in each study. For TBVS, the 10 estimates reported for the total scale ranged from 0.30 to 0.92, with a mean coefficient alpha of 0.75 (95% CI [0.69, 0.80]). The subscale of RBV shows the largest estimates ($M = 0.78$, 95% CI [0.67, 0.89]), followed by the subscales of VBVS ($M = 0.73$, 95% CI [0.64, 0.82]) and PBVS ($M = 0.73$, 95% CI [0.60, 0.86]) yielding the poorest average reliabilities.

Table 1 also shows the main summary statistics for the alpha coefficients obtained for CBVS. The 7 estimates reported for the total scale range from 0.59 to 0.97, with a mean coefficient alpha of 0.78 (95% CI [0.76, 0.81]). The subscale of WVVS shows the largest estimates ($M = 0.82$, 95% CI [0.74, 0.90]), followed by HI ($M = 0.81$, 95% CI [0.77, 0.84]) and

VSCV ($M = 0.79$, 95% CI [0.69, 0.90]) with OE ($M = 0.76$, 95% CI [0.74, 0.79]) and IP ($M = 0.76$, 95% CI [0.69, 0.82]) subscales yielding the poorest average reliabilities.

Table 1 Average Alpha Coefficients, 95% Confidence Intervals, and Heterogeneity Statistics for the TBVS and CBVS Total Score and Eight Subscales

TBVS			95% CI			
Total scale/subscale	k	α_+	LL	UL	Q	I^2
Coefficient alpha						
Total scale	10	0.75	0.69	0.8	546.78*****	94.88
PBV	10	0.73	0.6	0.86	298.09*****	96.98
VBV	10	0.73	0.64	0.82	148.51*****	93.94
RBV	9	0.78	0.67	0.89	38.91*****	79.44
CBVS			95% CI			
Total scale/subscale	k	α_+	LL	UL	Q	I^2
Coefficient alpha						
Total scale	7	0.78	0.76	0.81	527.91*****	94.13
OE	5	0.76	0.74	0.79	2.04	0.00
VSCV	7	0.79	0.69	0.9	123.58*****	95.15
IP	6	0.76	0.69	0.82	20.65*****	80.63
WVV	11	0.82	0.74	0.9	334.44*****	97.01
HI	5	0.81	0.77	0.84	1.49	0.00

Abbreviations: TBVS, Traditional Bullying Victimization Scale; PBV, Physical Bullying Victimization subscale; VBV, Verbal Bullying Victimization subscale; RBV, Relational Bullying Victimization subscale; CBVS, Cyber Bullying Victimization Scale; OE, Online Exclusion subscale; VSCV, Visual Sexual Cyber Victimization subscale; IP, Impersonation subscale; WVV, Written Verbal Victimization subscale; HI, Hidden Identity subscale; k , number of studies; LL and UL, lower and upper limits of the 95% confidence interval for α_+ ; I^2 , heterogeneity index; Q , Cochran's heterogeneity Q statistic.

**** $p < .0001$

According to the results, it can be seen that there were high levels of variability, $I^2=94.88$ for TBVS and $I^2=94.13$ for CBVS, among the values of Cronbach's Alpha for all respective studies. Therefore, meta-regression analysis was taken in order to know which study characteristics can affect the values of Cronbach's Alpha.

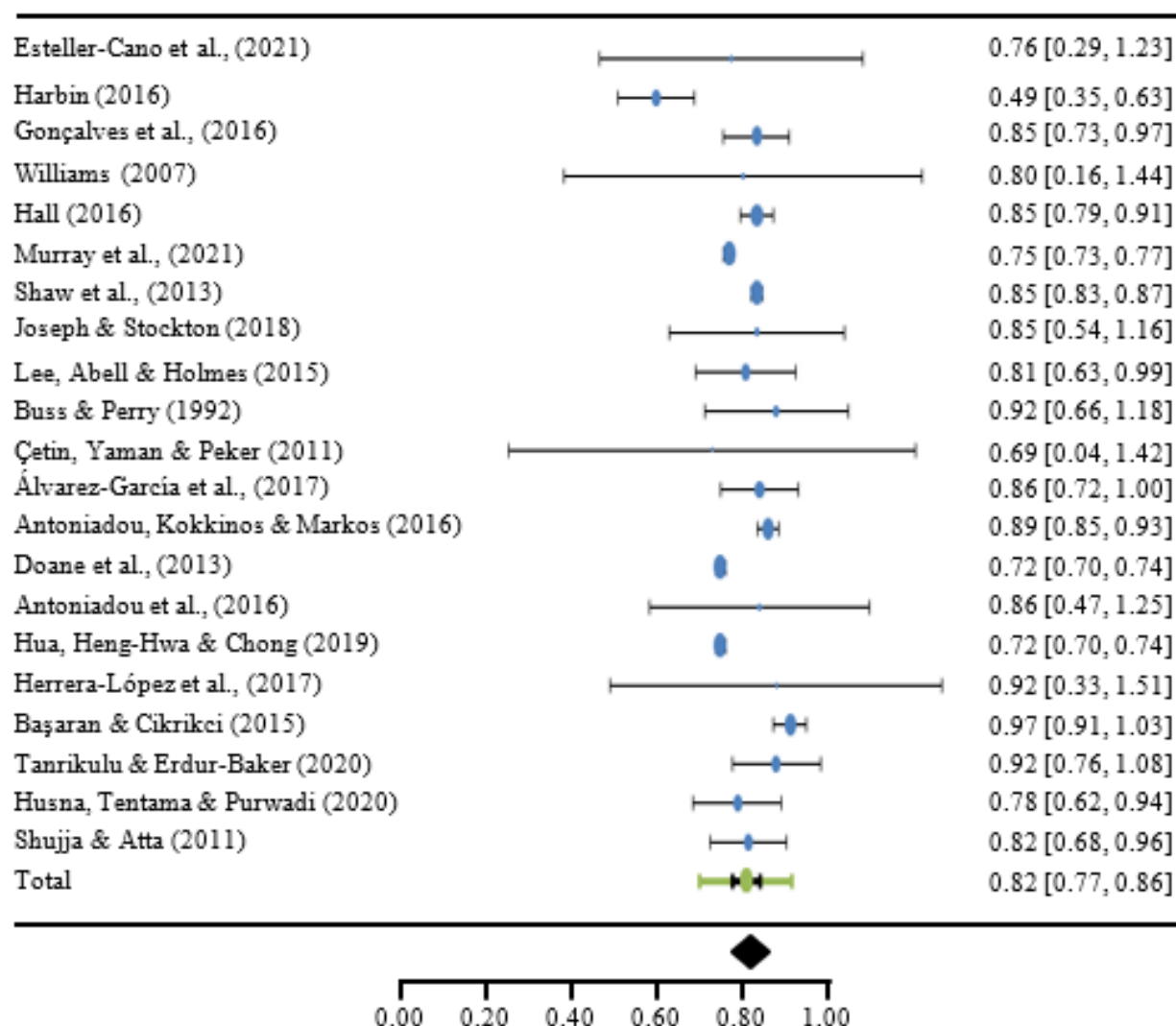


Figure 2 Forest Plot Displaying the Alpha Coefficients (and 95% Confidence Intervals) for the TBVS and CBVS Total Scores

Analysis of Moderator Variables

As a result of I^2 index, the moderator analyses were performed. Specifically, simple meta-regression was performed for continuous variables; gender (% male), age, and methodological characteristics such as sample size respectively, on alpha coefficients for the total scale, assuming mixed-effects models.

Table 2 shows the results of the simple meta-regression applied to alpha coefficients for the total scores of the TBVS and CBVS. Note that the sign of the regression slope, b_j , is obtained by taking the alpha coefficients transformed using Bonett's (2002) formula as the dependent variable. Therefore, the direction of the true association between the alpha coefficients and each moderator is the inverse of what is represented by the sign of the slope in Table 2.

For the TBVS score, the total score of the mean showed a positive, statistically significant association with the alpha coefficient ($p < 0.05$), accounting for the variance of 45%. Furthermore, only the mean age of the participants showed a negative statistically significant association with the alpha coefficient ($p < 0.001$), accounting for 53% of the variance. The other

two moderator variables; gender (% male) ($p < 0.001$, accounting for 47% of variance and sample size ($p < 0.05$), accounting for 34% variance showed a positive statistically significant associations with the alpha coefficient.

For the CBVS score, the mean age of the participants ($p < 0.05$), 17% variance and sample size ($p < 0.05$), 20% variance showed a positive statistically significant association with the alpha coefficient. The gender (% male) moderator do not show a relationship with the alpha coefficient.

Table 2 Results of the Simple Meta-Regression Applied on Alpha Coefficients for the TBVS and CBVS Total Scores, Taking Continuous Moderator Variables as Predictors

<i>Predictor Variable</i>	<i>k</i>	<i>b_j</i>	<i>F</i>	<i>p</i>	<i>Q_E</i>	<i>R²</i>
TBVS Total Score						
Mean Total Score	29	0.61	12.74	0.012	309.37*	0.45
Mean age (years)	29	-0.07	0.31	0.000	255.59*****	0.53
Gender (% male)	29	1.29	24.26	0.000	288.00****	0.47
Sample Size	29	0.00	13.65	0.012	363.15*	0.34
CBVS Total Score						
Mean Total Score	11	0.34	4.72	0.136	468.69	0.10
Mean Age (years)	11	0.41	5.94	0.021	440.60*	0.17
Gender (% male)	11	0.16	0.81	0.376	514.08	0.02
Sample Size	11	0.45	7.41	0.011	423.29*	0.20

Abbreviations: TBVS, Traditional Bullying Victimization Scale; CBVS, Cyber Bullying Victimization Scale; *k*, number of studies; *b_j*, regression coefficient of each predictor; *F*, Knapp-Hartung's statistic for testing the significance of the predictor, *p*, probability level for the *F* statistic; *Q_E*, statistic for testing the model misspecification; *R²*, proportion of variance accounted for by the predictor.

**** $p < .0001$, * $p < .05$

Conclusion, Discussion and Suggestion

This RG meta-analysis was based on a total of 21 studies that reported internal consistency with the data at hand. All of the articles that extracted the estimated reliability of test scores to assess bullying victimization, only one type of reliability was reported is Cronbach's alpha for internal consistency.

Regarding average reliability estimates, Ciccheffi (1994) suggested the following guidelines: unacceptable for coefficients lower than 0.7, fair for the range from 0.7 to 0.8, good for 0.8 to 0.9, and excellent for values over 0.9. Following these guidelines the average internal consistency reliability of the total scores on all instruments analyzed, both TBVS and CBVS total scores can be considered fair.

Furthermore, all of the subscales of TBVS can also be considered fair internal consistency reliability (0.73 – 0.78). For CBVS subscales, WV (0.82) and HI (0.81) can be considered good internal consistency reliability and the other three subscales; OE (0.76), VSCV (0.79), and IP (0.76) can be fair internal consistency reliability which are in the range of acceptable reliability for use in developing instruments.

On the other hand, analyses of moderator variables were conducted on total scores for the TBVS and CBVS. These moderator analyses allowed to know which characteristics of the studies exhibited a statistical relationship with the reliability coefficients for the TBVS and CBVS total scores. For TBVS, all of the moderator variables (mean age, gender; male %, and sample size) showed a significant statistical relationship with the reliability coefficients, which means that the mean age, gender (% male) and sample size affect the reliability of TBVS measure. Furthermore, only the mean age of the participants showed positive statistically significant relationship with reliability estimates ($b_j = -0.07$, $p < 0.001$), which means that samples with older participants exhibited better average reliability than samples with younger participants.

For the moderator variable of gender (% male), there was negative statistically significant relationship with reliability estimates ($b_j = 1.29$, $p < 0.001$), which means that smaller male % exhibited better average reliability than the larger ones. On the other hand, the larger the percentage of female, the better the average reliability for measure.

For the moderator variable of sample size, there was also negative statistically significant relationship with reliability estimates ($b_j = 0.00$, $p < 0.05$), which means that the smaller sample size exhibited better average reliability than the larger ones.

With regard to the CBVS, except gender (% male), the other two moderator variables showed negative statistically significant relationship with reliability estimates and did not show a statistical relationship with gender (% male). For the moderator variable of mean age, there was a negative statistically significant relationship with reliability estimates ($b_j = 0.41$, $p < 0.05$), which means that samples with younger participants exhibited better average reliability than samples with older participants.

For the moderator variable of gender (% male), there was no statistical relationship with the reliability coefficients ($b_j = 0.16$, $p > 0.05$), which means that the gender (% male) does not affect the reliability of CBVS measure. For the moderator variable of sample size, there was also negative statistically significant relationship with reliability estimates ($b_j = 0.45$, $p < 0.05$), which means that the smaller sample size exhibited better average reliability than the larger ones. Therefore, the results can be reasonably generalized to all the studies that applied the TBVS and CBVS measures.

For the above reasons, all of the subscales in both TBVS and CBVS are reliable and can be applied by the instrument developers according to their country, culture and society. In some case of variability with these subscales, the instrument developers have to apply with caution. Finally, the instruments can be developed for traditional bullying victimization with the subscales of physical, verbal, and relational and for cyber bullying victimization with the subscales of online exclusion, visual-sexual cyber victimization, impersonation, written verbal victimization and hiding identity.

To sum up, this study should be applied to qualitative study and confirm the reliability of constructs by interview technique. By interviewing these constructs to Myanmar youths, the researchers will be able to decide which constructs are to be relevant with Myanmar culture and which are not relevant and to be omitted them. By doing so, the systematic questionnaires for TBVS and CBVS will be able to be developed for Myanmar youths.

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RELATIONSHIP BETWEEN MENTAL WELL-BEING, ADJUSTMENT STYLES AND ACADEMIC ACHIEVEMENT OF STUDENT-TEACHERS

Aeint Thinzar Thet¹

Abstract

The main purpose of the present study was to study the relationship between mental well-being, adjustment styles and academic achievement of student-teachers. Questionnaire survey method was applied and quantitative approach was executed in this study. A total of 474 student-teachers (147 males and 327 females) from Yangon University of Education and Sagaing University of Education participated in this study. The required sample was selected by using random sampling technique. As the research instruments, Warwick-Edinburgh Mental Well-being Scale (WEMWBS, 2005) and Adjustment Styles Inventory developed by Kumar (1998), Reddy (1990) and Srinivas (1999) were applied to measure the mental well-being state and various adjustment styles of student-teachers. Academic achievement was described in terms of scores obtained from an achievement test including three subjects (Educational Psychology, English and Biology) in 2016-2017 Academic Year developed by the researcher. In the analysis of data, descriptive statistics, independent sample t-test, one-way ANOVA, Pearson's correlation technique and stepwise multiple regression analysis were used in this study. According to the results of regression analyses, it can be concluded that both mental well-being and three subscales of adjustment styles inventory: appraisal-focused, problem-focused and emotional-focused were also significant predictive of academic achievement of student-teachers. To sum up, the student-teachers who are in good state of mental well-being and able to adjust difficulties in their life are active in academic activities and achieve well in their student life in universities of education.

Keywords: mental well-being, adjustment styles, appraisal-focused, emotional-focused, problem-focused, academic achievement

Introduction

Mental conditions of both teacher and students play an important role in performing effective teaching learning activities. If the teachers and students are in good state of mental well-being, they can carry out academic and school programs without any difficulties. Mental well-being gives us a unified identity, satisfaction, happiness, love, respect, positive attitude, inner peace and direction to individual life. People with good mental well-being can make good decisions, form positive relationship with others and feel connected and supported. Mental well-being is a variable that is related to academic performance of students. People who have a good state of mental well-being are active in academic performance and achieved well.

Adjustment can be defined as a process of altering one's behavior to reach a harmonious relationship with their environment. As people are different from each another, they use different styles of adjustment in their daily experiences, physical environment and interactions with others. The adjustment styles of the individual play a decisive role in his total development. Students face new challenges to adjust to the new environment, new teachers, new academic teachers and the need to try to be able to adapt with the new and diverse group of other students from different cultural backgrounds. The students have to use various types of adjustment styles to overcome learning problems, instructional difficulties and to make satisfactory progress in exploratory experiences.

Academic achievement is the educational process carried out by students, teacher or institution over a certain period. It is one of the most important indicators in educational

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assessment and educational system. Academic systems are similar across cultures, but not completely identical, which forces students to change once they enter into a new academic system. Ridley (2004) pointed out that the courses of academic disciplines in higher education can be confusing and mysterious for those who are new to university life. As the students who have completed their basic education enter the higher education system, they need to adjust their behaviors, thoughts and feeling to be adaptable with new environment, academic subjects and classmates.

Purpose of the Study

The main purpose of the study was to study the relationship between mental well-being, adjustment styles and academic achievement of the student-teachers in universities of education.

Specific Objectives

- To investigate the mental well-being of student-teachers in universities of education.
- To study the adjustment styles of the student-teachers in universities of education.
- To examine the academic achievement of student-teachers in universities of education.

Scope

The study was geographically restricted to Yangon Region and Sagaing Region.

Definition of the Key Terms

Mental Well-being: Mental Well-being is defined as a state of being comfortable, healthy or happy in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully and is able to make a contribution to his or her community. ([http:// www.who.int/features/factfiles/mental](http://www.who.int/features/factfiles/mental)).

Adjustment: Adjustment is the outcome of the individual's attempts to deal with the stress and meet his needs, also his efforts to maintain harmonious relationships with the environment (Coleman, J. C, 1983).

Academic Achievement: Academic achievement becomes the corner stone of the developmental path of education and really, it becomes a strong determinant of effective teaching (Adval, S. B, 1952).

Review of Related Literature

According to World Health Organization (2001), an individual who has good mental health is able to realize his or her own abilities, cope with stress of everyday living, work productively and contribute to the community where he lives. Good mental health protects and helps us to avoid risk-taking behaviors that contribute to poor mental health (Moodie & Jenkins, 2005; NeLMH, 2004). Well-being is a positive outcome that is meaningful for people and generally includes global judgments of life satisfaction and feelings ranging from depression to joy.

The well-being of university students is an important research endeavor. Experiencing high levels of well-being is considered to be a central criterion of positive mental health. In addition to this, well-being has been found not only to be an outcome of favorable life circumstances such as academic success and satisfying relationships but also a predictor and part cause of these outcomes (Lyubomirsky, 2005). Mental well-being is beneficial for adults to live a

healthy life, making it an important aspect of one's life in the college years (Molina, Garcia, Castillo & Queral, 2011). Life dissatisfaction or even suicidal behaviours have also been documented in students who have a lack of support and poor well-being of one's self (Chao, 2012). The years that someone spends in colleges or universities are often one of the most stressful periods especially the beginning of the academic year and the transition from childhood to adulthood (Burris, Brechting, Carlson & Salsman, 2009). Well-being and adjustment to college or university was associated with incoming student's individuation from parents (Yelle, Kenyon & Koerner, 2009).

Successful adjustment to school largely depends on past experiences at home and on children's skills and knowledge (Fregussion, 2000). Adjustment to schooling is the interaction of the child personal and their experiences that ultimately determines how a child adjusts to school. A well-adjusted child is one who does not get affected adversely by the interactions such as conflicts, emotions etc., and whose personality development goes through a healthy course of socialization (Sangeeta et al., 2012). College adjustment reflects on how much an individual achieves through it and its effect on his personal growth (Arkoff, 1968). The college students of low socio-economic status and low academic achievement have more adjustment problems than the students of high socio-economic status and high academic achievement (Sangeeta & Chirag, 2012). Students of private schools are better adjusted than students of government schools (Surekha, 2008). Children of low socio-economic families are at risk from a variety of adjustment problems (Fregussion & Woodward, 2000).

Effective teachers have a good command of their subject matter and have a better academic performance. Without conceptual competencies, a teacher can never create a strong basement of academic development in his students. Academic achievement becomes the corner stone of the developmental path of education and really, it becomes a strong determinant of effective teaching (Adval, S. B, 1952).

Methodology

Sampling

A total of 474 third year to fifth year student-teachers participated in this study. The selected sample of third year to fifth year student-teachers for this study is described in the following table.

Table 1. Numbers of Participated Student-Teachers and Selected Universities

University	Year	Students Numbers		Total
		Male	Female	
University of Education (Yangon)	Third Year	34	47	81
	Fourth Year	20	81	101
	Fifth Year	16	50	66
University of Education (Sagaing)	Third Year	36	47	83
	Fourth Year	17	50	67
	Fifth Year	24	52	76
Total		147	327	474

Research Method

In this study, descriptive survey design was used.

Research Instrumentation

Warwick-Edinburgh Mental Well-being Scale (WEMWBS, 2005) was used to measure the mental well-being state of student-teachers. Participants rated 14 items relating to their mental well-being conditions on a 5-point Likert scale.

Adjustment Styles Inventory developed by Kumar (1998), Reddy (1990) and Srinivas (1999) was used to measure student-teachers' various adjustment styles. Participants rated 40 items on a 5-point Likert scale.

Students' academic achievement was described in terms of scores obtained from an achievement test on three subjects viz. Educational Psychology, English and Biology developed by the researcher. Moreover, as demographic data, gender and year were also assessed. Data were collected through self-reported survey questionnaire.

Pilot study was done with a sample of 60 student-teachers from third year, fourth year and final year from Yangon University of Education in the second week of December 2016 to test whether the wording of items, statements and instructions had their clarity in Myanmar version and were appropriate and relevant. After conducting the pilot study, the internal consistency (Cronbach α) of mental well-being questionnaire is 0.813 and adjustment styles inventory is 0.787. The participants from Yangon University of Education and Sagaing University of Education were distributed the self-reported survey questionnaire and achievement test in January, 2017.

Data Analysis and Findings

1. Mental Well-being Level of Student-teachers from Selected Universities

Descriptive analyses revealed that the mean and standard deviation of mental well-being of all participants were 74.12 and 8.55 respectively. Based on the descriptive analysis of mental well-being questionnaire, student-teachers in this study could be identified into three groups: 13% of students were in the high, 74% were in the moderate and 13% were in the low group. The finding showed that the mental well-being conditions of student-teachers was satisfactory.

2. Student-teachers' Adjustment Styles from Selected Universities

To investigate all the students' adjustment styles, descriptive statistics was carried out and the results showed that the mean scores for student-teachers' problem-focused adjustment style was the highest in all adjustment styles. It was clearly seen that the sample students reported having relatively high use of problem focused adjustment styles. They also used fairly high level of emotional focused adjustment styles, but low levels of appraisal focused adjustment styles.

3. Comparison of Mental Well-being and Adjustment Styles by Gender

Descriptive analyses showed that mean scores of mental well-being and adjustment styles for boys are greater than those of girls. The result of t test stated that there was no gender difference in mental well-being of student-teachers. Moreover, the results of t-test stated that there was gender difference in the adjustment styles of student-teachers. This meant that male student-teachers can easily adjust and solve the problems they are facing.

Table 2. Comparison of Mental Well-being and Adjustment Styles by Gender

Variable	<i>t</i>	<i>df</i>	<i>p</i>	Mean	Mean Difference
Mental Well-being	1.653	472	0.099	75.18 (M)	1.40
				73.78 (F)	
Adjustment Styles	4.195***	472	0.000	58.31 (M)	3.59
				54.71 (F)	

***The mean difference is significant at 0.001 level.

4. Comparison of each subscale of Adjustment Styles by Gender

Descriptive analyses on each subscale of adjustment styles revealed that regarding adjustment styles, except appraisal focused, boys reported to have greater level of the remaining adjustment styles: viz. problem focused and emotional focused. The results of t test confirmed that significant difference by gender exists in problem focused adjustment style and emotional focused adjustment style at 0.001 level. In general, males could control their mental state when they face difficulties in their life and also be able to overcome, control, solve and easily adjust to particular problems. This fact might be the reason why boys reported greater level of mental well-being and adjustment styles than girls.

Table 3. Comparison of each subscale of Adjustment Styles by Gender

Subscales of Adjustment Styles	<i>t</i>	<i>df</i>	<i>p</i>	Mean	Mean difference
Appraisal focused	1.459	472	0.145	48.30 (M)	2.103
				46.20 (F)	
Problem focused	4.200***	472	0.000	67.12 (M)	4.349
				62.77 (F)	
Emotional focused	3.448***	472	0.001	54.52 (M)	3.386
				51.54 (F)	

***The mean difference is significant at 0.001 level.

5. Comparison of Mental Well-being and Adjustment Styles by Universities

In addition, it was necessary to observe whether student-teachers have significant differences in mental well-being and adjustment styles with respect to university, descriptive statistics was computed. Then, independent sample t-test was computed to investigate whether there were any significant differences in mental well-being and adjustment styles by universities. The results of t test stated that there was no significant difference between Yangon University of Education and Sagaing University of Education for both mental well-being and adjustment styles of student-teachers.

6. Comparison of Mental Well-being and Adjustment Styles by Grade

In addition, it was necessary to observe whether student-teachers have significant differences in mental well-being and adjustment styles with respect to grade, descriptive statistics was computed. Then, ANOVA was computed to investigate whether there were any significant differences in mental well-being and adjustment styles of student-teachers by grade or not.

Table 4. Comparison of Mental Well-being and Adjustment Styles by Grade

Variable	Grade	N	Mean	SD	F	p
Mental Well-being	3 rd year	164	76.12	8.70	8.887**	.000
	4 th year	168	72.24	8.87		
	5 th year	142	74.35	7.46		
Adjustment Styles	3 rd year	164	55.99	8.56	9.837***	.000
	4 th year	168	53.75	7.19		
	5 th year	142	58.10	10.11		

The results showed that mental well-being condition of third year student-teachers was highest among the other grades. However, the adjustment styles of fifth year students were the higher than the others. This meant that fifth-year student-teachers can be able to adjust well as they are familiar with the learning environment for a long time.

Again, post-hoc comparison was computed using Tukey HSD test to find out the differences which particular class level had greatest differences in mental well-being.

Table 5. Results of Tukey HSD Multiple Comparisons for Mental Well-being of Student teachers by Grade

Variable	I (Grade)	J (Grade)	(I-J) Mean Difference	p
Mental Well-being	Third year	Fourth year	3.887***	0.000
		Fifth year	1.778	0.157

***The mean difference is significant at 0.001 level.

It was observed that mental well-being of third year student-teachers was significantly different from that of fourth year student-teachers. There was no significant difference between mental well-being of third year and fifth year student-teachers. Thus, it could be interpreted that mental well-being of student-teachers was different by Grade.

There was a significant difference in student-teachers' adjustment styles by Grade at 0.001 level. So, to find out which subscales have significant difference, ANOVA was carried out again for each subscale of adjustment styles.

Table 6. Comparison of Each Subscale of Adjustment Styles by Grade

Subscales of Adjustment Styles		Mean Square	F	p
Appraisal Focused	Between Group	1741.224	8.509***	.000
	Within Group	204.630		
Problem Focused	Between Group	1101.026	10.164***	.000
	Within Group	108.325		
Emotional Focused	Between Group	507.582	5.162**	.006
	Within Group	98.335		

Note: **The mean difference is significant at 0.01 level.

***The mean difference is significant at 0.001 level.

To find out which particular class level had greater difference, Tukey HSD post hoc test was conducted. Likewise, there were also significant differences depending upon appraisal-focused, problem-focused and emotional-focused subscales of third year, fourth year and fifth year.

Table 7. Results of Tukey HSD Multiple Comparisons for Adjustment Styles of Student-teachers by Grade

Variable	I (Class Level)	J (Class Level)	(I-J) Mean Difference	<i>p</i>
Appraisal Focused	Fifth year	Third year	4.996**	0.007
		Fourth year	6.498***	0.000
Problem Focused	Fourth year	Third year	- 4.042**	0.001
		Fifth year	- 4.914***	0.000
Emotional Focused	Fifth year	Fourth year	3.598**	0.004

Note: ***The mean difference is significant at 0.001 level.

**The mean difference is significant at 0.01 level.

7. Relationship between Student-teachers' Mental Well-being, Adjustment Styles and Academic Achievement

To examine the relationship between mental well-being, adjustment styles and academic achievement of student-teachers, it was calculated correlations.

Table 8. Correlation Among Mental Well-being, Adjustment Styles Factors and Academic Achievement

Variables	MW (total)	AS (total)	AF	PF	EF	Academic Achievement
MW (total)	1	.387**	.59	.547**	.233**	.391*
AS (total)		1	.488**	.801**	.926**	.342*
Subscales						
AF			1	.181**	.393**	.433*
PF				1	.555**	.291*
EF					1	-.160*

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

MW = Mental Well-being, AS = Adjustment Styles, AF = Appraisal-focused, PF = Problem-focused, EF = Emotional-focused

The results showed that mental well-being and overall adjustment styles were significantly inter-correlated. In addition, the results of bivariate correlations showed that mental well-being factors and adjustment styles factors were significantly correlated with academic achievement. Particularly, overall mental well-being and academic achievement were significantly correlated, ($r = 0.391$, $p < 0.05$), and also adjustment styles and academic achievement were significantly correlated ($r = 0.342$, $p < 0.05$). Therefore, it can be assumed that

student-teachers who adjust their difficulties by emotions usually get negative results in academic achievement.

8. Regression Analysis for Predictive Power of Adjustment Styles on Mental Well-being

To make more detailed investigation, further detail analyses and computations were undertaken by using regression analyses. The standard multiple regression analysis was conducted to predict the predictive power of adjustment styles on mental well-being of student-teachers.

Table 9. Regression Analysis for Predictive Power of Adjustment Styles on Mental Well-being

Variables	B	β	t	R	R^2	Adjusted R^2	F
Mental Well-being	47.722		21.728	0.553	0.306	0.302	69.069
Predicator Variables							
Appraisal-focused	-0.007	-0.012	-2.88				
Problem-focused	0.486	0.602***	13.021				
Emotional-focused	-0.083	-0.097*	-1.953				

Note: $R^2 = 0.306$, $F(3, 470) = 69.069$, *** $p < .001$, * $p < .05$

The results of standard multiple regression analysis pointed out $R^2 = 0.306$, $F(3, 470) = 69.069$ and $p < 0.001$. The adjusted R^2 value was 0.302 which means 30% of the variance in mental well-being can be explained. It was found that problem-focused adjustment styles were significant positive predictors and emotional focused adjustment styles were significant negative predictors of mental well-being of student-teachers. Figure 1 was drawn based on the findings of the multiple regression analysis which described how adjustment styles significantly affecting mental well-being.

The model can be explained by the following equation:

$$\text{Mental Well-being} = 47.722 + 0.486\text{PF} - 0.083\text{EF}$$

Where, PF = Problem-focused

EF = Emotional-focused

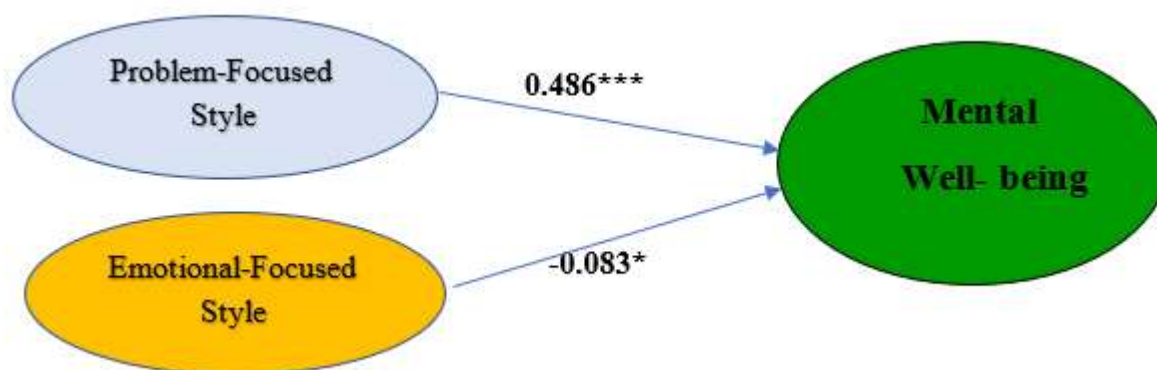


Figure 1. Predictive Powers of Adjustment Styles on Mental Well-being

9. Impact of Mental Well-being on Academic Achievement of Student-teachers

Multiple regression was conducted to predict the best predictor of student-teachers' academic achievement.

Table 10. Multiple Regression Analysis Summary for Mental Well-being and Academic Achievement

Variables	B	β	<i>t</i>	<i>R</i>	<i>R</i> ²	<i>Adj R</i> ²	<i>F</i>
Constant	64.058		19.685***	0.291	0.084	0.082	21.846*
Mental Well-being	.431	.228*	3.911*				

$R^2 = 0.082$, $F(1, 472) = 17.846$, $*p < .05$, $***p < .001$

$$\text{Academic Achievement} = 64.508 + 0.431\text{MW}$$

where, MW = Mental Well-being

From these results, we can interpret that the students who are in good state of mental well-being may lead to high achievement in their academic subjects. The adjusted R-square was 0.082. This indicated that approximately 8.2% of the variance in academic achievement was explained by this model.

10. Impact of Adjustment Styles on Academic Achievement of Student-teachers

To test the predictive contributions of the set of adjustment styles factors to academic achievement, the multiple regression analysis was conducted.

Table 11. Multiple Regression Analysis Summary for Adjustment Styles and Academic Achievement

Variables	B	β	<i>t</i>	<i>R</i>	<i>R</i> ²	<i>Adj R</i> ²	<i>F</i>
Constant	60.015		24.031***	.279	.078	.074	17.983*
Predictor Variables							
Appraisal focused	.452	.183*	2.597*				
Problem focused	.268	.336*	6.041*				
Emotional focused	-.283	-.314*	-5.743*				

$R^2 = 0.074$, $F(3, 470) = 21.983$, $***p < 0.001$, $*p < 0.05$

The results showed that emotional-focused adjustment style was a significant predictor of academic achievement ($\beta = -0.314$, $p < 0.05$), in negative position, and followed by problem-focused adjustment style ($\beta = 0.336$, $p < 0.05$) and appraisal-focused adjustment style ($\beta = 0.183$, $p < 0.05$) (see Table 10). This means that student-teachers who often apply emotional-focused adjustment style in solving their academic difficulties and daily life problems may not be able to perform well in their academic subjects and get low level of academic achievement. These student-teachers may emphasize only their mental condition and may not care about good grade or marks in their academic subjects. The adjusted R-square was 0.074. This means that approximately 7.4% of the variance in academic achievement was explained by the model. The visual presentation of how adjustment styles factors significantly contributing academic achievement of student-teachers in the current study can be seen in figure 2.

$$\text{Academic Achievement} = 60.015 + 0.452\text{AF} + 0.268\text{PF} - 0.283\text{EF}$$

Where, AF = Appraisal-focused

PF = Problem-focused

EF = Emotional-focused

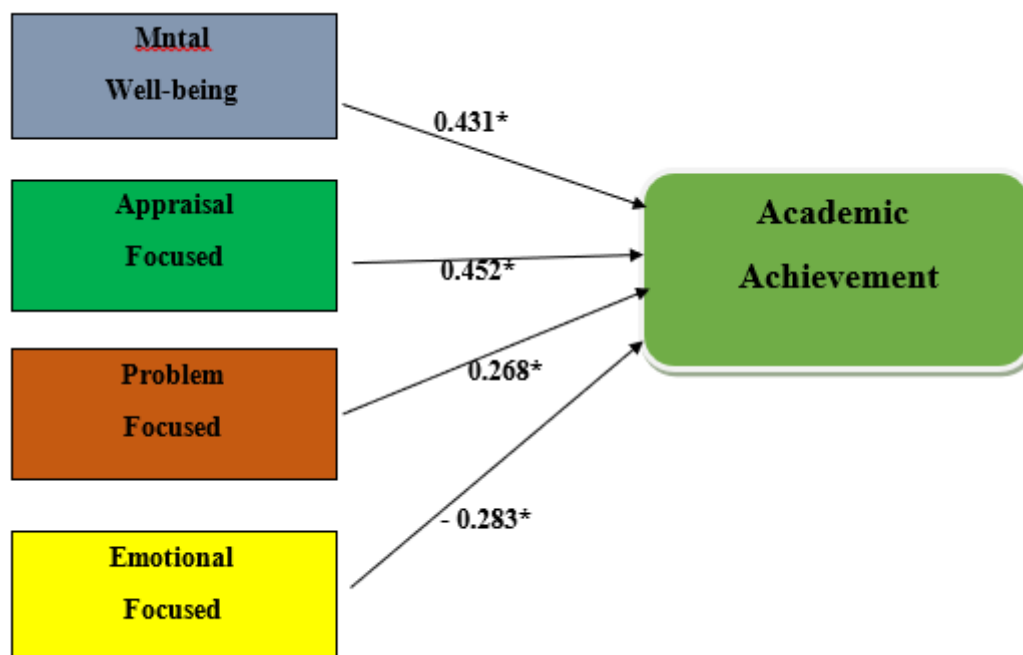


Figure 2. Predictive Power of Mental Well-being and Adjustment Styles on Academic Achievement

Conclusion

In this study, the results showed that the student-teachers from the selected universities were fairly in high level of mental well-being. There was no significant difference in mental well-being by gender. Among the three subscales of adjustment styles, significant gender differences were found in problem-focused and emotional focused adjustment styles. Male Student teachers can be more able to overcome, control, solve and easily adjust to the particular problems in their student life. There were no significant differences in both mental well-being and each subscale of adjustment styles between Yangon University of Education and Sagaing University of Education.

The result of ANOVA explored that there were significant differences in both mental well-being and adjustment styles among third year, fourth year and fifth year student-teachers. These finding showed that the mental well-being conditions of third year student-teachers are higher than fourth year and fifth year student-teachers. Moreover, it was found that there were also significant grade differences in each subscale of adjustment styles. According to the results, the fifth-year student-teachers can be able to adjust well as they are familiar with the learning environment for a long time.

The results of Pearson-product-moment correlations indicated that there were significant positive relationships between mental well-being and overall adjustment styles and academic achievement. To be exact, two subscales of adjustment styles (appraisal-focused and problem-

focused) have significant positive correlation with academic achievement of student-teachers but emotional-focused has significant negative correlation with academic achievement. More specifically, mental well-being was significant predictive of academic achievement and three subscales of adjustment styles inventory: appraisal-focused, problem-focused and emotional-focused were also predictive of academic achievement of student-teachers.

Thus, the results of this study provide the fact that the student-teachers who are in good state of mental well-being and able to adjust difficulties in their life are active in academic activities, achieve well in their student life in universities of education and can be able perform effective teaching-learning activities and communicate with their administrators, colleagues, parents and pupils in future professional field.

Suggestions of the study

The sample used in this study is only from third year, fourth year and fifth year student-teachers. To make more representative, all student-teachers from universities of education should be participated. As a result, the mental well-being plays an important role in predicting adjustment styles of student-teachers. Therefore, qualitative research such as interview with participants who were in low level of mental well-being should be conducted in order to investigate the causes of these mental health difficulties. Educators need to ask the students about their problems such as learning difficulties, home sickness and social difficulties etc., in order to improve their mental well-being and discuss how to overcome these problems to adjust in current learning environment year by year. Findings from such research may provide valuable guidance for those who are engaged in developing and operating programs to promote mental well-being of student-teachers.

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THE DEVELOPMENT OF CREAIVITY SCALE FOR PROSPECTIVE TEACHERS

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Abstract

The purpose of this study is to develop a self-report creativity scale by conducting survey method of prospective teachers. Participants were 726 prospective teachers from twenty educational degree colleges in this study. Based on many empirical studies, creativity measures indicated many problems and limitations. The creativity measure is based on the Khatena Torrance Creative Perception Inventory (KTCPI) and other creativity self-report instruments. After exploratory factor analysis and confirmatory factor analysis, four factors appear (1) Sensation of Environmental conditions (2) Self-belief (3) Imagination (4) Willingness and curiosity. Insights gained from this study enables adult educators to improve existing learning situations as well as develop new, more effective programs for student teachers.

Keywords: Creativity, Prospective Teachers, Imagination

Introduction

In today knowledge-based economy, creativity plays an important role in obtaining global competitive advantage because it is the manifestation of wisdom and knowledge of the human brain, which can transform creativity into economic value and offer people and organizations a sustained competitive advantage. Thus, creativity is also deemed an invaluable asset of the human brain, a necessary human resource in the 21st century, and a powerful means to improve the quality of life (Williamson, 2001). Teachers have always played a crucial role in preparing communities and societies and exploring development. They are the prime agents of change. The Government and the community should endeavor to create conditions which will motivate and inspire teachers on creativity. The greatest joy and the greatest hope for better world lie in the cultivation of creative power of the teacher. Primary education occupies the most important place in the ladder of education. Education Degree College of primary level which are called as Diploma of Teacher Educator (DTEd) play an important role in producing quality teachers for primary schools.

Education Degree Colleges have a policy about the quality of its graduates. Its vision is to be a leader in education, proficient teachers and education personnel, and promote research into local development. Thus, the aim is to enhance the quality of student teachers and society so that they have the potential to compete both nationally and internationally. Its mission is to produce teacher educators with knowledge and of sound morality. The creativity of student teacher is an important feature that will strengthen the community in its work and benefit local development.

Purpose of the Study

The main purpose of this study is to develop the creativity scale of measuring prospective teachers.

Definition of Key Terms

Creativity: Guilford defined creativity in terms of two criteria: originality (or novelty) and appropriateness, i.e., relevance to the task at hand, and this two-criterion definition become standard (e.g., Amabile, 1996; Feldman, Csikszentnuhalyi & Gardner, 1994; Runco, 2014; Sternberg, 1985).

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Prospective Teacher: Student teacher candidates with the knowledge, attitudes, behaviors and skills they require to perform their tasks effectively in the classroom, school, and wider community. (Operational definition)

Imagination: Imagination generally refers to the ability to mentally represent that is not physical presented. (Operational definition)

Review of Related Literature

Creativity is a highly complex and diffused construct (Sternberg, 1985) and hence, there is a lack of general consensus in defining creative behavior. A conceptual definition of creativity is presented by Guilford (1967). He proposed divergent thinking perspective to comprise of four dimensions: (a) fluency reflecting individual ability to generate numerous ideas, (b) flexibility reflecting the ability to generate ideas with a much broader range, (c) originality reflecting the ability to generate novel idea(s), and, (d) elaboration reflecting the ability to develop ideas further giving more meaning, depth, and strength (Mathew, 2001).

Creativity and creative behavior are not a homogeneous psychological attribute. Creativity and creative behavior are the result of complex interaction between varying characteristics and attributes of the individual and the environment (Mumford & Gustafson, 1988). According to these authors, creativity comprises of the following elements: (a) the underlying phenomena and inherent ability of the individual to generate new ideas, (b) the characteristics of the individual to help facilitate the process operation, (c) the qualities and abilities of the individual to transform ideas into implementation, (d) motivational factors encouraging the individual to be creative, and (e) the attributes of the work environment by providing feedback for individual effort. Creativity was defined by Amabile (1983, 1996) as comprising of essential elements of novelty, appropriateness, and usefulness. Creativity is often assessed against the immediate context or work situation. Creativity is defined as the generation of new ideas, and innovation as the translation of these ideas into action (Mumford & Gustafson, 1988). These situations demand ideas or responses or solutions much more than routine or mundane standard actions typically deemed appropriate given their powerful influence on organizational performance (Arad, Hanson & Schneider, 1997). Amabile (1996) also posited that the context or task needed to possess a heuristic rather than algorithmic dimension. Given the nature of the context, creative activities entail identifying the problem in heuristic contexts. Historically within the work context, creativity has been viewed as an individual phenomenon that interacts with barriers of cognitive abilities, attribution biases, social and contextual factors (Mathew, 2001).

Researchers and educators have used tests of the thinking. In this category, the Torrance Tests of Creative Thinking (TTCT) attempt to evaluate cognitive abilities of creative by measuring divergency (Davis, 1989). The TTCT has been extensively evaluated. Torrance (1975) analyzed TTCT research and concluded that there was evidence of a linkage between performance on the test and real-life achievement. A second category of tests is the personality/biographical inventory, such as the Khetena Torrance Creative Perception Inventory (KTCPI), which examines attitudes, motivations, interests, and histories of creative activity. The KTCPI has also been used widely to identify creative individuals in school and college settings. According to Khetena and Torrance (1998), it may be used as a diagnostic tool to encourage creative thinking and creative behavior. The KTCPI will be used in this research because it has been used extensively in previous research and was specifically designed to measure creative self-perception. There is considerable support for using the KTCPI in measuring creativity, particularly among college-age individuals. There is widespread agreement that psychologists can get a reasonable estimate of creative potential through creativity testing (Gardner & Wolf, 1994). There are some limitations to using the KTCPI in research. As these critiques of the

KTCPI remind researchers, many mental operations such as cognition, memory, convergent thinking, evaluation, and problem solving play a role in creative thinking.

Torrance himself contends that the weakest link in shaping education toward creative growth and accomplishment is the lack of appropriate instruments for assessment. A review of creativity measures indicate problems and limitations concerning creative process assessments. Based on the results of past research, the purpose of the current study was centered on creating a self-report scale to assess the use of various cognitive processes associated with creativity. The scale was constructed in such a way as to address creative processes in more general “real world” situations, rather than the more specific and arbitrary tasks contained in many divergent thinking measures. This study will help to measure the psychometrics tradition of creativity as a step toward improving the creativity scale development.

Method

This study is cross-sectional in nature and descriptive survey method.

Participants of the Study

Participants of this study were first year students from Education Degree College in the academic year of 2019-2020. Female were 62.19% and the rest are the males. There are fourteen Regions and States in Myanmar. In this study, 212 participants were from Mandalay Region, 39 from Yangon, 25 were from Bago, 30 were from Magway, 132 were Sagaing, and 76 were from Ayeyarwady Region. According to the State, 141 participants were from Shan State, 20 from Kayar State, 4 from Mon State, 11 from Chin State, 13 from Kayin State, 23 from Rakhine State.

Data Collection Procedures

The random sampling method was used in this study. Data for this study was collected entirely online using Google forms. Participants in this study were given access to the web address, and after giving informed consent completed the battery of measures in one testing session. Once response has been submitted, participants were linked to a page with debriefing information. This survey was conducted over a period of one month in October, 2020.

Instruments

According to Garfield, Taylor, Dennis and Satzinger (2001 as cited in Naude, 2005), it is now the time to adjust our research paradigms, and to start from scratch in understanding and investigating the role of individual differences in the design, enhancement and use of information systems. By realizing the role of individual traits in the creative process, systems can be put in place for the broad incorporation of tools for the enhancement of individual characteristics (Naude, 2005). The three instruments used for this study were either adopted, adapted or designed by the researcher. The descriptions of these instruments are as follows.

The Khetena- Torrance Creative Perception Inventory (KTCPI)

In this study, the first instrument used was the Khetena-Torrance Creative Perception (KTCPI). This is an autobiographical measure/ test entitled “Something About Myself” (SAM). This measure is based on the rationale that the personality characteristics of an individual, the thinking strategies he employs, and the products that emerge as a result of creative striving will reflect creativity (Khetena, 1977).

SAM is made up of 50 items, which can be easily administered and interpreted. It presents statements to which participants are required to respond with the expectation that the responses will reflect the extent to which they tend to function in creative ways. SAM yields 6 factors or creative orientations (Khatena, 1973). These orientations are Environmental

Sensitivity, Initiative, Self-Strength, Intellectuality, Individuality, and Artistry. The KTCPI can be used with adolescents or adult participants. The KTCPI questionnaires used a 5-point Likert scales ranging from strongly disagree= 1, to strongly agree= 5.

Cognitive Processes Associated with Creativity (CPAC)

As mentioned above, creativity was influenced by cognitive processes, external factors and personality. Cognitive Processes Associated with Creativity (CPAC) was used for this study. CPAC is developed by Miller, 2005. It includes 47 items. It is divided into six components: Incubation, Perspective-taking, Metaphorical and Analogical Thinking, Brainstorming, Imagery, and Flow. This instrument is used for undergraduate students. It is a 5 point Likert Scales ranging from strongly disagree=1 to strongly agree= 5.

Creativity Questionnaire (Fields and Bisschoff, 2014)

Torrance Test of Creative Thinking (TTCT) is the most popular test in educational setting. It is the most recommended test in educational field and can be administered as an individual or group test from kindergarten level to graduate level and beyond. It is also the most referenced of all creativity tests (Kim, 2006). Torrance (1990 as cited in Kim, 2006) identified creative strengths in his TTCT assessments, “emotional expressiveness, storytelling articulateness, movement or action, expressiveness of titles of lines or circles, unusual visualization, internal visualization, extending or breaking boundaries, humour, richness of imagery, colourfulness of imagery and fantasy”. The main focus of TTCT was to understand and nurture qualities that help people express their creativity (Kim, 2006).

Kleiman (2008 as cited in Fields and Bisschoff, 2014) developed a conceptual map of creativity in teaching and learning which was created from Phenomenography. Phenomenography focuses on the different number of ways in which individuals “experience, perceive, apprehend, understand and conceptualizes various phenomena (Tan and Prosser, 2004 as cited in Fields and Bisschoff, 2014). The research is still emergent and requires further analysis, but it offers helpful clues regarding creativity in the context of learning and teaching.

The Educational Model for Creative development (PECE) was developed by the institute of Creativity and Educational Innovations (INCEI) at the University of Valencia. The model adopts the approach that creativity can be taught and is an acquired skill. The model is related to the individual (development of creative and entrepreneurship spirit), to the process (of innovation), to the product, and to the context. The model assumes that creativity involves a set of attributes (like self-confidence, desire for achievement, sensitivity) and thinking skills (like fluency, mental flexibility, imagination). The model can be used to teach creativity and measure the educational quality of creativity. As this model, there is a lack of one specific valid and reliable test that can be used to measure creativity at undergraduate educational level, Fields and Bisschoff developed the Creativity Questionnaire in 2014. It includes 34 items and its factors are challenging the Status quo, detachment, Synthesis, cognition, associate and communicate, awareness, similarity, external motivation, sensitivity, experiment and combine, dimensional thinking and problem-solving. This instrument is used for undergraduate students. It is a 5 point Likert Scale ranging from strongly disagree to strongly agree.

Findings

Exploratory factor analysis (EFA) is a classical formal measurement model that is used when both observed and latent variables are assumed to be measured at the interval level (Fontaine, 2005). EFA was used to uncover the underlying structure of a relatively large set of creativity measures.

Principal axis factor analysis with varimax rotation was conducted to assess the underlying structure for the ninety eight items of the creativity questionnaires was examined in Table 1.

Table 1 KMO and Barlett's Test

Kaiser_Meyer_Olkin Measure of Sampling Adequacy		.927
Approx. Chi –Square		14442.57
Barlett's Test of Sphericity	<i>df</i>	4753
	<i>Sig</i>	.000

The Kaiser_Meyer_Olkin (KMO) measure are greater than 0.70 and is inadequate if less than 0.50. The KMO test tells one whether or not enough items are predicted by each factor. The Barlett test is significant ($p < 0.5$); this means that the variables are correlated highly enough to provide a reasonable basis for factor analysis of creativity.

Principal axis factor analysis with varimax rotation was conducted to assess the underlying structure for the 98 items of creativity. At first, six factors such environmental sensitivity, self-strength, intellectuality, individuality, curiosity and artistry were requested. Using varimax rotation means that the final factors will be as uncorrelated as possible with each other. As a result, the information explained by one factor is independent of the information in the other factors.

Throughout this analysis, items with initial values of less than 0.4 and those without loadings were discarded. After doing several steps, 36 items out of 98 items were eliminated because they had low or no loadings with any other factors. By taking out 36 items, the communalities were all above 0.4; it indicated that the relation between each item and other items is satisfactory. Given these overall indicators, factor analysis was conducted with 62 items.

After extraction, some of the factors were retained, and some were dismissed. After rotation, the first factor accounted for 17.024% of the variance, the second factor accounted for 9.427% of the variance, the third factor accounted for 5.326% of the variance and the fourth factor accounted for 3.932% of the variance.

Examination of the scree plot was shown in Figure1. The first factor was much larger than subsequent factors in terms of eigenvalue magnitude; eigenvalue of successive factors drop off quite drastically. Four factors were retained within the sharp descent, before eigenvalue level off. Based on the plot, it appears only four factors should be interpreted.

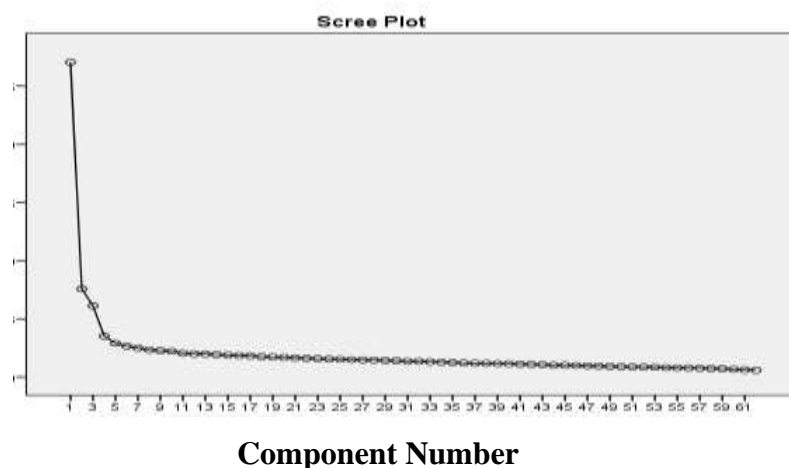


Figure 1 Scree Plot of Eigenvalues for Items of the Creativity Scale

Each factor was named according to the construct of the items.

Table 2 Factor Loadings

	Component			
	1	2	3	4
item 91	.703			
item78	.692			
item42	.676			
item63	.647			
item97	.620			
item56	.617			
item37	.593			
item80	.576			
item87	.572			
item94	.569			
item89	.567			
item2	.545			
item41	.542			
item84	.539			
item93	.538			
item25	.535			
item8	.529			
item6	.529			
item38	.515			
item58	.507			
item55	.504			
item95	.500			
item75	.491			
item3	.474			
item16	.465			
item92	.462			
item26	.462			
item44	.458			
item7	.458			
item81	.434			

	Component			
	1	2	3	4
item21	.414			
item53	.413			
item83	.401			
item32		.625		
item65		.581		
item31		.560		
item18		.553		
item49		.540		
item51		.539		
item36		.525		
item52		.504		
item35		.463		
item30		.462		
item61		.459		
item33		.454		
item60		.453		
item47		.450		
item9		.428		
item22		.404		
item68			.650	
item73			.620	
item72			.597	
item71			.588	
item86			.579	
item77			.549	
item40			.535	
item79			.427	
item88				.650
item70				.643
item54				.617
item90				.545
item59				.424

Factor 1 was named as sensation of environmental conditions because a person who is open to other's ideas and related ideas to what can be seen, touched or heard and is sensitive to meaningful ideas. It contains 33 items and factor loadings are from 0.401 to 0.703. Second factor was named as self-belief according to the structure of the items as a person who has self-confidence in matching talents against other and resourceful, versatile, willing to take risks, desires to excel and organizational ability. It contains 18 items and factor loadings are from 0.404 to 0.625.

Factor 3 was named as imagination. This type of person has intellectual curiosity, imagination and enjoys challenging tasks dislikes doing things in a prescribed routine. It contains 8 items and factor loadings are from 0.427 to 0.650. Factor 4 was named as willingness and curiosity and factor loadings are from 0.424 to 0.650.

Confirmatory Factor Analysis on Creativity

Confirmatory factor analysis (CFA) is a statistical technique used to verify the factor structure of a set of observed variables. In this study, CFA is used to test the hypothesis that a relationship between observed variables and their underlying latent constructs exists. The data of fit the models of creativity was examined in Table 3.

Table 3 Goodness of Fit Indices for Proposed and Final Model of Creativity Questionnaire

Fit Index	Proposed	Final
RMSEA	0.044	0.042
CFI	0.805	0.921
TLI	0.798	0.901
IFI	0.806	0.917
CMIN/DF	2.391	1.984

Based on the Table, CFI and TLI did not reach the adequate value. So, the model was re-specified. According to Sun (2005), it is a good to remove the items with low R^2 values (less than 0.3) from the analysis to remove the better model fit. After through the correlation of error terms, a χ^2/df ratio less than 2 or 3 and a RMSEA less than 0.08 indicate an acceptable model. For CFI and TLI a value greater than 0.9 indicate an acceptable fit and a value greater than 0.95 indicates a good fit. The model fit indices of creativity with 59 items.

Validity and Reliability of Creativity

Convergent Validity and Discriminant Validity of Creativity

Convergent validity is also an evidence to test construct validity. To establish convergent validity, composite reliability (CR) and average reliability extracted (AVE) should be used. AVE and CR values were computed by the formula using Microsoft Excel. Table 3 shows that the results of AVE and CR of creativity scale.

Table 4 Construct reliability and validity of Creativity

	CR	AVE	SEC	SB	I	W&C
Sensation of environmental conditions	0.913	0.430	0.655			
Self-belief	0.831	0.412	0.621	0.641		
Imagination	0.813	0.401	0.058	-0.06	0.633	
Willingness and curiosity	0.801	0.393	0.058	-0.066	-0.018	0.626

The AVE values for the model range from 0.393 to 0.430. The CR values range from 0.801 to 0.913. The composite reliability (CR) value is greater than the average variance extracted (AVE). According to Fornell and David (1981), the AVE should be above 0.5 and however, the value of 0.4 is acceptable if AVE value is less than 0.5, but CR is higher than 0.6. Then, the convergent validity was achieved for this construct. Therefore, the creativity scale can be assumed that it was a valid instrument to measure creativity of the prospective teachers.

For discriminant validity, it was used to show that the construct is actually differing from one another empirically. The discriminant validity was evaluated with square root of AVE with correlations of latent construct. The diagonal numbers in bold letters are the square root of AVE value was greater than all the inter-latent factor correlations for all factors in the relevant rows and columns. The square root the AVE is higher than the correlations between constructs indicating there is discriminant validity (Fung, 2016).

Reliability of Creativity

After the confirmatory factor analysis, the creativity scale consisted of four scale with 59 items. Table 5 shows that the reliability coefficient of each subscale for creativity.

Table 5 Reliability coefficient of Creativity

Factor	Cronbach's Alpha
Sensation of environmental conditions	0.912
Self-belief	0.849
Imagination	0.870
Willingness and curiosity	0.801
Total	0.812

Based on Table 5, reliability coefficient of each subscale ranged from 0.801 to 0.912 and the reliability coefficient of creativity was 0.812. Thus, the creativity scale was reliable to measure creativity of prospective teachers.

In summary, the area of creativity is neglected sometimes in the psychology. "When learning is purposeful, creativity blossoms. When creativity blossoms, thinking emanates. When thinking emanates, knowledge is fully lit. When knowledge is lit, economy flourishes". This statement reiterate the importance of learning to the creative person. From this perspective, learning is connected to the ability of creative. Also, prospective teachers are the role model of Myanmar Education. So, the development of creativity scale will be helped to achieve the Myanmar Educational Policies.

Discussions

According to the previous studies, it has been repeatedly asserted in numerous studies of creativity that those who are more creative tend to have higher levels of knowledge about the areas in which they are creative. The purpose of the Exploratory Factor Analysis and Confirmatory Factor Analysis were to develop and validate and efficient and direct measure of creativity scale.

Conclusion

This study is intended to provide more through information about the connection between the creativity and learning of the student teachers. While a wide variety of definitions, conceptualizations, and means of assessment exist within the field of research, the development of this creativity scale can contribute to the creativity literature. Additional examination of the cognitive processes of the CPAC scale is also beneficial to the usefulness of the newly developed scale. The aim of the study is to inform the creativity for college students in order to provide a precise reference for creativity-related policy improvements for the education system and to assist college students themselves toward self-evaluation for understanding and further enhancing a self-centered creative orientation. Insight gained from this study may enable adult educators to improve existing learning situations as well as develop new, more effective programs for student teachers.

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PERCEIVED SOCIAL SUPPORT AMONG PRE-SERVICE TEACHERS IN SAGAING UNIVERSITY OF EDUCATION

Khin Khin Thant¹ and Bay Lar²

Abstract

The main purpose of this study was to study perceived social support of pre-service teachers in Sagaing University of Education. The study conducted descriptive research design and quantitative survey method. The participants in this study were 360 pre-service teachers including 180 males and 180 females from Sagaing University of Education. In this study, the student's perceived social support was assessed by using Interpersonal Support Evaluation List (ISEL) Questionnaire including 4 subscales: appraisal support, tangible support, self-esteem support and belonging support. The whole scale of Interpersonal Support Evaluation List (ISEL) Questionnaire indicated satisfactory internal consistency with Cronbach's $\alpha = 0.88$. And data analysis, descriptive statistics, independent sample *t*-test were used in this study. Concerning dimensions of perceived social support, there was significant difference only in tangible support and self-esteem support by gender at $p < 0.01$ and $p < 0.05$ levels. It was found that males had higher tangible support than females whereas females had higher self-esteem support than males. Afterwards, fifth-year students had higher perceived social support than first-year students. The result highlighted that the more matured the students were, the more perceived social support they had. The *t*-test result showed that there was significant difference in tangible support and belonging support by grade at $p < 0.01$ and $p < 0.05$ levels. It may be due to the fact that as fifth-year students were aged, they can communicate with the people well and have more experiences on the social activities.

Keywords: social support, perceived social support, pre-service teachers

Introduction

Man takes birth in society and performs all activities in society. Therefore, man has been called a social culture. Man progresses and grows with operation of other persons. Thus, social operation, integration, and support are very much important for individual in their life. Social support can lead to improvement in several area of health and well-being. Social support can be described as providing of assistance or comfort to other people to help cope with a variety of problem. Social support develops strong interpersonal relationship among the people, which play significant role in practical life (Mahanta & Aggarwal, 2013; cited in Khan, 2015).

Social support such as advice and encouragement may increase the probability for students to become more prone play an active role in handling stress and problem solving, leading to high levels of life satisfaction among students. Perceived support is the subjective judgment that family and friends would provide quality assistance with future stressor. People with high perceived support believe that they can count on their family and friends to provide quality assistance during times of trouble (Gordon, 2011).

Social support is an important element in student's life. It may come from different sources such as family, friends, teachers, community, or any social groups to which one is affiliated. In early childhood, parent support seems to be most salient to develop.

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However, as children transition into middle and high school, perceptions of peer and teacher support tend to gain relative importance over parental support. Social support can come in the form of the tangible assistance provided by others when needed which includes appraisal of different situations, effective coping strategies, and emotional support (Dzulkifli & Yasin, 2009). Social support is an integral aspect of the environment and a well-known widely recognized concept associated with positive health practices that influence a person's physical and psychological well-being (Roth, 2004). In thinking more broadly, social support is an essential component of many people lives and all of the students participated in giving and receiving social support interaction every day.

Aim of the study

The main aim of the study is to investigate perceived social support of pre-service teachers in Sagaing University of Education.

The specific objectives are as follows:

1. To examine the levels of perceived social support of pre-service teachers in Sagaing University of Education.
2. To analyze perceived social support of pre-service teachers by gender.
3. To investigate perceived social support of pre-service teachers by grade.

Definitions of the Key Terms

Social Support	:	The specific actual transaction which took place between two or more people in which emotional concern, instrumental aid, information, or appraisal occurred (House & Khan, 1985).
Perceived Social Support	:	It is defined as a person's beliefs he will get support when he needs it (Day & Livingstone, 2003; cited in Barusman & Mihdar, 2014).

Review of Related Literature

Nature of Social Support

Social support is the physical and emotional comfort given to us by our family, friends, co-workers and others. Social support consists of acceptance, belonging, appraisal and coping, assistance, behavioral and cognitive guidance, modeling, tangible assistance and material aid. Social support help when coping with life stress, crisis, mental illness, physical illness, feeling of loss, loneliness, adolescent depressing, and performance related to academics. The term social supports, and related terms such as social integration and social networks, are often used interchangeably to refer to three distinct aspects of social relationships their existence or quantity, their formal structure, and their functional content or the degree to which they involve flows of affect or emotional concern, instrumental or tangible aid, information, and the like (House & Khan, 1985).

Theoretical Perspective of Social Support

Social support research should have a basis in theories about how social relationships influence our cognitions, emotions, behaviors and biology. The relationship perspective predicts that the effects of social support cannot be separated from relationship processes that often co-occur with support, such as companionship, intimacy, and low social conflict. One possibility is that cognitions about social environment are strongly interrelated and overlapping and that measures of support cannot be discriminated from closely associated concepts such as low conflict, companionship, intimacy, and social skills. Relationship satisfaction is defined as global, subjective evaluations of relationships and intimacy as the “bonded, connected, and close feelings people have toward each other” (Barerra, 1986). The mechanisms that have been proposed tend to be the same as those hypothesized to link social support concepts and include evaluating self-esteem contributing to positive appraisals, and promoting active coping with stressful events (Sarason, Sarason & Pierce, 1990).

Tardy’s Model of Social Support

Tardy (1985) proposed a comprehensive and multidimensional model of social support. In his view, social support may be conceptualized in terms of direction (i.e., given or received), disposition (i.e., available or actually utilized), description and evaluation (where description refers to qualitative aspects of support and evaluation refers to satisfaction with support), content (i.e., type of support), and in terms of social network, which addresses the specific individuals who either give or receive support, such as family or friends.

Types of Social Support

Tardy (1992) conceptualized four types of support. These include emotional, instrumental, informational, and appraisal support.

Emotional Support (Belonging Support)

This consists of comfort and security from others leading the affected person to believe that he/she is cared for by others (Sarason, et.al., 1990). Emotional support conveys the idea that a person is valued for his or her own worth and is accepted. This kind of support may result in the enhancement of self-esteem (Wan, Jaccard & Ramey, 1996).

Instrumental support (Tangible Support)

This refers to acts such as loaning money or giving of one’s time. It is also called tangible support because it involves the giving of material resources or services (Wan, Jaccard & Ramey, 1996).

Informational support (Self-esteem Support)

This consists of mainly of advice and counsel. While this might be helpful, it is the experience that often times people ask for advice when all they want is for someone to listen to them. If you are a good listener, the persons may believe that you have given them good advice, when what actually the case is that they feel understood (Barbour, 1990).

Appraisal support

This refers to evaluative feedback. Every person needs feedback whether they want it or not. Sometimes, the person who provides this is a ‘reality check’ who confronts rationalizations

or other escape mechanisms. Sometimes this takes the form of encouragement (Safree & Yasin, 2009).

Measuring the Components of Perceived Social Support

Dzulkifli & Yasin (2009) developed interpersonal support evaluation list (ISEL) questionnaire to assess perceived social support of students. This questionnaire included 4 subscales: appraisal support, tangible support, and belonging support. The “tangible” subscale is intended to measure perceived availability of material aid; the “appraisal” subscale, perceived availability of someone to talk to about one’s problems; the “self-esteem” subscale, the perceived availability of positive comparing one’s self to others; and the “belonging” subscale, the perceived availability of people one can do things with (Zimet, et. al., 1988).

Methods

Research Design

In this study, descriptive research design and quantitative survey method were used. Interpersonal support evaluation list questionnaire was used to assess perceived social support of pre-service teachers.

Participants

This study comprises of 180 first-year students (90 males and 90 females) and 180 fifth-years students (90 males and 90 females) in Sagaing University of Education.

Instrumentation

In this study, interpersonal support evaluation list (ISEL) Questionnaire developed by Dzulkifli & Yasin (2009) was used to assess perceived social support of pre-service teachers. There are 40 items in this questionnaire including 4 subscales: appraisal support, tangible support, self-esteem support and belonging support. The instrument is 4 point Likert scale which ranges strongly disagree = 1, disagree = 2, agree = 3, strongly agree =4. The whole scale of Perceived Social Support Questionnaire indicated satisfactory internal consistency with Cronbach’s alpha of 0.88.

Data Analysis

After collecting the required data, data entry was computed by using the SPSS 16.0 software (Statistical Package for Social Science). Finally, results from SPSS were carefully interpreted and prepared the findings and conclusions. To find out more detailed information, independent sample *t*-test was conducted.

Findings

The Levels of Perceived Social Support of Pre-service Teachers

In term of descriptive statistics, mean score and standard deviation of pre-service teachers’ perceived social support were presented in Table 1.

Table 1 Descriptive Statistics for Perceived Social Support of Pre-service Teachers

Variable	N	Minimum	Maximum	Mean	Std. Deviation
Perceived Social support	360	74	147	113.77	11.38

The mean and standard deviation of the whole sample were (113.77) and (11.38) respectively. According to the result, perceived social support of pre-service teachers was satisfactory because the total mean score (113.77) was greater than theoretical mean score (100). Therefore, it can be concluded that pre-service teachers have enough perceived social support.

The participants in this study were classified into three groups of perceived social support such as high, moderate and low. Based on descriptive analysis of perceived social support, participants with score above the (+1) standard deviation from the sample mean were identified as high group and participants with score below the (-1) standard deviation were identified as the low group. And then, participants with score between (+1) and (-1) standard deviation were identified as the moderate group.

Table 2 Perceived Social Support of Pre-service Teachers by Three Levels

Level	Frequency	Percent (%)
Low group	51	14%
Moderate group	262	73%
High group	47	13%

Therefore, it can be easily seen that most of pre-service teachers in Sagaing University of Education had moderate perceived social support.

Comparison for Perceived Social Support of Pre-Service Teachers by Gender

According to the mean scores in Table 3, males were higher than those of females in perceived social support.

Table 3 Descriptive Statistics and Independent Samples *t* test Results for Perceived Social Support of Pre-Service Teachers by Gender

Variable	Gender	Mean	Mean Difference	<i>t</i>	<i>df</i>	<i>p</i>
Perceived Social Support	Male	114.24	.939	.782	358	.435
	Female	113.31				

To find out more detailed information, independent sample *t*-test was conducted. The result mentioned that there was no significant difference in perceived social support of pre-service teachers by gender.

Comparison for Dimensions of Perceived Social Support of Pre-service Teachers by Gender

According to Table 4, mean scores of males were higher than females in appraisal support and tangible support. Then, mean scores of females were higher than that of males at self-esteem support.

Table 4 Descriptive Statistics and Independent Sample *t*-test Results for Dimensions of Perceived Social Support of Pre-service Teachers by Gender

Perceived Social Support	Gender	Mean	Mean Difference	<i>t</i>	<i>df</i>	<i>p</i>
Appraisal Support	Male	28.90	.317	.841	358	.401
	Female	28.58				
Tangible Support	Male	29.67	1.256	3.256**	358	.001
	Female	28.41				
Self-esteem Support	Male	27.26	-.639	-2.279*	358	.023
	Female	27.89				
Belonging Support	Male	28.42	.006	.014	358	.989
	Female	28.42				

* $p < 0.05$, ** $p < 0.01$

Table 4 revealed that there was significant difference only in tangible support and self-esteem support, among four dimensions of perceived social support by gender at $p < 0.01$ and $p < 0.05$ levels. It was found that males had higher tangible support than females. However, females had higher self-esteem support than males.

Comparison for Perceived Social Support of Pre-service Teachers by Grade

According to the mean scores in Table 5, perceived social support of fifth-year students were higher than those of first-year students.

Table 5 Descriptive Statistics and Independent Sample *t*-test Results for Perceived Social Support of Pre- service Teachers by Grade

Variable	Grade	Mean	Mean Difference	<i>t</i>	<i>df</i>	<i>p</i>
Perceived Social Support	First Year	112.13	-3.283	-2.762**	358	.006
	Fifth Year	115.42				

** $p < 0.01$

The result revealed that there was significant difference in perceived social support by grade at $p < 0.01$ level. So, it can be said that fifth-year students had higher perceived social support than first-year students. The result highlighted that the more matured the students were, the more perceived social support they had.

Comparison for Dimensions of Perceived Social Support of Pre-service Teachers by Grade

According to the result in Table 6, mean scores of fifth-year students were greater than that of first-year students in all subscales of perceived social support.

Table 6 Descriptive Statistics and Independent Sample *t*-test Results for Dimensions of Perceived Social Support of Pre-service Teachers by Grade

Perceived Social Support	Gender	Mean	Mean Difference	<i>t</i>	<i>df</i>	<i>p</i>
Appraisal Support	First Year	28.52	-.439	-1.167	358	.244
	Fifth Year	28.96				
Tangible Support	First Year	28.29	-1.500	-3.915**	358	.000
	Fifth Year	29.79				
Self-esteem Support	First Year	27.38	-.394	-1.400	358	.162
	Fifth Year	27.77				
Belonging Support	First Year	27.94	-.950	-2.472*	358	.014
	Fifth Year	28.89				

* $p < 0.05$, ** $p < 0.01$

In Table 6, it revealed that among four dimensions of perceived social support, there was significant difference in tangible support and belonging support by grade at $p < 0.01$ and $p < 0.05$ levels. It may be due to the fact that as fifth-year students were aged, they can communicate with the people well and have more experiences on the social activities.

Conclusion and Discussion

Conclusion

Social support can come in the form of tangible assistance provided by others by needed which include appraisal of different situations, effective coping strategies, and emotional support. Social support is an element that can help individuals to reduce the amount of stress experienced as well as to help individuals cope better in dealing with stressful situations. It has been recognized that the characteristic and quality of social support are central to the individual's adjustment (Lahey & Chohen, 2000).

Khan (2015) defined social support "the interpersonal interactions that include one or more of the following: the expression of positive affect of one person toward another; the endorsement of another person's behaviors, perceptions, or expressed views; and/ or the giving of symbolic or material aid to another. Gurung (2006) defined social support: "the experience of being valued, respected, cared about, and loved by others who are present in one's life" (Khan, 2015; Gurung, 2006; cited in Barbour, 1990).

Social support is critical because it provides interpersonal connectedness, fosters expressions of emotions, and offers encouragement, improved health, and reduced stress, increase likelihood of recovery, greater self-efficacy, better stress management skills, decreases anxiety and increases adherence (Lahey & Chohen, 2000).

Discussion

This study investigated the perceived social support of pre-service teachers in Sagaing University of Education. The instrument used in this study was the interpersonal support evaluation list (ISEL). The whole scale of perceived social support questionnaire indicated satisfactory internal consistency with Cronbach's alpha of 0.88. It is evident that this questionnaire has high reliability to access perceived social support.

According to the result, perceived social support of pre-service teachers was satisfactory because the total mean score (113.77) was greater than theoretical mean score (100). So it can be concluded that pre-service teachers have enough perceived social support. In this study, pre-service teachers were classified into three groups of perceived social support such as high, moderate and low. It can be seen that most of pre-service teachers in Sagaing University of Education had moderate perceived social support.

There was significant difference only in tangible support and self-esteem support by gender. It was found that males had higher tangible support than females while females had higher self-esteem support than males. It can be said that pre-service teachers' social support was influenced by gender. The result revealed that there was significant difference in perceived social support by grade. So, it can be said that fifth-year students had higher perceived social support than first-year students. The result highlighted that the more matured the students were, the more perceived social support they had. There was significant difference in tangible support and belonging support by grade. It may be due to the fact that as fifth-year students were aged, they can communicate with the people well and have more experiences on the social activities.

In order to live in our society successfully and to be effective in learning, human beings may need to develop perceived social support. Moreover, prospective teachers should become good leaders for our country. If a prospective teacher or pre-service teacher is good in perceived social support, he can lead for future which can give him knowledge and information. So he can create his life to be successful and he can increase his control over his own behavior and environment. Besides, he can take advantage to his environment. In this way, he will get satisfaction in his life. So, pre-service teachers need to become more perceived social support persons. If so, pre-service teachers will become successful persons in world affairs as well as in the way of gaining the ultimate life goal.

The future study needs to investigate perceived social support across university students, college students and other grades to encompass all adolescents. More research should be conducted on perceived social support and other variables such as adjustment, self-esteem and well-being and so on.

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SOCIAL SUPPORT, HARDINESS AND JOB SATISFACTION OF TEACHER EDUCATORS

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Abstract

The main aim of this study was to analyze the social support, hardiness and job satisfaction of teacher educators in Education Degree Colleges. In this study, a total of 62 participants of the analyze were selected by using random sampling technique. Descriptive research design and survey method were used in this study. Hardiness Test consisting of 50 items developed by Suzanne Kobasa (1996) (Cronbach's alpha = 0.81) was used to measure the hardiness of teacher educators. The *t* test result revealed that there was no significant difference in hardiness by gender. And, the Interpersonal Support Evaluation List (ISEL) consisting of 40 items developed by Cohen & Hoberman (1983) (Cronbach's alpha = 0.631-0.847) was used to measure social support of teacher educators. The results of *t* test showed that there was no significant difference in social support by gender. Moreover, Teacher Job Satisfaction Questionnaire (TJSQ) developed by Lester (1982) (Cronbach's alpha = 0.93), was used to analyze the job satisfaction among teacher educators. It encompassed 66 items in 9 subscales. The *t* test result revealed that there was no significant difference in job satisfaction by gender. To find out the relationships of social support, hardiness, social support and job satisfaction, Pearson product- moment correlation coefficient was used. According to the result, there were statistically significant correlation at the 0.01 level (2-tailed). The simple mediation path analysis was used to explicate the underlying mechanisms of the relationship between social support (IV) and job satisfaction (DV) through hardiness (Mediator). According to the result, Consistent Partial Mediation Model was found. Hardiness had significant direct effect on job satisfaction. Then, social support had significant direct effect on job satisfaction, and also significant indirect effect on it through hardiness as a mediator.

Keywords: hardiness, social support, satisfaction, job satisfaction

Introduction

One of psychological concepts that have been introduced by scientists of educational science is social support. It was one of the basic needs of human beings throughout the history. (Balbi, 1982) believed that humans can face crisis, threats and dangers during human history through help by others (Cited in RastegarKhaled, 2005). Thus, need to close attachment has been established and people can use support from family, friends and others. Social support is offered to enjoyment of love, support and attention of co- workers, supervisor, institutions, family members and friends. Many studies revealed that social support is one of the real elements on job satisfaction.

Social support is the availability of people that have demonstrated that they care, love, and value people (Kobasa, 1982); those that people can trust and rely on. Social support, according to Sarason, Levine, Basham, & Sarrason, (1983), increases the ability to withstand and overcome frustrations and problem-solving challenges. People perceive themselves as having high levels of social support, experience more positive events in their lives and have higher self-esteem (Sarason et. al). According to early research the personality trait of hardiness Kobasa (1982), social support could be more effective in mediating stress.

Individuals high on hardiness try to influence the outcomes of the life events, are actively engaged in them and, notwithstanding their positivity or negativity, try to learn something out of them. On the other hand, individual low on hardiness will be more likely to withdraw from some

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life circumstances and perceive them as more threatening (Maddi, 1999). It is suggested that hardiness acts as a protective factor in stressful situations predominantly through cognitive appraisal and coping behaviors.

Studies have found that hardiness is positively related to job satisfaction (Cash & Gardner, 2011). Employees high on hardiness see their job in better light, are more committed to their organizations (Sezgin, 2009), have more responsible work behaviors and are more efficient in stressful tasks (Manning, Williams, & Wolfe, 1988).

Satisfaction is one of the factors of the overall efficiency of work performed, being configured as a result of the relation between what individuals actually get from work (in terms of salary, status, appreciation, etc.) and their projected results.

According to Locke (1976), job satisfaction is a positive or pleasant emotional state resulting from a person's appreciation of his/ her own job. Miller (2009) supported the idea that this definition of job satisfaction is the most referenced and generally accepted description, characterizing the necessary component needed to depict what is meant by broad construct of job satisfaction.

Moreover, Job satisfaction is multidimensional, whether it comes to job satisfaction by itself or in wages, workplace safety, to promotion possibilities, recognition and appreciation, decision-making power and influence and of course carry a sense of productive work, useful and well done. Each of these dimensions may contribute to varying degrees, in shaping their sense of job satisfaction.

The importance of job satisfaction specially emerges to surface if had in mind the many negative consequences of job dissatisfaction such a lack of loyalty, increased absenteeism, increase number of accidents etc. Therefore, job satisfaction includes feelings and attitudes that everyone has about his/her job in a comprehensive definition. All aspects of a certain job such as good and bad, positive and negative aspects effect on satisfaction and dissatisfaction feeling (Imbert, 2004).

Purpose of the Study

The main aim of this study is to analyze the hardiness, social support and job satisfaction teacher educators in Education Degree Colleges. The specific objectives will be as follows:

1. To examine the social support, hardiness and job satisfaction teacher educators in Education Degree Colleges
2. To explore the differences in the social support, hardiness and job satisfaction teacher educators by gender
3. To find out the relationship among social support, hardiness and job satisfaction teacher educators
4. To examine whether social support predicts job satisfaction of teacher educators directly and indirectly through the mediator of hardiness

Definitions of Key Terms

Hardiness: "hardiness" was defined as a constellation of commitment, control, and challenge that serves as a "resistance resource" in encounters with stress (Kobasa, Maddi, & Kahn, 1982).

Social Support: The term "social support" refers to the various resources provided by one's interpersonal ties (Cohen & Hoberman, 1983).

Job Satisfaction: The term job satisfaction refers to the attitude and feelings people have about their work. Positive and favorable attitudes towards the job indicate job satisfaction (Armstrong, 2006).

Review of Related Literature

Kobasa's Hardiness Theory: The term "personality hardiness" has been used to describe persons who have a kind of personal and world view that underlies the positive capacity to cope with and mediate stress (Kobasa, 1979). In her originating research, Suzanne C. Kobasa (1979) stated that "persons who experience high degrees of stress, without falling ill, have a personality structure differentiating them from persons who become sick under stress". This personality structure "hardiness" was defined as a constellation of commitment, control, and challenge that serves as a "resistance resource" in encounters with stress (Kobasa, Maddi, & Kahn, 1982).

The resistance resource theory formed the foundation of Kobasa's proposed concept that individuals who are exposed to high levels of stress who do not become ill, may have characteristics that come under the rubric "personal hardiness" (Kobasa, 1979). Kobasa explained that these hardy individuals choose commitment rather than alienation, control rather than powerlessness, and challenge rather than threat. These three personality characteristics remain the basis of her continuous research on personal hardiness. Commitment involves activity and curiosity, not passiveness and alienation. It entails belief in the value for "what one is and what one is doing, as well as a tendency to involve oneself fully and vigorously in life." The committed individual finds life in general, and work in particular, meaningful and worth engaging, thereby lessening the threat perceived in situations and circumstances (Kobasa, 1982).

Control is the tendency to believe and act as if one is influential (rather than helpless) in the course of events in one's life. Individuals who have control strive to understand the reasons for things that occur with particular reference to their own sphere of responsibility (Kobasa, 1982). Control involves developing a repertoire of options and actions that transforms events into a continuing life plan (Holt, Fine, & Tollefson, 1987).

Challenge, the third dimension of the hardiness constellation, involves the belief that one should expect and accept change, not stability, as the normal pattern of life (Kobasa, 1982; Kobasa, Maddi, & Kahn, 1982). The anticipation of change is positive, rather than threatening and change is viewed as an incentive to growth. The individual with this characteristic emphasizes growing and changing, rather than conserving and protecting the status quo (Holt, Fine, & Tollefson, 1987).

Stress-Buffering Models of Social Support: Cohen and McKay (1984) argued that one's interpersonal relationships function as stress buffers only when the type of support resources that are offered by one's relationships match the coping requirements elicited by the stressor(s).

Cohen (1988) provided that the stress-buffering model posits that support "buffers" (protects) persons from the potentially pathogenic influence of stressful events. The following models focus on the perceived availability of social support because this conception has been found to result in stress-buffering effects.

Information-Based Model. To the extent that this information reduces the evaluation of the event would be appraised as less threatening and/ or harmful and hence the risk of illness increased. It is also likely that in many cases the perception of available support operates without any actual support being provided. That is, knowing (or at least believing) those others will provide needed information if it becomes necessary can similarly result in a potentially stressful event or events being appraised as benign. Emotional responses to stressful events may also elicit network provision of information.

Identity and Self-Esteem Model. They suggested that others' willingness to help and/ or the enhanced ability to cope that results from receiving help increase feelings of personal control and self-esteem. According to this model, social support may give the person a sense of identity

and belonging, increased self-esteem and perceived control. This positive psychological state suggested in this model may lead to good performance.

Social Influence Model. Social controls and peer pressures could influence persons to cope with stressors in particular normative manners. Such influence processes would promote health to the extent that the normative coping behaviors were effective in reducing perceptions of stress, no adjustive behavioral adaptations, and negative affective responses.

Tangible-Resource Model. Network contribution of aid or tangible or economic services could reduce the probability of potentially stressful events being appraised as threatening or harmful and hence could reduce the behavioral and affective concomitants of such an appraisal. Tangible resources could also help resolve specific (tangible-related) problems after a stress appraisal is made (Cohen, 1988).

Theories of Job Satisfaction: Theories of motivation present various approaches for the determinants of motivation and satisfaction. Lunenburg and Ornstein (1996) grouped them into two categories: content and process theories. Content theories concentrate on the definition of motivators, whereas process theories focus on how motivation occurs. The most popular three content theories are; (a) Maslow's Need Hierarchy Theory, (b) Herzberg's Motivation-Hygiene Theory, and (c) Alderfer's Existence Relatedness Growth Theory. The three major process theories are (a) Expectancy Theory, (b) Equity Theory, and (c) Goal-setting Theory.

According to Motivation-Hygiene Theory, developed by Herzberg, employees have two kinds of needs; hygiene and motivator (Furnham, Petrides, Jackson & Cotter, 2002). The motivation factors (motivators) are achievement, recognition, the work itself, responsibility, advancement, and growth. Company policies, interpersonal relations, working conditions, and salary constitute the hygiene factors (dissatisfiers).

This theory mainly focuses on the working environment, and asserts that job satisfaction is a consequence of the aspects of job which meet the individual's need for psychological growth, whereas job dissatisfaction arises from working conditions (Galloway, Boswell, Panckhurst, Boswell & Gren, 1985). Therefore, it is possible to be both satisfied and dissatisfied at the same time. Determinants of satisfaction have expanded in time by the development of various theories and research conducted to measure satisfaction.

Method

Participants

The participants of this study were teacher educators chosen from Katha, Sagaing and Mandalay Education Degree Colleges. A total of 62 teacher educators were selected by simple random sampling technique. Among 62 teacher educators, 6 are males and 56 are females.

Research Method

Descriptive research design and survey method were used in this study.

Instruments

Hardiness Scale: In this investigation, the third-generation version of the hardiness test/scale, also known as the personal views survey, was used to measure hardiness. This instrument was developed by Suzanne Kobasa in 1996. The current version is a 50-item, four-point Likert scale. The reliability coefficient for hardiness was .81.

Social Support Questionnaire: The Interpersonal Support Evaluation List (ISEL) (Cohen & Hoberman, 1983) was used in this study to measure social support. The ISEL consists of a list of

40 statements. For each statement check 4-point Likert scale. The reliability coefficient for social support was 0.631-0.847.

Job Satisfaction Questionnaire: Teacher Job Satisfaction Questionnaire (TJSQ) developed by Lester (1982), was used as the main instrument to analyze the job satisfaction among teacher educators' in Upper Myanmar Education Degree Colleges. It encompassed 66 items in 9 subscales. The instrument contains responses which are presented in the form of a five-point Likert scale. The reliability coefficient for job satisfaction was .93.

Data Collection Procedure

For collecting data for this study, the researcher requested permission from the Head of Department of Educational Psychology. Second, permission to collect data was acceded from the respective principals of Katha, Sagaing and Mandalay Education Degree Colleges. All of the participants' responses were gathered by survey method. On average, the participants spent about twenty-five minutes to complete all items. According to the above procedures, the collection of the required data was conducted in each selected Education Degree Colleges by survey procedure.

Findings

In this study, social support and hardiness on teacher educators' job satisfaction were investigated among the selected Education Degree Colleges from Upper Myanmar.

Teacher Educators' Social Support, Hardiness and Job Satisfaction

In terms descriptive statistics, mean and standard deviation of Teacher Educators' social support, hardiness and job satisfaction were calculated to analyze data. The results were described in Table 1.

Table 1 Descriptive Statistics of Teacher Educators' Social Support, Hardiness and Job Satisfaction

Variable	Minimum	Maximum	Mean	Std. Deviation
Social Support	91	152	127.60	12.895
Hardiness	98	145	126.11	9.066
Job Satisfaction	200	294	251.66	18.413

As shown in Table 1, the mean score and standard deviation of the teacher educators' overall social support were 127.60 and 12.895 respectively. Since the sample mean score (127.60) is greater than the theoretical mean (100) in overall social support, it can be assumed that the teacher educators' social support is satisfactory and effective for all teacher educators.

Next, the mean score and standard deviation of the teacher educators' overall hardiness were 126.11 and 9.066 respectively. Since the sample mean score (126.11) is greater than the theoretical mean (125) in overall hardiness, it can be assumed that the teacher educators' hardiness is satisfactory and effective for all teacher educators.

Moreover, the mean score and standard deviation of the teacher educators' overall job satisfaction were 251.66 and 18.413 respectively. Since the sample mean score (251.66) is greater than the theoretical mean (198) in overall job satisfaction, it can be assumed that the teacher educators' job satisfaction is satisfactory and effective for all teacher educators.

To find out the significant differences by gender, independent samples *t* test was used. The results were shown in Table 2.

Table 2 The Result of Independent Samples *t* Test for Social Support, Hardiness and Job Satisfaction of Teacher Educators by Gender

Variable	Gender	N	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>	<i>MD</i>
Social Support	Male	6	125.67	8.548	-.126	60	.900	-.107
	Female	56	126.16	9.192				
Hardiness	Male	6	127.50	9.975	-.019	60	.985	-.494
	Female	56	127.61	13.243				
Job Satisfaction	Male	6	255.67	10.875	-.557	60	.575	4.435
	Female	56	251.23	19.062				

Table 2 indicated that there were no significant differences between male and female for teacher educators' social support, hardiness and job satisfaction.

The Relationship Among Social Support, Hardiness and Job Satisfaction of Teacher Educators

To find out the relationship among social support, hardiness and job satisfaction of teacher educators, Pearson product-moment correlation coefficient was used. The results were shown in Table 3.

Table 3 The Relationship Between Social Support, Hardiness and Job Satisfaction of Teacher Educators

	Social Support	Hardiness	Job Satisfaction
Social Support	1	.424**	.643**
Hardiness		1	.547**
Job Satisfaction			1

Note: **Correlation is significant at the 0.01 level (2-tailed).

According to the result of Table 3, there was a statistically significant correlation in social support and hardiness ($r=.424$, $p<0.01$). Therefore, it can be interpreted that there was positive correlation between social support and hardiness of Education Degree College teacher educators.

Moreover, there was a statistically significant correlation in hardiness and job satisfaction ($r = .547$, $p <.01$). Therefore, it can be interpreted that there was positive correlation between hardiness and job satisfaction of teacher educators. This means that the teacher educators who are high in hardiness are also high in job satisfaction accordingly.

According to table, there was a statistically significant correlation in social support and job satisfaction ($r = .643$, $p <.01$). Therefore, it can be interpreted that there was positive correlation between social support and job satisfaction of teacher educators. This means that the teacher educators who are high in social support are also high in job satisfaction accordingly.

The Mediating Role of Hardiness on the Relationship Between Social Support and Job Satisfaction

The simple mediation path analysis was used to explicate the underlying mechanisms of the relationship between social support (IV) and job satisfaction (DV) through hardiness

(Mediator). After conducting the Simple Mediation Path Analysis in SPSS, the results of the direct and indirect effects between variables were presented in Table 4.

Table 4 Summary of Causal Effects for the Path Model (Job Satisfaction)

Outcomes	Determinants	Causal Effects		
		Direct	Indirect	Total
Hardiness $R^2 = 0.403$	Social Support	0.298**	-	0.298**
Job Satisfaction $R^2 = 0.488$	Social Support	0.716***	0.202***	0.918***
	Hardiness	0.679**	-	0.679**

Note. *** denotes significant paths t at $p < 0.001$.

** denotes significant paths t at $p < 0.01$.

According to the result, Consistent Partial Mediation Model was found. Hardiness had significant direct effect on job satisfaction. Then, social support had significant direct effect on job satisfaction, and also significant indirect effect on it through hardiness as a mediator (See in Figure 1). Totally, 48.8% of the variance in job satisfaction can be explained by the path model.

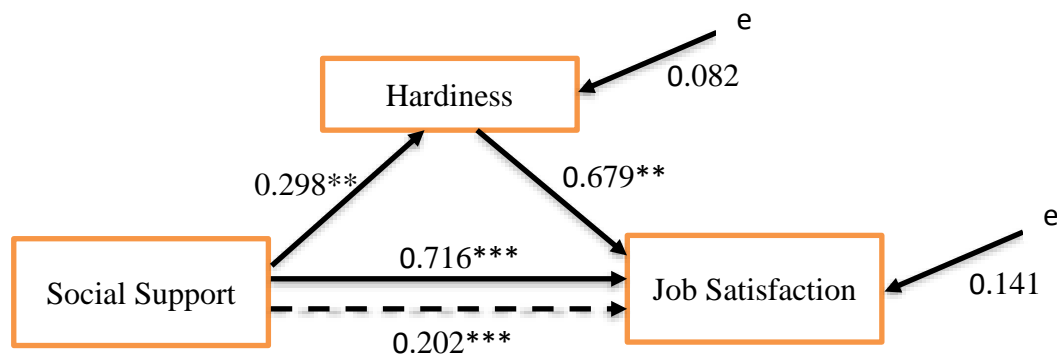


Figure 1 Simple Path Diagram for Predicting Job Satisfaction from Social Support and Hardiness

*** denotes significant paths t at $p < 0.001$.

** denotes significant paths t at $p < 0.01$.

Conclusion and Suggestions

As the results of descriptive statistic of the whole social support, hardiness and job satisfaction, it can be seen that teacher educators in this study have high level of social support, hardiness and job satisfaction.

Observing social support, hardiness and job satisfaction by gender were analyzed. An independent samples t test result by gender indicated that there was no significant difference between male and female teacher educators in social support, hardiness and job satisfaction.

There were positive correlations between social support and hardiness, social support and job satisfaction, hardiness and job satisfaction of teacher educators. It was consistent with the studies of Ganellen and Blaney (1984) found that commitment and challenge, but not control, were significantly correlated with social support. Therefore, the researchers conclude that the higher the level of social support subjects report, the higher their level of hardiness.

Moreover, Falinski (1985) found that personal hardiness contributed to the ability of New York state school superintendents to handle role stress and therefore feel job satisfaction. In another similar study by Hammond (1987), faculty, researchers, and administrators at a southwestern university responded to a questionnaire revealing that satisfaction could be predicted by hardiness, social support, and coping strategies. Gupta (1988) investigated the correlates of effectiveness and ineffectiveness in teacher's teaching. He found job satisfaction and financial support to be significantly influencing effective teaching.

The simple mediation path analysis was used to explicate the underlying mechanisms of the relationship between social support (IV) and job satisfaction (DV) through hardiness (Mediator). According to the result, Consistent Partial Mediation Model was found. Hardiness had significant direct effect on job satisfaction. Then, social support had significant direct effect on job satisfaction, and also significant indirect effect on it through hardiness as a mediator.

According to the result, teacher educators from Education Degree Colleges who have high level of social support, hardiness and job satisfaction in their job. One of the effective factors on job satisfaction is social support such as tangible support, belonging support, self-esteem support, appraisal support. All teacher educators need to be provided with social support for job satisfaction. Moreover, teacher educators need to be high on level of hardiness. When the social support and hardiness of teacher educators are improved, they will get job satisfaction in their lives efficiently.

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SELF-COMPASSION AND CONFLICT RESOLUTION OF STUDENT TEACHERS IN MANDALAY EDUCATION DEGREE COLLEGE

Mi Mi¹, Khin Hnin Nwe², Yar Zar Chit³

Abstract

The main aim of this study was to investigate self-compassion and conflict resolution of student teachers in Mandalay Education Degree College (2020-2021AY). A total of student teachers (Male=22, Female=48) from Mandalay Education Degree College was randomly selected in this study. Descriptive research design and survey method were used in this study. Self- Compassion Scale consisting of 41 items developed by Neff (2003a) (Cronbach's alpha = .781) was used to measure the Self- compassion of student teachers. The independent samples *t* test result revealed that there was no significant difference in Self- compassion by gender and subjects. And, Conflict Resolution Questionnaire consisting of 40 items developed by *Jock McClellan (1997)* (Cronbach's alpha = 0.772) was used to measure the student teachers from Mandalay Education Degree College. The results of independent samples *t* test showed that there were no significant differences in conflict resolution by gender and subject. There was moderately positive correlation between self-compassion and conflict resolution.

Keywords: Self-Compassion, Conflict Resolution, Self-Kindness, Common Humanity, Mindfulness

Introduction

In society, positive self-compassion not only makes individuals to perform his work in a better manner but also make satisfying and rewarding to them. On the other hand, unfavorable self-compassion makes individual tired, boring and unacceptable individuals.

Although the construct of self-compassion has emerged in Western psychological and health literatures over the last fifteen years, in Eastern self-compassion derived from the last many years the times of the Buddha. Buddhist principles that can also apply more generally to compassion. The roots of this construct lie in Buddhist psychology and philosophy. Self-compassion has been defined as "being touched by and open to one's own suffering, not avoiding or disconnecting from it, generating the desire to alleviate one's suffering and to heal oneself with kindness" (Neff, 2003a).

Self-compassion positively impacts psychological health by promoting adaptive emotion regulation in times of stress. Self-compassion defuses negative emotional patterns by promoting non-judgmental awareness of one's emotions and orienting oneself to respond to stressful events in a way that is self-supportive.

The lives of every person, agency, organization, and nation occur conflict, arguments, and change natural parts of our lives. Thus, as a teacher not only must be avoid of unpleasant conflict but also need to know the ways to avoid conflict. Conflict resolution is defined as an internal process whereby individuals' emotional intensity and arousal to cope effectively with stressful stimuli (Fisher & Ury, 1991).

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Conflict resolution is appropriate for almost any disagreement. Human daily lives offer plenty of opportunities for negotiation - between parents and children, teacher and pupil, co-workers, friends, etc., and as a result, a person probably already have a variety of effective strategies for resolving minor conflicts. But for more serious conflicts, and conflicts between groups rather than individuals, human being may need some additional skills.

Conflict resolution is a way for two or more parties to find a peaceful solution to a disagreement among them. The disagreement may be personal, financial, political, or emotional. Conflict resolution through negotiation can be good for all parties involved. Often, each side will get more by participating in negotiations than they would by walking away, and it can be a way for the group to get resources that might otherwise be out of reach.

Conflict is characterized by perceived differences and negative emotional states. The issues in conflict can be thought of as tangible and intangible, as needs or beliefs. Conflict often results in destructive ends but it does not have to. Collaboration and compromise are usually available as alternatives in a conflict situation. Pursuing these ends in conflict is called conflict resolution.

The conflict can best be dealt with by interest-based negotiation. Solutions are found when conflicting parties surface the interest behind their positions. The problem-solving process is used to allow the free creation of ideas that will best meet the needs to the two parties.

In Myanmar, studying the effect of self-compassion on conflict resolution of student teachers is an inevitable matter for now. Student teachers' self-compassion and conflict resolution are interdependent, and both are important for all-round development of students. The investigating of self-compassion and conflict resolution of student teachers is necessary and also essential for the psychological development of citizens in all countries.

Purpose of the Study: The main aim of this study is to investigate self-compassion and conflict resolution of student teachers in Mandalay Education Degree College. The specific objectives are as follow:

1. To examine the self-compassion and conflict resolution of student teachers from Mandalay Education Degree College
2. To measure the differences in self-compassion of student teachers by gender and subject
3. To explore the conflict resolution of student teachers from Mandalay Education Degree College by gender and subject
4. To find out the relationship between self-compassion and conflict resolution of student teachers
5. To find out the extent to which the impact of self-compassion on conflict resolution of student teachers

Definitions of Key Terms

Self-Compassion: is extending compassion to one's self in instances of perceived inadequacy, failure, general suffering. Self-Compassion a being composed of three main elements. Self-Kindness, Common humanity, and Mindfulness (Neff, 2003).

Conflict Resolution: is a way for two or more parties to find a peaceful solution to a disagreement may be personal, financial, political, or emotional. When a dispute arises, often the best course of action is negation to resolve the disagreement (Fisher & Ury, 1991).

Self- Kindness: when we consider our own needs, we are being kind to ourselves. Self-kindness can take many forms, such as rest, asking for help letting something go, setting boundaries, doing something fun, advocate for yourself, apologizing, or taking accountability (Neff, 2003).

Common Humanity: we tend to feel alone during challenging experiences or, emotion. We may ask, "why me?" these questions only add salt to the wound. Recognizing your common-humanity means remembering that these experiences are normal and part of being human. You are not alone (Neff, 2003).

Mindfulness: is being aware of and acknowledging our emotion. Recognize the physical, emotional, or mental pain of the moment by label an emotion, tuning into the body, or using a phrase to describe or reflect what you are feeling (Neff, 2003).

Related Literature Review

Self-compassion as a psychological concept has been for many decades, garnering more attention recently with other third-wave cognitive-behavioral concepts such as mindfulness. Self-compassion is the psychological concept of showing oneself kindness in the face of adversity or pain.

Self-Compassion Theory: Self-compassion is a positive attitude we can have towards ourselves, and it's also an empirically measurable construct. Operationally defined and introduced to the positive psychology literature by Associate Professor Dr. Kristin Neff, it is comprised of three separate constructs: Self-kindness, Common Humanity, and Mindfulness (Neff, 2003a; 2003b).

Self-compassion is a caring way to relate to one's self (Neff & Dahm, 2003). It consists of self-kindness, common humanity, and mindfulness. Self-kindness is defined as a caring self-talk that fosters acceptance and awareness of our own suffering and shortcomings. Common humanity is defined as viewing our own pain as a collective human experience. Mindfulness is defined as the experience of our own emotions and thoughts with a balanced awareness (Neff & Dahm, 2003).

The Six Components of Self-Compassion: The various Buddhist teachers (Kornfield, 1993; Salzberg 1997, Neff (2003b) has operationalized self-compassion as consisting of three main elements: kindness, common humanity, and mindfulness. These components combine and mutually interact to create a self-compassionate frame of mind. Self-compassion is relevant when considering personal inadequacies, mistakes, and failures, as well as when struggling with more general life situations that cause us mental, emotional, or physical pain.

Self-kindness vs. Self-judgment: Self-kindness is about showing kindness and understanding toward ourselves when a person fail at something, or when he is hurt (Neff, 2003a). Rather than being critical or judging himself harshly when a person already feel pain, he can recognize the negative influence of self-judgment and treat himself with warmth and patience instead (Gilbert & Irons, 2005).

Common humanity vs. Isolation: 'Being part of something bigger' is a pervasive concept in positive psychology literature, and it's long been argued that the need for connections is part of human nature (Maslow, 1943). Having Common Humanity means viewing our own individual experiences as embedded in the broader human experience, rather than seeing ourselves as isolated or separate from others (Neff, 2003a).

Mindfulness vs. Over-identification: Mindfulness is seen as the opposite of avoidance or over-identification in self-compassion theory-it entails acknowledging and labeling our own thoughts as opposed to reacting to them (Kabat-Zinn, 2003; Neff, 2010).

When a person has self-compassion, he is aware of his own hurtful thoughts and emotions without blowing up his significance through rumination. Instead, he adopts a positive balance between this over-identification at one extreme, and completely avoiding painful emotions and experiences at the other (Neff, 2003a).

Conflict Resolution: Conflict is a normal, natural part of human relationships. People will not agree about everything all the time. In and of itself, conflict is not necessarily a negative thing. When handled constructively it can help people to stand up for themselves and others, and work together to achieve a mutually satisfactory solution. But if conflict is handled poorly it can cause anger, hurt, divisiveness and more serious problems. This guide discusses how to deal with conflict in a constructive manner (Fisher & Ury, 1991).

Conflict Resolution Model: The conflict resolution working model is a process comprised of four stages: awareness, self-preparation, conflict reduction, and negotiation (Neil Katz & Kevin McNulty, 1994).

Stage 1- Awareness (Neil Katz & Kevin McNulty, 1994): This is the first stage of the conflict resolution model. It involves coming to awareness of the negative emotional states in a conflict. It emerges around the awareness of perceived differences, usually because of:

1. An assertion where one party attempts to influence another party or parties to achieve his or her needs.
2. One party takes a stand on an issue that is opposed by another party or parties.
3. One party attempts to exercise power or control over the actions or behavior of the other party or parties.
4. Feedback, where one party gives feedback to another and the feedback is resisted.
5. An assertion where a party attempts to influence another party or parties to achieve his needs.

Stage 2- Self Preparation: This second stage of the conflict resolution model involves accessing a resourceful state, deciding a person's outcome and planning the steps to achieve it. This stage can take place quickly or involve a considerable amount of time depending on the context.

A person will first need to "own" and take charge of his own emotions or internal states. A belief tends to exist that emotional states just occur or are somehow controlled by other's actions or behaviors. I believe that emotional states are chosen by people at some level and are controllable. Owning and controlling your emotional state and then ensuring that you can maintain a resourceful state throughout a conflict situation is essential to successfully resolving conflict.

Stage 3- Conflict Reduction: The third stage of the model, conflict reduction, involves reducing the level of emotional energy (diffusing negative emotions) and clarifying to understand the differences. This allows disputing parties to settle the conflict, that is, agree to eliminate destructive behavior as well as negative attitudes and feelings toward each other. This settlement may not be an agreement that resolves all the differences but one that enables the disputing

parties to go forward with an understanding of their differences and mutual respect for one another (Neil Katz & Kevin McNulty, 1994).

Stage 4- Negotiation: Negotiation is a communication process where each party attempts to influence each other to get what they want or need from each other. Interest based negotiation is a particular form of negotiation where the outcome is to achieve an integrative agreement. An integrative agreement is one in which all the parties get their interests at least partially satisfied.

Problem solving is an important step in the negotiation and conflict resolution model presented in the section. Overall, the stages are to prepare for the conflict, to manage the negative emotional energy in the conflict, and to negotiate acceptable agreements. Negotiation involves the identification of interests and problem solving to identify acceptable joint agreements. Conflict resolution most generally requires problem solving. Problem solving in the context of conflict is a joint effort to find a mutually acceptable solution.

Method

Sampling

The Participants of this study were second year student teachers attending in (2020-2021) Academic Year from Mandalay Education Degree College. The number of participants was 70 student teachers (22 males, 48 females). The sample was chosen by using simple random sampling technique.

Research Method

The design and method used in this study were descriptive research design and survey method.

Instruments

Self- Compassion Scale: The key instrument used to measure Self- Compassion Scale was developed by (Neff, 2003a). The scale for Self- Compassion was composed of six subscales: (a) Self-Kindness (b) Self-judgement (c) Common Humanity (d) Isolation (e) Mindfulness and (f) Over Identify. There were 41 items for the whole scale. It was scored with five -point Rating scales. The reliability coefficient for Self- Compassion was 0.95.

Conflict Resolution Questionnaire: The key instrument used to measure Conflict Resolution Questionnaire was developed by *members of Jock McClellan (1997)*. It was composed of 10 subscales: (a) view of conflict (b) Atmosphere (c) Clarification (d) Needs (e) Power (f) Future (g) Options (h) Doables (i) Mutual benefit agreements and (j) Extra Consideration. There were 40 items for the whole scale. It was scored with five-point Rating scales. The reliability coefficient of Conflict Resolution was .85.

Data Collection Procedure

For collecting data for this study, the researcher requested permission from the Head of Department of Educational Psychology. Second, permission to collect data was acceded from the respective principal of Mandalay Education Degree College. All of the participants' responses were gathered by survey method. On average, the participants spent about forty-five minutes to

complete all items. According to the above procedures, the collection of the required data was conducted in each selected person by survey procedure.

Findings

An analysis of Descriptive Statistics, mean and Standard deviation of student teachers' Self-Compassion were presented in Table 1

Table 1 Descriptive Statistics for Student teachers' Self-Compassion

Variable	Minimum	Maximum	Mean	Std. Deviation
Self-Kindness	22	45	34.47	4.346
Self- Judgement	10	24	17.19	2.666
Common Humanity	23	40	31.39	4.837
Isolation	15	31	24.34	3.575
Mindfulness	19	39	30.89	4.522
Over Identify	8	19	14.06	2.283
Total Self-Compassion	115	182	152.33	13.418

As shown in Table 1, the mean and standard deviation of the student teachers' overall six subscales of self-compassion were (152.33) and (13.418) respectively. Since the sample mean (152.33) is greater than the theoretical mean (123) in overall self-compassion, it can be assumed that the student teachers' self-compassion is satisfactory.

The performance of students in each subscales was assessed according to the mean percentages of six subscales of self-compassion. The results showed that the highest mean score was self-kindness (34.47) while the lowest mean score was in over identify (14.06).

Table 2 Descriptive Statistics for Student Teachers' Conflict Resolution

Variable	Minimum	Maximum	Mean	Std. Deviation
View of conflict	9	20	14.49	2.448
Atmosphere	9	20	15.54	2.685
Clarification	9	20	14.94	2.776
Needs	10	20	15.70	2.487
Power	10	20	15.74	2.263
Future	10	20	15.26	2.185
Options	9	19	14.36	2.265
Doables	10	20	15.64	2.353
Mutual benefit agreements	10	20	14.83	2.408
Extra Consideration	8	19	13.56	2.641
Total Conflict Resolution	124	181	150.06	13.425

As shown in Table 2, the mean and standard deviation of the student teachers' overall ten subscales of conflict resolution were (150.06) and (13.425) respectively. Since the sample mean (150.06) is greater than the theoretical mean (120) in overall conflict resolution, it can be assumed that the student teachers' conflict resolution is satisfactory.

The performance of students in each subscales was assessed according to the mean percentages of ten subscales of conflict resolution. The results showed that the highest mean scores was power (15.74) and the lowest mean scores was in Extra Consideration (13.56). It can be concluded that student teachers had the best performance in power and the lowest performance in extra consideration.

Table 3 Results of Independent Samples *t* test for Self compassion and Conflict Resolution by Gender

Variable	Gender	N	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>	<i>MD</i>
Self-Compassion	Male	22	151.45	12.667	-.367	68	.715	-1.275
	Female	48	152.73	13.861				
Conflict -Resolution	Male	22	149.91	13.162	-.062	68	.951	-.216
	Female	48	150.13	13.681				

The results of *t* test showed that there were no significant differences in self-compassion and conflict -resolution by gender.

Table 4 Results of Independent Samples *t* test for Self compassion and Conflict -Resolution by Subject

Variable	Subject	N	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>	<i>MD</i>
Self-Compassion	Science	5	143.40	19.191	-1.560	68	.123	-9.615
	Art	65	153.02	12.821				
Conflict -Resolution	Science	5	149.20	12.276	-.147	68	.883	-.923
	Art	65	150.12	13.595				

The results of *t* test showed that there were no significant differences in self-compassion and conflict resolution by subject.

Relationship Between Self compassion and Conflict resolution

In order to explore relationship between self-compassion and conflict resolution of Education Degree College student teachers, Pearson Product Correlation Coefficient was calculated. The results were shown in Table 5.

Table 5 Relationship Between Self Compassion and Conflict Resolution

Variables	Correlation	Conflict resolution
Self -compassion	Pearson Correlation	.55***
	Sig. (2-tailed)	.000
	N	70

Note: *** Correlation is significant at 0.00 level (2-tailed).

According to the result of Table, there was a statistically significant correlation in student self-compassion and conflict resolution ($r=.55$, $p<0.01$). Therefore, it can be interpreted that there was positive correlation between self-compassion and conflict resolution of student teachers. This means that student teachers with higher level of self-compassion would possess greater in conflict resolution.

The Result of Multiple Regression for Factors of Self compassion and Conflict Resolution

The regression analysis was conducted in order to investigate how well the self-compassion predicts conflict resolution. The results were shown in Table 6.

Table 6 Model Summary of Self compassion and Conflict resolution

Model	R	R Square	Adjusted R Square	Standard Error of Estimate
1	.704 ^a	.496	.448	9.976

a. Predictors: (Constant), Self-compassion

It may be seen that a total of 44.8% of the variance in student teachers' conflict resolution can be predicted by self-compassion.

To find out the effect subscales of self-compassion on conflict resolution, simultaneous multiple regression was computed. A combination of six subscales: Self-Kindness, Self-judgement, Common humanity, Isolation, Mindfulness and Over Identified was expected to determine students' conflict resolution. The result was shown in Table 7.

Table 7 Results of Multiple Regression Analysis for subscales of Self compassion on Conflict resolution

Variables	Unstandardized Coefficients		Standardized Coefficients	<i>t</i>	<i>p</i>
	B	Std. Error	Beta		
(Constant)	96.289	16.320		5.9	.000
Self-Kindness	.885	.364	.287	2.432	.018
Self-Judgment	.104	.469	.021	.222	.825
Common Humanity	-.272	.330	-.098	-.825	.412
Isolation	-.289	.352	-.077	-.820	.416
Mindfulness	1.698	.412	.572	4.118	.000
Over Identification	-1.095	.580	-.186	-1.887	.064

Table showed the intercept, unstandardized regression coefficient (B), and standardized regression coefficient β for model. By applying the results of multiple regression analysis presented in Table 7, the resultant model for subtests of self-compassion can be defined as in the following equation:

$$\text{CR} = 96.289 + .885 \text{ SK} + .104 \text{ SJ} - .272 \text{ CH} - .289 \text{ I} + 1.698 \text{ M} - 1.095 \text{ OI}$$

Note: CR = Conflict resolution, SK = Self-Kindness, SJ = Self judgement,

CH = common Humanity, I=isolation, M = Mindfulness, OI = Over Identified

Among all subscales of self-compassion, self-kindness, and mindfulness were significant predictors of students' self-compassion. However, other dimensions like self-judgement, common humanity, mindfulness, over identified and isolation were not significant predictors of students' Self-Compassion.

Conclusion and Suggestions

This study can support in examining and shaping the self-compassion of student teachers. In addition, through the findings of this study, pre-service teacher training programmers can know the differences of student teachers' self-compassion and can support them to become strong positive self-compassion on their experiences.

A person in life, no matter what pain he had experienced or mistakes he had made, his future will not stop, and he can begin again. One small step at a time, he can practice self-compassion and move in the direction of greater health, happiness, and joy.

If become a conflict, should do meditation practice and exposure to Buddhist teachings. They might be a useful means of achieving greater mental health for human who are suffering from a lack of self-compassion.

According to Neff and Germer (2013), the Mindful Self-Compassion program effectively teaches individuals how to become more compassionate toward themselves. The more Mindful Self-Compassion participants practiced formal meditation, the more they increased their self-compassion levels. By wrapping emotional pain in the warm embrace of self-compassion, suffering is ameliorated and wellbeing is enhanced, allowing for healthier functioning in daily life.

Moreover, teaching co-curricular subjects such as physical education, industrial arts/domestic science, agriculture, fine arts and music make students mindful and then this performance looks like meditation. Self-compassion is associated with healthy relationship functioning and the tendency to integrate concerns with autonomy and connectedness when faced with relationship conflicts. Thus, the benefits of self-compassion may not only be personal, but also interpersonal.

For this reason, counselors who work with individuals experiencing relationship conflicts with family, friends, or partners might consider encouraging self-compassion as a way should treatment these conflicts in a psychologically beneficial manner.

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TEACHING APTITUDE AND TEACHING COMPETENCY OF STUDENT TEACHERS

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Abstract

The main purpose of this study was to investigate the teaching aptitude and teaching competency of student teachers. Moreover, the present study was to examine the differences in teaching aptitude and teaching competency in terms of gender, reason of professional selection, subject stream and the relationship between teaching aptitude and teaching competency. The descriptive research design and quantitative survey method were used. A total of 101 fifth year student teachers (male=26, female=75) was chosen from Sagaing University of Education by using simple random sampling technique. In this study, Teaching Aptitude Test Battery (TATB) developed by Karim and Dixit (1986) consisting of 80 items was used to measure teaching aptitude and General Teaching Competency Scale (GTCS) developed and standardized by Passi and Lalita (2011) consisting of 21 items to measure teaching competency of student teachers. The reliability coefficients of Teaching Aptitude Test Battery (TATB) and General Teaching Competency (GTCS) were 0.964 and 0.918 respectively. According to the descriptive statistics, student teachers from Sagaing University of Education were satisfactory on teaching aptitude and teaching competency. The result of independent samples *t* test showed that there were no significant differences in teaching aptitude and teaching competency by gender. Furthermore, there was no significant differences in teaching aptitude but there were significant differences in teaching competency by reason of professional selection. The result of ANOVA showed that there were no significant differences in teaching aptitude and teaching competency by subject stream. The Pearson Product-Moment Correlation result revealed that there were significant positive relationships between teaching aptitude and teaching competency. It can be concluded that those who have high teaching aptitude are also high in teaching competency. Finally, the regression analysis indicated that 30% of teaching competency can be predicted from teaching aptitude.

Keywords: Aptitude, Teaching Aptitude, Teaching Competency

Introduction

People differ from one another and within themselves in their performance in one or the other field of human activity such as leadership, music, art, mechanical work, teaching etc. Many individuals under similar circumstances outperform others in acquiring certain knowledge or skills and efficient in certain jobs. This is because of their natural or acquired ability or capacity. Such natural acquired ability or capacity of a teacher for teaching is most important to be a successful teacher. Such ability or capacity can be further developed through the appropriate training.

Teacher education system is an important vehicle to improve the quality of education. The revitalization and strengthening of the teacher education system is a powerful means for the upliftment of education standards. It inculcates the necessary pedagogical skills, and competencies among the teachers and makes them professionally competent to meet the demands of the society. The success of any educational process depends on teaching aptitude, teaching competency, teaching attitude, teaching interest and many more factors. A modern view of teaching aptitude includes professional activities in the school, such as co-operating in teams, building professional learning communities, participating in school development and evaluating and changing working conditions. Furthermore, teaching competency is the competency of the teachers and their planning and preparing the lesson for teaching, classroom management, subject

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knowledge, interpersonal relationship, attitude towards the children, usage of teaching aids and time management during teaching-learning. Therefore, teaching aptitude and teaching competency can be considered as the determinant factor of effective teaching.

Purpose of the Study

The main purpose of this study is to investigate the teaching aptitude and teaching competency of student teachers from Sagaing University of Education. The specific objectives are:

- (1) To find out teaching aptitude and teaching competency of student teachers
- (2) To examine the differences in teaching aptitude of student teachers by gender, reason of professional selection and subject stream
- (3) To compare the differences in teaching competency of student teachers by gender, reason of professional selection and subject stream
- (4) To explore any relationship between teaching aptitude and teaching competency of student teachers
- (5) To examine the impact of teaching aptitude on teaching competency of student teachers

Definition of Key Terms

Aptitude: Aptitude is defined as a condition or set of characteristics which is regarded as symptomatic of the ability of an individual (fitness or capacity) of which one essential aspect is his readiness to develop an interest in exercising his ability (Bingham, 1937, cited in Kaur, 2014).

Teaching Aptitude: Teaching aptitude can be defined as a special ability or specific capacity which is distinct from the general intellectual ability of an individual, indicative of his probable success in a particular field after receiving appropriate opportunity for learning or training (Kaur, 2014).

Teaching Competency: Teaching competency is an integrated set of personal characteristics, knowledge, skills and attitude which are needed for effective performance in various teaching context (Jena, 2012).

Review of Related Literature

Teaching Aptitude

Teaching is considered to be the noblest of all the profession. It is named as the profession of the prophets. A person serving in any profession must have aptitude and competence in his profession. Aptitude of teachers towards teaching may be considered the most important factor, which may predict the success in that profession. Teaching aptitude helps the teachers in teaching effectively with great vigour and glamour.

Certain aspects of aptitude are inborn and it is also influenced by the environment. It is the ability to acquire, reflecting cumulative influence of the array of experience in everyday life. Teaching aptitude is a special ability or specific capacity of an individual to be skilled in teaching by receiving formal or informal training. Therefore, teaching aptitude is a condition or set of characteristics that estimates the extent to which the individual will profit from the specified training or course of studying or forecast the quality of his/her achievement in a new situation.

Various studies have proposed different criteria on how to assess teaching aptitude. In this research, the researcher used eight subscales of teaching aptitude test battery: co-operative attitude, consideration, wide interest and scholarly taste, fair mindedness and impartiality, moral character and discipline, optimistic attitude, motivational aspect and dynamic personality.

Teaching Competency

A teacher with good aptitude must be conscious of the essentials of components of teaching such as lesson planning, motivating students, content learning materials, learning strategies, consolidation, elaborations, group activity, continuous and comprehensive evaluation, discipline, multi- level and multi-grade activities, effective communication and interaction etc. Furthermore, teachers had to face innumerable problems inside and outside classrooms such as cognitive, methodological, parental, societal, administrative, managerial, communicative, interactive and students related.

Teaching competency includes the acquisition and demonstration of the composite skills required for teaching like introducing of lesson, questioning, explaining, reinforcement, understanding child psychology, recognizing behaviour, classroom management and giving assignments with clear instruction (Shukla, 2014). In this research, the facets of teaching competency are planning, presentation, closing, evaluation and managerial.

Method

Research Method

Descriptive research design and quantitative survey method was used.

Participants of the Study

The population for this study included fifth year second semester student teachers from Sagaing University of Education (2019-2020 Academic Year, 2021 May-June). A total of 101 student teachers (26 males and 75 females) would be selected by using simple random sampling technique.

Instruments

In this study, Teaching Aptitude Test Battery (TATB) developed by Karim and Dixit (1986) consisting of 80 items and General Teaching Competency Scale (GTCS) developed and standardized by Passi and Lalita (2011) consisting of 21 items were used to measure teaching aptitude and teaching competency of student teachers. Teaching Aptitude Test Battery (TATB) was composed of eight subscales: co-operative attitude, consideration, wide interest and scholarly taste, fair mindedness and impartiality, moral character and discipline, optimistic attitude, motivational aspect and dynamic personality. It was five-point Likert scale. General Teaching Competency Scale (GTCS) was composed of five subscales: planning, presentation, closing, evaluation and managerial. It was also five-point Likert scale. The reliability coefficients of Teaching Aptitude Test Battery (TATB) and General Teaching Competency Scale (GTCS) were 0.964 and 0.918 respectively.

Procedure

In this study, the related literature was gathered from several available books, journal and internet sources. And then, appropriate research instruments were prepared to use in this study. The instruments were assessed by the experts in the field of Educational Psychology and Methodology. The data collection procedure was begun to assess student teachers' teaching aptitude and teaching competency. After getting the required data, they were analyzed step by step. Finally, the interpretation of the findings was made and conclusion was drawn.

Analysis of the Data

The data were analyzed by using descriptive statistics, independent samples *t*- test and one-way ANOVA. The independent samples *t*-test was applied to compare the differences between teaching aptitude and teaching competency by gender and reason of professional

selection. One-way ANOVA was applied to compare the differences of teaching aptitude and teaching competency by subject stream. The Pearson Product Moment correlation was used to find the relationship between teaching aptitude and teaching competency of student teachers. Finally, simple linear regression was used to predict teaching competency from teaching aptitude of student teachers.

Data Analysis and Findings

Teaching Aptitude of Student Teachers

Descriptive statistics for student teachers' teaching aptitude was shown in Table 1.

Table 1 Descriptive Statistics for Student Teachers' Teaching Aptitude by Components

Subscales	N	No. of items	Mini	Max	Mean	SD
Co-operative Attitude	101	10	32	50	42.96	4.09
Consideration	101	10	35	50	43.11	3.97
Wide Interest & Scholarly Taste	101	10	32	50	42.41	3.92
Fair Mindedness & Impartiality	101	10	33	50	42.39	3.95
Moral Character & Discipline	101	10	34	50	44.33	3.94
Optimistic Attitude	101	10	29	50	41.31	4.32
Motivational Aspect	101	10	32	50	43.40	3.97
Dynamic Personality	101	10	26	50	42.67	4.23
Total	101	80	276	395	342.56	27.54

As shown in Table 1, the total mean of student teachers' teaching aptitude (342.56) was higher than the theoretical mean (240). It can be concluded that student teachers' teaching aptitude was satisfactory. The mean score of moral character and discipline subscale (44.33) had the highest and that of optimistic attitude subscale (41.31) had the lowest.

Comparison of Student Teachers' Teaching Aptitude by Gender

To explore the student teachers' teaching aptitude by gender, independent samples *t*-test was used. The results were shown in Table 2.

Table 2 Mean Comparisons and Results of Independent Samples *t* Test for Teaching Aptitude by Gender

Variable	Gender	N	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>	<i>MD</i>
Teaching Aptitude	Male	26	339.27	29.57	- .706	99	.482	-4.44
	Female	75	343.71	26.92				

In Table 2, the mean and standard deviation of male student teachers' teaching aptitude were 339.27 and 29.57 and those of female student teachers' teaching aptitude were 343.71 and 26.92. The mean score of female student teachers' teaching aptitude exceeded 4.44 points than that of male student teachers' teaching aptitude. According to the result of independent samples *t* test, there was no significant difference in student teachers' teaching aptitude by gender ($t = -.706, p > .05$).

Comparison of Student Teachers' Teaching Aptitude by Reason of Professional Selection

To explore the student teachers' teaching aptitude by reason of professional selection, independent samples *t* test was used. The results were shown in Table 3.

Table 3 Mean Comparisons and Results of Independent Samples *t* Test for Teaching Aptitude by Reason of Professional Selection

Variable	Reason	N	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>	<i>MD</i>
Teaching Aptitude	self	73	344.33	26.25	1.040	99	.301	6.37
	others	28	337.96	30.69				

In Table 3, the mean and standard deviation of student teachers who selected teaching profession by self were 344.33 and 26.25 and those of student teachers who selected teaching profession by others were 337.96 and 30.69. The mean score of student teachers who selected teaching profession by self was exceeded 6.37 points than that of student teachers who selected teaching profession by others. According to the result of independent samples *t* test, there was no significant difference in student teachers' teaching aptitude by reason of professional selection ($t = 1.040, p > .05$).

Comparison of Student Teachers' Teaching Aptitude by Subject Stream

In order to examine the differences in student teachers' teaching aptitude among subject stream, descriptive statistics was conducted.

Table 4 Descriptive Statistics of Student Teachers' Teaching Aptitude by Subject Stream

Variable	Subject Stream	N	Min	Max	Mean	SD
Teaching Aptitude	Science	63	276	395	340.60	29.76
	Arts	24	284	391	344.75	24.11
	Arts-Science	14	320	385	347.64	22.97

In Table 4, the mean of student teachers who took arts-science subject stream (347.64) was the highest and the mean of student teachers who took science subject stream (340.60) was the lowest in teaching aptitude. To explore whether student teachers' teaching aptitude by subject stream had significant difference or not, one-way ANOVA was conducted.

Table 5 ANOVA Results for Teaching Aptitude of Student Teachers by Subject Stream

Variable		Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>p</i>
Teaching Aptitude	Between Groups	718.038	2	359.019	.468	.628
	Within Groups	75168.794	98	767.029		
	Total	75886.832	100			

According to Table 5, there was no significant difference in student teachers' teaching aptitude according to subject stream. It can be interpreted that student teachers from Sagaing University of Education were not different in teaching aptitude.

Teaching Competency of Student Teachers

Descriptive statistics for student teachers' teaching competency was shown in Table 6.

Table 6 Descriptive Statistics for Student Teachers' Teaching Competency by Components

Components	N	No. of items	Mini	Max	Mean	Mean%	SD
Planning	101	4	10	20	16.56	82.8%	2.08
Presentation	101	11	29	55	46.12	83.85%	4.92
Closing	101	2	3	10	8.36	83.6%	1.18
Evaluation	101	2	4	10	8.14	81.4%	1.19
Managerial	101	2	5	10	8.60	86%	1.15
Total	101	21	63	105	87.85	83.66%	8.91

As shown in Table 6, the total mean of student teachers' teaching competency (87.85) was higher than the theoretical mean (63). It can be concluded that student teachers' teaching competency was satisfactory. The mean percent of managerial (86 %) had the highest and that of evaluation (81.4 %) had the lowest.

Comparison of Student Teachers' Teaching Competency by Gender

To explore the student teachers' teaching competency by gender, independent samples *t*-test was used. The results were shown in Table 7.

Table 7 Mean Comparisons and Results of Independent Samples *t* Test for Teaching Competency by Gender

Variable	Gender	N	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>	<i>MD</i>
Teaching Competency	Male	26	88.69	9.47	.556	99	.579	1.13
	Female	75	87.56	8.75				

In Table 7, the mean and standard deviation of male student teachers' teaching competency were 88.69 and 9.47 and those of female student teachers' teaching competency were 87.56 and 8.75. The mean score of male student teachers' teaching competency exceeded 1.13 points than that of female student teachers' teaching competency. According to the result of independent samples *t* test, there was no significant difference in student teachers' teaching competency by gender ($t = .556, p > .05$).

Comparison of Student Teachers' Teaching Competency by Reason of Professional Selection

To explore the student teachers' teaching competency by reason of professional selection, independent samples *t*-test was used. The results were shown in Table 8.

Table 8 Mean Comparisons and Results of Independent Samples *t* Test for Teaching Competency by Reason of Professional Selection

Variable	Reason	N	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>	<i>MD</i>
Teaching Competency	self	73	88.97	8.16	2.075	99	.041*	4.04
	others	28	84.93	10.19				

Note. * The mean difference is significant at .05 level.

In Table 8, the mean and standard deviation of student teachers' teaching competency who selected teaching profession by self were 88.97 and 8.16 and those of student teachers' teaching competency who selected the teaching profession by others were 84.93 and 10.19. The mean score of student teachers' teaching competency who selected the teaching profession by self was exceeded 4.04 points than that of student teachers' teaching competency who selected teaching profession by others. According to the result of independent samples *t* test, there was significant difference in student teachers' teaching competency by reason of professional selection ($t = 2.075, p < .05$).

Comparison of Student Teachers' Teaching Competency by Subject Stream

In order to examine the differences in student teachers' teaching competency among subject stream, descriptive statistics was conducted.

Table 9 Mean Comparisons for Teaching Competency by Subject Combination

Variable	Subject Combination	N	Min	Max	Mean	SD
Teaching Competency	Science	63	63	105	88.41	9.48
	Arts	24	76	102	88.50	6.48
	Arts-Science	14	70	105	84.21	9.55

In Table 9, the mean of student teachers who took arts subject stream (88.50) was the highest and those of student teachers who took arts-science subject stream (84.21) was the lowest in teaching competency. To explore whether student teachers' teaching competency by subject stream had significant difference or not, one-way ANOVA was conducted.

Table 10 ANOVA Results for Teaching Competency of Student Teachers by Subject Stream

Variable		Sum of Squares	df	Mean Square	F	p
Teaching Competency	Between Groups	215.145	2	107.573	1.365	.260
	Within Groups	7725.627	98	78.833		
	Total	7940.772	100			

According to Table 10, there was no significant difference in student teachers' teaching competency according to subject stream. It can be interpreted that student teachers from Sagaing University of Education were not different in teaching competency.

Relationship Between Student Teachers' Teaching Aptitude and Teaching Competency of Student Teachers

In order to explore the relationship between student teachers' teaching aptitude and teaching competency, Pearson Product-Moment Correlation Coefficient was calculated.

Table 11 Correlation Matrix Between Student Teachers' Teaching Aptitude and Teaching Competency

Variable	Teaching Competency
Teaching Aptitude	.557**
Sig. (2-tailed)	0.00

Note. ** Correlation is significant at 0.01 level (2-tailed)

According to Table 11, there is a significant positive relationship between teacher aptitude and teaching competency. It can be concluded that those who have high teaching aptitude are also high in teaching competency.

Simple Linear Regression for Teaching Competency from Teaching Aptitude

Simple linear regression is computed to predict teaching competency from teaching aptitude. The result was presented in Table 12.

Table 12 Simple Linear Regression Analysis Summary for Teaching Competency from Teaching Aptitude

	B	β	t	R	R^2	$Adj R^2$	F
Constant	26.114						
Teaching Aptitude	.184	.557	6.675	.557	.310	.303	44.561***

Note: *** $p < .001$

According to the result, a significant regression was found ($F = 44.561$, $p < .001$) that show to determine whether the model is a good fit for the data according to the p -value. The result showed that the teaching competency significantly predicted from teaching aptitude. R^2 for model was 0.310 and adjusted R^2 was 0.303. This indicates that 30% of the variance in the teaching aptitude was explained by the model. The model can be defined by the following equation:

$$\text{Teaching Competency} = 26.114 + 0.184 \text{ Teaching Aptitude}$$

Discussion, Suggestions and Conclusion

Discussion

The main aim of this study is to explore teaching aptitude and teaching competency of student teachers. The mean of student teachers' teaching aptitude was 342.56 and it can be interpreted that the student teachers' teaching aptitude was satisfactory. And, the mean of teaching competency was 87.85 and it can be said that student teachers' teaching competency was favorable.

Gender Difference: There was no significant difference in student teachers' teaching aptitude by gender. Female student teachers had slightly higher mean scores than male student teachers. This result was consistent with the findings of Ranganathan (2008), Augustine (2010), Pany (2013), Kalita (2016), Ei Mon Mon Aung (2019) and Yar Zar Chit (2020).

For teaching competency, there was no significant difference between male and female student teachers. Male student teachers had slightly higher mean scores than female student teachers. This result was consistent with the findings of Kandhavel and Nellaiyapen (2016).

Type of Professional Selection: There was no significant difference in student teachers' teaching aptitude by type of professional selection. The mean score of student teachers' teaching aptitude who selected teaching profession by myself was higher than that of student teachers' teaching aptitude who selected teaching profession by others.

For teaching competency, according to the result of independent samples t test, there was significant difference in student teachers' teaching competency by type of professional selection ($t = 2.075$, $p < .05$). The mean score of student teachers' teaching competency who selected

teaching profession by myself was significantly higher than that of student teachers' teaching competency who selected teaching profession by others.

Subject Stream: Descriptive statistics was used to compare means of student teachers' teaching aptitude by subject stream. According to this result, the mean of student teachers who took arts-science subject stream was the highest and those of student teachers who took science subject stream was the lowest in teaching aptitude. However, there was no significant difference according to subject stream in ANOVA result.

For teaching competency, descriptive statistics was also used to compare mean by subject stream. According to this result, the mean of student teachers who took arts subject stream was the highest and those of student teachers who took arts-science subject stream was the lowest in teaching competency. Depending on the results of one-way ANOVA, there was no significant difference in teaching competency among student teachers' subject stream.

Correlation between Teaching Aptitude and Teaching Competency of Student Teachers: According to the relationship between teaching aptitude and teaching competency of student teachers, there was significant and positive relationship. This result was consistent with the findings of Jena (2012), Bala and Singh (2013), and Kandhavel and Nellaiyapen (2016).

Simple Linear Regression Analysis Summary for Teaching Competency from Teaching Aptitude: According to the result, the teaching competency significantly predicted from teaching aptitude and 30% of teaching competency can be predicted from teaching aptitude.

Suggestions

The effectiveness of education depends upon quality of teachers in an institution. The quality of teacher's depends upon the quality of training received by them in different training institutions. Although teaching aptitude and teaching competency of student teachers from Sagaing University of Education were satisfactory, teaching aptitude test should be included in the selection of student teachers for teacher education institutions. The teacher trainers should use more attractive, interested and effective teaching learning activities. The student teachers should also be performed teaching learning activities (presentation, discussion, observation, making teaching aids and test construction) in and out of classes. Finally, the duration of teaching practice (peer-group teaching and bloc teaching) should be increased to improve their teaching aptitude and teaching competency.

Conclusion

Teaching aptitude and teaching competency shows the estimation of student teachers' abilities for the future performance. Therefore, this paper hoped that the teacher educators and administrators from teacher education institutions will get some ideas to promote the teaching aptitude and teaching competency of their student teachers. It can upgrade training to become competent teachers who should keep themselves abreast with development in their field.

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PRETEND PLAY AND DIVERGENT THINKING OF PRESCHOOL CHILDREN

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Abstract

The primary purpose of this study is to examine pretend play and divergent thinking of preschool children. The sample consists of 60 preschool children (26 males and 34 females) from Sagaing District and Pyin Oo Lwin District. The preschool children were randomly selected. Descriptive research design and survey method were used in this study. Affect in Play Scale – Preschool version was used to measure pretend play of preschool children. The Multidimensional Stimulus Fluency Measure was used to measure divergent thinking of preschool children. The data were analyzed by calculating descriptive statistics, independent sample *t* test and Pearson-Product Moment Correlation. According to results, there were significant differences in dimensions of pretend play by age. Then, female preschoolers were higher than male in pretend play, imagination, elaboration and positive affect. Then, females express fewer themes of negative affect in their pretend play than males. There were no significant differences in fluency and novelty scores of divergent thinking by gender. There was a significant difference in divergent thinking fluency score by age. Finally, there was significant positive correlation between pretend play and divergent thinking.

Keywords: *Pretend Play, Divergent Thinking, Fluency, Novelty*

Introduction

Early childhood is the most important part of human life. Only good early childhood education provided by teachers and parents will bring to become all round development in children. Moreover, play is one type of educational practice in childhood. Children can get many beneficial skills for their future life through playing. Play has its unique roles and benefits. The benefits of play are imperative in shaping one's life. In early childhood, children learn to develop their skills in physical, cognitive, emotional and social domains through play. Play is the main factor for child development.

The value of play in the child's development and learning has been expressed throughout history. Plato maintained that "enforced learning will not stay in the mind ... let your children lessons take the form of play" (cited in Hoffmann, 2014). Vygotsky (1978) suggested that in play, children create their zone of proximal development and may develop self-regulation (cited in Hoffmann, 2014). Piaget (1962) theorized that play provides a context in which interact with their environment and can create their own knowledge about the world (cited in Hoffmann, 2014).

Play can be rule-based, social, solitary, or competitive actions in nature. Play is a multidimensional construct and varies in meaning depending on the context (Cohen, 2006, cited in Hoffmann, 2014). Children engage in many different types of play such as puzzles, board games and outdoor activities. Among all types of play, pretend play, is generally agreed to be the most influential to the development of cognitive abilities (Mengying Zhang, 2017). According to Fein (1989), symbolism in the context of pretend play can be understood as behaviors in which a child treats one thing as if it were something else. For example, a child might pretend a

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rectangular block is a car. Through pretend play children display cognitive, affective, and interpersonal processes (Russ, 2004).

According to Russ (2004), pretend play involves both cognitive and affective processes which can be observed, such as the organization of a story's plot or the expression of emotion during play. Some aspects in pretend play such as the capacity to use fantasy and the ability engage in "as if" play action should be critical in many domains of creative capacity.

One of the major domains important in creativity is divergent thinking. Guilford (1968) defined divergent thinking is thinking that generates a variety of ideas and associations to a problem. Divergent thinking involves free association, broad scanning ability, and fluidity of thinking. Divergent thinking typically occurs in a spontaneous, free-flowing manner, such that many ideas are generated in an unorganized fashion. Many possible solutions are explored in a short amount of time, and unexpected connections are drawn (cited in Anoiko, 2011).

Singer and Singer (1990) suggested areas of cognitive development that are facilitated by pretend play activities. Pretend play helps the child to (a) expand vocabulary and link objects with actions, (b) develop object constancy, (c) form event schemas and scripts, (d) learn strategies for problem solving, (e) develop divergent thinking ability, and (f) develop a flexibility in shifting between different types of thought (narrative and logical).

In the previous studies of Fisher (1992) and Hoffman and Russ (2012), they explored that pretend play of school-aged children was related to dimensions of creativity such as storytelling and divergent thinking. Divergent thinking is a thought process or method used to generate creative ideas by exploring many possible solutions (Anoiko, 2011). Divergent thinking in particular has related to pretend play in a variety of studies in different research laboratories (Fisher, 1992). Hoffman and Russ (2012) found positive correlations between the cognitive and affective domains of pretend play and children's divergent thinking abilities, independent of verbal intelligence. Greater variety of affect categories expressed in pretend play related to better divergent thinking. Other studies by Russ and Grossman-McKee (1990) and Russ and Schafer (2006) have found that similar relations between both positive and negative affect in pretend play and divergent thinking.

Many parents and teachers in Myanmar also did not recognize the importance of pretend play, and other academic classes replaced the time for pretend play. To turn this situation around, it is necessary for adults to change their attitudes towards pretend play and increase their awareness on the benefits of pretend play, as the development in cognitive abilities are necessary for children's learning and improvement in one's whole life.

In Myanmar, educational researchers need to do more researches to explore the benefits of play, especially pretend play. Therefore, this current study aimed to examine the role of pretend play in divergent thinking of preschool children.

Aims of the Study

The main aim of this study is to examine pretend play and divergent thinking of preschool children. The specific objectives are as follow:

1. To explore pretend play of preschool children by gender
2. To compare pretend play of preschool children by age
3. To investigate divergent thinking of preschool children by gender

4. To examine divergent thinking of preschool children by age
5. To find out the relationship between pretend play and divergent thinking of preschool children

Research Questions

1. Are there any statistically significant differences in pretend play of preschool children by gender?
2. Are there any statistically significant differences in pretend play of preschool children by age?
3. Are there any statistically significant differences in divergent thinking of preschool children by gender?
4. Are there any statistically significant differences in divergent thinking of preschool children by age?
5. Is there any significant relationship between pretend play and divergent thinking of preschool children?

Scope of the Study

In this research, preschool children from Sagaing District and Pyin Oo Lwin District were selected as participants.

Definitions of Key Terms

- Pretend Play** - Pretend play is defined as play that includes the use of fantasy and make-believe and the use of symbolism (Russ, 2004).
- Divergent Thinking** - Divergent thinking refers to children's ability to generate a variety of Ideas / solutions (Fisher, 1992).
- Fluency** - Fluency is the sum of acceptable/reasonable responses the child gives to each Item (Fisher, 1988).
- Novelty** - Novelty is the sum of acceptable/reasonable responses given by less than 5% of the Sample (Fisher, 1988).

Method

Sampling

The sample consists of 60 preschool children from two selected private preschools in Sagaing District and Pyin Oo Lwin District. The preschool children were randomly selected.

Method

Descriptive research design and survey method were used in this study.

Instrumentation

Affect in Play Scale – Preschool version was used to measure pretend play of preschool children. It was previously adapted by Kaugars and Russ in 2009 from original version of Affect in Play Scale which was developed and validated by Russ (1999) for children six to ten years old. The instrument used in this study, Affect in Play Scale – Preschool Version, is a five-minute standardized play task. The target population for Affect in Play Scale – Preschool Version is four to six year old. Affect in Play Scale – Preschool Version is sensitive to individual differences in

children's play at this younger age. Video recording was used to collect the required data for pretend play.

In Affect in Play Scale – Preschool Version, the appropriate materials and instructions for younger age groups were used. In the original version of Affect in Play Scale, puppets were used to explore pretend play. However, according to the assumption of Russ and Kaugars (2009), puppets might be more difficult for young children to manipulate. Based on this assumption, they used toys that would be easy to play with for younger children and that could elicit pretend play in their new version of Affect in Play Scale – Preschool Version. Thus, the materials/toys in this Affect in Play Scale – Preschool Version are as follow: five soft, stuffed animals (elephant, bear, shark, dog and bunny), four small plastic animals (giraffe, cheetah, hippo and camel), a plastic car, three plastic cups and a ball.

In Affect in Play Scale – Preschool Version, the instructions contained three parts. First, a warm-up task is used to introduce materials/toys. In this warm-up task, the examiner establishes some rapport with children. The children are asked to name the different toys and some of their characteristics like the color and number of materials/toys. In the second part, the more explicit directions are given to children to “make up a story” with the toys by providing with several examples of what they can have the toys do. Finally, the children are not given a 1-minute warning near the end of their play time. Instead, they are just told when to start and stop.

The standard prompts for instances of play are given if preschool children do not play, do not talk and stop play early. At the end of play time, the examiner gives the final instruction to stop play activities. The guideline of stopping after 2 minutes if a child is unable to play is used with younger children.

In this Affect in Play Scale – Preschool Version, there are seven primary scores: frequency of affect expression, variety of affect expressions, quality of fantasy, comfort, no play episodes, functional play episodes, and pretend play episodes.

Affect in the child's play is coded as a frequency count. It is important to note that the affect within the child's story narrative is counted in affect scoring. The child's actual affect is not considered as the affect to measure. Both verbal and nonverbal affect expressions are recorded and scored. Frequency of affect expression is scored as the frequency count of instances in which the child expresses affect in any of the twelve possible categories. The variety of affect expressions is the number of different affect categories that are represented in each child's 5-minute play session. The possible categories included in Affect in Play Scale – Preschool Version are five positive affect (nurturance/affection, happiness/pleasure, competition, oral, sexual), six negative affect (aggressive, anxiety/ fear, sadness/hurt, frustration/disappointment, oral aggression, anal) and undefined affect expression. The Undefined Affect score is a count of affect that does not clearly fall into the positive or negative affect category. The undefined affect expression category includes sound effects and comments that are not understandable but seem to include affect (i.e., *roar*, *beep beep*, and *vroom*).

Imagination is the rating of the child's ability to engage in pretend play and the uniqueness of their play events. Organization is the rating of the quality of the plot and coherence of the narrative. Elaboration is the rating of the complexity and embellishment in the themes, uses of sound effects, and characters. Comfort is the rating of the child's enjoyment and involvement in the play task. In this study, the rating for three components of quality of fantasy

and comfort are adapted based on the scoring scheme of Affect in Play Scale – Preschool Version.

No play is the absence of any interaction with toys. If the child name an object or describe its actual properties (for example, count the number of cups) or he is absently moving a toy in a repetitive fashion but attending to another activities, these are also coded in this category (e.g., short motor movements rolling ball while talking to examiner about unrelated topic).

Functional play is defined as simple repetitive muscle movements with objects. For example, a child may throw the ball up and down, push the car back and forth without making any sounds, stack the cups, or line up the animals.

Pretend play includes using one object to represent another or attributing activities to inanimate objects (i.e., pretending the cup is a bathtub, having the animals talk to one another). The examples or characteristics of pretend play are as follow:

- inanimate objects may be treated as animate (e.g., the stuffed bear may talk),
- one object or gesture may be substituted for another (e.g., the cup may be a bathtub),
- the child may perform an activity usually done by someone or something else (e.g., pretend to be a dog),
- speech may be substituted for action (e.g., “Let’s pretend we’re going to bed”) and
- language may be used to describe a situation (e.g., “Let’s pretend this is the swimming pool”).

In scoring three types of play, the child’s predominant activity in each 20-second interval is scored (i.e., occurs for greater than or equal to 10 seconds within each 20-second interval).

The inter-rater reliability was determined by calculating an intraclass correlation coefficient (ICC). The pilot results for Affect in Play Scale – Preschool Version (APS-P) are as shown in Table 1.

Table 1 Pilot Results for Affect in Play Scale – Preschool Version (APS-P)

Scores in APS-P	Intraclass Correlation Coefficient (ICC)	95%CI
Variety of Affect	0.823	0.663-0.912
Positive Affect		0.715-0.927
Negative Affect	0.852	0.740-0.934
Undefined Affect	0.866	
Frequency Of Affect (Total)	0.877	0.712-0.944
	0.879	0.763-0.940
Imagination		0.701-0.924
Organization	0.846	0.754-0.938
Elaboration	0.874	
	0.898	0.797-0.950
Comfort	0.822	0.663-0.911
No Play	0.850	0.709-0.925
Functional Play	0.837	0.685-0.919
Pretend Play	0.908	0.813-0.955

According to the guideline for reporting intraclass correlation coefficient (ICC) of Koo and Li (2016), the pre-determined ranges of inter-rater reliability outcomes are identified as poor (<0.5), fair (0.50-0.75), good (0.75-0.90) and excellent (0.9-1). Based on this guideline, the ICCs in scores of Play Scale – Preschool Version (APS-P) were interpreted and converted into reliability outcomes. Thus, the pilot results indicated that seven scores in Play Scale – Preschool Version (APS-P) have good and excellent inter-rater reliability.

Multidimensional Stimulus Fluency Measure (MSFM) by Moran, Milgram, Sawyers and Fu (1983) was used for measuring divergent thinking of preschool children in the current study. This instrument is widely accepted as a measure of divergent thinking for preschoolers as it assesses ideational fluency, the best single measure of divergent thinking, and is a predictor of creative capacity. The two main scores are Fluency and Novelty. Fluency is the sum of acceptable/reasonable responses the child gives to each item. Novelty is the sum of acceptable/reasonable responses given by less than 5% of the sample. MSFM consists of six items. The interrater reliability was determined by calculating an intraclass correlation coefficient (ICC). The pilot results for Multidimensional Stimulus Fluency Measure (MSFM) are as shown in Table 2.

Table 2 Pilot Results for Multidimensional Stimulus Fluency Measure (MSFM)

Scores in MSFM	Intraclass Correlation Coefficient (ICC)	95%CI
Fluency	0.945	0.889-0.973
Novelty	0.801	0.557-0.908

As shown in Table 2, the fluency score has excellent inter-rater reliability with intraclass correlation coefficient of .945 and the novelty score has good inter-rater reliability with intraclass correlation coefficient of .801. The pilot results for the MSFM indicated that it is a reliable measure with good and excellent interrater reliability.

Data Analysis

The data was analyzed by using SPSS software. By descriptive analysis, the mean, standard deviation, maximum and minimum scores for preschool children's scores in APS-P and MSFM were calculated. Independent samples *t* test analysis was used to investigate whether there were significant differences in pretend play and divergent thinking of preschool children by gender and age. Finally, Pearson-Product Moment Correlation was carried out to find out if there were any significant correlations between pretend play and divergent thinking.

Findings

Descriptive Statistics for Dimensions of Pretend Play in Preschool Children

To investigate the dimensions of pretend play of preschool children, the descriptive statistics was carried out and the results were shown in Table 3.

Table 3 Descriptive Statistics for Dimensions of Pretend Play in Preschool Children

Variable	N	Minimum	Maximum	Mean	SD
No Play	60	0	14	3.05	3.132
Functional Play	60	0	11	2.72	2.630

Variable	N	Minimum	Maximum	Mean	SD
Pretend Play	60	0	15	9.22	4.038
Imagination	60	1	5	3.08	1.266
Organization	60	1	5	3.10	1.020
Elaboration	60	1	5	2.97	1.390
Comfort	60	1	5	3.62	0.804
Variety of Affect	60	1	7	4.00	1.315
Positive Affect	60	0	14	5.27	3.102
Negative Affect	60	0	14	3.35	3.804
Undefined Affect	60	0	6	1.62	1.678
Frequency of Affect	60	2	25	10.23	4.862

As shown in Table 3, pretend play had the highest mean score (9.22) with standard deviation (4.038) in three types of play. Moreover, the mean scores and standard deviations in four cognitive components of pretend play were 3.08 and 1.266 for imagination, 3.10 and 1.020 for organization, 2.97 and 1.390 for elaboration and 3.62 and 0.804 for comfort respectively. According to the results, the mean score in positive affect was higher than that of negative affect. Moreover, undefined affect had the lowest mean score (1.62) and standard deviation (1.678). Thus, this result revealed that most of preschool children displayed more segments of pretend play in their five minutes play session and more expressed the positive affect category.

Comparison of Dimensions of Pretend Play in Preschool Children by Gender

To find the differences in dimensions of pretend play between male and female preschool children, descriptive analysis and independent sample *t* test were calculated and the results were described in Table 4.

Table 4 Results of Independent Samples *t* test on Dimensions of Pretend Play in Preschool Children by Gender

Variable	Gender	N	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>
No Play	Male	26	3.54	3.922	.992	58	.327
	Female	34	2.68	2.358			
Functional Play	Male	26	3.50	3.076	2.073*	58	.043
	Female	34	2.12	2.086			
Pretend Play	Male	26	7.96	4.779	-2.054*	58	.046
	Female	34	10.18	3.109			
Imagination	Male	26	2.65	1.355	-2.387*	58	.020
	Female	34	3.41	1.104			

Variable	Gender	N	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>
Organization	Male	26	2.81	1.059	-1.989	58	.051
	Female	34	3.32	.945			
Elaboration	Male	26	2.50	1.503	-2.361*	58	.022
	Female	34	3.32	1.199			
Comfort	Male	26	3.50	1.068	-.904	58	.373
	Female	34	3.71	.524			
Variety of Affect	Male	26	4.04	1.399	.197	58	.845
	Female	34	3.97	1.267			
Positive Affect	Male	26	3.77	2.582	-3.58**	58	.001
	Female	34	6.41	3.006			
Negative Affect	Male	26	5.50	4.760	3.917**	58	.001
	Female	34	1.71	1.508			
Undefined Affect	Male	26	2.04	1.777	1.699	58	.089
	Female	34	1.29	1.548			
Frequency of Affect	Male	26	11.31	6.392	1.513	58	.136
	Female	34	9.41	3.115			

Note: *The mean difference is significant at 0.05 level.

**The mean difference is significant at 0.01 level.

According to the above table, female children were significantly higher than male in pretend play, imagination, elaboration and positive affect. The results showed that there were the significant differences in functional play and negative affect by gender and the mean score of male were greater in functional play and negative affect than that of female. Thus, this finding was in agreement with the results of the studies of Fehr and Russ (2013).

Comparison of Dimensions of Pretend Play in Preschool Children by Age

In order to investigate whether there were significant differences in dimensions of pretend play of preschool children by age, descriptive statistics and independent sample *t* test were conducted. Preschool children's age was categorized into two groups (4 years and below and over 4 years). The results were shown in Table 5.

Table 5 The Results of Independent Samples *t* test for Dimensions of Pretend Play in Preschool Children by Age

Variable	Age	N	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>
No Play	4 years and below	32	4.25	3.637	3.615**	58	.001
	Over 4 years	28	1.68	1.611			

Variable	Age	N	Mean	SD	t	df	p
Functional Play	4 years and below	32	3.63	3.024	3.175**	58	.003
	Over 4 years	28	1.68	1.588			
Pretend Play	4 years and below	32	7.09	4.098	-5.437***	58	.000
	Over 4 years	28	11.64	2.215			
Imagination	4 years and below	32	2.50	1.191	-4.358***	58	.000
	Over 4 years	28	3.75	1.005			
Organization	4 years and below	32	2.63	1.008	-4.420***	58	.000
	Over 4 years	28	3.64	.731			
Elaboration	4 years and below	32	2.47	1.319	-3.189**	58	.002
	Over 4 years	28	3.54	1.261			
Comfort	4 years and below	32	3.38	.976	-2.732**	58	.009
	Over 4 years	28	3.89	.416			
Variety of Affect	4 years and below	32	3.69	1.306	-2.019*	58	.048
	Over 4 years	28	4.36	1.254			
Positive Affect	4 years and below	32	4.81	3.267	-1.217	58	.228
	Over 4 years	28	5.79	2.872			
Negative Affect	4 years and below	32	2.28	2.568	-2.336*	58	.024
	Over 4 years	28	4.57	4.598			
Undefined Affect	4 years and below	32	1.53	1.524	-.418	58	.677
	Over 4 years	28	1.71	1.863			
Frequency of Affect	4 years and below	32	8.63	3.635	-2.832**	58	.007
	Over 4 years	28	12.07	5.470			

Note: *The mean difference is significant at 0.05 level.

**The mean difference is significant at 0.01 level.

***The mean difference is significant at 0.001 level.

The results of *t* test from Table 5 showed that there were significant differences by age ($t=-5.437$, $p<0.001$) in pretend play and it revealed that over 4 years aged preschool children tend to display more in pretend play episodes than 4 years and below. However, 4 years and below aged preschool children in the current study were significantly more participated in no play and functional play. Moreover, over 4 years preschool children were significantly higher than 4 years and below in all cognitive components of pretend play. In the scores of affective process of pretend play, there were significant differences in variety of affect, negative affect and frequency of affect between 4 years and below and over 4 years. The result showed that the mean scores of over 4 years aged children in variety of affect, negative affect and frequency of affect were higher than those of 4 years and below. This was similar to the findings of Fehr (2010).

Descriptive Statistics for Dimensions of Divergent Thinking of Preschool Children

To investigate divergent thinking of preschool children, the descriptive statistics was calculated and the results were presented in Table 6.

Table 6 Descriptive Statistics for Dimensions of Divergent Thinking of Preschool Children

Variable	N	Minimum	Maximum	Mean	SD
Fluency	60	4	32	17.48	6.756
Novelty	60	0	9	2.350	1.830

According to Table 6, the maximum score of preschool children in fluency was 32 and the mean score was 17.48 ($SD= 6.756$). The mean score and standard deviation for novelty was 2.35 and 1.83 respectively.

Comparison of Dimensions of Divergent Thinking of Preschool Children by Gender

To know whether there were any significant differences or not in dimensions of divergent thinking of preschool children by gender, descriptive statistics and independent sample t test were conducted. The results were presented in Table 7.

Table 7 The Results of Independent Sample t test for Dimensions of Divergent Thinking of Preschool Children by Gender

Variable	Gender	N	Mean	SD	t	df	p
Fluency	male	26	16.73	7.198	-.752	58	.455
	female	34	18.06	6.448			
Novelty	male	26	2.08	1.573	-.881	58	.382
	female	34	2.44	1.599			

According to the above Table 7, there were no significant differences in two scores of divergent thinking. Thus, the results of the current study concluded that preschool children's divergent thinking did not depend on gender. This finding was agreed with the finding of Fehr and Russ (2016).

Comparison of Dimensions of Divergent Thinking of Preschool Children by Age

In order to investigate whether there were significant differences in dimensions of divergent thinking of preschool children by age, descriptive statistics and independent sample t test were conducted. The result was shown in Table 8.

Table 8 Results of Independent Sample t test for Dimensions of Divergent Thinking of Preschool Children by Age

Variable	Age	N	Mean	SD	t	df	p
Fluency	4 years and below	32	14.50	5.501	-4.123***	58	.000
	Over 4 years	28	20.89	6.511			
Novelty	4 years and below	32	2.00	1.796	-1.531	58	.131
	Over 4 years	28	2.61	1.257			

Note: ***The mean difference is significant at 0.001 level.

In Table 8, there was a significant difference in fluency score of divergent thinking by age. However, there was no significant difference in novelty score of divergent thinking by age. This finding of the present study was in line with Wallace and Russ (2015).

The Relationship between Pretend Play and Divergent Thinking of Preschool Children

In order to investigate the relationship between pretend play and divergent thinking of preschool children, Pearson Product-Moment Correlation was applied.

Table 9 Inter-correlations between Dimensions of Pretend Play and Two Scores of Divergent Thinking in Preschool Children

Score	NP	FP	PP	I	O	E	C	VA	PA	NA	UA	FA	F	N
NP	-													
FP	-.031	-												
PP	-.757**	-.629**	-											
I	-.557**	-.395**	.693**	-										
O	-.622**	-.419**	.756**	.668**	-									
E	-.525**	-.443**	.699**	.637**	.656**	-								
C	-.699**	-.180**	.662**	.548**	.584**	.595**	-							
VA	-.358**	-.049	.306*	.234	.227	.213	.240	-						
PA	-.462**	-.283*	.542**	.339**	.490**	.541**	.232	.220	-					
NA	-.289*	.015	.216	.085	.200	.166	.344**	.552**	-.101	-				
UA	.126	-.033	-.075	.055	-.126	-.129	-.035	.384**	-.260*	.144	-			
FA	-.477**	-.180	.489**	.302*	.426**	.430**	.405**	.705**	.469**	.667**	.292*	-		
F	-.426**	-.283*	.519**	.481**	.298*	.199	.334**	.328*	.158	.049	.111	.178	-	
N	-.238	-.123	.255*	.343**	.276*	.228	.193	.447**	.126	.090	.163	.207	.482**	-

Note: * Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

NP = No Play, FP = Functional Play, PP = Pretend Play

I = Imagination, O = Organization, E = Elaboration, C = Comfort

VA = Variety of Affect,

PA = Positive Affect, NA = Negative Affect, UA=Undefined Affect

FA = Frequency of Affect

Table 9 showed the correlations between dimensions of pretend play and two divergent thinking scores of preschool children. It indicated that the divergent thinking fluency score had moderate positive correlation with pretend play ($r=.519$, $p<0.01$) and imagination ($r=.481$, $p<0.01$) and it was slightly positively correlated with organization ($r=.298$, $p<0.05$), comfort ($r=.334$, $p<0.01$) and variety of affect ($r=.328$, $p<0.05$). Moreover, the divergent thinking novelty score was significantly positively correlated with pretend play ($r=.255$, $p<0.05$), imagination ($r=.343$, $p<0.01$), organization ($r=.276$, $p<0.05$) and variety of affect ($r=.447$, $p<0.01$). These results of the current study were agreed with the studies of Hoffmann and Russ (2012). Moreover, no play and functional play negatively correlated with other dimensions of pretend play and divergent thinking scores. Therefore, the result interpreted that preschool children more engaged in pretend play had higher in divergent thinking.

Conclusion

The main purpose of this study was to study the relationship between pretend play and divergent thinking of preschool children. Moreover, gender differences and grade differences in pretend play and divergent thinking were also explored. In this study, a total of 60 preschool children from Sagaing District and Pyin Oo Lwin District participated. In this study, Affect in Play Scale – Preschool version (APS-P) for measuring the dimensions of pretend play and Multidimensional Stimulus Fluency Measure (MSFM) for assessing divergent thinking were used in this study. APS-P is a standardized 5-minute play task designed to measure various dimensions of preschool children's pretend play.

To analyze gender difference in pretend play, independent sample *t* test was computed and the result revealed that the mean scores of female in pretend play, imagination, elaboration and positive affect variables were significantly higher than those of male. However, male significantly engaged in functional play and expressed more in negative affect. These results were in agreement with the result of Fung and Cheng (2015) and they found that girls tend to engage in more pretend play and express fewer themes of aggression and negative affect in their pretend play than boys (cited in Marcelo, 2016). Moreover, another recent study by Yates and Marcelo (2014) also found that males expressed more negative affect and less positive affect in play than females.

Age differences in pretend play variables were explored in this study. The result revealed that older children in the current study significantly occurred in more pretend play segment and younger children significantly showed in more no play and functional play. Moreover, this study also found that older children were significantly better than in all cognitive variables of pretend play and frequency of affect. These findings are similar with the results of Fehr and Russ (2016). Moreover, the result of this study showed that older children expressed in more negative affect and displayed in more variety of affect. Therefore, pretend play variables depend on age in preschool aged children. This may be due to the theoretical facts that as children grow older, their pretend play becomes more sophisticated in form, organized in content, and social in context (Smolucha & Smolucha, 1998) and pretend play peaks during late preschool (Pellegrini & Smith, 1998).

In the current study, there was no significant gender difference in divergent thinking task. This result was in line with the studies of Tegano and Moran (1989) and Fehr and Russ (2016). Moreover, the result found age differences in divergent thinking fluency score. However, it did not find age differences in divergent thinking novelty score. Therefore, it can be concluded that older preschool children generated more fluent in responding the divergent thinking task.

The major finding of this study was that pretend play showed significant, positive correlation with two scores divergent thinking. Pretend play moderately correlated with divergent thinking fluency score and it slightly correlated with divergent thinking novelty score. However, no play and functional play negatively correlated with divergent thinking scores as well as the cognitive and affective variables of pretend play. Thus, the result was interpreted that children who displayed in more pretend play episodes in their play were better on divergent thinking task.

Moreover, imagination and organization in the cognitive variables of pretend play positively correlated with both fluency and novelty scores of divergent thinking. This finding is

similar with the findings of Wallace and Russ (2015). Moreover, this study found that variety of affect positively correlated with divergent thinking scores and comfort, one cognitive variable of pretend play positively correlated with divergent thinking fluency score. Therefore, this study interpreted that preschool children whose play was rated as better organized, more imaginative elements, more enjoyable in their play and displaying different categories of affect generated more responses on divergent thinking task. These findings may be confirmed with the suggestions that pretend play involves making associations which is an important part of divergent thinking (Russ, 2004) and it should also facilitate divergent thinking because in play children practice divergent thinking skills by using toys and objects to represent different things and by role-playing different scenarios (Singer & Singer, 1990).

The above results carry implications for how parents, preschool teachers and educators view divergent thinking and some benefits of pretend play. It is need to examine the future research studies concerning pretend play and divergent thinking. Moreover, the factors affecting on pretend play and divergent thinking need to explored in the future studies.

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AN ANALYTICAL STUDY OF THE EFFECT OF CLASSROOM EMOTIONAL CLIMATE ON MOTIVATING LEARNERS

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Abstract

The main aim of the present study is to explore the effect of classroom emotional climate on motivating learners. The specific objectives are to explore the emotional climate of students in classroom, to assess students' motivational orientations, to investigate the effect of classroom emotional climate on motivation. In this study, descriptive survey design was used. Data were collected from about 1932 high school students by using stratified random sampling technique. What Is Happening in this Class? (WIHIC) Questionnaire and Motivated Strategies for Learning Questionnaire (MSLQ) were used as the instruments in this study. The overall results showed that most of high school students fell into moderate classroom emotional climate level group. Data analysis involved the use of descriptive and inferential statistics. The results revealed that female students possessed better classroom emotional climate than male students. According to the t-test result, female students have more motivation than male students. The results of ANOVA pointed out that there were statistically significant difference among classroom emotional climate levels on motivation at 0.001 level. The result of correlation showed that classroom emotional climate was positively correlated with motivation. Teacher support, involvement, investigation, task orientation, cooperation, and equity were key predictors on motivation. However, student cohesiveness and teacher support were not significant predictors on motivation.

Keywords: Classroom Climate, Emotional Climate, Motivation

Introduction

At the beginning of the year teachers have the goal of establishing a classroom environment that is favorable for helping all students work cooperatively in order to learn. The classroom environment can either improve or impede a student's ability to learn and feel safe and comfortable as a member of the class. Classroom that encourage emotional well-being create an atmosphere for both learning and emotional development. Classroom climate is a broad construct, made up of students' feelings about their instructor and peers.

Baer and Bandura (1963) identified Social Learning Theory, where people learn behaviors through the observation of other people, and in turn imitate behaviors they see modeled by others. In this case, if teachers portray a positive climate within their classroom, students tend to respond to this positivity and react to it in the same manner, social learning theory of Bandura, supports a learning environment where everyone feels safe.

Some teachers have successfully chosen strategies in their classroom that create a positive climate in the classroom for students. Some teachers though, may find it hard to choose the right classroom management strategies to create a positive classroom climate. Classroom climate affects a student's attitude towards other students in the class, the teacher and the activities they do.

A positive classroom climate will reduce the student anxiety, while a negative classroom climate has the opposite effect, increasing student anxiety. When students misbehave, they are disruptive to their classmates and teacher, less engaged in lessons, and consequently perform worse in school (Finn, Pannozzo, & Voelkl, 1995; Freiberg, Huzinec, & Templeton, 2009). A

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key aspect of teacher student interactions pertains to the teacher's ability to cultivate an emotionally supportive classroom climate, and motivating learners which is the focus of this study.

Purposes of the Study

The main aim of the present study is

- to explore the effect of classroom emotional climate on motivating learners

The specific objectives are

- to explore the emotional climate of students in classroom,
- to assess students' motivational orientations
- to investigate the effect of classroom emotional climate on motivation

Definitions of Key Terms

Classroom Climate: the intellectual, social, emotional, and physical environments in which students learn (Ambrose et al., 2010).

Emotional Climate: the quality of social and emotional interactions in a shared space (e.g. classroom, school, organization, etc.) between two people or groups (e.g. students and teachers) (Brackett, Rivers et al., 2012).

Motivation: the process through which people initiate, guide and maintain themselves in order to achieve goals (Nevid, 2013).

Review of Related Literature

The classroom is a primary micro context in which students and teachers interact. The quality of social and emotional interactions in the classroom between and among students and teachers (e.g., teacher and peer support, student autonomy) creates the classroom emotional climate (Daniels & Shumow, 2003; Jia et al., 2009; Pianta, La Paro, & Hamre, 2008; Ryan & Patrick, 2001). Classroom emotional climate is expected to influence learning outcomes for students (Brophy, 1986, 1988; Konstantopoulos, 2009; Stuhlman & Pianta, 2009).

According to the Teaching Through Interactions Framework (Hamre & Pianta, 2007), classrooms characterized as high in classroom emotional climate have (a) teachers who are sensitive to students' needs; (b) teacher-student relationships that are warm, caring, nurturing, and congenial; (c) teachers who take their students' perspectives into account; and (d) teachers who refrain from using sarcasm and harsh disciplinary practices. Such classrooms also are ones in which the teacher fosters student comfort and enjoyment by regularly expressing warmth toward, respect for, and interest in students and by encouraging their cooperation with one another. Teachers in classrooms high in classroom emotional climate also are aware of their students' emotional and academic needs and respond to their students by choosing age-appropriate activities that both encourage self-expression and cater to their interests and points of view.

In contrast, classrooms with a negative emotional climate (i.e., low classroom emotional climate) are ones in which teachers and students share little emotional connection and regularly disregard, disrespect, taunt, humiliate, threaten, or even physically lash out at one another. Teachers in such classrooms do not design or apply lessons with students' perspectives or cognitive capabilities in mind, nor do these teachers divert from a lesson plan when students'

boredom, discomfort, or confusion arises. Classroom emotional climates characterized as “neutral” have teachers and students who provide inconsistent regard for each other. The teacher may be moderately warm, respectful, and aware of students’ emotions but also may be controlling or dismissive at times. Students in these classrooms sometimes share with and assist one another or laugh and smile with their teacher, but at other times are insensitive and uncertain about how to approach their teacher.

Theobald (2006) asserted that one of the greatest challenges for teachers in this century is to provide a learning environment that stimulates students’ motivation to learn. Motivation is the internal circumstance that instigates and focuses goal-oriented behaviour (Schunk, 2004). In studying students’ motivation to learn science, researchers have examined “why students strive to learn science, how intensively they strive, and what beliefs, feelings, and emotions characterize them in this process” (Glynn, Taasobshirazi & Brickman, 2009). Research has indicated that motivated students are the key to successful learning engagement in classrooms (Pajares, 2001, 2002; Pajares & Schunk, 2001). In order to improve their academic achievement, these students are more likely to increase class attendance, participate in class activities, ask questions and advice, join study groups and increase their study time.

Method

Sampling

The participants for this study were chosen by using stratified random sampling technique. Firstly, two states (Mon and Rakhine) and three regions: (Mandalay, Sagaing and Bago) (30% of total states and regions) were selected. And then, 4 high schools under Department of Basic Education from each selected state and region. Therefore, altogether 18 high schools were chosen and then nearly 100 high school students from each high school were selected. Finally, 1932 students participated in this study.

Research Method

In this study, descriptive survey design was used.

Research Instrumentation

WIHIC questionnaire consists 7 scales and 56 items. The seven scales are student cohesiveness, teacher support, involvement, task orientation, investigation, cooperation, and equity. The purpose of the study is to measure high school students’ classroom emotional climate. The WIHIC has personal and Class forms to measure the perceptions of students about classroom, and to measure the emotions of students about the actual environment of the classroom. The What Is Happening in this Class? (WIHIC) instrument which is a well-used questionnaire in classroom environment research (Fraser et al., 2013). The questionnaire is designed to measure students’ perception of their classroom environment in various educational contexts. According to the piloting result, the internal consistency of WIHIC Questionnaire is 0.907.

The MSLQ is a popular instrument that had been used by numerous researchers to measure high school students’ self-regulation (Duncan & McKeachie, 2005). This instrument comprises two parts, a motivation section and a learning strategies section. The motivation section consists of six scales and 31 items that assess intrinsic goal orientation, extrinsic goal orientation, task value, control of learning beliefs, self-efficacy for learning and performance and text anxiety. According to the piloting result, the internal consistency of MSLQ Questionnaire is 0.829.

Data Analysis and Findings

Analysis of Classroom Emotional Climate Level of High School Students

Descriptive Statistics of Classroom Emotional Climate

Descriptive analyses revealed that the mean and standard deviation of high school students' classroom emotional climate were 207.91 and 26.51 respectively. According to the norms of Fraser et al., What Is Happening in this Class? WIHIC Questionnaire, the scores for all respondents were calculated on their responses to the 56 measures on the WIHIC. The maximum possible scores is 280 and minimum possible score is 0. The mean WIHIC score for respondents was 207.91 and standard deviation (SD) was 26.51. The respondents' scores ranged from a low of 5 to a high of 280. Respondents with scores in the range of 0 to 181 were considered low classroom emotional climate. Scores in the range of 182 to 234 represented moderate classroom emotional climate in respondents. Students with high classroom emotional climate scores ranged from 235 to 280 (Fraser et al., 1996).

Table 1. Descriptive Statistics of High School Students' Classroom Emotional Climate

	Mean	SD	N	Minimum	Maximum
Classroom Emotional Climate	207.91	26.51	1932	96	272

Results revealed that $n = 309$, 15.99% of the students had low level of classroom emotional climate and $n = 311$, 16.09% of students had high level of classroom emotional climate. The majority of respondents were scored as possessing moderate classroom emotional climate ($n = 1312$, 67.9%) (see Table 2). Figure 1 illustrates the distribution of respondents WIHIC scores in range of low, moderate, and high.

Table 2. Frequency and Percentage of High School Students' Classroom Emotional Climate Levels

Classroom Emotional Climate Level	Frequency	Percentage
Low	309	15.99%
Moderate	1312	67.9%
High	311	16.09%

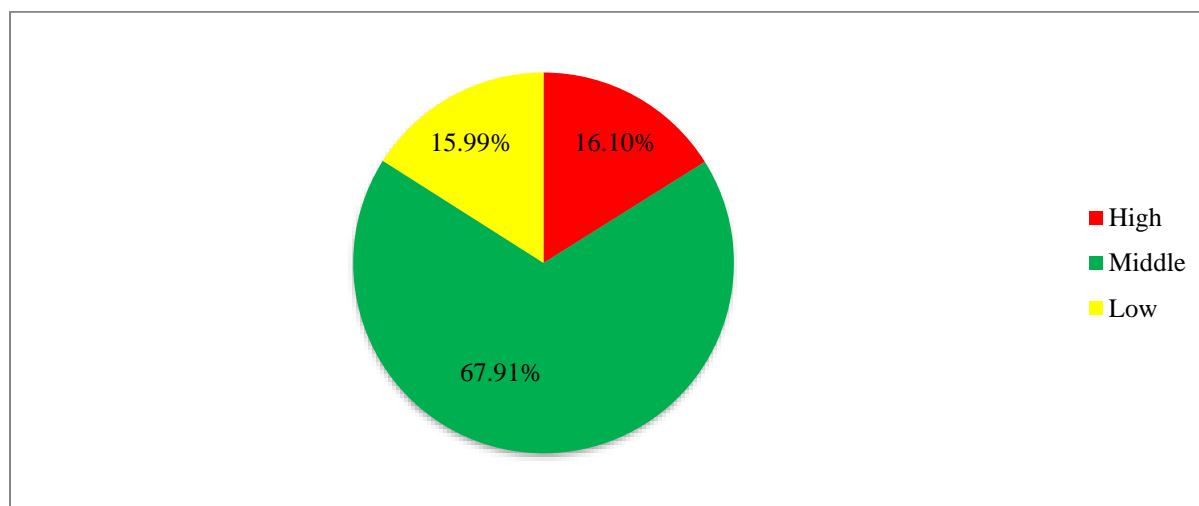


Figure 1. Percentage of High School Students on Classroom Emotional Climate Level

Comparison of High School Students' Classroom Emotional Climate by Gender

According to Table (3), the mean score of female students was more than that of male students. This mean that female students were high in classroom emotional climate than male students. To confirm the result, the independent sample t test was used. The results revealed that gender difference was found to be on classroom emotional climate. This finding is consistent with girls' higher secondary schools had higher classroom emotional climate as compared to boys' higher secondary schools (Komal Singh, 2016).

Table 3. Mean Comparison of High School Students' Classroom Emotional Climate by Gender

Gender	Mean	SD	<i>t</i>	<i>p</i>
Male	205.18	26.759	-4.458***	.000
Female	210.53	26.004		
Total	207.91	26.505		

Note: ***The mean difference is significant at 0.001 level.

And then, the differences between seven classroom emotional climate components on gender were investigated. Table 4 revealed that the mean differences between classroom emotional climate components on gender. Among seven components, the mean scores of female students were significantly higher than that of male students in student cohesiveness, involvement, task orientation, cooperation, and equity. This finding evidently pointed out that female students more know, help and are supportive of one another, have attentive interest, participate in discussions, perform additional work and enjoy the class, complete activities planned and to stay on the subject matter, involved in cooperative learning and are treated equally by the teacher are significantly more than male students.

Table 4. Mean Comparisons of Male and Female Students' Classroom Emotional Climate Components

Classroom Emotional Climate Components	Gender	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>
Student Cohesiveness	Male	32.27	4.672	-3.130**	1930	.002
	Female	32.93	4.587			
	Total	32.61	4.639			
Teacher Support	Male	28.07	5.625	-.641	1930	.521
	Female	28.24	5.849			
	Total	28.16	5.739			
Involvement	Male	23.36	5.374	-2.084*	1930	.037
	Female	23.87	5.287			
	Total	23.62	5.335			
Investigation	Male	27.17	5.750	-.231	1930	.817

Classroom Emotional Climate Components	Gender	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>
Task Orientation	Female	27.23	5.816	-6.665***	1930	.000
	Total	27.20	5.782			
	Male	32.99	5.467			
Cooperation	Female	34.46	4.162	-6.595***	1930	.000
	Total	33.74	4.900			
	Male	29.52	5.623			
Equity	Female	31.17	5.424	-2.952**	1930	.003
	Total	30.36	5.583			
	Male	31.79	6.179			
Equity	Female	32.62	6.191	-2.952**	1930	.003
	Total	32.22	6.197			
	Male	31.79	6.179			

*The mean difference is significant at 0.05 level.

**The mean difference is significant at 0.01 level

***The mean difference is significant at 0.001 level.

Analysis of Motivation of High School Students

Descriptive Statistics of High School Students' Motivation

Descriptive analyses revealed that the mean and standard deviation of high school students' motivation were 175.44 and 18.38, respectively.

Table 5. Descriptive Statistics of High School Students' Motivation

	Mean	SD	N	Minimum	Maximum
Motivation	175.44	18.38	1932	63	227

Table 6. Descriptive Statistics of High School Students' Motivation Components

Motivation Components	Mean (%)	SD
Intrinsic Goal Orientation	77.53%	3.169
Extrinsic Goal Orientation	86.78%	3.523
Task Value	83.5%	4.634
Control of Learning Beliefs	85.89%	3.456
Self-Efficacy for Learning and Performance	77%	6.496
Test Anxiety	77.68%	5.050

Table 6 showed that the mean percentage of extrinsic goal orientation was the highest compared with other motivation components. It was found that high school students who are high in extrinsic goal orientation engaged in learning task.

Comparison of High School Students' Motivation by Gender

The results showed that the mean score of female students (178.50) was significantly higher than that of male students (172.26). To investigate the differences of motivation by gender, t-test was used. According to the t-test result, there was a significant difference between male and female students on motivation. It was found that female high school students have more motivation than male high school students. So, female students had more motivation than male students (see Table 7).

Table 7. Mean Comparison of High School Students' Motivation by Gender

Gender	N	Mean	SD	<i>t</i>	<i>p</i>
Male	946	172.26	20.368	-7.571***	.000
Female	986	178.50	15.659		
Total	1932	175.44	18.381		

***The mean difference is significant at 0.001 level.

And then, the differences between six motivation components on gender were investigated. Table 10 revealed that the mean differences between motivation components on gender. Among six components, the mean scores of female students were significantly higher than that of male students in intrinsic goal orientation, extrinsic goal orientation, task value, control of learning belief, self-efficacy for learning and performance and test anxiety. This finding evidently pointed out that female students' goals and value beliefs for a course, their beliefs about their skill to succeed in a course, and their anxiety about tests in a course significantly more than male students.

Table 8. Mean Comparison of High School Students' Motivation by Gender

Motivation Components	Gender	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>
Intrinsic Goal Orientation	Male	21.40	3.320	-4.244***	1930	.000
	Female	22.01	2.988			
	Total	21.71	3.169			
Extrinsic Goal Orientation	Male	23.64	3.994	-8.237***	1930	.000
	Female	24.94	2.864			
	Total	24.30	3.523			
Task Value	Male	34.43	5.158	-6.047***	1930	.000
	Female	35.69	3.972			
	Total	35.07	4.634			
Control of Learning Beliefs	Male	23.76	3.506	-3.758***	1930	.000
	Female	24.34	3.384			
	Total	24.06	3.456			

Motivation Components	Gender	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>
Self-Efficacy for Learning and Performance	Male	42.45	7.077	-4.506***	1930	.000
	Female	43.77	5.814			
	Total	43.12	6.496			
Test Anxiety	Male	26.58	5.093	-5.178***	1930	.000
	Female	27.77	4.942			
	Total	27.19	5.050			

***The mean difference is significant at 0.001 level.

Comparison of High School Students' Motivation by Classroom Emotional Climate Levels

According to Table (9), the students from high classroom emotional climate had more motivation than students from other two levels. The results of ANOVA pointed out that there were statistically significant difference among classroom emotional climate levels on motivation.

Table 9. Mean Comparison of High School Students' Motivation by Classroom Emotional Climate Levels

CEC Levels	Low CEC	Moderate CEC	High CEC	<i>F</i>	<i>p</i>
N	309	1312	311	187.835***	.000
Mean	160.89	176.18	186.81		
(SD)	21.700	16.025	14.406		

***The mean difference is significant at 0.001 level.

Relationship of Classroom Emotional Climate and Motivation of High School Students

To investigate how the components of classroom emotional climate were correlated with components of motivation, it was calculated correlation.

Table 10. Inter-correlation between Components of Classroom Emotional Climate and Components of Motivation

CM CCEC	IGO	EGO	TV	COLB	SEL	TA
SC	.158**	.166**	.240**	.104**	.296**	.019
TS	.158**	.161**	.250**	.102**	.258**	.020
IVT	.143**	.095**	.192**	.052*	.266**	-.014
IGT	.257**	.198**	.310**	.124**	.448**	-.031
TO	.274**	.280**	.396**	.202**	.453**	.093**
CP	.254**	.267**	.364**	.218**	.358**	.134**
EQ	.259**	.221**	.345**	.200**	.452**	-.006

**Correlation is significant at 0.01 level.

As already mentioned above, components of classroom emotional climate were significant positively correlated with intrinsic goal orientation, extrinsic goal orientation, task value, control of learning beliefs, and self-efficacy for learning and performance. Task orientation and cooperation were significant positively correlated with test anxiety.

The following regression analyses were conducted to measure the influence of classroom emotional climate components on motivation. A seven step hierarchical multiple regression analysis was used to assess how much additional variance in motivation can be explained by incrementally adding predictor variables to the equation. Hierarchical multiple regression was chosen because theoretical relevance was given priority over statistical considerations. Variables that explained motivation were entered seven steps. In Step 1, “Motivation” was the dependent variable and student cohesiveness was the independent variable. In Step 2, student cohesiveness and teacher support were entered into the Step 2 equation. The process was repeated at Step 3 with student cohesiveness, teacher support and involvement, at Step 4 with student cohesiveness, teacher support, involvement and investigation, at Step 5 with student cohesiveness, teacher support, involvement, investigation and task orientation, at Step 6 with student cohesiveness, teacher support, involvement, investigation, task orientation and cooperation and at Step 7 with student cohesiveness, teacher support, involvement, investigation, task orientation, cooperation and equity. Before the hierarchical multiple regression analysis was performed, the independent variables were examined for collinearity. Results of variance inflation factor VIF (all less than 2.0) and collinearity tolerance (all greater than .717) suggested that the estimated β s are well established in the following regression model.

Table 11. Standardized Beta Coefficients from Hierarchical Multiple Regression Analysis of Classroom Emotional Climate Components on Motivation

Predictors	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7
1.SC	.260***	.194***	.177***	.153***	.081***	.015	-.005
2.TS		.175***	.155***	.114***	.087***	.077***	.042
3.IVT			.058*	-.069**	-.062**	-.096***	-.094***
4.IGT			.	.305***	.192***	.176***	.152***
5.TO					.316***	.257***	.228***
6.CP						.223***	.196***
7.EQ							.163***
8.R ²	.067	.094	.096	.163	.237	.268	.286
9.Adj R ²	.067	.093	.095	.161	.235	.266	.283
10.R ² Change	.067***	.026***	.002*	.066***	.074***	.031***	.018***
11.F value	F(1,1930) = 139.381 $p < 0.000$	F(2,1929) = 99.762 $p < 0.000$	F(3,1928) = 68.370 $p < 0.000$	F(4,1927) = 93.496 $p < 0.000$	F(5,1926) = 119.347 $p < 0.000$	F(6,1925) = 117.453 $p < 0.000$	F(7,1924) = 109.857 $p < 0.000$

* Correlation is significant at 0.05 level.

**Correlation is significant at 0.01 level.

***Correlation is significant at 0.001 level.

The results of the regression analysis showed that student cohesiveness was able to account for 6.7 % of the variance in motivation when entered at Step 1, $R^2 = .067$, $F = (1, 1930) = 139.381$, $p < 0.000$. The combination of student cohesiveness and teacher support was able to account for 9.3% of the variance in motivation when entered at Step 2, $R^2 = .094$, $F = (2, 1929) =$

99.762, $p < 0.000$. The combination of student cohesiveness, teacher support and involvement was able to account for 9.5% of the variance in motivation when entered at Step 3, $R^2 = .096$, $F = (3, 1928) = 68.370$, $p < 0.000$. The combination of student cohesiveness, teacher support, involvement and investigation was able to account for 16.1% of the variance in motivation when entered at Step 4, $R^2 = .163$, $F = (4, 1927) = 93.496$, $p < 0.000$. The combination of student cohesiveness, teacher support, involvement, investigation and task orientation was able to account for 23.5% of the variance in motivation when entered at Step 5, $R^2 = .237$, $F = (5, 1926) = 119.347$, $p < 0.000$. The combination of student cohesiveness, teacher support, involvement, investigation, task orientation and cooperation was able to account for 26.6% of the variance in motivation when entered at Step 6, $R^2 = .268$, $F = (6, 1925) = 117.453$, $p < 0.000$. The combination of student cohesiveness, teacher support, involvement, investigation, task orientation, cooperation and equity was able to account for 28.3% of the variance in motivation when entered at Step 7, $R^2 = .286$, $F = (7, 1924) = 109.857$, $p < 0.000$. At Step 7, the β results revealed that task orientation ($\beta = .228$, $p < 0.001$), cooperation ($\beta = .196$, $p < 0.001$), and equity ($\beta = .163$, $p < 0.001$) were positive and significant predictors of high school students' motivation. Investigation ($\beta = -.094$, $p < 0.001$) and involvement ($\beta = -.3769$, $p < 0.001$) were negative and significant predictors of high school students' motivation.

Based on the results, the adjusted R-square increased from .067 to .283 with the addition of subsequent sets of variables. The multiple R^2 was .283, which means that the total contribution by the combined set of classroom emotional climate accounted for approximately 28.3% of the variance of motivation. Thus, the collective relationship between motivation and the set of predictor variables can be characterized as moderately strong. The β results showed that involvement, investigation, task orientation, cooperation, and equity were key predictors on motivation. However, student cohesiveness and teacher support were not significant predictors on motivation (see Table 11).

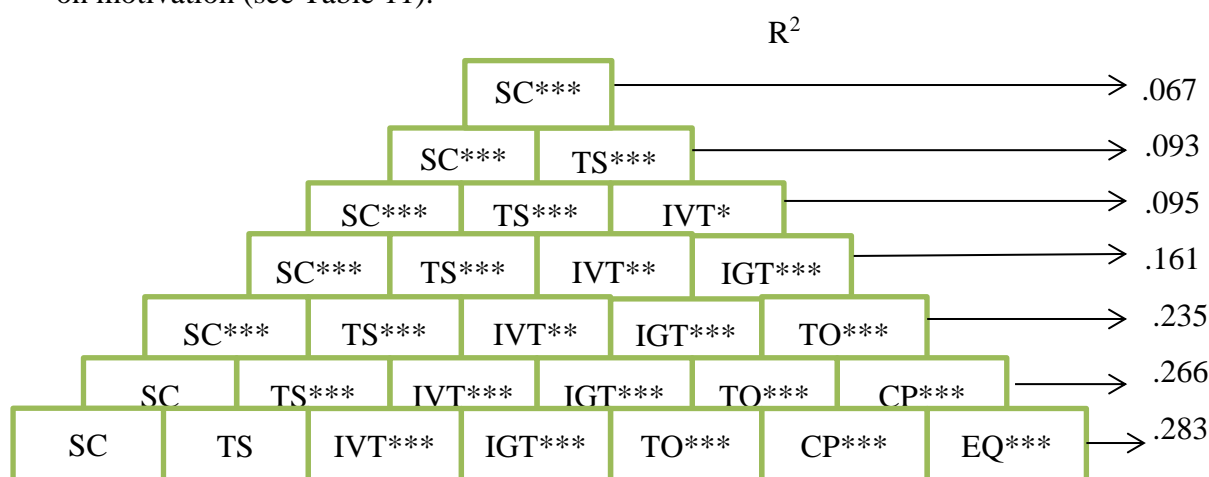


Figure 2. Predictive Models of Components of Classroom Emotional Climate on Motivation of High School Students

Predictors of Motivation of High School Students

To identify the best model for predicting the high school students' motivation and moral maturity, simple linear regression analysis was conducted. Regression analysis revealed that model significantly explained the high school students' motivation; $F = 558.795$, $p = .000$, R^2 for

model was 0.225 and adjusted R^2 was 0.224. Table 15 displays the intercept, unstandardized regression coefficient (B), and standardized regression coefficient β for model. According to the result, classroom emotional climate contributed 22.4% variance to motivation of high school students.

Table 12. Regression Analysis for Prediction of Motivation

Variable	B	β	t	R	R^2	Adj R^2	F
Predictor of Motivation	107.126		36.770***	.474 ^a	.225	.224	558.795***
Classroom Emotional Climate	.329	.474	23.639***				

*** $p < .001$

Motivation = 107.126 + 0.329 Classroom Emotional Climate

Conclusion

In this study, there were significant differences in classroom emotional climate, and motivation by regions and states. Female students were higher in classroom emotional climate, and motivation than male students. There was a significant difference in motivation by classroom emotional climate levels. The result of correlation showed that classroom emotional climate was positively correlated with motivation. Teacher support, involvement, investigation, task orientation, cooperation, and equity were key predictors on motivation. However, student cohesiveness and teacher support were not significant predictors on motivation. It can be predicted that students who possess high classroom emotional climate have more motivation in learning. This finding is consistent with the results of Guivernau and Duda (2002).

When a classroom climate is characterized by warm, respectful, and emotionally supportive relationships, students perform better academically in part because they are more motivated in learners. Teachers who create a positive emotional climate for learning demonstrate that the classroom is a safe and valuable place to be and are enthusiastic about learning. The study recommends that Teachers should ensure that the classroom emotional climate should be supportive for the development of adolescents' motivation. The classroom atmosphere is crucial role for motivation in adolescents.

Limitations of the Study

Firstly, this study only focused on seven possible indicators of classroom emotional climate but literature indicates that there are other factors, such as leadership, community and teacher dedication, which may contribute to the climate within a school. Secondly, that the questionnaire was only administered to students and not to educators and principals as well. Thus only the perceptions of students were identified and this study could have benefited if the educators and the principal were also asked to fill in a questionnaire to obtain a complete account of the classroom climate based on all the views of the parties participating in the school system. Thirdly, the sample size of eighteen classrooms from seven townships may have been too small for this study.

Suggestions

The prime goal of education should be to develop children's morality, rather than to teach them only intellectual knowledge. School climate can be an important element in a school therefore further research is needed into other factors that may be indicators of the climate of a school such as leadership, community involvement, educator dedication and educator efficacy. Furthermore, the future researches should investigate the relationship between classroom emotional climate and other psychological constructs.

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AN EXPLORATORY FACTOR ANALYSIS INTO PROFESSIONAL PRIDE OF IN-SERVICE TEACHERS

Hnin Nandar Aye¹, Khin Nyunt Nyunt Saw²

Abstract

The purpose of this study is to explore the factors influencing the professional pride of in-service teachers. Sample 300 in-service teachers from selected basic education schools participated in this study. Professional Pride Questionnaire (Williams & DeSteno, 2009) and Professional Pride Questionnaire (Ehtesham, Muhammad, 2011 & Mangkau, 2013) will be used as research instruments of this study. Based on the literature review, Professional Pride Questionnaire (PPQ) was categorized by seven subscales: (1) Structure of Pride, (2) Teachers' Job Involvement, (3) Teachers' Career Identity, (4) Teachers' Career Planning, (5) School Personal Opinions, (6) School Programs and (7) School Policy. According to the exploratory factor analysis results, professional pride questionnaire (PPQ) was influenced by three factors: (1) Structure of Pride, (2) School Programs and (3) Teachers' Job Involvement. There may be more benefits in conducting a longitudinal study using both quantitative and qualitative research methods.

Keywords: Professional Pride, In-service Teachers, Exploratory Factor Analysis

Introduction

Education plays pivotal role in the development of a country and it is mainly imparted by teachers. No national reconstruction is possible without the active cooperation of the teacher. So, teachers are the builders of a nation. A society or a nation can progress only with the help of its teachers. A teacher's behavior can make a student's life. In spite of the importance of teachers, they have their particular place and position in the society. There are various factors, which affect them and in due course affect their work. Such factors are internal and external. Among so many factors, teachers' pride and competency have their own effect on the work and effectiveness of teachers (Doubmbia, 2013). Teachers are the main backbone and heart of the education system of our country. Teachers play a vital role in improving the educational process. In 21st century, teachers are playing the greater roles and given bigger commitments in the profession (due to the influence of globalization). If teachers have a high level of pride, it can be assured that a more enjoyable, energetic and effective school environment which indirectly will give positive effects on the students' academic achievement.

Teachers shoulder the huge responsibilities in molding the young minds to achieve the vision and mission of the country. Teachers as professionals should possess different skills, knowledge and values. The quality of teaching depends largely on the level of teachers' involvement in relation to the professional exerted by the organization. Teaching is a highly noble profession and teachers are always a boon to the society. Since a teacher is a role model for the students; professional pride, job satisfaction and professional commitment of teachers become very vital in the fields of education.

Pride is a multifaceted self-relevant emotion that plays an indispensable role because it motivates individuals to persevere (Tracy & Robins, 2007). Pride plays an influential role in the respiration to adhere to moral standards and the performance of socially valued actions especially since it confirms aspects of individuals' identities (Tracy & Robins, 2004). Pride serves as a moral indicator that assists individuals in evaluating their thoughts, feelings, and behaviours to point out what is acceptable or unacceptable in terms of societal standards (Tangey, 2003). Professional pride means, the feeling of dedication among the individuals of a group towards

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their profession. Pride area involves two essential components namely-pride in one's being in the teaching profession and a strong desire for professional development.

Teachers' total involvement and devotion is must for empowering the students. Teachers who have pride in their profession not only seek all round development of children put to their charge but also work hard for their own professional growth to contribute their best to the profession as teachers. During and even after school hours, a pride teacher's mind remains always occupied with thoughts of children, their growth, individually as well as collectively and improvement of their performance. The professional teachers can be effective and successful by not only helping the students to realize their full potential but also helping the society to develop a sense of belonging among its members. Teachers who will be satisfied in their profession, they will always work and try to improve his teaching.

Purpose of the Study

The main purpose of the study is to explore the factors influencing the professional pride of in-service teachers.

Definition of Key Terms

Professional Pride: Professional pride is an evaluative emotion that drives an individuals' goal directed behaviour through thoughts (Tracy & Robins, 2007).

In-service Teachers: Teachers are persons who help students to acquire knowledge, competence or virtue and provide education for people (Williamson McDiarmid, G & Clevenger-Bright M, 2008).

Exploratory Factor Analysis: Exploratory factor analysis (EFA) is a multivariate statistical technique that attempts to identify the smallest number of hypothetical constructs that can parsimoniously explain the covariation observed among a set of measured variables that is identify the common factors that explain the order and structure among measured variables (Brown, 2015).

Review of Related Literature

Teachers are essential for the effective functioning of education system and for improving the quality of learning processes. Moreover, teachers are those who educate the youth of society who in turn become the leaders of the next generation of people. Teachers need to have good quality and attitudes towards students, and society. Kennedy has pointed out that outcomes of education are affected by the quality of the teaching work force. Therefore, effective teachers' pride on their profession are must for educational improvement, which we are striving hard to bring about.

Feelings of pride can also motivate and reinforce behaviours that maintain a positive self-concept. After success experiences individuals will develop pride, which can promote positive feelings and thoughts about the self (Tracy & Robins, 2004). Pride is a concept that is closely related to self-efficacy and self-esteem. Thus, when individuals feel good about themselves and the work they perform they will experience pride. Pride is a motivator of behavior (Tracy & Robins, 2007; Williams & DeSteno, 2009). Thus, when individuals experience pride regarding performance it will motivate them to excel in order to experience pride in the future. Pride can motivate individuals to obtain positive self-evaluations that facilitate the development of a congruent sense of self (Tangney, 2003). Self-conscious emotions such as pride are essentially emotions of self-regulation. Thus, pride has the potential to shape an individual's identity and to regulate their behaviour.

In-service teachers perceive pride as a factor for teaching and learning. Pride is a critical resource for learning and pursuing information (Titsworth, McKenna, Mazer, & Quinlan, 2013).

Although pride is a universal emotion (Tracy & Robins, 2004), pride is not culturally homogeneous. Pride is an important emotion to encourage in learners. If pride is a positive emotional stimulus, which can increase self-confidence, willpower, and productivity, and even improve newly learned information retention (Nielson & Lorber, 2009). Pride could have a prominent place in classrooms. Pride is a current topic of educational and psychological interest. In classrooms, teachers are encouraged to foster individual and collective pride among their students to assist learning, help build resilience in students, and prevent racism (Winkler, 2012). Pride is a positive emotion known to encourage positive and meaningful relationships between students (Titsworth et al., 2013).

Pride is a positive emotion to encourage in ourselves and others. Pride is either a positive or a negative emotion. Although public displays of pride suggest a positive reflection of self, pride is a self-conscious emotion as embarrassment (Brosi, Spörrle, Welp, & Heilman, 2016). Tracy and Robins (2004) suggest that pride motivates individuals by enhancing positive feelings associated with pride. Pride provides individuals with feedback regarding the social and moral acceptability of behaviours and increases the likelihood of future pro-social behaviours (Michie, 2009; Williams & DeSteno, 2008). Pride provides individuals with feedback on their acceptability as individuals because through the mechanism of pride individuals are provided with positive feedback which makes them feel appreciated.

Personal values and beliefs usually play a key role in the basis of pride (Katzenbach, 2003). Higher levels of pride in teachers promote success in learners. Graham (1996) discuss various factors that seem to play an important role in the effect that highly pride teachers can have on learner success, namely: (a) Teachers experienced higher levels of autonomy and efficacy; (b) they received more participation, feedback and collaboration from colleagues and learners and (c) they provide the best possible learning activities to learners in their classrooms since resources formed the core of their teaching strategies.

Method

Research Method

Design of this study is cross sectional in nature and descriptive survey method.

Participants of the Study

The total sample of this study is 300 in-service teachers (PAT, JAT, SAT) from Kyaunggon Township, Ayeyarwaddy Region. Among the respondents, 127 were male (42%) and 173 were female (58%).

Research Instruments

Based on expert reviews of the questionnaire, professional pride questionnaire (PPQ) consists of seven subscales including 74 items which explored professional pride of in-service teachers. Seven subscales are: (1) Structure of Pride, (2) Teachers' Job Involvement, (3) Teachers' Career Identity, (4) Teachers' Career Planning, (5) School Personal Opinions, (6) School Programs and (7) School Policy. The questionnaire was designed with five point Likert scale (1 = Strongly Disagree, 2 = Disagree, 3 = Undecided, 4 = Agree, 5 = Strongly Agree).

Data Collection Procedure

Twelve experts in the field of educational psychology gives valuable suggestions regarding the clarity of statements, appropriateness of the language. Research tools were edited to avoid ambiguity and repetition of statements. Data were gathered in Kyaunggon Township, Ayeyarwaddy Region at February-March, 2020. In each school of the first day, Professional Pride Questionnaire (PPQ) was given to the in-service teachers and explained about the questions by the researcher. Then, in-service teachers were asked to tick the number which is the most appropriate answer they feel in the Likert scale. According to the above procedures, the collection of the required data was conducted in each selected school by survey procedure.

Data Analysis and Research Findings

Exploratory Factor Analysis of Professional Pride Questionnaire (PPQ)

In this study, exploratory factor analysis was conducted to find the number of factors influencing a set of measures and the strength of the relationship between each factor and each observed measure. To investigate the number of constructs and structure of professional pride of in-service teachers using professional pride questionnaire included 74 items, an exploratory factor analysis with Varimax rotation was conducted.

Before the exploratory factor analysis, KMO and Bartlett's Test is assessed to check the appropriate of subscales for factor analysis (see Table 1).

Table 1 KMO and Bartlett's Test Result of Professional Pride Questionnaire (PPQ)

Kaiser-Meyer-Olkin Measure of Sampling		.889
Bartlett's Test of Sphericity	Approx. Chi-Square	13677.395
	<i>df</i>	2701
	Sig	.000

The table 1 gives information about two assumptions of factor analysis. To determine whether the subscales were suitable for factor analysis, the Bartlett's Test of Sphericity and KMO (Kaiser-Meyer Olkin Measure of Sampling Adequacy) tests were used. The first test examined if the subscales of the scale are inter-independent, and the latter examined sample sufficiency. As shown in Table 1, KMO=0.889 > 0.50 indicated that the sample data are suitable for factor analysis (Hair et al., 2011). The Bartlett's Test ($p < 0.001$) showed that the correlations coefficients are not all zero. As a result, both assumptions required for factor analysis are satisfied.

Table 2 Communalities of Items

Items of PPQ	Initial	Extraction
Item 1	1.000	.469
Item 2	1.000	.405
Item 3	1.000	.332
Item 4	1.000	.356
Item 5	1.000	.384
Item 7	1.000	.477
Item 8	1.000	.525
Item 9	1.000	.580
Item 10	1.000	.566
Item 12	1.000	.461
Item 13	1.000	.401
Item 14	1.000	.349
Item 15	1.000	.576
Item 16	1.000	.393
Item 18	1.000	.466
Item 20	1.000	.385
Item 21	1.000	.571

Items of PPQ	Initial	Extraction
Item 24	1.000	.372
Item 27	1.000	.419
Item 28	1.000	.542
Item 29	1.000	.413
Item 40	1.000	.412
Item 41	1.000	.441
Item 50	1.000	.506
Item 55	1.000	.543
Item 56	1.000	.507
Item 58	1.000	.513
Item 59	1.000	.462
Item 60	1.000	.541
Item 61	1.000	.492
Item 62	1.000	.376
Item 63	1.000	.617
Item 64	1.000	.332
Item 65	1.000	.448
Item 66	1.000	.589
Item 67	1.000	.555
Item 68	1.000	.582
Item 69	1.000	.576
Item 70	1.000	.458
Item 71	1.000	.383
Item 72	1.000	.539
Item 73	1.000	.489
Item 74	1.000	.603

Communalities range from 0 to 1 where 0 means that the factors don't explain any of the variance and 1 means that all of the variance is explained by the factors. Variables with small extraction communalities cannot be predicted by the factors and it should be considered eliminating them if too small. In the present result, the communalities of all variables are acceptable and satisfied according to Table 2.

Table 3 Factor Loadings of Each Item

Items of PPQ	Component		
	1	2	3
Item 1	.637		
Item 2	.618		
Item 3	.545		
Item 4	.543		
Item 5	.569		
Item 7	.635		
Item 8	.679		

Items of PPQ	Component		
	1	2	3
Item 9	.691		
Item 10	.735		
Item 12	.619		
Item 13	.516		
Item 15	.638		
Item 18	.516		
Item 24	.513		
Item 27	.572		
Item 40	.546		
Item 41	.521		
Item 55		.559	
Item 56		.636	
Item 58		.618	
Item 59		.624	
Item 60		.724	
Item 62		.653	
Item 63		.599	
Item 64		.508	
Item 65		.521	
Item 66		.739	
Item 67		.672	
Item 68		.732	
Item 69		.680	
Item 70		.548	
Item 71		.574	
Item 72		.624	
Item 73		.645	
Item 74		.704	
Item 14			.537
Item 16			.598
Item 20			.585
Item 21			.743
Item 28			.536
Item 29			.638
Item 50			.668
Item 61			.717

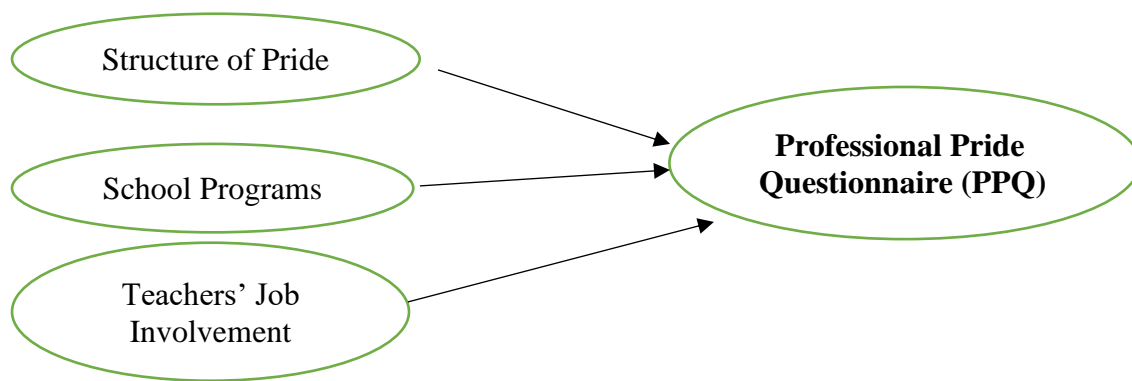
A Principal axis factoring was run with Varimax rotation to check the scale construct validity. This rotation provided three factors with acceptable loadings. The items under first factor consist of 17 items with factor loadings between 0.513 – 0.691. The items under second factor consist of 18 items with factor loadings between 0.508 - 0.739 and the items under third factor consist of 8 items with factor loadings between 0.536 - 0.743.

Table 4 Exploratory Factor Analysis Result of Professional Pride Questionnaire (PPQ)

	Eigenvalues	% of Variance	No. of Items
1 st factor	19.000	25.676	17
2 nd factor	5.115	6.912	18
3 rd factor	3.395	4.588	8
Total		37.176 %	43

According to Table 4, three factors explaining 37.176 % of total variance were obtained. The first factor explained by 25.676 % of total variance. Second factor is explained by 6.912 % of total variance and third factor is explained by 4.588 % of total variance. By this way, a three-factored construct consisting of 43 items explaining 37.176 % of total variance is obtained.

Naming the Factors

**Figure 1** Factors of Professional Pride

Each factor was named in accordance with the construct explained by the items as shown in Figure 1. First factor could be named as structure of pride. The items under this factor are related that the satisfaction, feelings and familiarity in the profession. Second factor could be named as school programs. These factor is related that the responsibilities, beliefs and adjustment in working conditions. Third factor could be named as teachers' job involvement. The items of these factor are related that collaborating, sharing knowledge and experiences with colleagues.

Reliability Coefficient of Professional Pride Questionnaire (PPQ)

To determine the reliability of each factor and whole questionnaire, Cronbach alpha values were computed and are given in Table 5. The values all reach acceptable levels indicating the questionnaire can be interpreted as reliable.

Table 5 Reliability Coefficient of Professional Pride Questionnaire (PPQ)

Factors	Cronbach Alpha
Structure of Pride	0.911
School Programs	0.925
Teachers' Job Involvement	0.865
Professional Pride Questionnaire (PPQ)	0.930

Discussion

In this study, it was observed that there are all together three factors of professional pride questionnaire (PPQ). Tracy & Robins (2004) stated that pride have an effect on individuals' level of commitment. According to Tangey (2005), pride plays a significant role in commitment processes by regulating behaviours that support and strengthen commitment. Pride, committed and competent teachers are required in every educational institution so as to increase the effectiveness of the institution, it is necessary to know about professional pride and how it is influenced by other variables.

Professional pride is influenced by the work situation and satisfaction of the teachers in working conditions. School authorities should identify the ways and means through which teachers can be provided with facilitating work environment which will influence their work, pride and also commitment towards teaching. Satisfaction from the job is necessary for full devotion, pride and commitment of teachers towards the profession. This research explored how pride is employed as a feature of teaching and learning. Consequently, to understand pride from the perspective of a classroom teacher, it was appropriate to speak directly to the teachers within their school community. The in-service teachers could still embrace pride in the classroom, but only if it sustains the collectivist nature of the classroom and school community. Pride is perceived as individualistic, self-congratulatory, isolating, extrinsic, and self-centered.

Previous research has indicated that pride experiences can influence individuals adjustment in society in positive or negative ways. Related research shows a strong relationship between pride and commitment level in teachers, learner performance and school-promotion. The mediating role that satisfaction, alternatives and investments made can play in the relationship between pride and commitment. Since teachers have professional pride in their profession, teachers are the future designers of students and society.

Conclusion

In this research, Professional Pride Questionnaire (PPQ) for Myanmar Basic Education Teachers was constructed by using exploratory factor analysis. Firstly, Professional Pride Questionnaire (PPQ) contained 74 items. However, after loading factor analysis, 31 items that are not correlated with any factor were discarded. In current study, it was observed that there are three factors that can adequately explain professional pride and the reliability of each factor was satisfactory. Therefore, final Professional Pride Questionnaire (PPQ) with a three-factored construct consisting of 43 items explaining 37.176% of total variance is obtained. Therefore, this questionnaire will give good enough information about professional pride of basic education school teachers in Myanmar.

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ACHIEVEMENT GOALS, APPROACHES TO LEARNING AND ACHIEVEMENT OF GRADE 1 STUDENTS

Hnin Wai Wai Htet¹

Abstract

The primary purpose of this study was to investigate achievement goals, approaches to learning and achievement of Grade 9 students. Then, this study was to explore the mediating effects of approaches to learning between achievement goals and achievement of Grade 9 students. Descriptive survey method and quantitative data analysis were applied in this study. A total of 600 Grade 9 students (288 males and 322 females) were selected from Yangon Region and Nay Pyi Taw Council Area. Student achievement goals were examined by achievement goals inventory (AGI) and student approaches to learning were examined by approaches to study skills inventory for students (ASSIST). Results showed that Grade 9 students oriented both mastery goal and performance goal for their learning tasks. Concerning with the learning approaches of Grade 9 students, results revealed that Grade 9 students endorsed deep approach and strategic approach more than surface approach for their learning tasks. Next, results of t test revealed that there were significant gender differences in achievement goals (mastery goal and performance goal) and also in the strategic approach. Lastly, hierarchical multiple regression analysis was conducted to examine the mediator effects of the three approaches to learning. The results revealed that approaches to learning (strategic approach and surface approach) have a mediating effect between achievement goals and achievement. In addition, the findings of bivariate and partial correlations also indicated that strategic and surface approaches are mediators due to sizeable decrease in the partial correlations as compared to the bivariate correlations.

Keywords: Achievement Goals, Mastery Goal, Performance Goal, Approaches to Learning.

Introduction

Academic achievement is one of the most important indicators of learning and understanding in Basic Education sector in Myanmar. School context and perceived academic ability become the determinants of students' success in Myanmar. Thus, students and teachers have put much emphasis on academic studies, grades and test scores. Achievement of students does not depend on only the quality of schools and teachers. Nevertheless, teachers and educators have, so far, rarely noticed the factors affecting students' academic outcomes.

Actually, achievement is undoubtedly an important research in the heart of educational psychologists. In their attempt to investigate what determine academic outcomes of learners, researchers have come with more questions than answers. In recent time, literature has shown that learning outcomes, academic achievement and academic performance could be determined by such variables as: family, school, society, and motivation (Aremu & Oluwole, 2001).

Achievement goals have become an important motivational construct in organizational research providing an explanation for the approaches, responses, and reasons that individuals use to engage in achievement activities (Ames, 1992). It is also undeniable that achievement goals influence critical school-related outcomes, including attention, effort, goals, performance, behavior, well-being, test scores, grades and school completion. There are two main categories of goals – mastery (learning) and performance (Dweck & Legget, 1988). Students hold mastery goal when their goal is to truly understand or master the task at hand; students who are mastery-oriented are interested in self-improvement and tend to compare their current level achievement to their own prior achievement. Performance oriented learners determine their ability by outperforming others in competitions or surpassing others in achievement or grades, and are eager to receive public recognition for their superior performance (Ames, 1992; Pintrich, 2000a).

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Two goal orientations are associated with very different approaches to learning. Orientation toward a goal is presumed to be a function of individual differences or to be included by situational constraints, as it influences the approach students take to learn and the strategies they use in learning. In order to construct learning area effectively, students' individual differences should be taken into consideration in schools. Approaches to learning, which is one of the important individual differences that should be considered, are related with students' motivation and using their appropriate strategies for learning.

The quality of learning is dependent on the approaches taken because what students learn is closely associated with how they go about learning it. Approaches to learning refer to the learners' different ways of relating to the learning task- „how“ and „why“ a learner learns. The „how“ are the strategies devised by the learner to solve the problems defined by their motives (the why of learning). This combination of motive and strategy is called “an approach to learning” (Shelly, 2014).

To summarize, achievement goals and learning approaches adopted by the students are either to the benefit or to the detriment of achievement. An understanding of how learning approaches of students relate to achievement goals and achievement of Grade 9 students may help teachers and curriculum developers to review their instructional methods and curriculum in order to foster future education. Additionally, identifying factors affecting students' performance in the present study can be critically important in helping students to improve academic achievement.

Purposes of the Study

1. To explore the achievement goals of Grade 9 students
2. To study the learning approaches of Grade 9 students
3. To study the differences of achievement goals of Grade 9 students by gender
4. To investigate the differences of learning approaches of Grade 9 students by gender
5. To study how approaches to learning affect between the achievement goals and achievement of Grade 9 students

Definitions of Key Terms

Achievement goals. Achievement goals are defined as competence-relevant aims that individuals strive for in achievement settings (Pekrun, Elliot, & Maier, 2009).

Mastery goal. Mastery goal orients the student towards learning and understanding, developing new skills, and a focus on self-improvement using self-referenced standards (Pintrich, 2000a).

Performance goal. Performance goal represents a concern with demonstrating ability, obtaining recognition of high ability, protecting self-worth and a focus on comparative standards relative to others and attempting to surpass others (Pintrich, 2000a).

Approaches to learning. Approaches to learning can be defined as the intentions and motives a student has in undertaking a learning task, as well as the corresponding strategies by which these intentions and motives are accomplished (Diseth, 2007, cited in Gurlen, Turan, & Senemoglu, 2013).

Deep approach. Deep approach to learning indicates that students are motivated by an inherent interest in a certain subject and employed strategies such as reading widely, seeking in-depth meanings, and integrating new knowledge with past experiences (Biggs, 1987). Surface approach. Surface approach to learning denotes that the student's motive is to meet the minimum

requirement of the course or simply to pass tests, with only a limited personal interest in the subject (Biggs, 1987).

Strategic approach. Strategic approach to learning is described as an achieving orientation, characterized by the intrinsic motivation to achieve academic success and adoption of both deep and surface learning strategies depending on the task requirements (Entwistle & Ramsden, 1983).

Related Literature Review

Achievement Goals

Achievement goal theory describes general goal orientations that concern the reasons or purposes students are pursuing when approaching and engaging in a task. This theory originally stressed two general orientations to achievement: mastery and performance goals (Ames 1992; Dweck and Leggett, 1988). Mastery goal orients the student towards learning and understanding, developing new skills, and a focus on self-improvement using self-referenced standards. Performance goal represents a concern with demonstrating ability, obtaining recognition of high ability, protecting self-worth and a focus on comparative standards relative to others and attempting to surpass others (Pintrich, 2000a).

The dominant theoretical approach to goal orientation in academic settings is one that distinguishes between mastery and performance orientations. The simple distinction between these goal orientations contends that students who set mastery goals focus on learning the material and mastering the tasks at hand. Students who set performance goals are concerned with demonstrating their ability and performance as measured by their relative standing to other's achievements. The distinction between these two different goal orientations has been a major focus in previous research regarding achievement motivation (Ames, 1992; Ames & Archer, 1988; Harackiewicz & Elliot, 1993; Nicholls, 1983; Maehr, 1984; as cited in Was, C, 2006).

Approaches to Learning

Students may be likely to adopt one learning approach more often than the other, however, their selection of learning approaches may be influenced by learning circumstances (Biggs & Moore, 1993; Entwistle & Ramsden, 1983; Marton, Hounsell, & Entwistle, 1997; Marton & Saljo, 1997; Prosser & Trigwell, 1999, as cited in Huang, 2008). The approaches taken by students are suggested to be dependent on a range of variables, including their motivation to learn, (Biggs, 1987); teaching quality (Entwistle & Ramsden, 1983); and their perceptions of the learning situation (Prosser & Trigwell, 1999, as cited in Huang, 2008). Importantly, these theories propose that the adoption of particular learning approaches is believed to be associated with different learning outcomes (Huang, 2008).

Method

Sampling

A total of 600 Grade 9 students (288 males and 312 females) from Yangon Region and Nay Pyi Taw Council Area participated by using random sampling technique.

Table 1. Number of Students from Each Selected School

School	Region	No. of male Students	No. of female Students	Total
School (1)	Yangon	23	36	59
School (2)	Yangon	27	35	62
School (3)	Yangon	31	31	62
School (4)	Yangon	30	30	60

School	Region	No. of male Students	No. of female Students	Total
School (5)	Yangon	30	27	57
School (6)	Nay Pyi Taw	50	49	99
School (7)	Nay Pyi Taw	49	61	110
School (8)	Nay Pyi Taw	48	43	91
Total		288	312	600

Research Method

In this study, descriptive survey design and quantitative approach were used.

Measures

The total marks of all six subjects from the first semester examination were used for achievement of Grade 9 students.

Achievement Goals Inventory (AGI)

To assess Grade 9 students'-oriented achievement goals, Achievement Goals Inventory (Conducted by Roedel, Schraw & Plake (1994) was used. Achievement Goals Inventory comprises 12 items for assessing mastery goal and 5 items for assessing performance goal. The selected students have to answer five-point Likert scale (1=strongly disagree, 2=disagree, 3=undecided, 4=agree, 5 = strongly agree). The alpha score of AGI was 0.72.

Approaches to Study Skills Inventory for Students (ASSIST)

To assess Grade 9 students' adopted approaches to learning, Approaches to Study Skills Inventory for Students developed by Entwistle, Tait & McCune (1998) was used. ASSIST consists of 16 items for assessing deep approach, 20 items for assessing strategic approach and 16 items for assessing surface approach. The target participants have to answer five-point Likert scales (1=strongly disagree, 2=disagree, 3=undecided, 4=agree, 5=strongly agree). The alpha score of ASSIST was 0.67.

Data Analysis and Research Findings

Achievement Goals of Grade 9 Students

Descriptive statistics related to the Grade 9 students' achievement goals were carried out. According to the results of table 2, the mean percentage for students' mastery goal and that of students' performance goal were not so different. It can be interpreted that Grade 9 students adopted both mastery goal and performance goal for their learning tasks. It is possible that students adopting both mastery and performance goals may work hard with expectations of understanding the learning content as well as performing better than his/her classmates.

Table 2. Means and Standard Deviations for Achievement Goals

Subscales of Achievement Goals Inventory	Mean	Mean %	SD
Mastery Goal	47.53	79.22	8.147
Performance Goal	20.03	80.13	13.338
Total (AGI)	67.57	79.49	7.728

Comparison for Achievement Goals by Gender

To find out the differences between the achievement goals by gender, descriptive analysis was made. The means and standard deviations of achievement goals for both boys and girls

were reported in table 3. The results showed that the mean score of female students was slightly higher than that of male students in mastery goal. Also, the mean score of female students was higher than that of male students in performance goal.

Table 3. Means and Standard Deviations for Achievement Goals by Gender

Subscales of Achievement Goals Inventory	Gender	N	Mean	Mean%	SD
Mastery Goal	Male	288	46.99	78.32	8.718
	Female	312	48.04	80.06	7.498
Performance Goal	Male	288	19.27	77.07	13.642
	Female	312	20.74	82.95	12.420
Total (AGI)	Male	288	66.26	77.95	8.152
	Female	312	68.77	80.91	7.034

To make more detailed investigation on the gender difference of Grade 9 students'-oriented achievement goals, independent sample *t* test was conducted (see table 4). The results of *t* test stated that there was gender difference for achievement goals at the 0.001 level. There was gender difference in mastery goal at the 0.01 level. This finding is congruent with the findings of earlier studies conducted by Anderman & Young in 1994 with regard to gender. Their findings showed that girls are reported to adopt more mastery goal than boys.

In contrast with the findings of previous research studies conducted by Meece & Holt in 1993, Roeser, Midgley & Urdan in 1995, Markku in 1997, females were significantly different from males on performance goal at the 0.001 level. Based on the results, it can be interpreted that Grade 9 female students are significantly better than Grade 9 male students on achievement goals, mastery goal and performance goal. Female students are likely to orient mastery goal and performance goal because they may both want to enhance their level of competence and want to demonstrate their competence and attempt to surpass others in the classroom.

Table 4. Results of Independent Sample *t*-test for Achievement Goals by Gender

Achievement Goals	<i>t</i>	<i>df</i>	Sig(2-tailed)	Mean Difference
Mastery Goal	-2.631	598	.009	-1.743**
Performance Goal	-5.526	598	.000	-5.879***
AGI (Total)	-4.771	598	.000	-2.959***

Note: ** mean difference is significant at the 0.01 level.

*** mean difference is significant at the 0.001 level.

Approaches to Learning of Grade 9 Students

To explore the approaches to learning of Grade 9 students, descriptive analysis was conducted (see table 5). Descriptive analysis revealed that the mean percentages of deep approach and strategic approach were higher than that of surface approach. It can be interpreted that Grade 9 students used deep approach and strategic approach more than surface approach for their academic activities. Grade 9 students may have both the intention to understand the studied material thoroughly and the intention to achieve the highest possible grade.

Table 5. Means and Standard Deviations for Approaches to Learning

Subscales of Approaches to Learning	Mean%	SD
Deep Approach	75.31	9.454
Strategic Approach	75.80	8.182
Surface Approach	60.68	10.006

Comparison for Approaches to Learning by Gender

To find out the differences between the approaches to learning by gender, descriptive analysis was made. The means and standard deviations of approaches to learning for both boys and girls were reported in table 6. It was observed that the mean scores for deep approach and surface approach were almost the same by gender. The mean score of female students was slightly higher than that of male students for strategic approach.

Table 6. Means and Standard Deviations for Approaches to Learning by Gender

Subscales of Approaches to Learning	Gender	N	Mean	Mean%	SD
Deep Approach	Male	288	60.10	75.13	9.574
	Female	312	60.39	75.48	9.355
Strategic Approach	Male	288	74.87	74.87	8.426
	Female	312	76.66	76.66	7.867
Surface Approach	Male	288	48.09	60.11	9.861
	Female	312	48.97	61.21	10.125

To obtain more detailed information on the gender difference of Grade 9 students' adopted approaches to learning, independent sample *t* test was conducted (see Table 7). The results of *t* test stated that significant gender difference was found for the strategic approach at 0.01 level. It can be interpreted that female students are more inclined towards using strategic approach than male students. It may be because female students choose their learning strategy to maximize their academic success; they seem to be cue conscious and very aware of assessment practices.

Table 7. Results of Independent Sample *t*-test for Approaches to Learning by Gender

Subscales of Approaches to Learning	<i>t</i>	<i>df</i>	Sig (2-tailed)	Mean Difference
Strategic Approach	-2.689	598	.007	-1.789**

Note: ** mean difference is significant at the 0.01 level.

Relationships of the Achievement Goals and Approaches to Learning Variables to Achievement of Grade 9 Students

Pearson product-moment correlations were calculated to examine the relationships between the variables, the criterion $p < 0.05$ was used to determine statistically significant correlations. The results of bivariate correlations showed that two achievement goals correlate positively and significantly with achievement. As expected, all three approaches to learning correlate significantly with achievement: deep and strategic approaches correlate positively with achievement whereas surface approach correlate negatively with achievement. The deep

approach and the strategic approaches correlate positively with each other whereas the deep approach correlates negatively with the surface approach.

In order to test the mediator effects of the three approaches to learning, partial correlations were computed between achievement goals variables and achievement of Grade 9 students, statistically controlling for the effects of the three approaches to learning. If there was a significant decrease or the disappearance in the partial correlations as compared to the bivariate correlations, this would indicate that deep approach, strategic approach and surface approach are mediators of achievement. The results of partial correlations pointed out that the mastery goal and performance goal were not significantly correlated with achievement after controlling for the effects of three approaches to learning. These results indicate that approaches to learning have a mediator effect on the relationship between achievement goals and achievement. The results of bivariate correlations and partial correlations were displayed in table 8.

Table 8. Correlations Between the Achievement Goals and Approaches to Learning to Achievement of Grade 9 Students

	Bivariate Correlations						Partial Correlation
	(1)	(2)	(3)	(4)	(5)	(6)	(6) ^a
Achievement Goals	1	.250**	.552**	.565**	-.179**	.137**	.011
(1) Mastery Goal							
(2) Performance Goal		1	.127**	.318**	.185**	.138**	.109
Approaches to learning			1	.569**	-.129**	.103*	—
(3) Deep Approach							
(4) Strategic Approach				1	-.046	.208**	—
(5) Surface Approach					1	-.144**	—
(6) Achievement						1	—

Note: * Correlation is significant at the 0.05 level, ** Correlation is significant at the 0.01

level, *** Correlation is significant at the 0.001 level

^aControlling for the deep approach, the strategic approach and the surface approach.

Mediator Effects of Approaches to Learning on Achievement

To examine the mediator effects of approaches to learning on achievement, a hierarchical multiple regression analysis was conducted (see table 9). In other words, the outcome variable (achievement) is regressed on both the mediators and the predictors.

More specifically, a two steps hierarchical multiple regression was used to examine the possible unique contribution of each achievement goal on achievement when the effects of the deep approach, the strategic approach and the surface approach were statistically controlled for. Thus, the deep approach, the strategic approach and the surface approach were entered first and the set of achievement goals was entered last.

In the first step, achievement was the dependent variable and the deep approach, the strategic approach and the surface approach were the independent variables. In the second step, achievement goals were entered. Before the hierarchical multiple regression analysis was conducted, the independent variables were examined for collinearity. Results revealed that

collinearity tolerance (all greater than 0.551) suggested that the estimated β s are well- established in the following regression model.

Based on the results, the adjusted R^2 change increased from .058 to .066 with the addition of achievement goals variables. It showed that the addition of achievement goals variables significantly improved on the prediction by the approaches to learning, explaining about 1.1% additional variance. This finding revealed that approaches to learning have a mediating effect between achievement goals and achievement of Grade 9 students.

Table 9. Hierarchical Multiple Regression Analysis of Achievement Goals and Approaches to Learning on Achievement

Predictors	Achievement (Model 1)	Achievement (Model 2)
	β	β
Approaches to Learning	-.044	-.036
Deep Approach		
Strategic Approach	.226***	.188***
Surface Approach	-.139**	-.162***
Achievement Goals	n.a	-.007
Mastery Goal		
Performance Goal	n.a	.115
F	F(3,596)= 13.222***	F(2,594)= 3.564*
	0.062	0.074
	0.058	0.066
Change	0.062***	.011*

Note: *p < 0.05, **p < 0.01, ***p < 0.001

Conclusion

In Myanmar, teachers and principals have expressed concern over the high expectations of academic skills for the education of their students. However, teachers and educators have, so far, rarely noticed the factors affecting students' academic outcomes. Findings from my research may support teachers and educators in instructing students on how to adopt achievement goals and how to apply effective learning approaches. In this study, Grade 9 students endorsed both mastery goal and performance goal for their various achievement activities. Previous quantitative studies have not supported the view that students who adopted multiple goal patterns report higher academic results than those who endorsed mastery goal only (Ironsmit et al., 2003, Pintrich, 2000a; Wolters, 2004, as cited in Harackiewicz, et al, 1998). This result therefore suggests students' mastery goal orientation is likely to be a more important factor influencing their achievement. Therefore, teachers need to find out ways to reduce performance goal inclination among the students and motivate students to inculcate the habit of adopting mastery goal. Moreover, there existed gender difference in achievement goals, mastery goal and performance goal. The present study indicates that Grade 9 female students are significantly better than Grade 9 male students on achievement goals, mastery goal and performance goal.

Also, Grade 9 female students are more inclined towards using strategic approach than male students. In examining the mediating effects of approaches to learning between achievement goals and achievement, the results pointed out that strategic and surface approaches are the bridge between achievement goals and achievement, which implies that achievement goals either has indirect effects through approaches on achievement, or that learning approaches mediate the effects of achievement goals on learning.

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DEVELOPING CULTURAL INTELLIGENCE TEST FOR BASIC EDUCATION TEACHERS IN MYANMAR

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Abstract

The main aim of this study is to develop cultural intelligence test for basic education teachers in Myanmar. A total number of 620 teachers (92 males and 528 females) from Mandalay Region, Yangon Region and Ayeyarwaddy Region participated in this study. The participants were collected by using random sampling method. Test items were received from “Diagnosing your cultural intelligence” of Christopher Earley and Elaine Mosakowski (2004), “Cultural intelligence scale” of Ang et al. (2007) and “11-dimension Expanded CQ scale” of Van Dyne et al. (2012). Cultural Intelligence test consists of four factors; metacognitive, cognitive, motivational and behavioural. Pilot testing was done with the sample of 50 basic education teachers from Madaya Township in Mandalay Region. In this pilot testing, 67 items were contained. After that, Cronbach alpha was conducted. According to the results, Cronbach alpha value for Cultural Intelligence Test was 0.95 and Cronbach alpha values for each dimension were also high. Then, field testing was conducted with 620 basic education teachers from selected Regions. Exploratory factor analysis and confirmatory factor analysis have been used to analyze the data. After loading exploratory factor analysis, four items which are not correlated with any factors are removed. Cultural Intelligence test, a four-factored construct consisting of 63 items explaining 43.351 % of total variance is obtained. According to the result of confirmatory factor analysis, its reliability and validity is also good enough to be used as an instrument to study cultural intelligence of basic education teachers.

Keywords: Cultural Intelligence, Exploratory factor analysis, Confirmatory factor analysis

Introduction

Today, enhancing organizational performance and increasing productivity are among the key objectives of organizations for achieving sustainable development. In this regard, the role of human resources, especially in varying occupational and organizational conditions, is of particular importance. The cultural diversity may act as a challenge for teachers because the ability to interact effectively in multiple cultures is not a skill possessed by all. As teachers continue to work with an increasingly culturally and linguistically diverse student population, their role has become more complex in addressing not only the academic and institutional demands of their work, but also the interpersonal and intrapersonal demands of meeting the needs of all learners. Teachers who thoroughly understand different cultural systems are able to interpret symbols from one frame of reference to another, can mediate cultural incompatibilities, and know how to build bridges or establish linkages across cultures that facilitate the instruction process. Teachers higher in CQ can more easily navigate and understand unfamiliar cultures, theoretically, they are expected to be more successful when working and communicating with cultures other than their own. Cultural intelligence helps teachers to think more deeply about their own cultural intelligence capabilities as well as help them to apply these ideas in the teaching-learning process. Teachers can also use cultural intelligence to monitor their own actions as well as those of their students. Therefore, this study intends to develop cultural intelligence test for examining the cultural intelligence of basic education teachers in Myanmar.

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Purpose of the Study

The main aim of the present study is to develop Cultural Intelligence Test for basic education teachers in Myanmar.

Definition of Key Term

Cultural Intelligence: an individuals' ability to perform in an effective manner in a culturally diverse setting (Ang & Dyne, 2008).

Exploratory factor analysis: a classical formal measurement model that is used when both observed and latent variables are assumed to be measured at the interval level (Thompson & Daniel, 1996).

Confirmatory factor analysis: a popular statistical method for providing support of construct validation in the psychological assessment literature (Thompson & Daniel, 1996).

Related Literature Review

Cultural Intelligence

In 2003, Christopher Earley and Soon Ang introduced the concept of Cultural Intelligence (CQ) to the social sciences and management disciplines. CQ is an extension of theory associated with contemporary approaches to understanding multiple intelligences. CQ has its roots in interpersonal intelligence (Gardner, 1983) and also in social emotional intelligence (Goleman, 1995; Goleman & Boyatzis, 2008) which is the ability to recognize, understand, and manage emotions both in ourselves and in others. Based on Sternberg and Detterman's Integrative Theoretical Framework on Multiple Loci of Intelligences, Ang et al. (2007) defined CQ as a multidimensional construct with four dimensions: metacognitive, cognitive, motivational, and behavioral.

Metacognitive CQ is the person's cultural consciousness and awareness of cultural cues during interactions with people from other cultural backgrounds (Ang & Van Dyne, 2008). It includes processes such as planning, monitoring and revising mental models of cultural norms for different countries or groups of people. Cognitive CQ is a competence based on the knowledge of norms, practices, and conventions used in different cultural settings, acquired through education and personal experience (Ang et al., 2008). It includes knowledge of the economic, legal, and social systems of different cultures, as well as the value system of these cultures. Motivational CQ represents a capability to direct attention and energy toward learning about and functioning in situations characterized by cultural differences (Ang et al., 2008). It is an individual's preference to be intrinsically motivated to adapt, to understand, to relate, and to adjust to diverse cultures. Finally, behavioral CQ refers to the capability to exhibit appropriate verbal and nonverbal behavior when interacting with people from different cultures (Ang et al., 2008).

Method

Sampling

The population for this study included basic education teachers from selected regions. A total of 620 basic education teachers were selected. Among them 92 were male teachers and 528 were female teachers. In order to ensure the representation of all basic education teachers, a random sampling method was applied. Basic Education teachers of one region from Upper Myanmar (Mandalay Region) and two regions from Lower Myanmar (Yangon Region and Ayeyarwaddy Region) were participated.

Research Method

In this study, the researcher used descriptive survey design and quantitative approach.

Research Instrumentation

Test items for cultural intelligence test were received from the Cultural Intelligence Scale (CQS) by Ang et al. (2007), 11-dimension Expanded CQ scale (the E-CQS) by Van Dyne et al. (2012) and Diagnosing Your Cultural Intelligence by Earley and Mosakowski (2004). As conceptualized by Ang et al. (2007), CQ is a multidimensional construct with four dimensions: metacognitive, cognitive, motivational, and behavioral.

Firstly, the items were modified in Myanmar Language. With respect to conformity of meaning, the experts in the field of Educational Psychology were requested to do the editorial review of items. In order to validate the instrument, pilot testing was done with the sample of 50 basic education teachers from Madaya Township in Mandalay Region. In this pilot testing, 67 items for Cultural Intelligence Test were contained. And then, reliability analysis was made by using Cronbach's alpha value. When analyzing for test reliability, the internal consistency reliability (Cronbach's alpha) was 0.95. Thus, it is obvious that the internal consistency of Cultural Intelligence Test was high. Then, the test was administered to 620 basic education teachers from selected Region for the field testing. The data obtained were analyzed by using exploratory factor analysis and confirmatory factor analysis.

Data Analysis and Research Findings

Exploratory Factor Analysis of Cultural Intelligence Test

Before the exploratory factor analysis, the appropriate of subscales for factor analysis was assessed. Table 1 gives information about two assumptions of factor analysis. To determine if the subscales were suitable for factor analysis, the Bartlett Test of Sphericity and KMO (Kasier-Meyer Olkin Measure of Sampling Adequacy) tests were used. The first test examined if the subscales of the scale are inter-independent, and the latter examined sample sufficiency. As shown in Table 1, $KMO=0.944>0.70$ indicated that the sample data are suitable for factor analysis (Hair et al., 2006). The Bartlett's Test ($p<0.001$) showed that the correlations coefficients are not all zero. As a result, both assumptions required for factor analysis are satisfied.

Table1: The results of KMO and Barlett's tests

Kasier-Meyer-Olkin Measure of sampling		.944
Bartlett's Test of Sphericity	Approx. Chi-Square	39082.276
	Df	2211
	Sig	0.000

After this, Figure 1 shows a scree plot of eigenvalues plotted against the factor numbers. The criterion of Eigenvalue >1 was used for determining the number of the factors the graphic. In figure 1, the curve has an instant it could be interpreted that the scale has four factors.

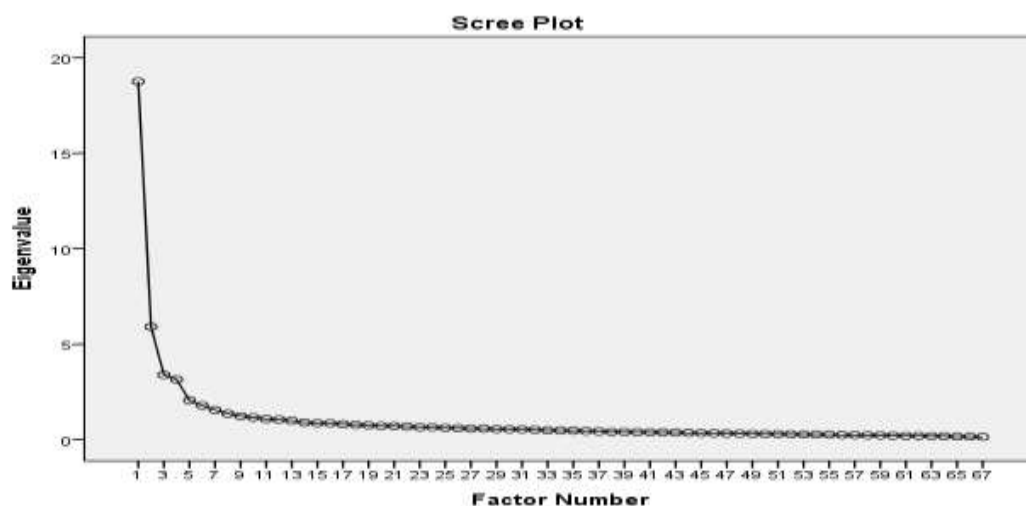


Figure 1: The Scree plot of Cultural Intelligence Test

A Principal axis factoring was run with varimax rotation to check the scale construct validity. In Table 2, four factors explaining 43.351 % of total variance were obtained. First factor explained 12.754% of total variance and has factor loadings ranging from 0.509- 0.771. Second factor explained 12.597% of total variance and has factor loadings ranging from 0.405-0.791. Third factor explained 10.331% of total variance and has factor loadings ranging from 0.427-0.685. Fourth factor explained 7.669 % of total variance and has factor 4 loadings from 0.416-0.698. After loading exploratory factor analysis, items of CQ16, CQ33, CQ14, CQ32 are not correlated with any factors and they are removed. By this way, a four-factored construct consisting of 63 items explaining 43.351 % of total variance is obtained.

Table2: Factor loadings for principle axis factoring with Varimax Rotation on Cultural Intelligence items

Items	Factor			
	1	2	3	4
CQ55	.771			
CQ54	.764			
CQ58	.763			
CQ59	.734			
CQ53	.717			
CQ56	.704			
CQ52	.678			
CQ64	.652			
CQ51	.631			
CQ66	.628			
CQ65	.609			
CQ67	.561			

Items	Factor			
	1	2	3	4
CQ60	.561			
CQ57	.560			
CQ63	.556			
CQ61	.547			
CQ62	.509			
CQ23		.791		
CQ26		.759		
CQ21		.755		
CQ22		.749		
CQ25		.701		
CQ30		.692		
CQ28		.671		
CQ17		.608		
CQ19		.598		
CQ15		.592		
CQ18		.573		
CQ29		.538		
CQ31		.527		
CQ24		.515		
CQ27		.503		
CQ14		.493		
CQ20		.405		
CQ49			.685	
CQ46			.673	
CQ48			.664	
CQ47			.659	
CQ50			.618	
CQ40			.616	
CQ39			.608	
CQ41			.601	
CQ43			.583	
CQ38			.576	

Items	Factor			
	1	2	3	4
CQ37			.485	
CQ36			.474	
CQ42			.467	
CQ44			.436	
CQ35			.434	
CQ45			.427	
CQ4				.609
CQ8				.570
CQ7				.564
CQ6				.549
CQ2				.548
CQ5				.528
CQ11				.508
CQ12				.497
CQ3				.493
CQ9				.492
CQ1				.463
CQ10				.462
CQ13				.416
% of total variance	12.754%	12.597%	10.331%	7.669

Each factor was named in accordance with the construct explained by the items. First factor could be named as Behavioral CQ. The items under this factor consisted of 17 items with loadings between 0.509 - 0.771% of total variance. Second factor could be named as Cognitive CQ. The items under this factor consisted of 17 items with loadings between 0.405 - 0.791% of total variance. Third factor could be named as Motivational CQ. The items under this factor consisted of 16 items with loadings between 0.427- 0.685% of total variance. Fourth factor could be named as Metacognitive CQ. The items under this factor consisted of 13 items with loadings between 0.416- 0.609% of total variance. Therefore, this test contains total items of 63 and is generally said to be reliable and valid measure. Next, in order to more reliable, confirmatory factor analysis on cultural intelligence test is also computed.

Confirmatory Factor analysis on Cultural Intelligence Test

Confirmatory factor analysis was also used to establish the four factors of cultural intelligence test. According to Hu and Bentler (1999), the maximum cutoff value of 0.8 for RMSEA and the maximum cutoff value of 0.90 for TLI and CFI and a p-value for the Chi square less than 0.005 can be considered as the model is a good fit. Fit indices for assessing the goodness of fit in confirmatory factor analysis is presented in Table 3.

Table 3: Fit Indices for Assessing the Goodness of Fit in Confirmatory Factor Analysis (Bentler, 1999)

Name	Index	Level of acceptance
Discrepancy chi square	Chisq	0.000
Root Mean Square of Error of Approximation	RMSEA	<0.08
Comparative fit index	CFI	>0.90
Tucker-Lewis Index	TLI	>0.90

Table 4: Model Fit Indices of Cultural Intelligence Test

Cultural Intelligence Test	Chisq	RMSEA	CFI	TLI
	0.0000	0.051	0.890	0.906

The data of fit of the models of cultural intelligence test was examined in Table 4. Based on the data presented in Table 4, CFI and TLI was nearly 0.90 and RMSEA ranged from 0.05 to 0.1 and chi-square was found significant at $p < 0.05$. Therefore, the model fit indices of cultural intelligence test with 63 items.

Validity and Reliability of Cultural Intelligence Test

Convergent Validity

Convergent validity is also an evidence to test construct validity. To establish convergent validity, factor loading of the indicator variables, composite reliability (CR) and average variance extracted (AVE) should be used. AVE and CR values were computed by the formula using Microsoft Excel. Table 5 showed that the result of AVE and CR of cultural intelligence test.

Tabel 5: Construct reliability (CR) and average variance extracted (AVE) of Cultural Intelligence Test

Factor	CR	AVE
Mecognitive CQ	0.881	0.57
Cognitive CQ	0.928	0.622
Motivational CQ	0.912	0.647
Behavioral CQ	0.917	0.836

The AVE values for the model ranged from 0.57 to 0.836. The CR values ranges from 0.881 to 0.928. According to Fornell and Larcker (2011), AVE should be above 0.5 and CR should be 0.6 and above. According to Table 5, AVE values were above 0.5 and CR values were above 0.6 so that convergent validity was achieved for this construct. Cultural intelligence test was assumed that it was a valid instrument to measure cultural intelligence of basic education teachers in Myanmar.

Discriminant Validity of Cultural Intelligence Test

Discriminant validity was used to show that the construct is actually differing from one another empirically. Discriminant validity was evaluated with square root of AVE with correlations of latent construct. The results were shown in Table 6.

Table 6: Square root of AVE with Correlations of Latent Factors of Cultural Intelligence Test

Factors	Mecognitive CQ	Cognitive CQ	Motivational CQ	Behavioral CQ
Mecognitive CQ	<i>0.755</i>			
Cognitive CQ	0.500	<i>0.788</i>		
Motivational CQ	0.510	0.552	<i>0.804</i>	
Behavioral CQ	0.455	0.386	0.616	<i>0.836</i>

The diagonal numbers in italic are the square root of AVE values.

According to Table 6, all the square root of AVE values was greater than 0.5 and these values were greater than all the inter-latent factor correlations for all factors in the relevant rows and columns. According to Fornell and Larcker (2011), square root of AVE should be above 0.5. Then, according to Hair et al (2011), square root of AVE values was greater than the inter-latent factor correlations. Thus, the results of the discriminant validity of Cultural Intelligence Test were congruent with Fornell and Larcker and Hair et al (2011). According to Table 6, discriminant validity can be accepted for the measurement model and the discriminant model and the discriminant validity between the constructs.

Reliability of Cultural Intelligence Test

After the result of confirmatory factor analysis of Cultural Intelligence Test, it consisted of four subscales with 63 items in this study. Table 7 showed that the number of items and described reliability coefficient for each subscale of Cultural Intelligence Test.

Table 7: Number of Items retained and Reliability Coefficient for each subscale of Cultural Intelligence Test

Factor	Number of items	Cronbach's Alpha
Mecognitive CQ	13	0.862
Cognitive CQ	17	0.931
Motivational CQ	16	0.914
Behavioral CQ	17	0.941

Based on Table 7, reliability coefficient of each subscale ranged from 0.862 to 0.941 and the reliability coefficient of Cultural Intelligence Test was 0.950. Thus, cultural intelligence test was reliable to measure Cultural intelligent of basic education teachers in Myanmar.

Discussion

In order to promote teacher quality, recently researchers have proposed and developed the concept of CQ to better understand and explain differences in cross-cultural effectiveness. To measure CQ, many researchers developed the cultural intelligence scale, which has been used in an increasing number of studies. However, the validity of previous CQ studies might be questionable, due to the omission of discriminant validity tests. To overcome these limitations, this research examines the validity and reliability of the CQ construct by testing the Cultural

Intelligence Test with a sample of 620 basic education teachers. Cultural Intelligence Test provides satisfactory reliability, convergent validity and discriminant validity. As does any research, this research contains some limitations. This research used self-reported Cultural Intelligence Test, further research could use peer or superior reviewed measures to obtain more objective data. Alternatively, other measurement methods could be applied. To prevent measures of attitudes rather than adaptation behavior, the use of role- playing and critical incident techniques might be beneficial.

Conclusion

In this research, Cultural Intelligence Test for Myanmar Basic Education Teachers was constructed by using exploratory and confirmatory factor analysis. Firstly, Cultural Intelligence Test contained 67 items. However, after loading factor analysis, four items that are not correlated with any factor were discarded. Therefore, final Cultural Intelligence Test with a four-factored construct consisting of 63 items explaining 43.351 % of total variance is obtained. This test will give good enough information about cultural intelligence of basic education teachers in Myanmar.

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EFFECT OF PERSONAL CHARACTERISTICS OF STUDENTS AND THEIR HOME ENVIRONMENT ON ACADEMIC ACHIEVEMENT AT BASIC EDUCATION HIGH SCHOOLS IN MYANMAR

Lei Yin Win¹ and San Win²

Abstract

The present study provided an examination of the effect of personal characteristics of students (Academic Self-efficacy, Academic Motivation) and their home environment (Parental Involvement, Socio-Economic Status) on academic achievement of students at Basic Education High Schools in Myanmar. A total of 1309 Grade-11 students from 15 government schools and 3 private schools in 6 Regions and States. Academic self-efficacy scale and academic motivation scale which had Cronbach's alpha of 0.929 and 0.839 were used to assess student personal factors and parental involvement questionnaire which had Cronbach's alpha of 0.889 and socio-economic questionnaire were used to assess home environment. Before executing discriminant analysis, data were firstly screened for outliers and then, assumptions for discriminant analysis were checked. Group statistics showed that there were mean differences among all the student and parent factors under the categories of high, average, and low achieving groups. ANOVA table revealed all the student and parent factors were reliable discriminators of the high, average, and low achieving groups. The conducted discriminant analysis was a three-group analysis, and therefore, two discriminant functions were obtained. Discriminant function 1 was statistically significant with Wilks' Lambda = .42, chi-square = 398.86 at $p < .001$ while Function 2 was statistically significant with Wilks' Lambda = .91, chi-square = 13.64 at $p < .001$. Standardized canonical discriminant function coefficients and structure matrix revealed that students' academic achievement was mainly determined by socio-economic status and parental involvement and contributed 39.69 %. Academic self-efficacy and academic motivation contributed additional 8.41% to students' academic achievement. The discriminant model classified correctly 77.3 % of students as high achievers, 10.8% of students as average achievers, and 74.7% of students as low achievers respectively. A total of 60.9 % of teachers were correctly classified into three groups with 60.2% of cross-validated grouped cases were correctly classified.

Keywords: Academic Achievement, Parental Involvement, Academic Motivation, Academic Self-Efficacy

Introduction

Importance of the Study

Education is an important human virtue, necessity of society, bases of excellent life and sign of freedom. Education plays an impressive role in the enhancement of individual and society. The improvement of any nation is hinged on solid educational settlement for its citizenry. Education allows a person to develop physically, mentally, socially, emotionally and intellectually. Education is crucial to creating a society, that is dynamic and productive, providing opportunity and fairness to all. Therefore, it is very axiomatic that efforts need to be geared in the direction of maintaining high standards in schools and institutions. The standards will be reflected in students' academic achievement (Adeyemi, A. M., & Adeyemi, S. B., 2014).

The advancement of the education sector is a high priority for Myanmar and the government was dedicated to effective implementation of practical education reform. In accordance with the statistics from Myanmar Board of Examination (2017), average pass rate amongst rural Basic Education High Schools is below the national with many achieving zero

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percent pass rate. It, consequently, becomes very critical for educators to uncover the likely grounds of low academic achievement.

Crosnoe, Johnson and Elder (2004) stated that higher scholastic achievement is a top priority for educators and various researchers have sought to identify its determinants. It is supposed for making a difference locally, regionally, nationally and globally. Educators, trainers, and researchers have long been interested in investigating the variables contributing effectively for quality of performance of students. The ultimate aspect for the educators is to capitalize their students' education effectively so that they may be able to display quality performance in their academics. To achieve this objective, this study tries to account various surrounding variables to concurrently examine the influencing factors upon Myanmar matriculation examination pass rate. By providing the information that can contribute higher academic achievement, this can enlighten educators and responsible authorities to create the better learning environment that enhance quality education in the Myanmar community.

Purpose of the Study

The primary purpose of the study is to investigate the impact of students' personal characteristics such as academic self-efficacy and academic motivation and their home environment such as parental involvement and socio-economic status on the academic achievement of Grade-11 students.

Definitions of Key Terms

Academic Achievement refers to the level of schooling in which students have successfully completed and their ability to attain success in their studies (Larocque et al., 2011). In this study, it will be taken as the outcome of matriculation examination.

Parental Involvement may be defined as parental participation in the educational processes and experiences of their children (Jeynes & William, 2007). It typically concerns the amount of effort put into child-oriented education as well as other activities (Nyarko, 2011).

Academic Motivation is defined as a mental, emotional and behavioral determinants of student investment in education and commitment (Tucker et al., 2002). It is the starting point for learning a lesson, mobilizes the student and contributes to the student to perform what he or she should do during the school years (Peklaj and Levpušček, 2006).

Academic Self-Efficacy refers to student's beliefs in their ability to master new skills and tasks, often in a specific academic domain (Pajares and Miller, 1994).

Review of Related Literature

Academic achievement is assumed an outcome of education and is defined as a student's success in reaching educational goals (Shakir, 2014). It is considered to be the heart which the whole education system pivots on. In the words of Kpolvie, Joe and Okoto (2014), secondary education plays a crucial role in laying the foundation for the further education of students. If a sound foundation is laid at the secondary school level, students can better deal with the challenges of life and profession with great ease. However, different people have explained various factors responsible for the scholastic achievement of students.

Achievement Motivation Theory: McClelland's theory postulated that people are motivated in varying degrees by their need for achievement, need for power, and need for affiliation and that these needs are acquired, or transformed, during an individual's lifetime (Daft, 2008; Lussier & Achua, 2007). Another theory of Achievement Motivation was proposed by Atkinson and Feather (1966) as cited in Zenzen (2002). They asserted that an individual's achievement-oriented behavior is on the basis of three parts: the first part being the individual's predisposition

to success, the second part being the probability of success, and third, a person's beliefs about the value or cost of the task. This theory can be aligned to the study as has been held by others (Nyoni & Garikai, 2017) and is very relevant to the current study.

Walberg's Theory of Educational Productivity: According to Farooq, Chaudhary, Shafiq & Berhanu (2011), Theory of Educational Productivity by Walberg (1981) determined three groups of nine factors based on affective, cognitive and behavioral skills for optimization of learning that affect the quality of academic performance: Aptitude (student ability, development level and motivation); instruction (amount and quality); environment (home, classroom, peers and exposure to mass media outside of school).

Self-Determination Theory: In the words of Hardre, Chen, Huang, Chiang, Jen & Warden (2006), according to self-determination theory, students' motivation for academic engagement varies in both strength (amount) and quality (nature), and both variations determine learning, achievement, and continuation to further education. Self-determined, intrinsic motivation emerges from the learner's own needs and desires rather than from outside pressures (Deci & Ryan, 1987). Although it is this high-quality, self-determined, intrinsic motivation that most dominantly predicts positive school-related engagement and success, all students are not all intrinsically motivated for every task or subject. Students can promote their motivation towards learning of tasks and content through internalization, the process of a student adopting increasing choice and value for learning, and ownership of the learning process (Reeve, Deci, & Ryan, 2004; Ryan & Connell, 1989). Internalization is promoted through the support of three important student characteristics: autonomy, competence, and relatedness (Black & Deci, 2000; Ryan & Deci, 2000). Through internalization, a student becomes increasingly self-determined (versus other-determined or extrinsically pressured) (Deci, 1995; Reeve et al., 2004).

Student Factors that Affect Students' Academic Achievement

Academic Self-Efficacy: Self-efficacy refers to student's perceptions in their ability to master new abilities and tasks, often in a particular educational domain (Pajares and Miller, 1994). Learners achieve information to appraise their self-efficacy from their performances, their vicarious experiences, the persuasions they receive from others, and their physiological reactions. Self-efficacy beliefs have an impact on task choice, effort, persistence, resilience, and achievement outcomes (Bandura, 1997; Schunk, 1995). Therefore, it is not surprising that many researches revealed that self-efficacy affects academic achievement motivation, learning and educational success (Pajares, 1996; Schunk, 1995). In line with these findings, Schunk and Zimmerman (1994) reported that there was a positive direction between self-efficacy and academic achievement and that if students are trained to have higher self-efficacy beliefs their overall academic performance additionally improves. Students with strong senses of self-efficacy tendency engage in challenging activities, invest more effort and time, persistence, and show excellent academic performance in comparison with students who do not own such confidence (Bong, 2001).

Motivation for Learning: Singh (2011) opined that one of the most essential factors that lead one to their goals is the drive. This drive is known as motivation. The drive may derive from an internal or external source. According to need theory, which is also known as the content theory of motivation mainly focuses on the internal drives that energize and direct human behavior. Motivation for learning is defined as students' tendency for making efforts with the aim of achieving academic success (Ryan & Deci, 2000). According to the theoretical background, the self-determination theory (Ryan & Deci, 2000) as cited in (Maric, 2014), the individual factors and intrinsic motivation have greater impact on motivation for learning and academic engagement than social, environmental factors and extrinsic motivation. Recent researchers

showed the significance of individual motivational factors and intrinsic motivation for learning and achieving higher academic success (Castiglia, 2010; Nedeljković, 2012; Parr, 2011; Velki, 2011, as cited in Maric, 2014).

Parent Factors that Affect Students' Academic Achievement

Home Environment and Parental Involvement: The family is a social unit in any society and it is the main source of early stimulation and experience in influence of home environment on academic performance of high school students. Home environment and early experiences help to develop curiosity, help build self-efficacy beliefs and shape the individual's behavior (Nordin et al., 2012). The home has a tremendous influence on students' physical, psychological, emotional, social and economic state. In continuation, learner's home environment factors that influences their academic performances may be considered in terms of parental participation and support in students' learning and socio-economic status of the family.

The scholastic achievement of students heavily depends upon the parental involvement in their academic activities to gain the higher level of quality in academic success (Barnard, 2004; Henderson, 1988; Shumox & Lomax, 2001, as cited in Nordin et al., 2012). And, parental involvement may be varied from culture to culture and society to society. In the words of Epstein (1995), the supportive learning activities in the home that reinforce school curricula might decorate the educational accomplishment of students.

Socio-Economic Status: The family's socio-economic factor has an impact on the student's aspiration, motivation, self-efficacy and involvement in co-curriculum activities. As reported in Dukmok & Ishtaiwa (2015), students' academic achievement may be affected by the socio-demographic foundation of their guardians such as the education level, family size and family income (Juma, Simatwa, & Ayodo, 2012; Udida et al., 2012). In studies conducted by Udida et al. (2012) and Selvam (2013), students' learning was positively impacted by their parents' level of education. Krashen (2005) as cited in Farooq et al., (2011) concluded that students whose parents are educated can better assist their children in their work and participate at school. Educated parents can offer such a surrounding that suits best for educational success of their children. The school educators can provide guidance and counseling to parents for nurturing positive home environment for enhancement in students' quality of academic work (Marzano, 2003).

Method

Participants of the Study

According to a release from the Myanmar Board of Examination for 2018-2019 Academic Year, the researcher divided Regions and States into three groups such as high, average, and low achieving groups. These groups were presented in the Table 1.

Table 1 Regions and States Representing High, Average and Low Achieving Group

High Achieving Group	Average Achieving Group	Low Achieving Group
<ul style="list-style-type: none"> • Mon • Mandalay • Sagaing 	<ul style="list-style-type: none"> • Tanintharyi • Yangon • Magway • Shan (North) • Nay Pyi Taw • Kachin • Bago (West) • Ayeyarwady 	<ul style="list-style-type: none"> • Bago (East) • Rakhine • Shan (East) • Chin

High Achieving Group	Average Achieving Group	Low Achieving Group
	<ul style="list-style-type: none"> • Kayar • Shan (South) • Kayin 	

In line with the purpose of exploring the factors affecting the academic achievement of students, the researcher decided to study all these three groups. The participants of the study were obtained by selecting two Regions and States from each of the high, average and low achieving groups with the simple random sampling technique. Mon State and Mandalay Region were selected as high achieving group, Yangon Region and Bago (West) Region were chosen as average achieving group as well as Bago Region (East) and Rakhine State were chosen as low achieving group. From each of the selected Regions and States, three basic education high schools from different townships including basic education high (branch) schools and private schools were randomly selected by the researcher. Finally, a total of 1309 students from the selected 18 schools involved in the study.

Instrumentation

Academic Motivation Scale developed by Vallerand et al. (1992, 1993) which is a 27-item Likert type instrument and Academic Self-Efficacy Scale prepared by Gafoor & Ashraf (2006) which is a 40-item Likert type instrument was adapted and applied to assess the personal characteristics of students. Parental Involvement Questionnaire developed by Naseema and Gofoor (2001) which was a 62-item Likert type instrument and Socio-Economic Status Questionnaire were applied to examine the home environment of students. Pilot testing was conducted with 85 high school students and the results revealed that all the selected instruments were reliable and acceptable for Myanmar students in accordance with their Cronbach's alpha values (Academic Self-Efficacy Scale; $\alpha = 0.929$, Academic Motivation Scale; $\alpha = 0.839$, Parental Involvement Questionnaire; $\alpha = 0.889$).

Data Analysis and Findings

Discriminant Analysis was conducted to examine whether the four variables, parental involvement, socio-economic status, academic self-efficacy and academic motivation, could distinguish students' academic achievement as high, average and low achieving groups. Preliminary Statistics were conducted to check the assumption of discriminant analysis. Since discriminant analysis was highly sensitive to outliers, data for the study was firstly screened for outliers. Firstly, several outliers were removed by using Mahalanobis distance.

Assumption of normality and linearity was checked by evaluating bivariate scatterplots of the independent variables such as parental involvement, socio-economic status, academic self-efficacy, and academic motivation. The result revealed that this assumption was satisfied since the shape of the scatterplots showed elliptical.

Table 2 Pooled Within-Groups Matrices

Variable	1	2	3	4
1. Parental Involvement	1.00	.15	.52	.26
2. Socio-Economic Status		1.00	.17	.09
3. Academic Self-Efficacy			1.00	.49
4. Academic Motivation				1.00

Table 2 did not indicate the existence of multicollinearity among all the independent variables, i.e., all the correlation coefficients were less than .60 and accordingly supporting one of the assumptions of discriminant analysis.

The basic assumption in discriminant analysis is that variance-co-variance matrices are equivalent. According to Table 3, Box's M test was 131.73 with $F = 5.87$ which was significant at $p < .001$. So, it could be concluded that the three groups do differ in their covariance matrices, violating the assumption.

Table 3 Box's M Test of Equality of Covariance Matrices

Box's M	131.73
<i>F</i>	5.87***
<i>p</i>	.000

*** $p < 0.001$

However, one should keep in mind that Box's M is highly sensitive to non-normal distributions (Mertler & Vannatta, 2002). When with large samples, a significant result is acceptable and Box's M should be interpreted in conjunction with inspection of the log determinants.

Table 4 Log Determinants Table

Achievement Group	Rank	Log Determinant
low	4	-5.49
average	4	-4.53
High	4	-4.11
Pooled within-groups	4	-4.81

In Table 4, the values of log determinants were quite similar. On the other hand, with large sample, a significant Box's M was acceptable.

Consequently, as all the assumptions were checked, discriminant analysis was conducted by applying enter method.

Table 5 Group Statistics Table

Achievement Group	Variable	N	Mean	SD
Low	Parental Involvement	459	3.00	.28
	Academic Self-Efficacy	459	2.65	.27
	Academic Motivation	459	3.15	.32
	Socio-Economic Status	459	2.01	.76
Average	Parental Involvement	316	3.13	.27
	Academic Self-Efficacy	316	2.79	.29
	Academic Motivation	316	3.26	.37
	Socio-Economic Status	316	2.56	.35

Achievement Group	Variable	N	Mean	SD
High	Parental Involvement	534	3.17	.28
	Academic Self-Efficacy	534	2.79	.31
	Academic Motivation	534	3.21	.37
	Socio-Economic Status	534	2.89	.66

The group statistics table provided basic descriptive statistics for each of the independent variables for each of three achieving groups (see Table 5). The table showed that among the four variables, differences between mean scores of all variables were slightly different except socio-economic status variable which showed the sound mean scores difference.

Table 6 ANOVA Table for Tests of Equality of Group Means

Variable	Wilks' Lambda	F	df1	df2	p
Parental Involvement	.93	42.85***	2	1306	.000
Socio-Economic Status	.75	203.96***	2	1306	.000
Academic Self-Efficacy	.92	35.05***	2	1306	.000
Academic Motivation	.98	8.07***	2	1306	.000

*** $p < 0.001$

Table 6 provided strong statistical evidence of significant differences between mean scores of high, average, and low achieving groups for all predictor variables with socio-economic status, parental involvement and academic self-efficacy producing very high value F 's in line with the values of Wilks' Lambda.

Significant Tests and Strength of Relationship for Each Function

The conducted discriminant analysis was a three-group analysis, and so two discriminant functions were obtained as described in Table 6.

Table 7 Eigenvalue and Wilks' Lambda Table

Test of Function	Eigen value	Canonical Correlation	% of Variance	Wilks' Lambda	Chi-square	df	p
1	.68	.63	96.5	.42	398.86***	8	.000
2	.11	.29	3.5	.91	13.64***	3	.000

*** $p < 0.001$

In Function 1, a canonical correlation of .63 represented that the correlation between the discriminant function and the levels of dependence variables. Squaring this value produced the effective size, which revealed that the model explained 39.69 % of the variation in the grouping variable, academic achievement. In function 2, additional 8.41 % of variation was explained by the model with a canonical correlation of .29. Since the effective size of the function 2 was low, it can be concluded that there might other unassessed factors for a more complete picture affecting matriculation examination pass rate that need to be explored.

According to Table 7, both discriminant functions were significant at $p < .001$. By inspecting the two functions, function1 was significant, Wilks' Lambda = .42, chi-square= 398.86, $p < 0.001$ as well as function 2 was significant, Wilks' Lambda = .91, chi-square= 13.64, $p < 0.001$. Comparing these two functions, function 1 had greater discriminating ability between three achievement groups as its smaller Wilks' Lambda.

Discriminant Function Coefficients

Table 8 Standardized Canonical Discriminant Function Coefficients

Variable	Standardized Function Coefficients	
	Function 1	Function 2
Socio-Economic Status	.89	-.36
Parental Involvement	.49	.43
Academic Self-Efficacy	.22	.59
Academic Motivation	-.16	.42

Standardized canonical discriminant function coefficients for Function 1 and Function 2 in Table 8 indicated the relative importance of independence variables in predicting the dependence variable, students' academic achievement. Socio-economic status was the strongest predictor while parental involvement was next important variable in Function 1. These two variables with large coefficients stand out as those that strongly predicted allocation to high, average and low achieving groups. On the other hand, academic self-efficacy was strongest variable in discriminant function 2 and gained additional explanation of the model.

Table 9. Structure Matrix Table

Variable	Correlation Coefficients with Discriminant Functions	
	Function 1	Function 2
Socio-Economic Status	.90*	-.18
Parental Involvement	.42*	.27
Academic Self-Efficacy	.29	.78*
Academic Motivation	.16	.82*

The interpretation of structure matrix table (Table 9) provided another way of indicating the relative importance of predictors. Based on the structure coefficient value, it could be concluded that students' academic achievement was mainly determined by socio-economic status and parental involvement. Academic self-efficacy and academic motivation were not clearly loaded on discriminant function 1. Accordingly, the first function seemed to reflect socio-economic status and parental involvement but not the other values. One reasonable interpretation would be that seems to reflect parent factors. Hence, Function 1 was so named as parent factors. Given that Function 1 achieved significance, it can thus conclude the extent to which parent factors vary across the three achievement groups; high, average, and low. On the other hand, the second function seemed to reflect academic self-efficacy, and academic motivation but not socio-economic status and parental involvement. One reasonable interpretation would be that academic self-efficacy and academic motivation seems to reflect student factors. So, function 2 accounted for variation of student factors among high, average and low achieving groups.

Table 10. Canonical Discriminant Function Coefficients (Unstandardized coefficients)

Variable	Function	
	1	2
Parental Involvement	.58	2.31
Socio-Economic Status	.31	-.09
Academic Self-Efficacy	.28	.98
Academic Motivation	-.11	1.02
(Constant)	-3.21	-7.58

According to Table 10, two discriminant function equations were as follows.

Parent Factor = $-3.21 + (.58 \times \text{Parental Involvement}) + (.31 \times \text{Socio-Economic Status}) + (.28 \times \text{Academic Self- efficacy}) - (.11 \times \text{Academic Motivation})$

Student Factor = $-7.58 + (2.31 \times \text{Parental Involvement}) - (.09 \times \text{Socio-Economic Status}) + (.98 \times \text{Academic Self-efficacy}) + (1.02 \times \text{Academic Motivation})$

Classification Statistics

The classification matrix was shown in Table 11. It clearly showed how students constituting the sample are distributed across groups. Original classification results revealed that 77.3 % of students as the low achieving group were correctly classified, 10.8% as average achieving group where as 74.7 % of those as high achieving group were correctly classified. It was found that the conducted discriminant analysis was weak in explaining the average achievement group when compared to high and low achievement groups. For the overall sample, 60.9 % of students were correctly classified into high, average, and low achieving groups while 60.2 % of cross-validated grouped cases were correctly classified.

Table 11. Classification Results for High, Average, and Low Achievement Groups

Academic Achievement Group			Predicted Group Membership			Total
			low	average	high	
Original	Count	low	355	29	75	459
		average	171	34	111	316
		high	102	33	399	534
	%	low	77.3	6.3	16.3	100
		average	54.1	10.8	35.1	100
		high	19.1	6.2	74.7	100
Cross-validated	Count	low	356	25	78	459
		average	170	34	112	316
		high	104	30	400	534
	%	low	77.6	5.4	17.0	100
		average	53.8	10.8	35.4	100
		high	19.5	5.6	75.0	100

Note. 60.9 % of original grouped cases correctly classified.

Cross validation is done only for those cases in the analysis. In cross validation, each case is classified by the functions derived from all cases other than that case.

60.2 % of cross-validated grouped cases correctly classified.

Conclusion

The results of discriminant analysis highlighted that both parent factors (parental involvement and socio-economic status) and student factors (academic self-efficacy and academic motivation) were significant predictors of students' academic achievement, especially the family environment had tremendous effect with its stronger contribution on the discriminant function. The findings gave prominence to the fact that although both student factors were positively correlated with academic pass rate, there might exist unexplored students' personal characteristics influencing upon it that needs to be explored.

Suggestions

The findings of the current study give prominence to the view that parental involvement in a child's education along with social, environmental and economic factors may impact students' development in the areas such as cognition, and intellectual development. It is recommended that schools should capitalize upon what parents are already doing by helping them to support and interact with their children at home learning activities that reinforce what is being taught in school. The results of this study pointed out the strong positive bond between homes and schools in the development and education of children which confirmed Hoover-Dempsey and Sandler (1997) argued that parental involvement enhances academic self-efficacy, intrinsic motivation for learning as well as self-regulation which in turn operates to enhance educational attainment of students.

Epstein (1995) stated that parents, school, and community are important spheres of influence on students' development and that educational accomplishment is enhanced when these three environments operate collaboratively toward the shared goals. This study recommends that schools must help families create family environments that nurture students' learning by providing them with information in the areas such as children's health and nutrition, discipline, adolescents' needs, parenting approaches. At the same time, schools must seek to comprehend and incorporate aspects of their students' family life into what is taught in the schools.

Limitations of the Study

Despite the contribution of this study, there are some limitations that need further examination and investigation. The selected independent variables from each of the factors were elicited by the researcher on the basis of the review of the related literature and the previous researches on the underlying area. A more complete picture of explanation should be conducted through the meta-analysis. Secondly, since the study was conducted the survey during the middle of academic year, there might students drop out problems and teachers who might transfer or promote to another schools. Thirdly, the term academic achievement in the study referred to the achievement of the combination of six subjects and it could not specify the exact academic subject matter.

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THE EFFECTIVENESS OF LANGUAGE LEARNING STRATEGIES TRAINING ON ENGLISH LANGUAGE ACHIEVEMENT OF SECONDARY SCHOOL STUDENTS

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Abstract

English is prescribed as a compulsory subject in Myanmar Education System. It is also significant in shaping students' academic achievement. Therefore, to make secondary school students improve in English, it is needed to find different ways. Language learning strategies and their training models have been got a lot of attention and popularity in the field of English language learning. Therefore, a study was conducted as a training of language learning strategies to make improve English language achievement of secondary school students. As the sample of the study, a total of 51 secondary school students (38 males and 13 females) were chosen. To examine the effectiveness of language learning strategies training, a paired sample *t* test was used to analyse the data. According to the result, it was found that English language achievement of low achievement group improved significantly by training with language learning strategies used by high achievers.

Keywords: English Language Achievement, Language Learning Strategies, Language Learning Strategies Training

Introduction

According to Aristotle (1976), man is a rational animal and that what sets him apart, what raises him above the animals, is that he has the ability to reason, and it is very clear that he cannot reason without language (cited in Modrak, 2001). Language is essential for human beings and it is the cause of civilization. Because of language, men can express their feelings and thoughts, share their experience and communicate each other. Language can also make any communication effective. In such a way, they establish a balanced and adaptable living through language.

Among different languages, the language which is used all over the world as an international language and the link among different people from different language backgrounds in all parts of the world is English. According to Crystal (1997), approximately '2' billion people communicate in English worldwide; '450' million speak English as a first language along with '500' million who speak it as a fluent second language, and another '1' billion use it as a foreign language. Nearly one third of the world's population is studying English, and predictions suggest that by 2050, half of the world population will be proficient English speakers (cited in Thandar Soe, 2015).

English is regarded differently in different places of the world: some use it as a first language, some as a second language and the others as a foreign language. As for Myanmar, it is used as a foreign language and prescribed as one of academic subjects in education. According to Francis and Rivera (2007), language is the gateway for learning and the vehicle that facilitates acquisition of new knowledge through direct and indirect interaction with other humans, as well as through the reflective processes of introspection (cited in Thandar Soe, 2015).

Therefore, there were findings that English language positively correlated with over all academic achievement of the students. For example, Hamzah (2013) examined the effect of English language proficiency towards social capital and academic achievement among 81 undergraduate students enrolled in Economics courses from year two and three in University Utara Malaysia (UUM). The findings showed that there was a positive relationship of English language proficiency towards academic achievement.

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Therefore, it can be said that the students' achievement in their education depends upon English language achievement. In other words, if students' academic achievement is desirable, their English language achievement must be upgraded. Here, finding the different ways to make improve students' English language achievement becomes important much.

Wenden (1985) reminded us by using an old proverb which states: If a man was given a fish, it was enough to eat for a day. If how to fish was taught, it was enough to eat for a lifetime. This proverb reminded that if students are provided only spoon-feeding teaching, the problems would be solved just shortly. However, if the strategies of how to solve the problems were taught, the learning would be able to manage in the life-long. Language learning strategies are processes which are consciously selected by learners and which may result in actions taken to enhance the learning or use of a second or foreign language through the storage, retention, recall, and application of information about that language (Cohen, 1990).

Many studies also verified that there was a significant positive relationship between language learning strategies use and successful English language learning. For instance, Takeuchi (1993) conducted a survey on 78 Japanese first year students of English at a women's college in Kyoto and concluded that this study confirmed that the self-reported frequency of some language learning strategies was positively related to proficiency of English. Also, Kato (2005) indicated that language learning strategies had several important implications for teaching English to Japanese university students. Next, Kyungsim and Leavell (2006) discovered that the more active strategy users in their study made faster progress than those who employed strategies less often (cited in Kato, 2005).

Accordingly, different language learning strategies training models emerged in the field of language learning strategies to make learners improve in their English language. Rubin (1981) claimed that the strategies are not the preserve of highly capable individuals, but could be learned by others. O'Malley et al. (1994) also stated that the learning strategies of good language learners, once identified and successfully taught to less competent learners, could have considerable potential for enhancing the development of second language skills; and that second language teachers could play an active and valuable role by teaching students how to apply learning strategies to varied language activities and how to extend the strategies to new tasks both in the language classroom and in content areas requiring language skills.

Therefore, the present study is an attempt to explore the effectiveness of language learning strategies training on students' English language achievement as a way of improving English language achievement of secondary school students.

Aim and Objectives

The main aim of this study is to investigate the effectiveness of language learning strategies training on secondary school students' English language achievement.

The specific objectives were:

- (1) To examine whether high English language achievers were high language learning strategies users or not;
- (2) To investigate whether low English language achievers were low language learning strategies users or not;
- (3) To explore language learning strategies used by high English language achievers;
- (4) To find out whether low English language achievers were improved in their English language achievement or not by training with language learning strategies used by high English language achievers;

Hypotheses of the Study

Hypothesis 1: High English language achievers were high language learning strategies users.

Hypothesis 2: Low English language achievers were low language learning strategies users.

Hypothesis 3: low English language achievers were improved in their English language achievement by training with language learning strategies used by high English language achievers.

Definition of Key Terms

English Language Achievement: The ability to repeat language elements that have been taught and mastered. (Oxford, 1990).

Language learning strategies: Specific actions taken by the learner to make learning faster, more enjoyable, more effective, and more transferrable to new situations (Bong, 2021).

Language learning strategies Training: A training in the use of learning strategies in order to improve their learning (Oxford & Nyikes, 1990).

Method

Research Design

One group pretest-posttest experimental research design was utilized in the present study.

Sampling

In Myanmar Education System, there are two levels in secondary school level: lower secondary school level and upper secondary school level. In the lower secondary school level, Grade 6 and Grade 7 are included while the upper secondary school level includes Grade 8 and Grade 9. Among them, Grade 9 students were selected as a target population. By using purposive sampling technique, a total of 51 Grade 9 students (38 males and 13 females) were selected from No (1) Basic Education High School (Minbu), Minbu (Sagu) Township, Minbu District, Magway Region.

Participants

Since the purpose of this study was to train the low English language achievers with language learning strategies used by high English language achievers, the primary step is to select the students with low and high English language achievement.

Firstly, a total of 1838 Grade 9 students were administered with English language achievement test and strategies inventory for language learning as a pretest. Secondly, based on descriptive analyses of English language achievement scores, the students were classified into three groups. The students with above the (+1) standard deviation from the sample mean were regarded as the high achievement group, the students with scores below the (-1) standard deviation were identified as the low achievement group. And, the students whose scores were between (-1) standard deviation and (+1) standard deviation were taken as the moderate achievement group.

Finally, 51 Grade 9 students (38 males and 13 females) from the low achievement group and low strategies users were selected as the participants to conduct this study during 5 weeks with a schedule of three times a week: a two-hour class session.

Instrumentation

In the present study, the three instruments were used for collecting the data. They are the strategies inventory for language learning, the instruments for intervention and English language achievement tests for pretest and posttest.

I. Strategies Inventory for Language Learning (SILL)

To examine language learning strategies of the students, the present study used Oxford's (1990) Version 7.0 of the Strategies Inventory for Language Learning (SILL), designed for English as Foreign Language/English as Second Language learners. The SILL uses a five-point Likert-type scale ranging from 1 ("Never or almost never true of me") to 5 ("Always or almost always true of me"). The taxonomy of strategies consists of 50 statements about strategies used by language learners covering six broad categories of strategies, each represented by a number of items in Table 1.

Table 1 Item Distributions of Strategies Inventory for Language Learning

Strategies	Item Range	Number of total Items
Memory	Items 1-9	9
Cognitive	Items 10-23	14
Compensation	Items 24-29	6
Metacognitive	Items 30-38	9
Affective	Items 39-44	6
Social	Items 45-50	6
Total		50

II. Instrument for Intervention

Although there were many training models of language learning strategies, the intervention protocol was based on Oxford's Training Model of Language Learning Strategies (1990). Because, students used of language learning strategies were investigated by Oxford's (1990) SILL and also, it has been used widely and confidentially in the field of language learning. Among the fifty strategies of strategies inventory for language learning, the twelve strategies of language learning used by high achievement group were filtered and trained to low achievement group.

For the intervention plan, 20 reading passages were retrieved from Google Images. After that, the lesson plans were prepared by selecting most relevant 15 reading passages combined with language learning strategies used by high achievement group on the basic of Oxford's Training Model of Language Learning Strategies (1990). After planning the instrument for intervention, expert review was taken from the two junior assistance teachers who teach English in Basic Education Schools and one assistant lecturer from Department of Methodology, Magway Education Degree College in order to examine whether the reading passages and lesson plans were relevant with Grade 9 students or not. And then, the experimental study was performed with three parts: the first section was demonstrating by the researcher, the second one was self-learning by the students and third one was for the section of practicum. Among each section, 15 minutes was taken as a break time to retain students' attention.

Therefore, the instrument for intervention was constituted of 15 reading passages and 12 language learning strategies based on Oxford's (1990) training model of language learning strategies.

III. Instrument for Pre-test and Post-test

In the present study, in order to examine students' English language achievement, four English language achievement tests were developed with similar contents and similar test forms based on table of specifications, Grade 9 English text book and Grade 9 examination question format. The tests were administered to the same participants (Grade 9 students) in the preliminary testing. After revising some items, two sets of items within the allowance of difficulty index and discrimination power were selected. The parallel form reliability between the two tests was 0.3 ($p < 0.01$). Using Cohen's (1988) guidelines, the effect size is medium for studies in this area. Therefore, after revising some items, one was administered as pre-test and another one as post-test.

Intervention and Data Collection Procedure

Planning the intervention, intervention procedure, data collection, data analysis and results were presented in the following.

Planning the Intervention

The purpose of the intervention was to examine whether low English language achievers can be improved or not if they were trained with language learning strategies of high English

language achievers. Therefore, whether high achievement group were high language learning strategies users or not, whether low achievement group were low strategies users or not and the language learning strategies used by high achievement group were investigated.

The first step was to examine whether high achievement group were high language learning strategies users or not. Descriptive statistic was employed to examine students' use of language learning strategies. According to Oxford (1990) classification, learners with a mean of 2.5 and under are low strategy users, learners with a mean of 2.5 to 3.5 are moderate strategy users and the mean for high users is more than 3.5.

As it was shown in Figure 1, the high English language achievers applied all the strategies at different level of frequencies in order to get their English language achievement. Specifically, they used language learning strategies moderately when they learn English because each mean of strategies they used was between 2.5 and 3.5.

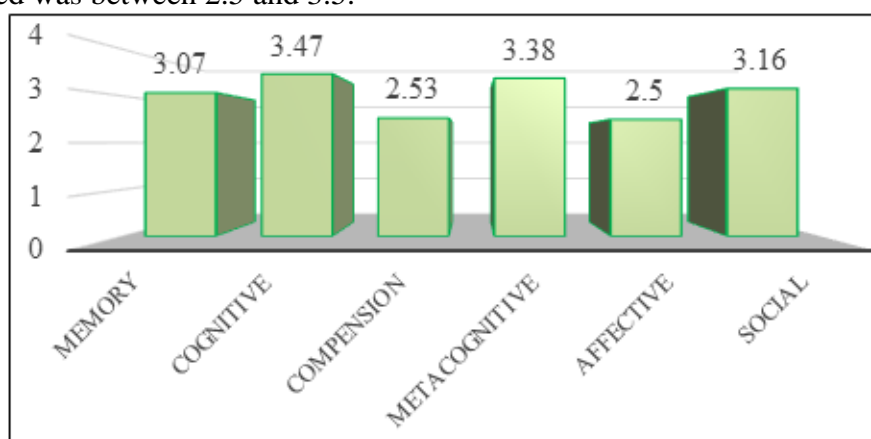


Figure 1 Graphic Representation of Strategies Used by High Achievement Group

Secondly, whether low achievement group were also low language learning strategies users or not was confirmed. Again, descriptive statistic was conducted to examine students' use of language learning strategies.

It was mentioned in Figure 2 that the low English language achievers also applied all the strategies at different level of frequencies in order to get their English language achievement. However, in checking descriptive statistic, it was found that students in low achievement group used language learning strategies poorly because each mean of strategies they used was 2.5 and under.

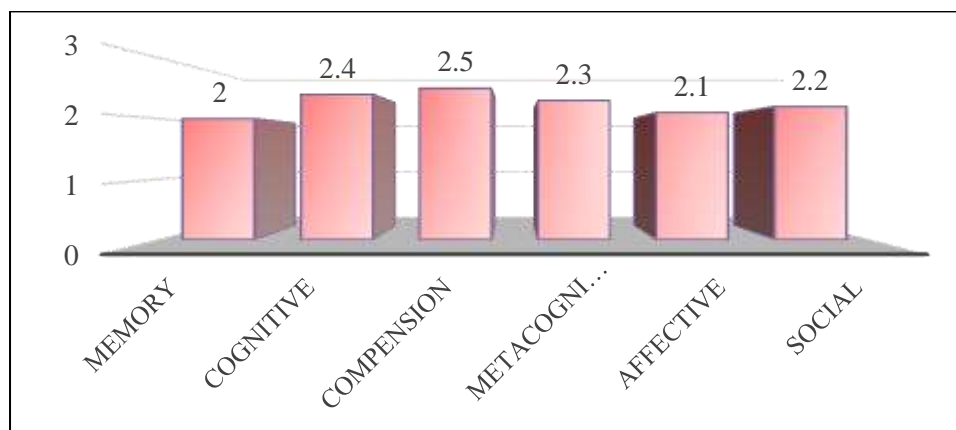


Figure 2 Graphic Representation of Strategies Used by Low Achievement Group

The above results agreed with the previous studies that revealed in Kato (2005) that there was significant relationship between language learning strategies and English language achievements.

After investigating the high and low English language achievement group of the students, the next step of selecting language learning strategies used by high achievement group was performed.

In the followings, the means of strategies that high achievers utilized were presented. According to this, the items that those students highly used (mean value was more than 3.5) were selected to use in intervention practice.

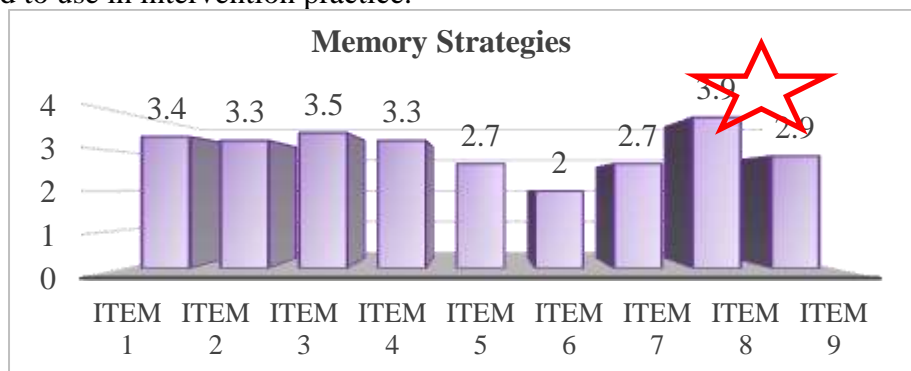


Figure 3 Graphic Representation of Memory Strategies used by high achievers

In Figure 3, it was shown that the students in high achievement group applied the memory strategies moderately while they learn English. Strategy in item 8: “I review English lessons often”; was the most frequently applied item in this section. So, this item was picked to use in the intervention practice. According to Oxford (1990), memory strategies enable learners to store and retrieve new information of a new language. So, high achievers liked to use this strategies in their learning.

Concerning the items measuring the cognitive strategies, the result showed that the students in high achievement group applied the cognitive strategies moderately in their learning English. Specifically, strategies in item 11, 12, 15, 18, 19 and 21: “I try to talk like native English speakers, I practice the sounds of English, I watch English language TV shows spoken in English or go to movies spoken in English, I first skim an English passage (read over the passage quickly) then go back and read carefully, I look for words in my own language that are similar to new words in English and I find the meaning of an English word by dividing it into parts that I understand”; were the most frequently applied ones in this section. Therefore, these items were taken to use in the intervention practice. According to Oxford (1990), cognitive strategies enable learners to understand and produce new language. That’s why, high achievers seemed to choose most of this strategies to use.

Each mean of cognitive strategies that high achievers utilized were presented in Figure 4.

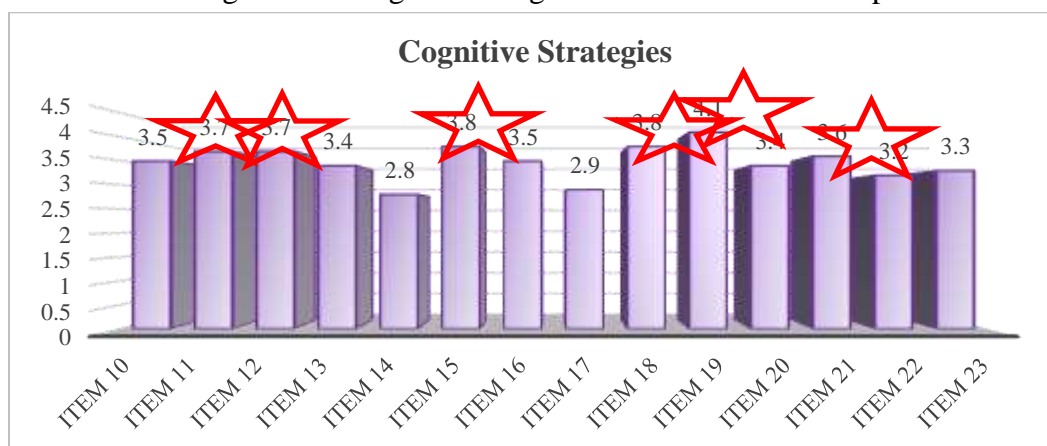


Figure 4 Graphic Representation of Cognitive Strategies used by high achievers.

When the answers of the high achievement group for the items handling compensation strategies was examined, it was shown that they applied the compensation strategies moderately while they learn English. Strategy in item 24: “To understand unfamiliar English words, I make guesses”; as the most frequently applied one in this section. So, this item was selected to use in the intervention practice. According to Oxford (1990), compensation strategies allow learners to use the language despite knowledge gaps. That’s why, high achievers wanted to choose some of this strategies to use.

In Figure 5, each mean of compensation strategies that high achievers utilized were mentioned.

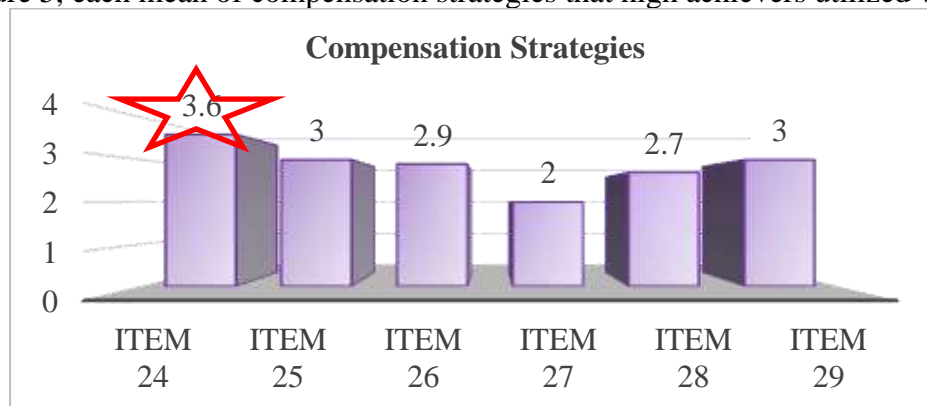


Figure 5 Graphic Representation of Compensation Strategies used by high achievers.

Also, metacognitive strategies applied by high achievement group was examined. The data analysis revealed that the students utilized the metacognitive strategies moderately while they learn English. Strategies in item 31, 32 and 37: “I notice my English mistakes and use that information to help me do better, I pay attention when someone is speaking English and I have clear goals for improving my English skills”; were the most frequently applied ones in this section. And thus, these strategies were chosen in order to be used in the intervention practice. According to Oxford (1990), metacognitive strategies allow learners to evaluate their own language learning pattern and coordinate the learning process. Therefore, high achievers used some of this strategies in their language learning.

Figure 6 described each mean of metacognitive strategies that high achievers applied.

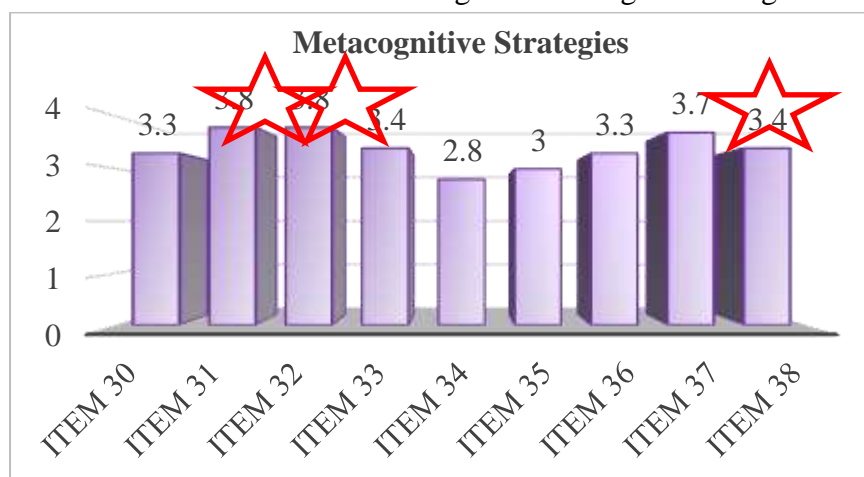


Figure 6 Graphic Representation of Metacognitive Strategies used by high achievers.

When the language learning strategies used by high achievement group was investigated, it was described that the students in high achievement group applied the affective strategies moderately while they learn English. Strategy in item 40: “I encourage myself to speak English even when I am afraid of making a mistake” was the most frequently applied one in this section. Therefore, this item was taken to use in the intervention practice. According to Oxford (1990),

affective strategies help learners gain control and regulate personal emotions, attitudes, and values. Therefore, high achievers needed this strategies in their language learning.

Each mean of affective strategies that high achievers applied was shown in Figure 7.

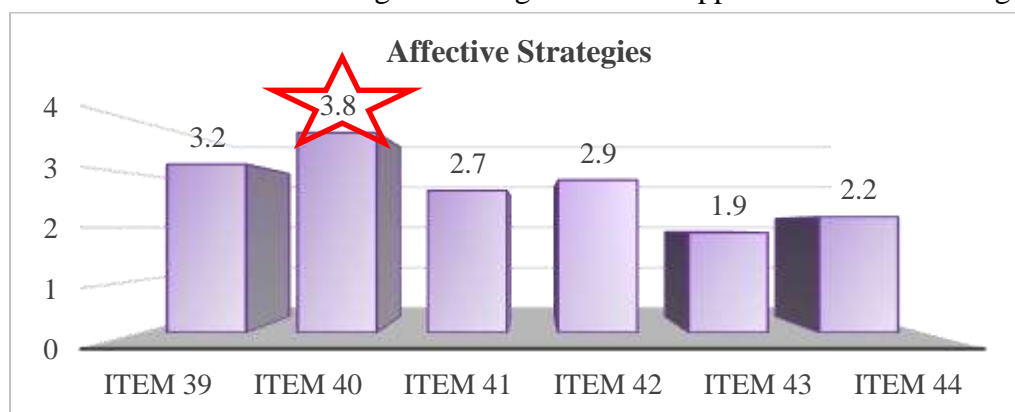


Figure 7 Graphic Representation of Affective Strategies used by high achievers.

Regarding the use of language learning strategies, the students had shown that they applied the social strategies moderately while they learn English. Nevertheless, there was no strategy that students highly used in learning English. In Figure 8, each mean of social strategies that high achievers applied was presented. According to Oxford (1990), social strategies allow users to interact with users such as asking questions and cooperating with native speakers. Most of Myanmar students have less access to interact with native speakers nor someone who can speak like native speakers. Therefore, maybe they cannot choose this strategies to highly use.

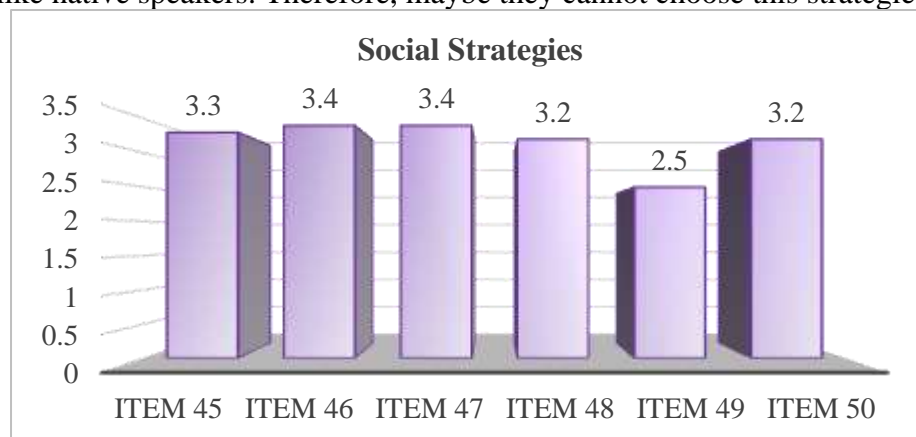


Figure 8 Graphic Representation of Social Strategies used by high achievers.

To sum up, the 12 language learning strategies highly applied by the high English language achievers were collected for the intervention practice and each was shown in Table 2.

Table 2 Language Learning Strategies Selected for Intervention Practice

No.	Strategies	Item to be Used	Total Number of Item to be Used
1.	Memory Strategies	Item 8	1
2.	Cognitive Strategies	Item 11,12,15,18,19, 21	6
3.	Compensation Strategies	Item 24	1
4.	Metacognitive Strategies	Item 31, 32, 37	3
5.	Affective Strategies	Item 40	1
6.	Social Strategies	-	-
Total			12

Intervention Procedure

Before the intervention practice of the study was conducted, permissions for the intervention and data collection were requested to the township educational officer (TEO) and the headmaster. An intervention practice was performed at No (1) Basic Education High School, Minbu, Magway Region for five weeks in late January and February, 2020.

Firstly, the participants were interviewed to confirm whether they are low strategies users or not. Most of the students revealed that they rarely used language learning strategies while they learnt English. Some students said that though they want to use language learning strategies in their learning English because they wanted to get high achievement, unfortunately, they did not know any language learning strategies and how to use them. Some students replied that they did not know using language learning strategies and they just followed the teaching of their teachers from schools and private tuitions that they did not even have enough time to study.

Then, they were introduced with the intervention protocol and expected benefits and also, encouraged to participate actively and they could ask questions whatever they wanted to know. After that, the intervention was carried out according to the lesson plans. The lesson plans were combined with reading passages, language learning strategies used by high achievement group, worksheets, group work activities, discussions as well as question and answer methods. The procedure followed Oxford's (1990) Language Learning Strategies Training model. It was carried out step by step in the following:

- (1) Learners are asked to immerse into an authentic language task without instructional cues;
- (2) Suggest and demonstrate other helpful strategies, mentioning the need for greater self-direction and expected benefits, and making sure that the students are aware of the rationale for strategy use;
- (3) Allow learners plenty of time to practice the new strategies with language tasks and show how the strategies can be transferred to other tasks;
- (4) Provide practice using the techniques with new tasks and allow learners to make choices about the strategies they will use to complete the language learning tasks;
- (5) Help students understand how to evaluate the success of their strategy use and to gauge their progress as more responsible and self-directed learners.

As the schedule was three periods in a week, the first period was demonstration of the researcher how to learn a reading passage by using language learning strategies, the second one was their self-learning another reading passage and giving feedback by the researcher and the third one was the session of evaluating the success of their strategy use.

After the intervention procedure, the posttest was administered with English language achievement test.

Data Analysis and Results

To examine students' English language achievement before and after intervention, the paired sample *t* test was conducted. According to the statistical analysis results, the mean scores differed prominently at $p < 0.001$. Therefore, it can be concluded that students' English language achievement was different before and after the intervention. Again, the analysis of mean values, the mean of English language achievement after the intervention practice was higher than that of before the intervention practice. So, it can be said that English language achievement of students was significantly higher than before intervention at $p < 0.001$ and it was shown in Table 3. It also meant that the intervention practice was effective for making improvement in students' achievement in English language. After all, it can be concluded that practicing language learning

strategies of high English language achievers could improve well English language achievement of students in low achievement group.

Table 3 Paired Sample *t* test Results of English Language Achievement Before and After Intervention

Intervention	Mean	Std. Deviation	Mean Difference	<i>t</i>	<i>df</i>	<i>p</i>
Before	9.61	4.03	-8.54	-18.71	50	.000
After	18.16	4.73				

Note. The mean difference is significant at the 0.001 level.

To sum up, the data analysis was conducted to examine whether low English language achievers can be trained with language learning strategies used by high English achievers to improve their English language achievement. The results pointed out that by training students with poor English language achievement with language learning strategies used by high English language achievers, their English language achievement was improved than before the intervention.

Discussion

According to the intervention practice results, it can be concluded that low English language achievers can be made to improve in their English language achievement by training language learning strategies used by high English language achievers. So, this research pointed out that language learning strategies can be trained to make improvement in English language achievement. In other words, the more students were trained with language learning strategies, the more English language achievement they can get. So, the parents and the teachers should investigate their children's use of language learning strategies, should encourage their children or students to use language learning strategies in learning English and their children and students should be trained with different language learning strategies. The educators should consider language learning strategies uses and training to put in regular teaching-learning program via the student-teachers and teachers in Universities of Education, Education Degree Colleges and Refresher Courses of Basic Education.

Conclusion

The main aim of this study was to investigate the effectiveness of language learning strategies on students' English language achievement. Language learning strategies uses of the high and low English language achievement groups were found out. Language learning strategies used by high achievers were carefully selected and trained to low achievement group. After that, English language achievement of low group before and after the intervention was compared. According to the results, it can be proved that low achievement group can be improved by training with language learning strategies used by high achievement group.

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AN ANALYTICAL STUDY ON MULTIPLE INTELLIGENCES AND SELF-EFFICACY OF GRADE 10 STUDENTS

May Thu Wint¹, Khin Myo Thein²

Abstract

The aim of this study was to investigate the effectiveness of multiple intelligences on self-efficacy of Grade 10 students from Yangon and Bago Regions. Quantitative data analysis was used in this survey. Multiple intelligences and self-efficacy questionnaires were applied. Multiple intelligences questionnaire consists of eight subscales (linguistic intelligence, mathematical intelligence, visual intelligence, bodily-kinesthetic intelligence, musical intelligence, interpersonal intelligence, intrapersonal intelligence and naturalist intelligence) and 80 items and self-efficacy questionnaire consists of 10 items. A total of 748 Grade 10 students (365 males and 383 males) from six Basic Education High Schools in Yangon and Bago Regions participated according to random sampling technique. Based on the results, the participants had higher interpersonal intelligence than other intelligences. The results of independent sample t test showed that male students were higher than female students in mathematical and naturalist intelligences and there was no significant difference in student's self-efficacy by gender. With regard to subject combination, students with science combination (who were majoring in Biology) were higher than students with (science+arts) combination (who were majoring in Economics) in mathematical and naturalist intelligences. The findings of multiple regression analysis revealed that linguistic, mathematical, musical, interpersonal, intrapersonal and naturalist intelligences were significant predictors for self-efficacy. Therefore, the findings of this study shed light on the effectiveness of multiple intelligences.

Keywords: Multiple Intelligences, linguistic intelligence, mathematical intelligence, visual intelligence, bodily-kinesthetic intelligence, musical intelligence, interpersonal intelligence, intrapersonal intelligence and naturalist intelligence, self-efficacy

Introduction

Multiple Intelligences (MI) theory has been attracting for educators and researchers. It maintains that all human possesses at least eight different intelligences to learn and demonstrate understanding. According to Christison (1999), MI theory provides teachers to use as a guide for developing classroom activities that address multiple ways of learning and knowing. In academic setting, self-efficacy has always been the interest of researchers and educators for a long time. Self-efficacy is the measure of student's own competence to complete tasks and reach goals. When students are valued and appreciated for who they are and how they learn due to their strong sense of self-efficacy will be more successful in their intellectual abilities. Therefore, the current study emphasized the effect of multiple intelligences on self-efficacy of Grade 10 students.

Purposes of the Study

The purpose of the study is to examine the effect of multiple intelligences on self-efficacy of Grade 10 students.

Research Questions

- ◆ Is there in significant difference in multiple intelligences of Grade 10 students by gender?
- ◆ Is there in significant difference in multiple intelligences of Grade 10 students by specialization?

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- ◆ Is there in significant difference in self-efficacy of Grade 10 students by gender?
- ◆ Is there in significant difference in self-efficacy of Grade 10 students by specialization?
- ◆ Is there a significant relationship between multiple intelligences and self-efficacy of Grade 10 students?
- ◆ Which factors of multiple intelligences are the best predictors for self-efficacy of Grade 10 students?

Definitions of Key Terms

Multiple Intelligences: The separate intelligences that enable a person to solve problems or to fashion products that are valued in society. (Gardner, 2004)

Verbal/Linguistic Intelligence: It is the sensitivity to the meaning and order of words. (Gardner, 2004)

Logical/Mathematical Intelligence: It is the ability to handle chains of reasoning and to recognize patterns and order. (Gardner, 2004)

Visual/Spatial Intelligence: It is the ability to perceive the world accurately and recreate or transform aspects of that world. (Gardner, 2004)

Bodily-kinesthetic Intelligence: It is the ability to use the body skillfully and handle objects adroitly. (Gardner, 2004)

Musical/Rhythmic Intelligence: It is the sensitivity to pitch, melody, rhythm and tone. (Gardner, 2004)

Interpersonal Intelligence: It is the ability to understand people and relationships. (Gardner, 2004)

Intrapersonal Intelligence: It is access to one's emotional life as a mean to understand oneself and others. (Gardner, 2004)

Naturalist Intelligence: It is the ability to recognize and classify the numerous species in the environment. (Gardner, 2004)

Self-Efficacy: It is a person's belief in his or her ability to succeed in a particular situation. (Bandura, 1993)

Review of Related Literature

Gardner's Multiple Intelligences Theory

Howard Gardner (1983) introduced Multiple Intelligences (MI) Theory, "*Frames of Mind*". He proposed that human beings possess at least eight intelligences: verbal/linguistic intelligence refers to sensitivity to words and languages; logical/mathematical intelligence has to do with adeptness with numbers and logic; visual/spatial intelligence is related to vision and spatial perception; bodily-kinesthetic intelligence has to do with the nimbleness of a person's body; musical/rhythmic intelligence involves creativity, music and rhythm; interpersonal intelligence enables a person to recognize the personalities and motivations of others; intrapersonal intelligence symbolizes that one can distinctively recognize one's own strength, weakness and emotions; naturalist intelligence refers to the sensitivity to nature and others.

Self-Efficacy

Bandura (1997) was first to present, research, and expand on the construct of self-efficacy. He posited that self-efficacy beliefs impact how people motivate themselves, think, feel and act. Wood & Bandura, (1989) defined self-efficacy as “beliefs in one’s capabilities to mobilize the motivation, cognitive responses, and courses of action needed to meet given situation demands”. Bandura claimed that beliefs of efficacy constitute the key factor of human agency.

Methodology

Sampling

The participants for this study were chosen by using stratified random sampling technique. Finally, the six schools were randomly selected in Yangon Region and Bago Regions. They are B.E.H.S (2) Hlaing, B.E.H.S (1) Hmaw Bi, B.E.H.S (1) Insein, B.E.H.S (1) Pyay, B.E.H.S (2) Pyay, B.E.H.S (3) Pyay. Secondly, 748 Grade 10 students from selected schools were participated in this study. There were 365 males and 383 females.

Research Method

In this study, descriptive survey design and quantitative approach will be used.

Research Instrumentation

The Multiple Intelligences Questionnaire adapted Dr. Moe Moe Naing (2008, May) comprises eight subscales: Linguistic Intelligence, Mathematical Intelligence, Visual Intelligence, Bodily-kinesthetic Intelligence, Musical Intelligence, Interpersonal Intelligence, Intrapersonal Intelligence and Naturalist Intelligence and total of 80 items. General Self-Efficacy Scale developed by Schwarzer & Jerusalem (1995) consists of 10 items used in this survey questionnaire. The internal consistency coefficient of MI inventory was 0.743 and SEQ was 0.805.

Data Analysis and Research Findings

To investigate the differences in students’ multiple intelligences by gender and subject combination, descriptive statistics and independent sample *t*-test were carried out.

Table 1 Descriptive Statistics and Results of Independent Sample *t*-test for Students’ Multiple Intelligences by Gender

Intelligence Area	Gender	N	<i>M</i>	<i>SD</i>	<i>t</i>	<i>df</i>	<i>p</i>
Linguistic Intelligence	Male	365	6.94	1.51	-1.031	746	.303
	Female	383	7.06	1.68			
Mathematical Intelligence	Male	365	6.58	1.96	2.439*	746	.015
	Female	383	6.23	1.88			
Visual Intelligence	Male	365	6.45	1.56	1.809	746	.071
	Female	383	6.25	1.57			
Bodily-kinesthetic Intelligence	Male	365	6.88	1.50	.974	746	.330
	Female	383	6.77	1.63			

Intelligence Area	Gender	N	M	SD	t	df	p
Musical Intelligence	Male	365	7.52	1.78	-.514	746	.608
	Female	383	7.59	1.78			
Interpersonal Intelligence	Male	365	8.52	1.64	-.037	746	.970
	Female	383	8.52	1.58			
Intrapersonal Intelligence	Male	365	7.20	1.67	.692	746	.489
	Female	383	7.12	1.36			
Naturalist Intelligence	Male	365	8.15	1.56	.207	746	.045
	Female	383	7.90	1.91			

Note. * $p < 0.05$

Based on the results in table 1, it was also observed that the mean score of male students in mathematical and naturalist intelligences were higher than that of female students. As independent sample t test, there was also significant difference in mathematical and naturalist intelligences by gender at 0.05 level. So, it can be claimed that male students had higher in mathematical and naturalist intelligences than female students. In other words, male students used numbers effectively, think logically and understand nature and recognize different things according to their sensitivity than female students.

Table 2 Descriptive Statistics and Results of Independent Sample *t*-test for Students' Multiple Intelligences by Subject Combination

Intelligence Area	Subject Combination	N	M	SD	t	df	p
Linguistic Intelligence	Biology	371	6.99	1.62	-.160	746	.873
	Economics	377	7.01	1.58			
Mathematical Intelligence	Biology	371	6.68	1.86	3.972***	746	.000
	Economics	377	6.12	1.96			
Visual Intelligence	Biology	371	6.37	1.58	.352	746	.725
	Economics	377	6.33	1.55			
Bodily-kinesthetic Intelligence	Biology	371	6.77	1.46	-.843	746	.400
	Economics	377	6.87	1.64			
Musical Intelligence	Biology	371	7.44	1.80	-1.806	746	.071
	Economics	377	7.67	1.75			
Interpersonal Intelligence	Biology	371	8.59	1.62	-1.186	746	.236
	Economics	377	8.45	1.60			
Intrapersonal Intelligence	Biology	371	7.08	1.63	-1.422	746	.155
	Economics	377	7.24	1.40			

Intelligence Area	Subject Combination	N	M	SD	t	df	p
Naturalist Intelligence	Biology	371	8.27	1.61	3.908***	746	.000
	Economics	377	7.78	1.85			

Note. *** $p < 0.001$

Based on the results in table 2, it was observed that the mean scores of Grade 10 students in linguistic and visual intelligences were not quite different. But the mean scores of students who were majoring in Biology were higher than that of students who were majoring in Economics concerning mathematical, interpersonal and naturalist intelligences. So as to observed clearly the significant difference of the multiple intelligences by specialization, independent sample *t* test was executed again. The results showed that there were significant differences in mathematical and naturalist intelligences at 0.001 level. Therefore, it was concluded that Grade 10 students who were majoring in Biology developed and used fully their logical process and classified features of natural and artificial environments than Grade 10 students who were majoring in Economics.

To investigate the differences in students' self-efficacy by gender and subject combination, descriptive statistics and independent sample *t*-test were carried out.

Table 3 Descriptive Statistics and Results of Independent Sample *t*-test for Students' Self-Efficacy by Gender

Self-Efficacy	Gender	N	M	SD	t	df	p
Student's General Self-Efficacy	Male	365	7.16	2.06	.814	746	.416
	Female	383	7.04	2.15			

According to the results, the mean score of male students was slightly higher than that of female students. But in order to see clearly the differences *t*-test was calculated, there were no significant differences in students' self-efficacy by gender. So, it can be said that gender is not a related factor of self-efficacy among students.

Table 4 Descriptive Statistics and Results of Independent Sample *t*-test for Students' Self-Efficacy by Subject Combination

Self-Efficacy	Subject Combination	N	M	SD	t	df	p
Student's General Self-Efficacy	Biology	371	7.25	2.20	.814	746	.053
	Economics	377	6.95	1.99			

Based on the *t*-test results, the mean score of students who were majoring in Biology was slightly higher than that of students who were majoring in Economics. But in order to see clearly the differences *t*-test was calculated, there were no significant differences in students' self-efficacy by subject combination. So, it can be claimed that subject combination is not a related factor of self-efficacy among students.

Relationship Between Multiple Intelligences and Self-Efficacy

To find out the correlation between multiple intelligences and general self-efficacy, Pearson product-moment correlation was carried out. The following table presented the correlation between eight categories of multiple intelligences and general self-efficacy of Grade 10 students.

Table 5 Intercorrelations Between Multiple Intelligences and Self-Efficacy

Variables	GSE	LI	MTI	VI	BI	MUI	IEI	IRI	NI
GSE	-	.34**	.31**	.20**	.12**	.18**	.24**	.30**	.27**
LI		-	.20**	.28**	.20**	.33**	.26**	.22**	.24**
MTI			-	.24**	.19**	.10**	.18**	.12**	.32**
VI				-	.30**	.30**	.17**	.18**	.29**
BI					-	.34**	.23**	.15**	.19**
MUI						-	.29**	.17**	.19**
IEI							-	.15**	.24**
IRI								-	.12**
NI									-

** Correlation is significant at the 0.01 level (2-tailed).

Note: GSE= General Self-Efficacy, LI= Linguistic Intelligence, MTI= Mathematical Intelligence, VI= Visual Intelligence, BI= Bodily-kinesthetic Intelligence, MUI= Musical Intelligence, IEI= Interpersonal Intelligence, IRI= Intrapersonal Intelligence, NI= Naturalist Intelligence

Based on the results of table 4, all factors of multiple intelligences were correlated with one another. Especially, linguistic, mathematical and intrapersonal intelligences were strongly correlated with general self-efficacy.

Therefore, in order to investigate the predictive power of multiple intelligences to Grade 10 student's general self-efficacy, multiple regression analysis was conducted.

Table 6 Multiple Regression Analysis Between Multiple Intelligences and Self-Efficacy

Variables	B	β	<i>t</i>	<i>p</i>
GSE (constant)	10.338		2.409*	.016
LI	3.246	.247	7.326***	.000
MTI	2.613	.239	7.233***	.000
LRI	2.966	.214	6.438***	.000

* $p < 0.05$, *** $p < 0.001$

Note: GSE= General Self-Efficacy, LI= Linguistic Intelligence, MTI= Mathematical Intelligence, IRI= Intrapersonal Intelligence

The result showed that linguistic, mathematical and intrapersonal intelligences were significantly related with general self-efficacy. Linguistic, mathematical and intrapersonal intelligence were significant predictors in positive direction. So, it can be interpreted that the

higher the linguistic, mathematical and intrapersonal intelligences of students, the higher the general self-efficacy. The produced multiple regression equation for the relationship between multiple intelligences and general self-efficacy was:

$$\text{GSE} = 10.338 + 3.246\text{LI} + 2.613\text{MTI} + 2.966\text{IRI}$$

Based on the results of multiple regression analysis, the following model was drawn by depicting how multiple intelligences significantly affected student's self-efficacy.

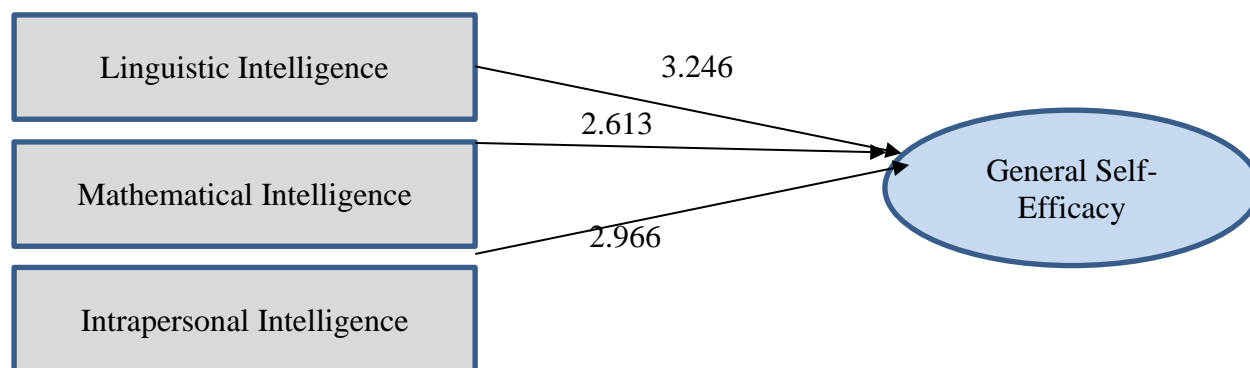


Figure 1 Predictive Powers of Multiple Intelligences on Self-Efficacy

According to the above figure, general self-efficacy and linguistic intelligence, mathematical intelligence and intrapersonal intelligence of Grade 10 students in Yangon and Bago Regions were strongly correlated. Linguistic intelligence, mathematical intelligence and intrapersonal intelligence can be predicted for general self-efficacy of Grade 10 students.

Discussion and Suggestions

From the theoretical standpoint, it was suggested for the future that the educators and psychologists need to emphasize the effectiveness of students' multiple intelligences to cultivate the students with a high sense of self-efficacy and to fulfill the student's education. The present study has some necessities because of its recruited scope and selected sample and it is limited by its special focus on only eight categories of intelligences except from existentialism. Furthermore, the future researchers should conduct the studies with larger sample size from different states and regions to be more reliable and valid. Moreover, longitudinal study should be extended to explore the effectiveness of multiple intelligences and self-efficacy.

Conclusion

The main objective of this study was to investigate the effect of multiple intelligences on self-efficacy of Grade 10 students. Based on the descriptive analyses, there were significant differences in mathematical and naturalist intelligences by gender. This finding was the same with the previous report in the literature of Moe Moe Naing, 2008. Male students in Yangon and Bago have higher in mathematical and naturalist intelligences than female students. Moreover, it was also observed that Grade 10 students from Yangon and Bago Regions who were majoring in Biology have higher in mathematical intelligences than Grade 10 students who were majoring in Economics. But there were no significant differences in self-efficacy with gender and subject combination.

As expected in the present study, linguistic, mathematical and intrapersonal intelligences self-efficacy was found to have a positive correlation with multiple intelligences. This finding in

line with the previous research (Yazdanimoghaddam & Khoshroodi, 2010). Linguistic, mathematical and intrapersonal intelligences were significant predictors in positive direction for self-efficacy. The higher the linguistic, mathematical and intrapersonal intelligences of students, the higher the self-efficacy. So, the present study suggested that teachers and educators need to promote students' multiple intelligences because it was positively associated with multiple intelligences. It can contribute to teachers and educators for integrating multiple intelligences into the school curriculum.

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A CONFIRMATORY FACTOR ANALYSIS OF TEACHER EDUCATORS' PROFESSIONAL CAPITAL QUESTIONNAIRE

Mya Pyae Sone Kyaw¹, San Win²

Abstract

In this study is to measure professional capital of teacher educators by using teacher professional capital questionnaire. The teacher professional capital questionnaire was developed by Hargreaves and Fullan (2012). Professional Capital Survey for Teacher measures the systematic development and integration of three types of capital – human, social, and decisional – with the teaching profession”. The original questionnaire comprised of 36 items that separated into the three dimensions (human, social, and decisional) with a 5point Likert Scale. The researcher adapted the response scale to a 4point Likert Scale used (1= strongly disagree, 2= disagree, 3= agree, 4 = strongly agree) to get for a firm decision by the respondents. The aim of the study was to validate the professional capital questionnaire in a sample of teacher educators from Education Degree Colleges by using confirmatory factor analysis (AMOS). A total 370 teacher educators from the Education Degree Colleges were selected to examine the psychometric properties of the scale. The results of the confirmatory factor analysis showed that the model fits with the three factors structure (TLI=0.904, CFI= 0.914, SRMR= 0.059, RMSEA=0.038, $p=0.00$). Besides, the convergent and discriminant validity and internal consistency = 0.860 supports the accuracy of the 28 items of professional capital questionnaire that use in Myanmar to measure professional capital of teacher educators.

Keywords: Professional Capital, Capital, Confirmatory Factor Analysis, Teacher Educators

Introduction

In teaching profession, the task of teacher educators is not as easy as it seems. Nowadays, professional capital can be utilized to distinguish between amateurs and professionals among teacher educators. Professional capital is, of course, about the qualities and talents of individuals. Professional capital highlights the importance of the individual and collective assets of teachers that underpin effective professional performance, and subsequent student learning. Hargreaves and Fullan (2013) positions professional capital in the teaching profession as a key component of "individually updated elevate the team's performance and increase quality throughout the whole profession". Professional capital of teacher is the result of human capital (quality of the individual), and social capital (quality of interactions within a group), and decisional capital (quality in making good decisions based on information and professional judgment).

When most teachers came as a model of professional capital, they become smart, capable, committed, collegial, determined, thoughtful, willing to learn, discreet and wise. Their moral purpose is expressed in their tireless and savvy mission of serving their students and their communities, and in learning, always learn how to do it right. When teachers teach like a pro, people trust them because there are highly qualified people who have undergone rigorous training that connects theory to practice and stay many years in the job, constantly perfecting their craft.

Professional capital is essential for the most effective and necessary teaching in the most challenging educational situations. Educators with sound professional capital have a strong sense of certainty and tend to proactively seek learning opportunities and critically question policies

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and strategies that inform their practices (Eraut, 2012). According to Hargreaves and Fullan (2012), professional capital enables teacher educators to perform like professionals.

Since professional capital plays an important part in developing the professionalism among teacher educators, it becomes essential to develop the reliable scale for teacher educators in Myanmar. By using confirmatory factor analysis (AMOS) on professional capital scale, this study will help to provide the valid and reliable scale so as to be able to detect the professional capital of Myanmar teacher educators.

Purpose of the Study

The main purpose of the study is to validate the professional capital questionnaire to measure professional capital of teacher educators from Education Degree Colleges in Myanmar.

Definitions of Key Terms

Professional Capital: Professional Capital is a concept that shows professionalization of teaching should be critical and fostered through the process of capacity building over time (Hargreaves & Michael Fullan, 2012).

Capital: Capital refers to "assets that can be leveraged to accomplish desired goals" (Hargreaves & Fullan, 2012).

Confirmatory Factor Analysis: Confirmatory factor analysis is a hypothesis testing method which tests whether the obtained data set is suitable for a model (Schriesheim, Hurley, & Scandura, 1997).

Teacher Educator: Nowadays, the term "teacher educators" commonly refers to both those who educate prospective teachers and those who educate practicing teachers, that is, to those who initiate, guide, and support teacher learning across the lifespan (Even, 2005).

Related Literature Review

Theory of Professional Capital

In *Professional Capital: Transforming Teaching in Every School*, Andy Hargreaves and Michael Fullan (2012) propose the concept of professional capital that demonstrates professionalization of teaching must be important and promoted through the process of capacity building over time. The concept of professional capital may have a potential for the current teaching workforce to empower themselves to raise the professionalization of teaching. Commonly, a 'profession' is characterised by self-regulation, specialized knowledge, and adherence to a code of ethics formulated by members (Evetts, 2006). Relatedly, among the key elements that characterise most conceptions of professionalism are practitioner autonomy, quality and ethical standards.

Professionalism entails "the identification and expression of what is required and expected of members of a profession" (Evans, 2008). As such, "professionalism" highlights improved "quality and standards of practice" (Hargreaves, 2000). For Hargreaves and Fullan (2012), capital refers to "assets that can be leveraged to accomplish desired goals" The concept of professional capital includes "resources, investments, and assets that comprise, define, and develop professional and practice".

Leading teacher education scholars Andy Hargreaves and Michael Fullan (2012) identify three elements of professional capital of teachers, namely human capital, social capital and decisional capital. Professional capital is a function of the interactive combination of the three elements. Hargreaves and Fullan (2012) argue, "if one of the elements of the right-hand side of the equation ($PC=f(HC, SC, DC)$) is missing, then professional capital will be useless and the standard of teaching will fall short".

Hargreaves and Fullan (2012) place human capital as the crucial factor of professional capital in teaching profession. In the concept of human capital as a personal asset, Hargreaves and Fullan (2012) argue that human capital is about individual abilities as "having and developing the necessary knowledge and skills". Human capital is the qualities of the individuals, their qualifications and competencies—such as teacher experience, subject knowledge, and pedagogical skills. In teaching, human capital is "about knowing the subject and knowing how to teach, knowing the children and understanding how they learn". Beyond pedagogic and subject knowledge, human capital comprehends "understanding the diverse cultural and family circumstances in which your students come from, being familiar with and able to sift and sort the science of effective and creative practice, and having the emotional abilities to empathize with diverse groups of children and also adults in and around the schools.

Hargreaves and Fullan (2012) emphasize that social capital plays an important role in the development of professional capital because using social capital; a given group can generate sparks between different human capitals, which is impossible for one person to do. Realizing each teacher as a professional, a collaborative network to develop their knowledge and skills in the long term should lead to the cultivation of professionalism in teaching as a whole. Groups, teamwork, and collaboration are a powerful communication for teachers, school staffs and school leaders. School-level professional capital through its network should be circulated, shared, developed, and sustained. In the teaching profession, social capital is a form of 'collective capacity; and the social capital of teachers refers to "how the quantity and quality of interactions and social relationship" among themselves and with other relevant actors "affects their access to knowledge and information; their sense of expectation, obligation, and trust; and how far they are likely to adhere to the same norms or codes of behavior" (Hargreaves & Fullan, 2012).

The third component to construct professional capital in teaching is decisional capital. Decisional capital is a concept that arises from the field of law, and refers to the ability of an individual to make the right decisions when there is no concrete answer (Hargreaves & Fullan, 2013). Decisional capital refers to "the capital that experts acquire and accumulate through structured and unstructured experience, practice, and reflection - capital that allows them to make wise decision in situations where there are no fixed rules or indisputable proof to guide them". Decisional capital is about teachers' capacity and freedom to make sound judgement in their practices. As professionals, teachers with decisional capital are predisposed to "exercise their judgements and decisions with collective responsibility, openness to feedback, and willing transparency"(Hargreaves & Fullan, 2012).

Confirmatory Factor Analysis

Confirmatory factor analysis has become established as an important analysis tool for many areas of the social and behavioral sciences. It belongs to the family of structural equation modeling techniques that allow for the investigation of causal relations among latent and observed variables in a priori specified, theory-derived models. The main advantage of CFA lies

in its ability to aid researchers in bridging the often-observed gap between theory and observation. CFA can give the investigator valuable information regarding the fit of the data to the specific, theory-derived measurement model (where items load only on the factors they were designed to measure), and point to the potential weakness of specific items. CFA is best understood as a process, from model conceptualization, identification and parameter estimation, to data-model fit assessment and potential model modification. The main purpose of confirmatory factor analysis is to confirm or disconfirm some priori theory (Mueller & Hancock, 2001).

Method

Sample of the Study

The participants of the study were chosen by using stratified random sampling technique. Teacher Educators from Education Degree Colleges were selected as samples of the study. Firstly, four states (Shan, Mon, Rakhine and Kayar) and three regions: (Yangon, Bago, and Tanitharyi) were selected. Therefore, altogether 11 education degree colleges and 370 teacher educators were chosen for this study.

Research Method

In this study, descriptive survey design and quantitative approach were used.

Instrument

To measure Professional Capital, Professional Capital Questionnaire developed by Hargreaves and Fullan (2012) was used in this study. Professional Capital Survey for Teacher measures the systematic development and integration of three types of capital – human, social, and decisional – with the teaching profession”. The original questionnaire comprised of 36 items that separated into the three dimensions (human, social, and decisional) with a 5 point Likert Scale. But, the researcher adapted the response scale to a 4 point Likert Scale to get for a firm decision by the respondents. ". The items were rated on four-point likert Scale (1 = strongly disagree, 2= disagree, 3= agree and 4= strongly agree).

Human Capital - Item number 1 to 12 stands for human capital that consists of the individual assets, skills, and personal qualities that each teacher brings to school. The sample items were "I regularly search for professional learning opportunities to improve my teaching".

Social Capital - Item number 13 to 23 stands for social capital that refers to “how the quantity and quality of interactions and social relationship among people affects their access to knowledge and information”. The sample items were "I regularly examine student work in collaboration with other teachers".

Decisional Capital - Item number 24 to 35 stands for decisional capital that is ability to make discretionary judgements as an educator involving the development of expertise and professional judgements and incorporates the skill of individuals and groups to make effective decisions. The sample items were "On any given day, I would be able to provide evidence of what worked.

Data Collection Procedure

Professional Capital Questionnaire developed by Hargreaves and Fullan (2012) was used in this study. All of the items in this study were translated and modified into Myanmar version.

After preparing the measuring questionnaire, expert review was conducted for face validity and content validity by 16 experts who have special knowledge and well experience in the field of Educational Psychology. After content validation, based on the criticisms and suggestions of experts, some items were revised and one of the items is inconsistent with Myanmar culture and omitted this item from original questionnaire. Therefore, there are altogether 35 items in professional capital instrument.

The pilot testing was done during from June to September, 2020 to test whether the wording of items, statements and instructions had their clarity in Myanmar version and was appropriate and relevant to teacher educators. Pilot testing was conducted with 370 teacher educators from Hlegu Education Degree College, Thingangyun Education Degree College, Dawei Education Degree College, Kayar Education Degree College, Taunggyi Education Degree College, Pyay Education Degree College, Hpa-An Education Degree College, Kyaukphyu Education Degree College, Taungoo Education Degree College, Lashio Education Degree College and Kyainge Tong Education Degree College in the light of their responses, some items are revised.

After pilot study, researcher calculated confirmatory factor analysis by using AMOS software to confirm questionnaire may be model fit. In order to support the evidence of construct validity, convergent validity, discriminant validity and reliability can be analyzed by the use of Microsoft excel. Based on the result of the validation study, the researcher was developed professional capital questionnaire.

Research Findings

The Results of Confirmatory Factor Analysis

Confirmatory factor analysis was used to develop the reliable scale for teacher educators in Myanmar. Confirmatory factor analysis is a multivariate statistical procedure that is used to test how well the measured variables represent the number of constructs.

With confirmatory factor analysis (CFA), the researchers use a variety of fit indices to determine whether the model fit is acceptable or not. These indices include measures of global fit, or fit of the entire model to the data, such as the Goodness of Fit Index (GFI), chi-square, Tucker-Lewis Index (TLI) which is the same as Non-normed Fit Index (NNFI), Root Mean Square Error of Approximation (RMSEA), the Standardized Root Mean Square Residual (SRMR) and Comparative Fit Index (CFI). Hu and Bentler (1999) recommended that the maximum cutoff value of 0.8 for RMSEA and the cutoff value of 0.6 for SRMR and the minimum cutoff value of 0.90 for TLI and CFI and a *p*-value for the Chi-square less than 0.005 can be considered as the model is a good fit. There is the table for fit indices for assessing the goodness of fit in CFA (Bentler, 1990).

Table 1: Fit Indices for Assessing the Goodness of Fit in Confirmatory Factor Analysis (CFA) (Bentler, 1990)

Name	Index	Level of acceptance
Discrepancy chi square	Chisq	0.000
Comparative fit index	CFI	>0.09

Name	Index	Level of acceptance
Tucker-Lewis Index	TLI	>0.09
Root Mean Square of Error of Approximation	RMSEA	<0.08
Standardized Root Mean Square Residual	SRMR	<0.08

Further assessment of validity involved an assessment of construct validity: convergent validity and discriminant validity. Convergent Validity for the subscales was assessed by estimating the composite reliability (construct reliability) for each subscale and an assessment of the factors' average variance extracted (AVE). Hair, Black, Babin, and Anderson (2009) stated that an item factor loading ≥ 0.5 and $p < .05$, $AVE \geq 0.5$, and $CR \geq 0.6$. Moreover, Malhotra and Dash (2011) argue that AVE is often too strict, and convergent validity can be established through CR alone.

Factor Proposed Model

Table 2: Factor Proposed Model of Teacher Professional Capital Questionnaire

Name	Index	Level of acceptance
Discrepancy chi square	Chisq	0.000
Comparative fit index	CFI	0.656
Tucker-Lewis Index	TLI	0.632
Root Mean Square of Error of Approximation	RMSEA	0.064
Standardized Root Mean Square Residual	SRMR	0.062

If the CFI, TLI values are higher than 0.90 and RMSEA value ranges from 0.05 to 0.1 (Awang, 2012), the data fit to the model (as cited in Shamsuddin, 2015). Based on the Table 2, CFI and TLI did not reach adequate value. So, the model was re-specified. So, Hooper, Cough and Mullen (2008) expressed that it is a good to remove the items with low R² values (less than 0.2) from the analysis to remove the better model fit. In the present analysis, item 3, 5, 10, 11, 23 and 25 had R² value of 0.1 (less than 0.2). Therefore, these items were removed from this study.

Moreover, according to Anderson and Gerbing (1984), another way of improving model fit is through the correlation of error terms. The correlated error terms showed that there is additional information in the data that has not exploited in the current model. It also means that the observed covariation between a given pair of indicators has not been adequately accounted for by the factors present in the model. Positive values of correlated error terms mean that the model under predicts the particular indicator covariance whereas negative value mean that the model over predicts this covariance. Then, after correlated error terms, the analysis was run to get a perfect model fit. The final model for teacher professional capital with 28 items was shown in table 3.

Model Fit Statistics

Table 3: Model Fit Statistics for Teacher Professional Capital Questionnaire

Name	Index	Level of acceptance
Discrepancy chi square	Chisq	0.000
Comparative fit index	CFI	0.914
Tucker-Lewis Index	TLI	0.904
Root Mean Square of Error of Approximation	RMSEA	0.038
Standardized Root Mean Square Residual	SRMR	0.059

Based on the data presented in Table 3, CFI and TLI was greater than 0.9 and RMSEA ranged from 0.05 to 0.1 and chi-square was found significant at $p < 0.001$. Therefore, the model fit indices of teacher professional capital questionnaire with 28 items.

Validity and Reliability of Teacher Professional Capital Questionnaire

Content Validity

Content validity was conducted by 16 experts who have special knowledge and well experience in the field of Educational Psychology.

Convergent Validity

Convergent validity is also an evidence to test construct validity. To establish convergent validity, factor loading of the indicator variables, composite reliability (CR) and average variance extracted (AVE) should be used. AVE and CR values were computed by the formula using Microsoft Excel. Table 4 showed that the result of AVE and CR of teacher professional capital questionnaire.

Table 4: Construct reliability (CR) and average variance extracted (AVE) of Teacher professional capital questionnaire

Factor	CR	AVE
Human Capital	0.652	0.314
Social Capital	0.688	0.414
Decisional Capital	0.710	0.403

The AVE values for the model ranged from 0.314 to 0.414. The CR values ranges from 0.65 to 0.71. According to Hunang et al (2013), the value of AVE should be greater than equal to 0.5 and CR should be 0.6 and above. According to Table 4, AVE values were nearly 0.5 and CR values were above 0.6. Another assumption is that when CR is greater than AVE, convergent validity was achieved for this construct. Therefore, teacher professional capital questionnaire was assumed that it was a valid questionnaire to measure teachers' professional capital in Myanmar.

Discriminant Validity of Teacher Professional Capital Questionnaire

Discriminant validity was used to show that the construct is actually differing form one another empirically. Discriminant validity was evaluated with square root of AVE with correlations of latent construct. The results were shown in Table 5.

Table 5: Discriminant Validity of Teacher Professional Capital Questionnaire

Factors	Human Capital	Social Capital	Decisional Capital
Human Capital	0.56		
Social Capital	0.492	0.643	
Decisional Capital	0.422	0.444	0.635

The diagonal numbers in bold are the square root of AVE values.

According to Table 5, all the square root of AVE values was greater than 0.5 and these values were greater than all the inter-latent factor correlations for all factors in the relevant rows and columns. According to Fornell and Larcker (2011), square root of AVE should be above 0.5. Then, according to Hair et al (2011), square root of AVE values was greater than the inter-latent factor correlations. Thus, the results of the discriminant validity of Teacher Professional Capital were congruent with Fornell and Larcker and Hair et al (2011). According to Table 5, discriminant validity can be accepted for the measurement model and the discriminant model and the discriminant validity between the constructs.

Reliability of Professional Capital Questionnaire

After the result of confirmatory factor analysis, the final questionnaire consisted of three subscales with 28 items in this study. Table 6 showed that the number of items retained and described reliability coefficient for each subscale.

Table 6: Number of Items retained and Reliability Coefficient for each subscale

Factor	Number of items	Cronbach' Alpha
Human Capital	7	0.704
Social Capital	11	0.766
Decisional Capital	10	0.735
Total	28	0.860

Based on Table 6, reliability coefficient of each subscale ranged from 0.704 to 0.766 and the reliability coefficient of the whole questionnaire was 0.860. Thus, the professional capital questionnaire was reliable to measure teachers' professional capital in teacher education in Myanmar. Based on the results of adaptation and validation processes, professional capital questionnaire was reliable and valid in measuring professional capital of teacher educators.

Discussions

Aim of the research is to identify teacher educators are investigated through development of professional capital namely human capital, social capital and decisional capital through systematic review of existing literature. This study was carried out to develop professional capital questionnaire of teacher educators that was suitable in Myanmar culture. To confirm questionnaire may be model fit, CFA was applied. All the model fit indices (CFI=0.914, TLI=0.904, SRMR= 0.059, RMSEA=0.038 and $p=0.00$) indicated a good fit between the measurement model tested and the data.

After that, it was determined to be valid. The convergent validity of professional capital questionnaire was indicated by good composite reliability values and acceptable AVE values. The discriminant validity of the model was also indicated by the AVE values. The questionnaire was also found to be reliable in terms of the factors and internal consistency of the entire factors. As for the internal consistency reliability, the values of Cronbach's alpha pointed out the satisfactory results for reliability of professional capital questionnaire. Based on the data and results, the teachers' professional capital questionnaire has adequate psychometric properties (valid and reliable). Finally, the model fit indices of teacher professional capital questionnaire with 28 items.

The primary purpose of this study was to develop psychometrically sound questionnaire to examine teacher educators and to that end, the initial validation of the Teachers' professional capital was successful. This study could possibly assist principals in shaping what planned professional capital they need to be providing for their teacher educators to develop their profession. Beyond the scope of the instrument, future studies should continue to investigate its validity. This instrument should also be validated with different population group, and if it were validated with other culture group, it could potentially be used to assess cultural differences with respect to teachers' professional capital.

Conclusion

Ramsden (2003) claimed that education plays a significant role in developing and shaping the economic and social development for nations in a competitive world. In knowledge-based economics, governments would view universities as a platform for change in the society and expanding prosperity. Therefore, there is necessity for highly skillful and trained graduates in nations to plan and execute thoughtful plans for improving the teaching quality in the education as mentioned in Little et al, (2007).

Ameeta et al (2005) pointed out that the major goal of any teacher's education or training programme is to develop teachers for initiating desired results in learning among students to optimize the resources namely material and human. Teacher education is needed for inducting fresh or new teachers and tries to change them into effective and competent teachers.

According to Professor Hargreaves and Fullan (2012) professional capital enables teachers to perform like professionals. When most teachers came as a model of professional capital, they become smart, capable, committed, collegial, determined, thoughtful, willing to learn, discreet and wise. Their moral purpose is expressed in their tireless and savvy mission of serving their students and their communities, and in learning, always learn how to do it right.

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BRAIN DOMINANCE AND REFLECTIVE THINKING OF STUDENT TEACHERS ACROSS EDUCATION INSTITUTIONS

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Abstract

The primary objective of this study was to investigate the student teachers' reflective thinking skill. In addition, to examine the brain dominance was of next interest. Design of this study would be cross-sectional in nature. This study conducted across Education Institutions in Myanmar. A total of 1004 student teachers from two Universities of Education and five Education Degree Colleges participated in this study. Brain Dominance Test (Hough, 2010), and Reflective Thinking Questionnaire (Kember et al., 2000) were used as the research instruments. Brain Dominance Test is composed of 50 questionnaires. Reflective Thinking Scale is composed of 16 items. It consists of four subscales such as habitual action, understanding, reflection and critical reflection. Brain Dominance Test and Reflective Thinking Scale coded by using five point Likert type scale, with 1=definitely disagree to 5=definitely agree. The results stated that 343(34%) of student teachers were found to be whole brain thinkers, and 532(53%) were definitely left brain thinkers and the rest 129(13%) were definitely right brain thinkers. Among 1004 participants, the majority of student teachers have average level of reflective thinking skill. Specifically, it can be said that first year student teachers have higher level of reflective thinking than second year student teachers. Most of the definitely left-brain thinkers are in high level of reflective thinking group. Results indicated that there is a significant main effect of type of brain dominance on the reflective thinking of student teachers. Besides, reflective thinking of student teachers can differ depending on their gender and education level.

Keywords: Brain Dominance, Reflective Thinking, Student Teachers

Introduction

The adult human brain is a wet, fragile mass that weights a little over three pounds. It is about the size of a small grapefruit, it shaped like a walnut, and can fit in palm of your hand. Cradled in the skull and surrounded by protective membranes, it is poised at the top of the spinal column. The brain works ceaselessly, even when we are asleep. Although it represents only about 2 percent of our body weight, it consumes nearly 20 percent of our calories! The more we think, the more calories we burn. Perhaps this can be a new diet fad, and we could modify Descartes' famous quotation from "I think, therefore I'm thin"! (Sousa, 2006).

According to Khin Zaw (2001), man or homo sapiens as he somewhat arrogantly calls himself, in respect to his body and physiological functions, belongs to the animal kingdom. The brain of an animal is very far from being on a par with human counterpart. The human brain has long been regarded with wonder and awe. Unique among the animals, he has used his mind to reason; to count and speak. Brain scientists and psychologists must remember that the two brains are simply worlds apart in difference, not only in size and /or weight, but in qualitative biological organization. They also differ in performance functions. The higher an animal is in the scale of development, the more flexibility of action pattern and the less completeness of structural adjustment do we find at birth (Khin Zaw, 2001).

According to LoCicero (2005), on the thinking front, the brain's interconnected cells allow people to speak, describe, argue, create, articulate, organize, decide and dream. Anatomically speaking, the brain is split into two halves or more technically hemispheres. These halves are commonly called the right brain and left brain, but should more correctly be termed "hemispheres". These halves are separated by a deep groove called the corpus callosum. The corpus callosum is a thick band of fibers bridging the right and left hemispheres of the brain, allowing the two sides to communicate with each other. This bridge keeps the two halves in

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touch, swapping information back and forth. Fortunately, that connection keeps the left and right brains working in concert. Each hemisphere seems it should be completely identical to each other, but they're not really. The left side of the brain actually controls the action of right side of the body and vice versa. The nerves from each side cross over at the top of the spinal cord. The whole concept of right and left brain thinking was borne out of research conducted by American Nobel Prize Winner Roger Wolcott Sperry (LoCicero, 2005). Brain dominance is the idea that people use different sides of their brains to process different kinds of information. People use both sides of their brain, but most individuals tend to prefer thinking strategies associated with one side or the other. Such individuals are considered to be left-brain thinkers or right-brain thinkers. In most people, the left side seems to be the "words" side, controlling speech, understanding language, and reasoning things out. It can also be attributed such logical tasks as language and math to that side. On other hand, the right side seems to be the "picture" side, specializing in visual task, giving a sense of where things are, and responding to intuition. The right brain also is touted as the "emotional" one, responding to sensory perception, faces, and music. In addition, the left brain uses linear, sequential, symbolic, logical, verbal, and reality-based thinking, the right brain works with holistic, random, concrete, intuitive, nonverbal, and fantasy-oriented approaches (LoCicero, 2005).

In general, the left and right hemispheres of the brain process information in different ways. However, the learning and thinking process is enhanced when both sides of the brain participate in a balanced manner (Wagner, 2009). Recent research has shown that abilities in subjects such as math are actually strongest when both halves of the brain work together. According to Shephard (2001), neuroscience has provided a number of valuable insights into the cognitive or thinking activities of the brain. It has documented that the most successful people and high-performance teams use their "whole brain". Thus, learning to use whole brain for thinking, and learning, will make more effective.

Gibson (2002) proposed that every individuals use different sides of their brains to process different kinds of information because the dominance of their brain causes certain effects on their learning and communication. Each hemisphere of the brain is in charge of the variations in teaching methods in the classroom (Connell, 2005). Thus, teachers who are right-brained tend to use mainly right-brain teaching methods and the left-brained teachers use left-brain teaching methods (Connell, 2005). Hence, teachers' awareness of their brain dominance is an important issue that can help them to adjust their teaching method to students' brain dominance (as cited in Nu Nu Nyunt, 2010).

Many researchers have implied that reflective thinking has a similar nature to reflection, the reflective process, and reflective practice (Burbank, Ramirez & Bates, 2012; Osterman, 1990) (as cited in Choy, 2017). Reflection is the concept on the basis of reflective thinking. Reflection, the most general sense, is the cognitive inquiry process that contains analyzing and finding ways which will lead to production of new knowledge and experiences in the context of previous knowledge and development of alternative ways (as cited in Sunbul, 2012).

In the early 20th century, J. Dewey proposed an approach that all people learn from their experiences in education and stated that life itself was training and development, and the real purpose of education was to make development explicit. He also indicated that the most important need of the society was students' learning to reflect to life what they have learned at school. Dewey defines the reflective thinking as "active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusion to which it tends" (as cited in Mahasneh, 2013).

Improvement of teaching may be achieved through „reflection". Richard (1990) defines reflections a key component of teacher development. Paradigm of reflective teaching prevails in teacher education or training all over the world. Teachers use reflective teaching strategies to

improve their teaching quality (Bolton, 2010). Indeed, reflection is a purposeful activity that needs critical thinking and looks for solutions about the problems occurred during teaching and learning process (Loughran, 2005). So, the student teachers need to have a well knowledge of reflective thinking and use reflective teaching strategies to become the qualified teachers in future (as cited in Ashraf, 2017).

Teachers should help student teachers by promoting students' thinking skills rather than rote memorization of facts. In this regard, thinking reflectively is an important and necessary outcome of education. If student teachers have a chance to learn to think reflectively in the school, they will become truly educated person. So, it is the right time for the education in Myanmar to be aware of the need to inculcate the habit of reflective thinking in every academic discipline and at every level of education.

Although several thinking studies have been conducted in previous years throughout the world, research related to reflective thinking and brain dominance was rare, especially in the field of teacher education and teacher training in Myanmar. To fulfill this need, current study will seek to identify and explain reflective thinking and brain dominance of selected student teachers in the contexts of teacher education. Therefore, this study tried to explore the student teachers' reflective thinking skill and brain dominance with respect to learning environment in Myanmar context.

Aim and Objectives

The aim of this study is to investigate the student teachers' reflective thinking. And then, to examine their brain dominance is the next of interest. Finally this study explores the interrelationship between the student teachers' reflective thinking and brain dominance. The specific objectives of this research are-

1. To investigate the brain dominance of student teachers by gender, education institutions, and education level.
2. To examine the reflective thinking of student teachers by gender, education institutions, and education level.
3. To find out whether there is interaction effect among brain dominance and other independent variables on student teachers' reflective thinking.

Definition of Key Terms

Brain Dominance: Brain dominance is the idea that people use different sides of their brains to process different kinds of information (Nu Nu Nyunt, 2010).

Reflective Thinking: According to Dewey (1993), reflective thinking is defined as "active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusion to which it tends" (as cited in Mahasneh, 2013).

Student Teachers: A student teacher is a college, university or graduate student who is teaching under the supervision of a certified teacher in order to qualify for a degree in education (Bonadea, 2017).

Method

Research Design

The design used in this study was quantitative research design. Descriptive survey method was utilized in the present study.

Sampling

By using random sampling technique, the student teachers were selected from 7 Education Institutions in Myanmar. The number of the students administered by Education Institutions was mentioned in Table 1.

Table 1. Distribution of Student Teachers from 7 Education Institutions in Terms of Gender

No		Numbers of Participants				Total
		1 st Year		2 nd Year		
		Male	Female	Male	Female	
1.	Yangon University of Education	40	40	40	40	160
2.	Sagaing University of Education	40	40	40	40	160
3.	Hlegu Education College	40	40	40	40	160
4.	Mawlamyine Education College	40	40	40	40	160
5.	Taungoo Education College	40	40	40	40	160
6.	Monywa Education College	40	40	40	40	160
7.	Kyaukphyu Education College	40	40	40	40	160
		280	280	280	280	1120

Instrumentation

Brain dominance test is also a five-point Likert scale with 1 = never, 2 = sometimes, 3 = often, 4 = usually and 5 = always. A total of 50 items Questionnaire for Brain Dominance developed by Hough (2010), was used to investigate student teachers' type of Brain Dominance. The internal consistency (Cronbach's Alpha) for this questionnaire was 0.807. Among 50 items, 25 items stand for left-brain and other 25 items stand for right brain preference. Add the scores for each item to reach total score of each hemisphere. After that, subtract total score from greater total score of particular hemispheres either left or right to find the degree to which an individual tends to favour whether the left brain over the right brain or the right brain over the left brain.

Reflective thinking questionnaire was developed by Kember et.al (2000). There are four subscales in this questionnaire: habitual action, understanding, reflection and critical reflection. It is also a five-point Likert Scale where responses categories are definitely disagree, disagree with reservation, only to be used if a definite answer is not possible, agree only with reservation, and definitely agree, the scoring of these categories is 1,2,3,4, and 5, respectively. The internal consistency (Cronbach's Alpha) for this questionnaire was 0.660. The scores were added to differ the levels of reflective thinking of student teachers. The scores of under 59 was low level, the scores between 60 and 67 were designated as average level and student teachers who had scores above 68 were high level of reflective thinking.

Table 2. Distribution and Percentages of Student Teachers

	Whole Brain		Left Brain		Right Brain	
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%
Student Teachers	343	34%	532	53%	129	13%

In Table (3), it can be said that most of the male student teachers are left brain dominance and most of the female are right brain dominance. The proportion of whole brain dominance both the sex is almost equal.

Table 3. Brain Dominance of Student Teachers by Gender

	Whole Brain		Moderately Left Brain		Definitely Left Brain		Moderately Right Brain		Definitely Right Brain		Chi-Square	<i>p</i>
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%		
Male	163	33%	169	34%	110	22%	43	9%	6	2%	10.172*	0.038
Female	180	35%	158	31%	95	18%	65	13%	15	3%		

*The mean difference is significant at 0.05 level.

A chi-square test was conducted to address the research question of the relationship between the participants' brain dominance and gender. The results showed a significant difference $X^2(4, N=1004) = 10.172, p=0.038$. It can be interpreted that there is a relationship between the participants' brain dominance and gender. This finding was consistent with previous brain research. According to Gomathi (2017), there is a significant difference between brain dominance and gender.

In Table 4, student teachers from Education Degree Colleges have more use of whole brain than Education Universities.

Table 4. Brain Dominance of Student Teachers by Education Institutions

	Whole Brain		Moderately Left Brain		Definitely Left Brain		Moderately Right Brain		Definitely Right Brain		Chi-Square	<i>p</i>
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%		
YUOE	36	29%	42	34%	33	27%	11	9%	1	1%	44.795**	0.006
SUOE	40	30%	47	36%	34	26%	10	8%	0	0%		
TEC	64	39%	54	33%	34	21%	11	6%	1	1%		
HEC	58	36%	48	30%	19	12%	28	18%	6	4%		
MEC	39	30%	44	34%	20	15%	22	17%	5	4%		
MoEC	50	36%	43	31%	33	24%	10	7%	3	2%		
KEC	56	36%	49	31%	32	20%	16	10%	5	3%		

**The mean difference is significant at 0.01 level.

A chi-square test was conducted to address the research question of the relationship between the participants' brain dominance and education institutions. The results showed a significant difference $X^2(24, N=1004) = 44.795, p=0.006$. It can be interpreted that there is a significant relationship between the participants' brain dominance and education institutions.

Based on these findings, teacher educators from these institutions should be aware to make sure their course meet the need of their students and engage both left and right brain

functions. Besides, they should emphasize the co-curriculum course to have an equal balance of students' brain functions.

In Table 5, it can be said that the second year student teachers were more than the first year student teachers in the whole brain and right brain mode. But, in the type of left brain dominance, the percentage of first year student teachers was more than the second year student teachers.

Table 5. Brain Dominance of Student Teachers by Education Level

	Whole Brain		Moderately Left Brain		Definitely Left Brain		Moderately Right Brain		Definitely Right Brain		Chi-Square	<i>p</i>
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%		
1st Yr	165	33%	170	33%	112	22%	50	10%	9	2%	3.728	0.444
2 nd Yr	178	36%	157	31%	93	19%	58	12%	12	2%		

In Table 6, majority of the participants generally provided responses that displayed average level of reflective thinking skills. Most of the male student teachers are low level of reflective thinkers and most of the female are high level of reflective thinkers. In the average level of reflective thinking, the percentages the female get are more than the male.

Table 6. Chi-square Analysis of Reflective Thinking and Gender

Student Teachers	Low		Average		High		Chi Square	<i>p</i>
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%		
Male	217	44%	195	40%	79	16%	17.041***	0.000
Female	162	32%	247	48%	104	20%		

***The mean difference is significant at 0.001 level.

Chi-square test was conducted to address the research question of the relationship between the participants' reflective thinking and gender. The results showed a statistical significant difference $\chi^2(2, N=1004) = 17.041, p=0.000$. It can be concluded that a number of girls who belongs high and average reflective thinking skills are more than the boys in his study. In other words, girls are better at reflective thinking skills.

In Table 7, chi-square test was conducted to address the research question of the relationship between the participants' reflective thinking and education institutions. The results showed no statistical significant difference $\chi^2(12, N=1004) = 16.460, p=0.171$. It can be interpreted that there is no significant difference between the participants' reflective thinking from these education institutions. In other words, the level of reflective thinking doesn't depend on the different types of education institutions.

Table 7. Chi-square Analysis of Reflective Thinking and Education Institutions

	Low		Average		High		Chi Square	<i>p</i>
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%		
YUOE	43	35%	58	47%	22	18%	16.460	0.171
SUOE	53	40%	59	45%	19	15%		
TEC	52	32%	81	49%	31	19%		
HEC	61	38%	62	39%	36	23%		

	Low		Average		High		Chi Square	<i>p</i>
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%		
MEC	62	48%	42	32%	26	20%		
MoEC	49	35%	68	49%	22	16%		
KEC	59	37%	72	46%	27	17%		

In Table 8, results evidently showed that first year student teachers have the more percentages of high level of reflective thinking than second year student teachers. Conversely, results also showed that first year student teachers have less percentages of low level of reflective thinking than second year student teachers. The proportion of average level of reflective thinking skill both the first and second year is almost equal.

Table 8. Chi-square Analysis of Reflective Thinking and Education Level

	Low		Average		High		Chi Square	<i>p</i>
	<i>f</i>	%	<i>f</i>	%	<i>f</i>	%		
First Year	169	33%	228	45%	109	22%	11.510**	0.003
Second Year	210	42%	214	43%	74	15%		

**The mean difference is significant at 0.01 level.

A chi-square test was conducted to address the research question of the relationship between the participants' reflective thinking and education level. The results showed a statistical significant difference $\chi^2 (2, N=1004) = 11.510, p=0.003$. It can be interpreted that there is association between the participants' reflective thinking and education level.

In other words, it can be said that first year student teachers have high level of reflective thinking. The reason is that teacher educators who teach first year student teachers altered their teaching styles and classroom settings to promote their student teachers' level of reflective thinking in accordance with the modified new curriculum.

In Table 9, concerning brain dominance and reflective thinking, results indicated that there is a significant main effect of type of brain dominance on the reflective thinking of student teachers.

Table 9. Interaction Effect of Brain Dominance on Reflective Thinking

Source	df	<i>F</i>	<i>p</i>	Partial Eta Squared
Type of Brain Dominance	4	12.183***	0.000	0.047

*** The mean difference is significant at 0.001 level.

The two-way analysis of variance was conducted to investigate reflective thinking differences in the type of brain dominance among student teachers. ANOVA results showed a significant main effect for the type of brain dominance $F (4,999)=12.183, p<.001$, partial eta squared=.047. The Bonferroni post hoc test was conducted to determine which types of brain dominance were significantly different. Results revealed that the definitely left-brain dominance significantly differed in reflective thinking from all other types of brain dominance.

Table 10. Post Hoc Test Analysis of Reflective Thinking by Brain Dominance

(I) Type of Brain Dominance	(J) Type of Brain Dominance	Mean Difference (I-J)	Std. Error	<i>p</i>
definitely left	whole Brain	3.57***	0.632	0.000
	moderately left	2.50**	0.638	0.001
	moderately right	4.65***	0.852	0.000
	definitely right	6.61**	1.641	0.001

**The mean difference is significant at 0.01 level.

*** The mean difference is significant at 0.001 level.

In Table 11, concerning other independent variables and reflective thinking, results indicated that there is a significant main effect of gender and education level on the reflective thinking of student teachers.

Table 11. Interaction Effect of other Independent Variables on Reflective Thinking

Source	df	<i>F</i>	<i>p</i>	Partial Eta Squared
Gender	1	19.300***	.000	0.019
Education Level	1	9.867**	.002	0.010

** The mean difference is significant at 0.01 level.

*** The mean difference is significant at 0.001 level.

The two-way analysis of variance was conducted to investigate reflective thinking differences in gender and education level. ANOVA results show a significant main effect for gender $F(1,989) = 19.300$, $p < .001$, partial eta squared = .019 and for education level $F(1,989) = 9.867$, $p < .01$, partial eta squared = .010. Post hoc tests on gender and education level are not necessary because these variables have only two categories. Results revealed that reflective thinking of student teachers significantly differed depending on gender and education level. Concerning gender, a number of girls who belongs high and average reflective thinking skills are more than the boys in his study. In other words, girls are better at reflective thinking skills. By education level, first year student teachers have the more percentages of high and average level of reflective thinking than second year student teachers.

Discussion

Concerning brain dominance, majority of the student teachers (53%) from the sample were left brain thinkers. Education Colleges possess the more percentage of whole brain learners. Concerning reflective thinking, most of the female and first year student teachers possess more percentages of high and average level of reflective thinking. The reason is that teacher educators who teach first year student teachers change their teaching styles with the modified new curriculum and classroom settings. It promotes their student teachers' level of reflective thinking. The type of brain dominance makes an impact on the reflective thinking of student teachers. Besides, reflective thinking of student teachers can differ depending on their gender and education level.

As a result, this study indicates that student teachers tend to identify left brain characteristics as dominant traits in their colleges. Although right brain characteristics are generally present, the student teachers felt them to be stressed less frequently than the left counterparts. Education in Myanmar may be geared more to left brain functions than to right

brain ones. Educators need to reevaluate the content and methodology to more equally balance the scope of learning-in short, to educate the whole brain. Just as we need to use both legs to walk effectively, we need to use both hemispheres to respond to life in a balanced fashion (Acosta, 2012). Teachers should design lessons that include activities directed at both hemispheres so that students can integrate the new learning into a meaningful whole (Sousa, 2006). There are some ways to do that in daily planning

- (1) Deal with Concepts Verbally Visually
- (2) Design Effective Visual Aids.
- (3) Discuss Concepts Logically and Intuitively.
- (4) Avoid Conflicting Message
- (5) Design Activities and Assessments for Both Hemispheres.

Moreover, to improve the reflective thinking, student teachers should have opportunities to train with the above activities and approaches of the modified new curriculum. Based on the literature review and the findings of this study, there are implications within the design and development of courses to meet the learners' needs. Hence, it is important for teachers, instructors, adult educators, trainers, course designers, program and training developers to be aware of the individual learners' need and design course and training curriculum. Adult educators, teachers and instructors could change the way they design the courses by including certain specific activities to accommodate different learning styles of the student teachers to achieve course goals and to make sure that expected learning occurs. Students can enhance their learning using their most preferred or stronger learning styles and make an effort to enhance their weaker learning styles to make their learning experience more exciting for themselves.

Conclusion

Based on these findings, teacher educators from education institutions should be aware to make sure their teaching techniques to meet the skills of 21st century skill; critical thinking, creativity, collaboration and communication. Besides, they should emphasize the co- curriculum course and activities to have an equal balance of students' brain functions for thinking and learning. Teacher Educators should well implement teaching styles and classroom settings in accordance with the modified new curriculum to improve the reflective thinking skills of student teachers.

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DEVELOPMENT OF THE REFLECTIVE LEARNING QUESTIONNAIRE

Su Thinzar Phyo¹, May Cho Min²

Abstract

The capacity to reflect is recognized as one of the main generic competences and is of high importance in the context of pre-service teacher education. In Myanmar, there is a limit of readily usable questionnaire to explore whether student teachers engage in reflective learning. The purpose of this study was to develop the Reflective Learning Questionnaire of student teachers in Myanmar. A total of 500 student teachers participated in this study. To investigate the number of constructs and structure of reflective learning, exploratory factor analysis with Varimax Rotation was conducted. The exploratory factor analysis results revealed that reflective learning was influenced by the three factors: self-reflection on learning, connecting experience with knowledge, and critical reflection. The three-factored construct consisting of 26 items and explaining 50.394 % of total variance is obtained. Moreover, the internal consistency of the Reflective Learning Questionnaire was satisfying. Therefore, the Reflective Learning Questionnaire can use to measure reflective learning of student teachers.

Keywords: Reflective Learning, Reflective Learning Questionnaire, Student Teachers

Introduction

Education as a whole is expected to prepare younger generation to adapt better in the dynamic society. So, the development and existence of the world solely depends on the educated citizens. To nurture the educated person, the importance of quality education and qualified teachers should be considered. Nurturing qualified teachers and upgrading the quality of basic education teachers are two main tasks of the education promotion program in Myanmar. Pre-services Teacher Education Programs in Myanmar aim to prepare graduates to become qualified teachers equipped with pedagogical practices that will serve to meet the increasing the demands associated with the teaching profession. In the twenty-first century, the role of the teacher moves from one who is all-knowing and unquestionable to one who is continually learning, reflective and confident. Student teachers should equip with thoughtful reflection, critical thinking and increased self-awareness and responsibility to become effective professionals.

The capacity to reflect encompasses the need for student teachers not only to be able to reflect on their learning process while acquiring their professional knowledge, but is also directly related to their future careers and their academic competency. Being one of the most popular theories of professional knowledge in the last 30 years, reflective practice has been widely adopted not only by practicing teachers in their working environment, but in pre-service teacher education as well (Eraut, 1994). Critical reflection will help student teachers change their attitude, behavior and skills so to develop professional attitudes and values. Therefore, the first important factor for student teacher is that student teachers must be reflective learners and being reflective learners will support to become reflective teachers.

In Myanmar, the Reflective Learning Questionnaire is needed to measure student teachers' reflective learning. Indeed, none of the previous studies have focused on the development of Reflective Learning Questionnaire for student teachers in Myanmar. Therefore, this study aimed at developing Reflective Learning Questionnaire of student teachers.

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Purpose of the Study

The main purpose of the study was to develop Reflective Learning Questionnaire of student teachers in Myanmar.

Definitions of Key Terms

Reflective learning. It is the process of critically investigating the issue of concern, activated by experience, that produces the meaning in mind and a relatively change of conceptual perspective (Boyd & Fales, 1983).

Student teacher. A student who is learning how to teach and practicing teaching (Merriam-Webster, 1999).

Critical reflection. It is an awareness of the situation, evaluating the situation and making changes to action if necessary (Mezirow, 1998).

Review of Related Literature

Reflective Learning

John Dewey is one of the originators of the concepts of reflection and he believed that reflection is dynamic and conscientious thought of belief or supposed form of knowledge in basis and the further conclusions to which it and it needs communication to formulate experience. He suggested that reflection for learning should include recalling the event and then posing questions to explore why things turned out the way they did and what possible actions could have given a different outcome (Kalk et al., 2014).

Reflection is an activity that involves revisiting experiences with a view to gaining further knowledge. The reflector questions their knowledge relating to the experience and underlying assumptions. Reflection is not restricted to cognitive activity but also involves emotions and affect. Reflection is an important tool in the connection of theory and practice, which is of particular importance in the education of professionals. Learners can achieve better management of their learning by using reflection (Harmmond & Collins, 1991).

Reflective learning is an important type of learning both in formal and informal situation in school, higher education, at workplace, and in everyday life. Research studies pointed out that reflective ability is a learning strategy and means to promote learning benefits. This ability can be used to evaluate learning accomplishment experiences and elevate the promotion of learning motivation. Reflection is positive for learning and encouraging learners to undertake reflective learning (Hwang et al., 2018).

Reflective learning includes conscious thinking and critical analysis about what they have learned in the previous activity. Detailed metacognitive activities support and activate reflective learning to become more engaged in their own learning. Students are able to enhance awareness about the best practices they followed in order to learn more effectively and essential skills such as critical and creative thinking, adaptability and personal responsibility. Reflective learning as an efficient and competent manner should be provided in many ways to learners (Daradoumis & Arguedas, 2020).

According to David Boud, the concept of reflective learning is entwined with learning from experience. Reflective learning can dominant in professional training and is regarded as an element of the status attributed to good education. He argued that reflective learning concerns the provision of a framework that helps make sense of experience, which enables people to learn from experience. He defined reflection as a processes in which learners engage to recapture, notice and re-evaluate their, to work with their experience to turn it into learning. Boud points out

that experience is necessary for learning, but in itself does not automatically lead to learning. If learner engages with and transform experience, learning can occur. It is important that reflective learning needs be open and concerned with weakness as well as strengths. Boud also acknowledged that there is possible connection between the social science and the concept of reflective learning (as cited in Grant, 2005).

Colomer, Pallisera, Fullana, Burriel and Fernández (2013) conducted a comparative analysis on reflective learning in higher education. Their study provided data to suggest that reflective learning methodology helps students become more aware of the learning process; it encourages critical thinking and analysis of their own capabilities, proposing both strategies for improvement and new strategies for addressing challenges arising during the learning process. Gelfuso (2013) found that an important method to encourage and enhance reflective learning and the development of reflective skills is participation in small groups.

Methodology

Participants of the Study

A total of 500 student teachers (*Mage* = 19.3 years old) from Hpa-An Education Degree College participated in this study. Among the respondents, 185 were male (37%) and 315

were female (63%). All participants were recruited from Hpa-An Education Degree College by the researcher, given a thorough explanation about the study, and asked if they wished to participate in the questionnaire response voluntarily with informed consent.

Procedures

This study will conduct the three stages of the development and psychometric properties of the questionnaire: (1) item generation, (2) item reduction, and (3) assessment of basic psychometrical properties (reliability, factor structure).

The items of Reflective Learning Questionnaire have been generated by the researchers and experts in educational psychology based on the Reflection in Learning Scale (Sobral, 2001), Self-reporting Reflective Learning Appraisal Questionnaire (Colomer, Serra, Cañabate, & Serra, 2013), and Reflective Thinking Questionnaire (Kember et al., 2000). The Reflection in Learning Scale (Sobral, 2001) was developed with regard to multiple sources of information as reported before and cognitive regulation strategy. The scale includes 14 items with a 5-point Likert scale (1= never, 2= rarely, 3= undecided, 4= often, 5= always). The scale consists of four subscales - planning, monitoring, reflection and self-testing. Self-reporting Reflective Learning Appraisal Questionnaire was designed by Colomer, Serra, Cañabate and Serra in 2013 using four blocks of information. First block is self-knowledge to the daily situation. The second block is students' perceptions of connecting experiences with prior knowledge. The third means self-reflection on the learning process and the fourth is self-regulation of learning. It consists of 18 items. A five-point Likert scale was used (from 1 = strongly disagree through to 5 = strongly agree) to measure the concepts of each areas. The Reflective thinking Questionnaire was developed by Kember et al. in 2000. It contains 16 items and is based on Mezirow framework. It includes four subscales and these are: habitual action, understanding, reflection and critical reflection. Each subscale is composed of four items and a 5-point response scale (from 1 = definitely disagree through 5 = definitely agree) was applied. In total, a pool of 48 items was generated by the researchers and experts in educational psychology based on the three questionnaires.

The next step was to refine the collected items by asking twelve experts who have special knowledge and close relationship in the field of educational psychology. Next, revisions in item length, the wording of items, and content were made. Then, the wording and phrases of

some items were modified since they were inappropriate with student teachers. Finally, the final questionnaire consisted of 48 items in order to examine reflective learning of student teachers. The Reflective Learning Questionnaire was designed with five-point Likert scale (from 1 = Strongly Disagree to 5 = Strongly Agree). Finally, exploratory factor analysis of the Reflective Learning Questionnaire was conducted.

Results

Exploratory Factor Analysis of Reflective Learning Questionnaire

In this study, exploratory factor analysis was conducted to find the number of factors influencing a set of measures and the strength of the relationship between each factor and each observed measure. To investigate the number of constructs and structure of reflective learning using three questionnaires included 48 items, an exploratory factor analysis with varimax rotation was conducted.

Before the exploratory factor analysis, KMO and Bartlett's Test is assessed to check the appropriateness of subscales for factor analysis (see Table 1).

Table 1 KMO and Bartlett's Test Result of Reflective Learning Questionnaire

Kasier-Meyer-Olkin Measure of Sampling Adequacy		.89 (>0.5)
Bartlett's Test of Sphericity	Approx. Chi-Square	0.000 ($p < 0.001$)

The Table 1 gives information about two assumptions of factor analysis. To determine whether the subscales were suitable for factor analysis, the Bartlett Test of Sphericity and KMO (Kasier-Meyer-Olkin Measure of Sampling Adequacy) tests were used. The first test examined if the subscales of the scale are inter-independent, and the latter examined sample sufficiency. As shown in Table 1, KMO=0.889>0.50 indicated that the sample data are suitable for factor analysis (Hair et al., 2011). The Bartlett's Test ($p < 0.001$) showed that the correlations coefficients are not all zero. As a result, both assumptions required for factor analysis are satisfied.

Table 2 Communalities of Items

Items	Initial	Extraction
I reviewed subjects that previously studied during each course. (item 1)	1.000	.121
I found the relations between topics to structure more comprehensive notions about some theme. (item 3)	1.000	.595
I reflected about how studying and learning in various contexts and situations systematically. (item 7)	1.000	.961
I ask some questions to others the ways to do something and think about a better way for me. (item 14)	1.000	.751
I found my mistakes in what I had previously thought that was true during this course. (item 15)	1.000	.250
I need to understand facts and concepts that the teacher taught during this semester. (item 22)	1.000	.821
I continue to think about the material being taught during this course. (item 26)	1.000	.603

Items	Initial	Extraction
I try to reflect from the positive aspects of my knowledge and skills. (item 30)	1.000	.823
I often try to reflect from the negative views of my attitudes. (item 39)	1.000	.855
I prepared my learning activities and tasks in the courses carefully. (item 42)	1.000	.935
I discuss with my friends about learning and ways of studying. (item 2)	1.000	.182
I organized all topics in a course with each other and with those of other courses in training. (item 4)	1.000	.106
I tried to be aware of that I was studying and for what purposes. (item 6)	1.000	.915
I thought over the meaning of the content I was studying in relation to my personal experience. (item 8)	1.000	.424
I usually reflect on my behaviors to notice whether I could have improved in my works. (item 17)	1.000	.537
To do practical tasks, I have to understand the content taught in class first.(item 25)	1.000	.536
The feelings and emotions are analyzed when facing professional and daily circumstances. (item 29)	1.000	.596
I try to reflect from the negative views of my knowledge and skills. (item 37)	1.000	.669
I carefully notice the connection of what I learn and how I learn it. (item 40)	1.000	.586
I decide who or what I need to suggest and discuss. (item 43)	1.000	.842
I concluded the things that were learning every day in my studies. (item 10)	1.000	.176
I applied my ability to reflect during a learning situation. (item 11)	1.000	.205
I often reflect my experience and learn from it so I believe next performance will improve. (item 18)	1.000	.659
After this course, I have changed my usual method of doing things. (item 21)	1.000	.256
I try to reflect the material that I studied and the way to learn meaningfully. (item 44)	1.000	.654
I evaluate methods of solving problems and monitor my studying and analyzing the difficulties. (item 47)	1.000	.346

Communalities range from 0 to 1 where 0 means that the factors don't explain any of the variance and 1 means that all of the variance is explained by the factors. Variables with small extraction communalities cannot be predicted by the factors and it should be considered eliminating them if too small. In the present result, the communalities of all variables are acceptable and satisfied (see Table 2).

Table 3 Factor Loadings of Each Item in the Reflective Learning Questionnaire

Items	Factor Loadings		
	1	2	3
I reviewed subjects that previously studied during each course. (item 1)	.338		
I found the relations between topics to structure more comprehensive notions about some theme. (item 3)	.757		
I reflected about how studying and learning in various contexts and situations systematically. (item 7)	.967		
I ask some questions to others the ways to do something and think about a better way for me. (item 14)	.851		
I found my mistakes in what I had previously thought that was true during this course. (item 15)	.429		
I need to understand facts and concepts that the teacher taught during this semester. (item 22)	.894		
I continue to think about the material being taught during this course. (item 26).	.767		
I try to reflect from the positive aspects of my knowledge and skills. (item 30)	.897		
I try to reflect from the negative views of my attitudes. (item 39)	.961		
I planned my learning activities and tasks in the courses carefully. (item 42)	.953		
I discuss with my friends about learning and ways of studying. (item 2)		.417	
I organized all topics in a course with each other and with those of other courses in training. (item 4)		.302	
I tried to be aware of that I was learning and for what purposes. (item 6)		.938	
I thought over the meaning of the content I was studying in relation to my personal experience. (item 8)		.646	
I usually reflect on my behaviors to notice whether I could have improved in my works. (item 17)		.726	
To do practical tasks, I have to understand the content taught in class first.(item 25)		.725	
The feelings and emotions are analyzed when facing professional and daily circumstances. (item 29)		.766	
I try to reflect from the negative views of my knowledge and skills. (item 37)		.815	

Items	Factor Loadings		
	1	2	3
I carefully notice the connection of what I learn and how I learn it. (item 40)		.754	
I decide who or what I need to suggest and discuss. (item 43)		.906	
I concluded the things that were learning every day in my studies. (item 10)			.360
I applied my ability to reflect during a learning situation. (item 11)			.424
I often reflect my experience and learn from it so I believe next performance will improve. (item 18)			.801
After this course, I have changed my usual method of doing things. (item 21)			.471
I try to reflect the material that I studied and the way to learn meaningfully. (item 44)			.807
I evaluate methods of solving problems and monitor my studying and analyzing the difficulties. (item 47)			.534

A principal axis factoring was run with Varimax Rotation to check the scale construct validity. This rotation provided three factors with acceptable loadings. The items under first factor consisted of 10 items with loadings between .338 - .897. The items under second factor consisted of 10 items with loadings between .302 - .938 and third factor has factor loadings ranging from .360 - .807 (see Table 3).

According to Table 4, three factors explaining 50.394% of total variance were obtained. The first factor is explained by 27.898% of total variance. Second factor is explained by 15.691% of total variance and third factor is explained by 6.804% of total variance. By this way, a three-factored construct consisting of 26 items explaining 50.394% of total variance is obtained.

Table 4 Exploratory Factor Analysis Result of Reflective Learning Questionnaire

	Eigenvalues	% of Variance	No. of Items
1 st factor	8.090	27.898	10
2 nd factor	4.551	15.691	10
3 rd factor	1.973	6.804	6
Total		50.394 %	26

Naming the Factors

Each factor was named in accordance with the construct explained by the items as shown in Figure 1. The first factor could be named as self-reflection on learning. The second factor could be named as connecting experience with knowledge. The third factor could be named as critical reflection.

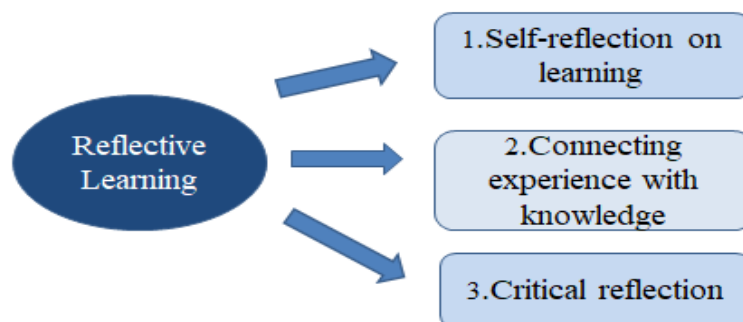


Figure 1. Factors of Reflective Learning

Reliability of Reflective Learning Questionnaire

The reliability of three factors and the whole questionnaire was determined by computing Cronbach's alpha values (see Table 5). The results revealed that all values are in satisfied levels and therefore the questionnaire is reliable.

Table 5 Reliability Coefficient of Reflective Learning Questionnaire

Factors	Cronbach's Alpha
Self-reflection on learning	0.950
Connecting experience with knowledge	0.893
Critical reflection	0.658
Reflective Learning Questionnaire	0.895.

Discussion

Reflection is claimed to help the professional trainee connect theory with practice adopt a deeper approach to learning (Entwistle, 1997). High value in teacher education and graduate employment is placed on the skill of being a reflective learner. This means that student teachers should critically evaluate their learning, identify areas of their learning that require further development and make themselves more independent learners. Therefore, developing a reliable Reflective Learning Questionnaire can be useful in exploring the quantitative data in professional preparation courses and especially in assessing the range of reflection in student teachers. But there may be more benefits in conducting a longitudinal study using both qualitative and quantitative research methods.

In this study, the Reflective Learning Questionnaire includes three factors: self-reflection on learning, connecting experience with knowledge and critical reflection. It was observed that there are three factors that can adequately explain reflective learning and the reliability of each factor was satisfactory. This questionnaire can be used as a diagnostic tool in classes that aims to promote reflective learning. It may be useful for to examine the inter-relationship between constructs related to learning activity.

Conclusion

According to Moon (1999), reflection makes continuity of learning and ensures the progress of individual and society. Reflective learning includes the knowledge of self, connecting the experience with knowledge and critically reflection what have learned. Therefore, the main point for education and professional trainees is reflection and the way to reflect in learning can improve their future profession. This study will help student teachers to investigate reflective learning in the context of teacher training using a quantitative approach.

Limitation and Future Research

This study recruited only student teachers from Hpa-An Education Degree College. Since only 500 student teachers participated in this study, the result may not represent all the student teachers in Myanmar. Future research should investigate student teachers' reflective learning to represent student teachers from all Education Degree Colleges in Myanmar.

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A STUDY ON CAREER SELF-EFFICACY AND TEACHING BEHAVIOR OF SENIOR ASSISTANT TEACHERS IN PYIN OO LWIN TOWNSHIP

Thae Phyu Phyu Nyein¹, Khin Khin Thant²

Abstract

The main purpose of the study was to study on career self-efficacy and teaching behavior of senior assistant teachers in Pyin Oo Lwin Township. Descriptive research design and survey method were utilized to explore the teachers' career self-efficacy and their teaching behavior. In this study, 102 Grade 10 teachers from the selected schools and 510 Grade 10 students from these schools were selected as the sample. Two questionnaires were used in the study: Teachers' Career Self-Efficacy Questionnaire (TCSEQ), and Teacher Behavior Inventory (TBI). Results of the study revealed that there was a significant positive relationship between teachers' career self-efficacy and teaching behavior. The independent sample t-test showed that significant differences were not found in career self-efficacy and teaching behavior of senior assistant teachers by gender and teaching subject. Furthermore, to examine the differences in teachers' career self-efficacy and teaching behavior by school groups and teaching experience, ANOVA was conducted. These results showed that there were significant differences by school types and also revealed that teaching experience affected on career self-efficacy and teaching behavior of senior assistant teachers. The findings of this study provide opportunities for teachers and educators to engage in working environment and adequate information that can foster higher sense of efficacy.

Keywords: Career Self-efficacy, Teaching Behaviour, Teacher Self-efficacy, Self-efficacy, Senior Assistant Teacher

Introduction

Teaching is one of the most significant professions in the society all around the world. The role of the teacher in society is both adorable and valuable. Teaching Profession has a great influence on the society and no other professions can have an influence more profound than that of a teacher. It can also be described as an infrastructure where significant and proficient socializing of the students takes place. To be an efficient teacher for the students, it is necessary to be skillful. The performance in the classroom must be able to pursue the students into the teaching learning process. And, teachers must be confident in their abilities in teaching and guiding their students.

Thus, teacher self-efficacy has great influence on the positive teaching behavior and strong enthusiasm on quality teaching. Teachers with high self-efficacy are optimist with their teaching behavior, more emphasize to explore the students' creative and critical thinking skill, more likely to use the advanced teaching methods which improve the students' investigative skill. So, teacher self-efficacy has been shown to be a powerful construct related to positive teacher behaviour and student outcome.

Purposes of the Study

The main aim of the present study is

- ❖ To study on career self-efficacy and teaching behaviour of senior assistant teachers

The specific objectives are

- ❖ To explore career self-efficacy and teaching behavior of senior assistant teachers
- ❖ To investigate the role of certain biographic variables such as gender, school groups, subject and teaching experience in determining teachers' career self-efficacy and teaching behaviour.
- ❖ To explore the relationship between career self-efficacy and teaching behaviour of senior assistant teachers.

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Definitions of Key Terms

Self-Efficacy: an individual's level of confidence in and beliefs about his/her capabilities to successfully carry out courses of action, perform given behaviour, accomplish given tasks, and attain desired performance outcomes (Bandura, 1977, 1986).

Career Self-Efficacy: people's judgments of their abilities to perform career behaviours in relation to career development, choice, and adjustment (Anderson & Betz, 2001; Niles & Sowa, 1992).

Teacher Self-Efficacy: the belief that teachers have about their abilities and skills as educators (Bandura, 1997).

Senior Assistant Teacher: teachers who teach in Grade10 and Grade11 in high schools.

Review of Related Literature

Career Self-efficacy

Career self-efficacy can be defined as people's judgments of their abilities to perform career behaviors in relation to career development, choice, and adjustment (Anderson & Betz, 2001; Niles & Sowa, 1992). Career self-efficacy provides important information relevant to understanding the complex career development process (Niles & Sowa, 1992). Career self-efficacy beliefs can lead to avoidance of or motivation toward career behaviors (Betz & Taylor, 2001). Betz (1992) revealed that low career self-efficacy can cause people to procrastinate making career decisions and may lead to poor career improvement. In general, the higher the career self-efficacy, the greater the career goals and challenges will set for themselves, and the stronger the commitment will be to them (Bandura, 1993, 1997). Therefore, low career self-efficacy beliefs should be emphasized and improved, whereas high career self-efficacy should be supported and enhanced.

Teachers' Career Self-efficacy and Teaching Behaviour

Teacher self-efficacy has been found to be consistently related to positive teaching behavior and strong pupil achievement, pupils learn more from teachers who have high self-efficacy, and highly self-efficacious teachers are eager to promote the students' creative and critical thinking, more likely to use active methods, group learning activities and fun learning activities for students. In addition, teachers with high self-efficacy exhibit greater enthusiasm for teaching, have greater commitment for teaching, and are more likely to remain in the teaching profession (Tschannen-Moran & Hoy, 2001, cited in Gavora, 2010). Moreover, career self-efficacy is considered important to successful job performance, and can greatly influence on work behaviors (Bandura, 1977, 1986; Niles & Sowa, 1992). Career self-efficacy has also been found to be one of the best predictors of many beginning career behaviors (Niles & Sowa, 1992). It has been found that career self-efficacy beliefs do indeed have a strong influence on career exploration, career performances and employment outcomes.

Method

Sampling

From each of the randomly selected schools in Pyin Oo Lwin Township, all senior assistant teachers in Grade-10 and 5 students for each teacher were selected randomly as the ratio of 1:5. Thus, the total sample for the study constituted 102 teachers and 510 Grade 10 students.

Research Method

In this study, descriptive survey design and quantitative approach were used.

Research Instrumentation

The career self-efficacy beliefs of senior assistant teachers were measured using TCSEQ modified by Bandura's Instrument Teacher Self-Efficacy Scales. Bandura's Instrument consists of 30 items with seven categories. To be relevance with Myanmar school culture, this measure consists of 23 items and 5 categories; efficacy to influence decision making, efficacy to influence school resources, instructional self-efficacy, disciplinary self-efficacy and efficacy to create positive school climate. The items assessed along a 5 point continuum as "1= Nothing", "2= Very Little", "3= Some Influence", "4= Quite A Bit", "5= A Great Deal".

Teaching Behaviour Inventory was developed by Harry G Murray, 1983. It consists of 60 items originally. And, it was adapted in accordance with Myanmar school culture. This measure consists of 58 items relevant to Grade-10 students with eight categories; clarity, enthusiasm, interaction, organization, pacing, disclosure, speech and rapport. Each of 58 items needs an optional response as "1= almost never", "2= rarely", "3= sometimes", "4= often", and "5= almost always". This questionnaire has eight reverse questions.

Then, these two instruments were adapted to Myanmar Version. And, expert review was conducted for face validity and content validity by three experts. After that, pilot testing was conducted with 10 senior assistant teachers and their 50 students as the ratio of 1:5. After piloting, item analysis was used to test the reliability of these two instruments. For the Teacher's Career Self-Efficacy Questionnaire (TCSEQ), the reliability coefficient was 0.866 and for Teaching Behaviours Inventory (TBI), it was 0.890.

Data Analysis and Research Findings

Senior Assistant Teachers' Career Self-efficacy

At first, means and standard deviations for Teacher Career Self-Efficacy Questionnaire were 93.54 and 11.21 (see Table 1).

Table 1. Basic Descriptive Statistics for Teachers' Career Self-Efficacy

Variables	No. of Items	Minimum	Maximum	Mean	Mean Percentage	SD
Decision Making	2	3	10	8.25	82.50%	1.35
School Resources	1	1	5	3.85	77.00%	0.97
Instructional Self- efficacy	9	24	45	36.26	80.57%	4.82
Disciplinary Self- efficacy	3	6	15	13.16	87.73%	1.89
Efficacy for positive School Climate	8	12	40	32.02	80.05%	5.36
Teacher's Career Self-Efficacy	23	63	115	93.54	81.34%	11.21

Table 1 showed that the mean and standard deviation for the whole sample were 93.54 and 11.21. By the mean percentage of the components of teachers' career self-efficacy scale, disciplinary self-efficacy was the highest and efficacy for school resources was the lowest. It could be interpreted that teacher participants had the higher self-efficacy concerning discipline and they had the high believes that they can control their students well but they had low efficacy

in getting school resources. The mean percentages of career self- efficacy components could be seen obviously in Figure 1.

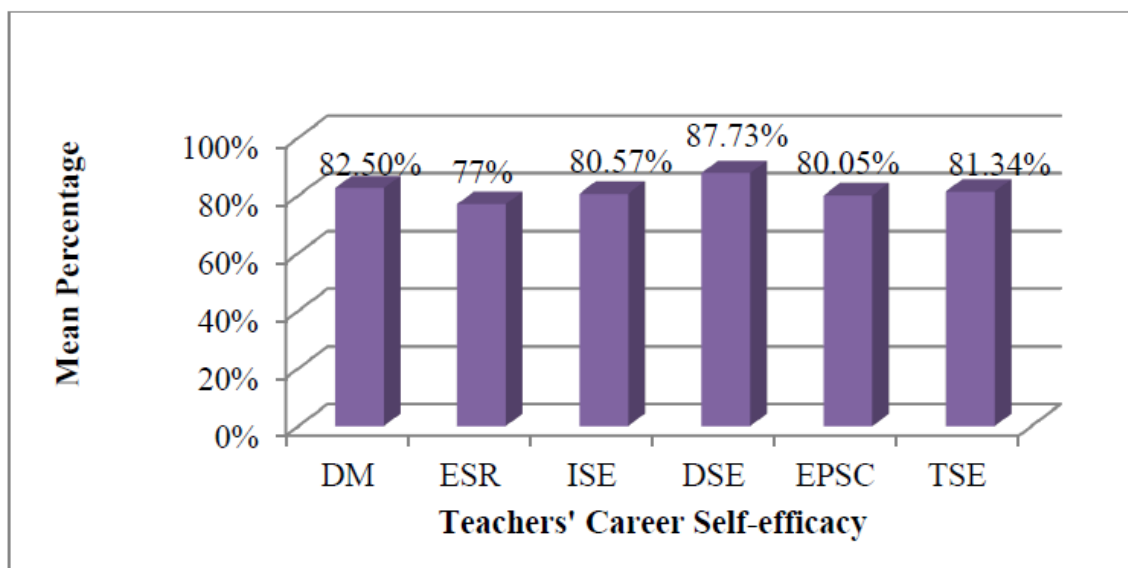


Figure 1. Mean Percentage of Teachers' Career Self-Efficacy by Components

DM= Decision Making, ESR= Efficacy for School Resources, ISE= Instructional Self-Efficacy, DSE= Disciplinary Self-Efficacy, EPSC = Efficacy for Positive School Climate

Furthermore, the teachers were grouped in order to figure out their career self-efficacy as low, middle and high. Teachers with scale of the (+1) standard deviation above the sample mean were identified as high group and teachers with scale below the (-1) standard deviation lower than the sample mean were identified as the low group. And, teachers with scale between (+1) and (-1) standard deviation and equal to the sample mean were identified as the middle group. It could be seen clearly in Table 2.

Table 2. Grouping for Teachers' Career Self-Efficacy

Variables	High group	Middle group	Low group	Total
Career Self-Efficacy	13 (12.7%)	75 (73.5%)	14 (13.8%)	102

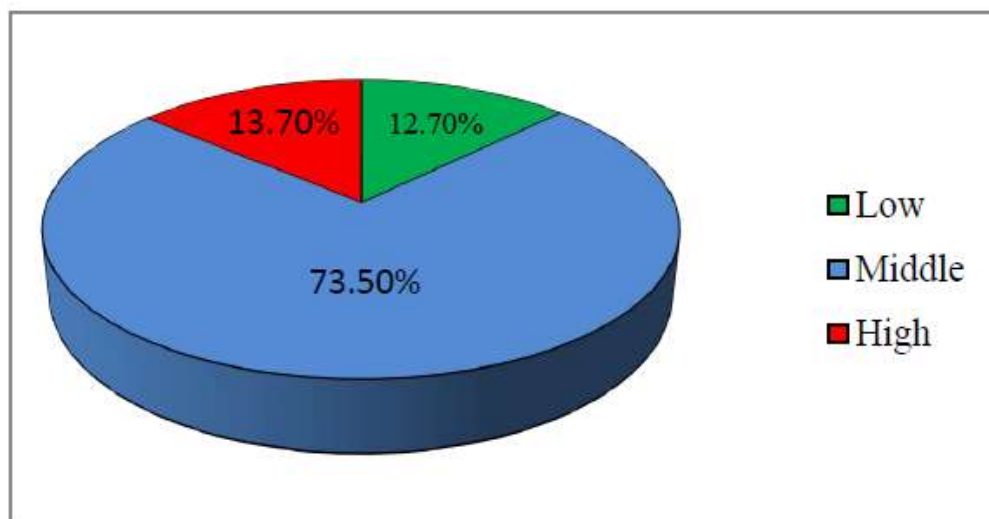


Figure 2. Grouping for Career self-efficacy of SAT Teachers with Percentage

By Table 2 and Figure 2, out of 102 teachers, 13 teachers (12.7%) were identified as efficacy scale high groups, 75 teachers (73.5%) as middle group and 14 teachers (13.8%) as low groups. It revealed that the career self-efficacy of senior assistant teachers in Pyin Oo Lwin Township was commonly not very high and very low, and so it was in the moderate level.

Senior Assistant Teachers' Teaching Behaviour

Mean and standard deviation of senior assistant teachers' teaching behaviour were explored by the descriptive statistics by the dimensions (see Table 3).

Table 3. Descriptive Statistics for Teaching Behaviour

Dimension	Number of Items	Minimum	Maximum	Mean	Mean Percentage	SD
Clarity	11	24	53	45.04	84.89%	4.20
Enthusiasm	10	24	47	36.41	77.47%	4.09
Interaction	9	18	41	31.53	76.90%	3.92
Organization	7	16	34	28.02	82.41%	3.71
Pacing	5	13	25	21.06	84.24%	2.41
Disclosure	6	13	29	23.45	80.86%	2.80
Speech	5	14	90	19.74	21.93%	7.22
Rapport	5	12	23	17.81	77.43%	2.61
Teaching Behaviour	58	140	266	222.40	83.46%	19.94

According to the mean percentages of the components of teaching behavior inventory scale, clarity was the highest mean percentage. It could be interpreted that the participant teachers can use methods to explain or clarify the concepts and principals of the subject matter but their speech is unclear in the classroom teaching. The mean percentages of teaching behavior dimensions were shown clearly in Figure 3.

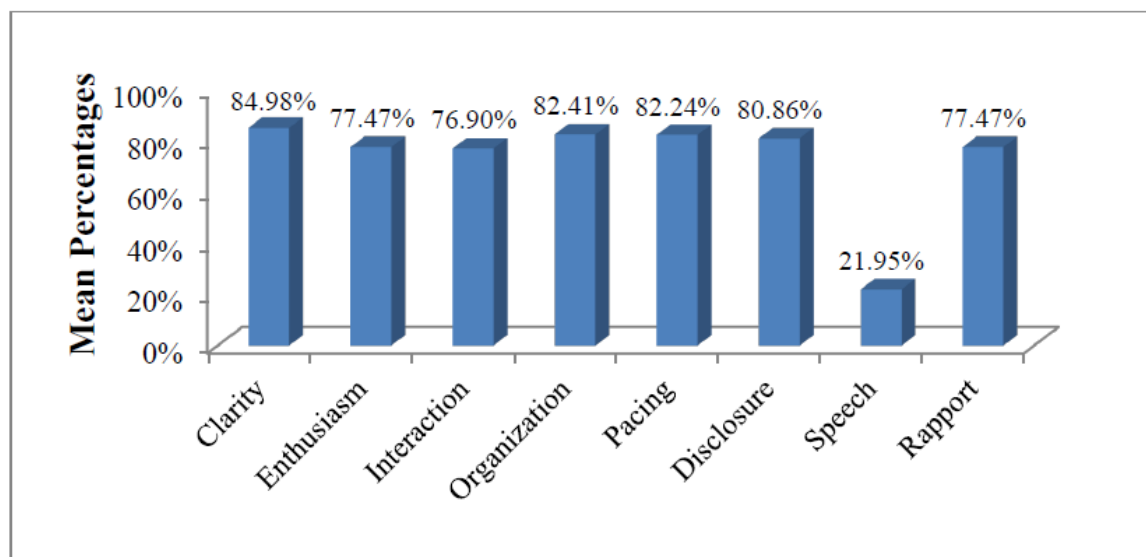


Figure 3. Mean Percentage of Teaching Behaviour Scale

Descriptive Statistics of Teachers' Career Self-Efficacy and Teaching Behaviour by Gender

The result of *t*-test which indicated the differences of career self-efficacy and teaching behaviour of teachers by gender was shown in Table 4.

Table 4. Results of *t*-test of Career Self-Efficacy and Teaching Behaviour of Teachers by Gender

Variables	Gender	N	Mean	Mean Percentage	<i>t</i>	<i>df</i>	<i>p</i>
Career Self-Efficacy	Male	14	95.86	88.76%	0.836	100	0.408
	Female	88	93.17	81.02%			
Teaching Behaviour	Male	14	225.56	90.95%	0.636	100	0.526
	Female	88	221.90	.42%			

Table 4 showed that career self-efficacy of males was slightly higher than that of females. However, no significant differences ($t = 0.836, p > 0.05$) were identified by gender. It could be interpreted that beliefs of their capabilities in teaching tasks did not differ between male and female teachers. It can also be found that there were no significant differences between male and female teachers for teaching behaviour ($t = 0.636, p > 0.05$).

Descriptive Statistics of Teachers' Career Self-Efficacy and Teaching Behaviour by Teaching Subject

The independent sample *t*-test was used to find out the significant differences between art teachers and science teachers on career self-efficacy and teaching behaviour.

Table 5. Results of *t*-test of Career Self-Efficacy and Teaching Behaviour by Subject

Variables	Subject	N	Mean	Mean Percentage	<i>t</i>	<i>df</i>	<i>P</i>
Teacher's Career Self-Efficacy	Art	39	92.03	80.02%	-1.073	100	0.286
	Science	63	94.48	85.89%			
Teaching Behaviour	Art	39	218.46	86.69%	-1.528	100	0.117
	Science	63	224.84	84.53%			

Table 5 showed the mean percentage of science teachers was slightly more than that of art teachers in career self-efficacy but the mean percentage of art teachers was slightly more than that of science teachers in teaching behaviour. Then, based on the *t*-test, there was no significant difference between career self-efficacy of art teachers and science teachers ($t = -1.073$, $p > 0.05$). And also, it can be found that there was no significant difference between teaching behaviours of art and science teachers ($t = -1.582$, $p > 0.05$). Thus, it can be interpreted that the career self-efficacy and teaching behaviour of art and science teachers were not different.

Descriptive Statistics of Career Self-Efficacy and Teaching Behaviour of Teachers by School Groups

To investigate the differences of teachers' career self-efficacy and their teaching behaviour among the school groups (downtown, suburb and private), descriptive statistics was carried out (see Table 6).

Table 6 Mean and Standard Deviation of Teachers' Career Self-Efficacy and Teaching Behaviour by School Groups

Variables	School Groups	N	Mean	Mean percentage	Std. Deviation
Teachers' Career Self-Efficacy	Downtown	72	91.24	83.71%	11.13
	Suburb	13	99.31	90.28%	10.62
	Private	17	98.88	85.98%	8.83
	Total	102	93.54	81.34%	11.21
Teaching Behaviour	Downtown	72	220.17	82.77%	21.48
	Suburb	13	237.09	94.46%	11.65
	Private	17	220.61	90.77%	12.56
	Total	102	222.40	83.61%	19.94

According to Table 6, the mean percentage of suburb school for the teachers' career self-efficacy was the highest among the three groups of school See (Figure 4).

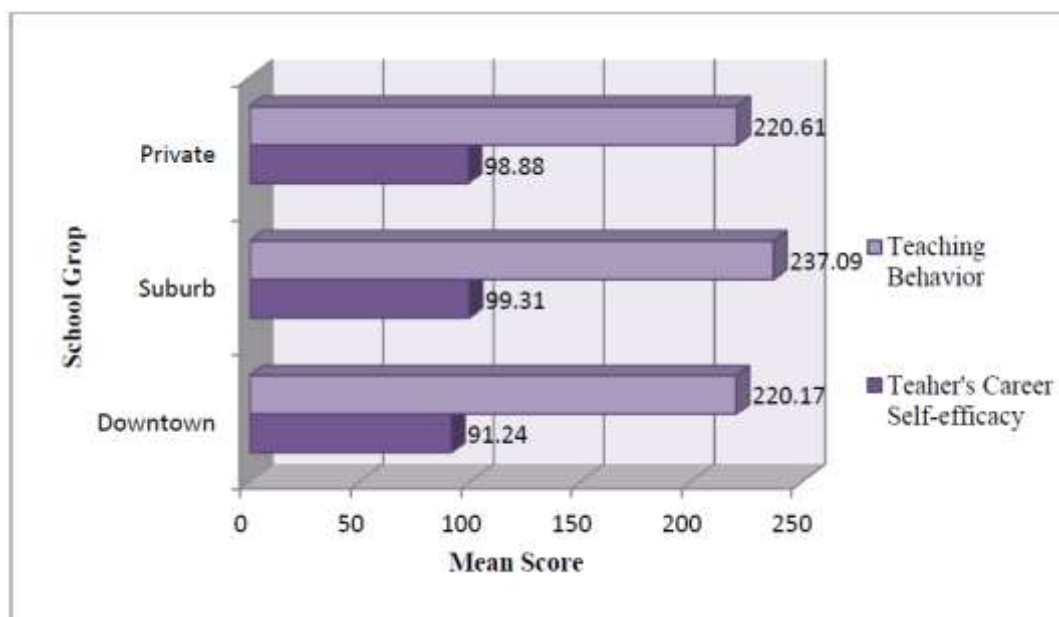


Figure 4. Mean Score of Teachers' Career Self-Efficacy and Teaching Behaviour by School Groups

To make sure these differences, one-way analysis of variance (ANOVA) was conducted and the result revealed that there were significant differences in teachers' career self-efficacy between school groups ($F(2, 99) = 5.643, p < 0.01$). Concerned with teaching behaviour, there were also significant differences between school groups. ($F(2, 99) = 4.314, p < 0.05$). So, there were significant differences both in career self-efficacy and teaching behaviour of teachers according to school groups at 0.05 level (see Table 7).

Table 7. ANOVA Results of Teachers' Career Self-Efficacy and Teaching Behaviour by School Groups

Variables	Sum of Square		df	Mean Square	F	p
Teachers' Career Self-Efficacy	Between Groups	1299.823	2	649.912	5.643	.005*
	Within Groups	11401.520	99	115.167		
	Total	12701.343	101			
Teaching	Between Groups	3217.928	2	1608.964	4.314	.016*
	Within Groups	36923.071	99	372.960		
	Total	40141	101			

Note: * The mean difference is significant at the 0.05 level.

Then, Post Hoc test was computed by Tukey (HSD) method to be specific about the significance between teachers' career self-efficacy by school groups.

Table 8. Tukey (HSD) Results of Teachers' Career Self-Efficacy and Teaching Behaviour by School Groups

Variables	School (I)	School (J)	Mean Differences(I-J)	p
Teachers' Career Self-Efficacy	Downtown	Suburb	-8.072*	.038
		Private	-7.646*	.026
	Suburb	Downtown	8.072*	.038
		Private	0.425	.994
	Private	Downtown	7.646*	.026
		Suburb	-0.425	.994
Teaching Behaviour	Downtown	Suburb	-16.920*	.012
		Private	-0.440	.996
	Suburb	Downtown	16.920*	.012
		Private	16.481	.058
	Private	Downtown	0.440	.996
		Suburb	-16.481	.058

Based on the results in Table 8, the career self-efficacy of teachers from private and suburb schools were more than that of teachers from schools of downtown area. The career self-efficacy of the teachers was significantly different according to school groups ($p < 0.05$). It could be interpreted that teachers from suburb schools had higher efficacy than private and downtown schools and also the teachers from private school had the higher career self-efficacy than the teachers from schools in downtown area.

Furthermore, teaching behaviour of teachers from suburb school was significantly different from that of teachers from downtown schools ($p < 0.05$), and it revealed that teachers

from school in suburb area had better teaching behaviour than those from schools in downtown area.

Descriptive Statistics of Teachers' Career Self-Efficacy and Teaching Behaviour by Teaching Experience

In order to find out whether teaching experience may affect the teachers' career self-efficacy or not, the following Descriptive Table will show

Table 9. Mean and Standard Deviation of Teachers' Career Self-Efficacy and Teaching Behaviour by Teaching Experience

Variables	Years of Experience	N	Mean	Std. Deviation
Career Self-Efficacy	0-10	20	83.05	14.784
	11-20	37	90.08	7.053
	21-30	21	96.52	4.781
	Above 30	24	105.00	3.781
	Total	102	93.54	11.214
Teaching Behaviour	0-10	20	216.71	20.718
	11-20	37	217.77	20.285
	21-30	21	225.64	18.711
	Above 30	24	231.45	16.869
	Total	102	222.46	19.936

According to Table 9, there were differences in career self-efficacy of teachers in terms of teaching experience. Among the groups, Teachers with above 30 years teaching experience had the highest career self-efficacy. Similar with career self-efficacy, the mean score of the teachers with the highest teaching experience had the highest mean score in teaching behaviour. Figure 5 clearly supported these findings.

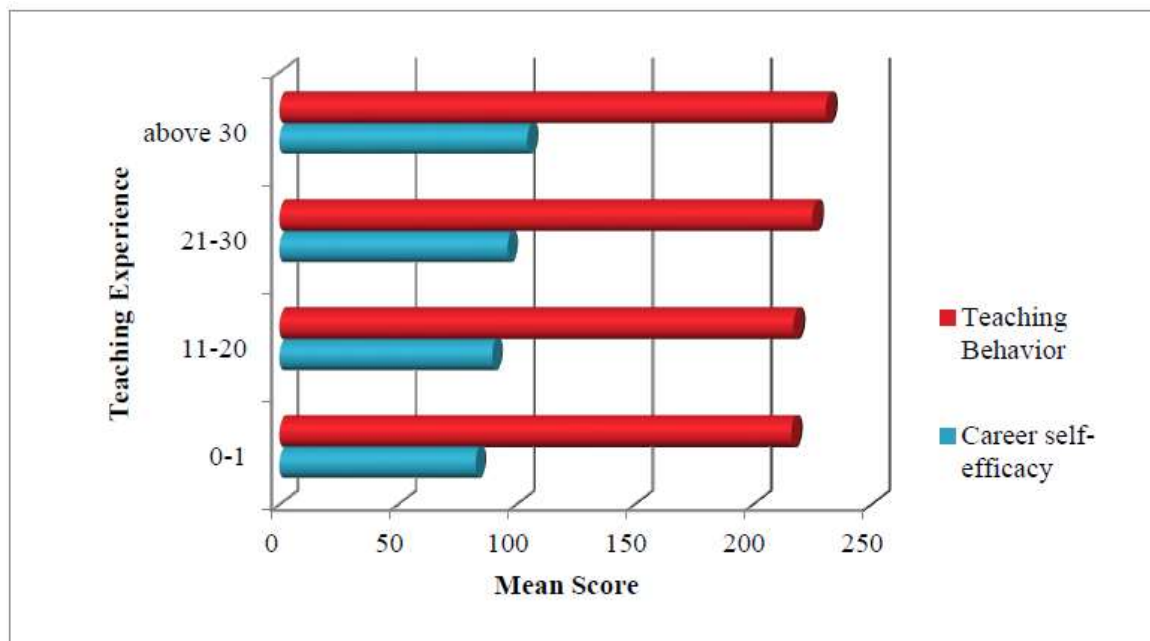


Figure 5. Mean Score of Career Self-Efficacy and Teaching Behavior by Teaching Experience

Besides, ANOVA was also calculated to explore the significant differences in career self-efficacy and teaching behaviour of teachers by teaching experience (see Table 10).

Table 10. ANOVA Results of Career Self-Efficacy and Teaching Behaviour of Teachers by Teaching Experience

Variables	Sum of Squares		df	Mean Squares	F	p
Teachers' Career	Between Groups	5982.398	3	1994.133	29.086	.000*
	Within Groups	6718.945	98	68.561		
	Total	12701.343	101			
Teaching Behaviour	Between Groups	3625.519	3	1208.506	3.243	.025*
	Within Groups	36515.480	98	372.607		
	Total	40141.000	101			

Note: * The mean difference is significant at the 0.05 level.

According to teaching experience, Table 10 pointed out that there were significant differences among groups of teaching experience in teachers' career self-efficacy ($F(3, 98) = 29.086$, $p < 0.001$) and in teaching behaviour ($F(3, 98) = 3.243$, $p < 0.05$) at 0.05 level. Beyond these results, Tukey (HSD) was conducted to explore specifically.

Table 11 Tukey (HSD) Results of Career Self-Efficacy and Teaching Behaviour of Teachers by Teaching Experience

Variables	Teaching Experience (I)	Teaching Experience (J)	Mean Differences (I-J)	p
Teachers' Career Self-Efficacy	0-10	11-20	-7.031*	.015
		21-30	-13.474*	.000
		Above 30	-21.950*	.000
	11-20	0-10	7.031*	.015
		21-30	-6.443*	.027
		Above 30	-14.919*	.000
	21-30	0-10	13.474*	.000
		11-20	6.443*	.027
		Above 30	-8.476*	.005
	Above 30	0-10	21.950*	.000
		11-20	14.919*	.000
		21-30	8.476*	.005
Teaching Behaviour	0-10	11-20	-1.063	.997
		21-30	-8.928	.453
		Above 30	-14.740	.063
	11-20	0-10	1.063	.997
		21-30	-7.865	.447
		Above 30	-13.677*	.040
	21-30	0-10	8.928	.453
		11-20	7.865	.447
		Above 30	-5.812	.745

Variables	Teaching Experience (I)	Teaching Experience (J)	Mean Differences (I-J)	<i>p</i>
	Above 30	0-10	14.740	.063
		11-20	13.677*	.040
		21-30	5.812	.745

Note: * The mean difference is significant at the 0.05 level.

Table 11 indicated that teaching experience may influence to some extent in the career self-efficacy and their teaching behavior. There were significant differences among the all groups of teaching experience in career self-efficacy. For teaching behaviour, it could be found that there were significant differences between teachers with 11-20 years teaching experience and teachers with above 30 years teaching experience. Thus, results revealed that teachers with more experience had higher self-efficacy and better teaching behaviour.

The Relationship between Teachers' Career Self-Efficacy and Teaching Behaviour

In order to explore the relationship between career self-efficacy and teaching behaviour of senior assistant teachers in Pyin Oo Lwin Township, the Pearson Product-Moment Correlation Coefficient was calculated. The result was shown in Table 12.

Table 12. Relationship between Teachers' Career Self-Efficacy and Teaching Behaviour

Variables	Teachers' Career Self-Efficacy	Teaching Behavior
Teachers' Career Self-Efficacy	1	.210*
Teaching Behaviour	.210*	1

Note: * Correlation is significant at the .05 level (2-tailed).

By the result of Table 12, there was a statistically significant correlation in career self-efficacy and teaching behaviour ($r = .210$, $p < .05$). Therefore, there was a positive relationship between teachers' career self-efficacy and their teaching behaviour. This meant that teachers with high levels of self-efficacy performed their teaching tasks efficiently had good teaching behaviour.

Conclusion

In this study, there were significant differences in career self-efficacy and teaching behavior of senior assistant teachers by school groups. Teachers in school group in suburb area have higher self-efficacy and better teaching behavior. There were no significant differences in career self-efficacy and teaching behavior of senior assistant teacher by gender and by teaching subject. This result was consistent with the findings of Magno and Sembreno (2007), but in contrast with the study of Klassen (2010) who reported that female teachers have better manners and more enthusiasm in the classroom. Moreover, there were significant differences in career self-efficacy and teaching behavior by teaching experiences. It can be interpreted that teacher's self-efficacy is different according to their teaching experience. But teaching behavior is not concerned with the teaching experience. There was only a significant difference between 11-20 years of teaching experience and above 30-year experience. It can be interpreted that teachers become confidence with their teaching skills throughout their experience. This finding was consistent with the study of Klasin (2007) and Gavora (2012).

Correlation analyses showed that teachers' career self-efficacy and teaching behaviour were significantly correlated ($r = .210, p < 0.05$). This meant that the strength of correlation is correlated to some extent. Thus, it could be interpreted that career self-efficacy effects on teaching behaviour. The higher the self-efficacy of the teachers had, the better their teaching behavior is. This result was consistent with the finding of Bandura (1989) and Ashraf (2012).

Thus, teacher's career self-efficacy has a great influence on the teaching performance in the classroom. As a model of the students, teachers must be creative, enthusiasm, confident, mastery and positive-minded. Teacher with high self-efficacy have greater interest for teaching, greater commitment to the profession and more active in the classroom. So, high career self-efficacy teachers can surely provide fantastic education for their students.

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THE EFFECTIVENESS OF POSITIVE PSYCHOLOGY INTERVENTION ON SUBJECTIVE WELL-BEING AND PSYCHOPATHOLOGY OF LOWER SECONDARY SCHOOL STUDENTS

Than Htay Soe¹, May Cho Min²

Abstract

A model of mental health, dual factor model, imagines the status of mental health as a mixture of psychopathology and subjective well-being. To make lower secondary school students not only decrease their psychopathology in which externalizing and internalizing behavior but also increase subjective well-being including negative and positive affect and life satisfaction. Thus, to examine the effect of positive psychology intervention (PPI) program on students' subjective well-being and psychopathology required. Therefore, this study was conducted as an investigation of the effectiveness of positive psychology intervention (PPI) on subjective well-being and psychopathology of grade 6 students. In this study, the equal number of boys and girls in Grade 6 (76 students) and 6 teachers in Grade 6 are participated. Pre-test post-test control group design and purposive sampling method were used. Experimental and control groups were assigned equally based on the results of pre-test. To improve students' subjective well-being and to reduce psychopathology, the PPI was used in the experimental group. Results showed that participants in the experimental group showed significant lower level of psychopathology (the behaviors of externalizing and internalizing) and negative affect and higher levels of life satisfaction and positive affect than control group. Thus, it can be said that subjective well-being and psychopathology of lower secondary school students can be promoted and reduced by PPI program.

Keywords: Positive Psychology Intervention, Subjective Well-Being, Psychopathology

Introduction

Mental health has been approached from the viewing without involving psychopathology as the same meaning of psychological wellness. Not only it solely focuses on psychopathology to clarify mental health standing is insufficient but also it should be investigated positive aspects of human functioning according to the results of the growing consensus and the argument among psychologist. In this situation the dual factor model of mental health is needed as support. Greenspoon and Saklofske (2001) assumed that although the presence of subjective well-being (SWB) and the absence of psychopathology were associated, these facts has not evidenced consistently via research. Therefore, psychopathology and subjective well-being are same poles on the same spectrum. However, it is more nuanced on the mental health status and sometimes it can have both levels (high and low). Support for a dual-factor model initially helped as a provider for a system integration to assess mental health which includes four separate mental health categories based on psychopathological levels and SWB mainly life satisfaction. The findings of research recommended that student with low and high level of psychopathology and SWB show superior academic, social, and physical health results and outcomes associate with those students who have low SWB and without psychopathology.

Diener (2000) stated that subjective well-being "scientific term for happiness" is a combination of three distinct which are interrelated parts: life satisfaction, the affects of positive and negative. Diener (2000) defined that life satisfaction is the cognitive appraisal of person's life that is a global evaluation of overall life and within each component specially friends, family or school. Positive affect is the frequency with which people experience

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positive feelings. Negative affect is the frequency with which one faces negative emotion. Children who are high SWB experience positive emotions which is ongoing frequency highly while negative emotions are low and have high satisfaction with their whole life.

“Architecture of sustainable happiness” is for shedding light on first mechanisms affecting individual’s chronic level of happiness in order to improve SWB (Lyubomirsky, Sheldon & Schkade, 2005). This model demonstrates that one’s chronic level of happiness can be classified by three components such as life circumstances, genetic set point and intentional activity. A sizable portion can be attributed to purposeful activities although heritability accounts for the biggest variance percent among individuals’ levels of happiness. Moreover, this model postulates that people participating in brief, scripted activities created to mimic the behaviors and thoughts of happy one can develop their personal levels of happiness (Layous & Lyubomirsky, 2014). PPIs engage individuals’ behaviors to foster malleable factors relative to high well-being with the generating goal a lasting effect on their happiness. The popularity of research studies on PPI have been increased in recent years. Most studies revealed the efficacy of multicomponent PPIs in adult sample while few researches had explored the effect of PPIs in school children. To handle this gap, the purpose of this study is to examine the effectiveness of positive psychology intervention at increasing subjective well-being and reducing psychopathology of lower secondary school students. This study aims to investigate the effect of positive psychology intervention on subjective well-being and psychopathology of lower secondary school students. By examining the impact of PPI on the success of students as indicators, it can inform key stakeholders with the evidence of positive outcomes as positive intervention. Moreover, PPI programs aligns with an ecological framework consistent with best practices in school psychology service delivery by involving teachers and parents in this intervention activities.

Aim and Objectives

This study aims to examine the effect of positive psychology intervention on subjective well-being and psychopathology of lower secondary school students. The specific objectives were:

- (1) To investigate the differences in components of subjective well-being (i.e., life satisfaction, positive affect, negative affect) of students who participated in experimental group and control group.
- (2) To explore the differences in internalizing behavior and externalizing behavior of students who participated in experimental group and control group.

Hypotheses of the Study

The hypotheses of the study were as follows.

Hypothesis 1: Students who participate in intervention program will demonstrate significantly higher levels of life satisfaction and positive affect than students who participate in the control group while they will demonstrate significantly lower level of negative affect than control group students.

Hypothesis 2: Students who participate in the positive psychology intervention program on promoting happiness will demonstrate significantly lower levels of internalizing behavior and externalizing behavior than students who participate in the control group.

Definitions of Key Terms

Subjective well-being. Subjective well-being is the term of happiness comprising of three distinct and unique components which are positive affect, negative affect and life

satisfaction (Diener, 2000).

Psychopathology. Psychopathology refers to externalizing disorders such as conduct disorder, oppositional defiant disorder and internalizing disorders such as anxiety and depression (Suldo et al., 2016).

Positive psychology interventions. Positive psychology interventions (PPIs) is a type of programs, activities or practices designed to increase positive feelings, behaviors and thoughts (Sin & Lyubomirsky, 2009).

Review of Related Literature

Positive Psychology

The field of positive psychology scientifically studies the numerous factors and traits that contribute to the thriving and optimal functioning of individuals. Positive psychology emerged in response to pathology-focused traditional models of mental health, which have largely sought to remedy and heal human deficits and weaknesses in order to improve human functioning (Seligman & Csikszentmihalyi, 2000). Thus, positive psychology conceptualizes mental health in terms of not only having or not positive indicators of mental health, but also the presence or absence of psychopathology (Greenspoon & Saklofske, 2001).

Subjective Well-Being and Psychopathology

Subjective well-being is combined of three components: life satisfaction, positive affect, and negative affect (Diener, 2000). Life satisfaction is operationalized as one's cognitive appraisal of their life, which may refer to a global evaluation of life overall or within a single domain such as family, friends, or school (Diener, 2000). Positive and negative affect are described as the frequency with which one experiences negative emotions such as fear, sadness and disgust, positive emotions such as contentment, love, and joy.

The research of positive psychology has called into question the traditional one-dimensional approach to mental health indicating the superior psychological functioning equates with absence of psychopathology. According to subjective well-being and levels of psychopathology, mental health can be classified four groups determined (Greenspoon & Saklofske, 2001).

Methodology

The design used in this study was pre-test post-test control group design.

Participants of the Study

The sampling method used in this study was purposive sampling method. This study participated 76 Grade 6 students and 6 Grade 6 teachers. A prior power analysis revealed that a total of samples size 70 participants is required in this study design. Therefore, a total of 76 Grade 6 students (38 boys and 38 girls, Mage = 11.3 years old) and 6 teachers from school of practicing Taungoo Education Degree College participated in this study and the sample size is sufficient. After recruitment was complete, students completed a pre-test of subjective well-being and their teachers completed students' internalizing and externalizing behavior for their students. The students were divided into two groups based on pre-test scores. The selected students were assigned as the experimental group and the control group. Each group consisted of 38 students.

Measures of the Study

Life satisfaction. The Students' Life Satisfaction Scale (Huebner, 1991) was used to investigate students' life satisfaction. (e.g., **"I am pleased with my life," "I have what I want in life"**). The internal consistency in this study was 0.73.

Positive and negative affect. To examine positive affect and negative affect of the students, the present study used Positive and Negative Affect Schedule (Ebesutani et al., 1999). (**positive affect e.g., cheerful, happy, proud and negative affect e.g., mad, afraid, sad**). Cronbach's Alpha for positive affect was 0.71 and negative affect was 0.70.

Internalizing and externalizing behavior. In the present study, Student Internalizing Behavior Screener (SIBS; Cook et al., 2012) was used to examine students' student internalizing behavior. (e.g., **anxiety, bullying victimization, isolation or peer rejection**). The internal consistency (Cronbach's Alpha) in this study was 0.76.

Student Externalizing Behavior Screener (SEBS; Cook et al., 2012) was used to examine students' student externalizing behavior. (e.g., **defiance or adult opposition, aggression, bullying**). The internal consistency (Cronbach's Alpha) in this study was 0.75.

Instrumentation

All the measures used in this study were adapted to Myanmar version. After preparing the measuring scales, expert review was conducted for face validity and content validity by twelve experts who have special knowledge and close relationship in the field of educational psychology and educational test and measurement. Next, revisions in item length, the wording of items, and content were made during preliminary administrations of the questionnaire. And then, a pilot study was conducted with a sample of 30 Grade 6 students, and 6 respective teachers from practicing school of Hpa-An Education Degree College to test whether the wording of items, statements and instructions had their clarity in Myanmar version and were appropriate and relevant to Grade 6 students. Then, the wording and phrases of some items were modified since they were inappropriate with children's understanding level. Cronbach's alphas for all the measures in this study were above 0.7, hence having satisfactory reliability.

Positive Psychology Intervention Program

(i) Sessions 1-2: Building Positive Relationships

The aim of this session is students to establish good relationships with their classmates and teachers and provide information to the parents.

In session 2, the students need to memorize times when classmates were supportive of each other and when the teacher was supportive of his/her students, as well as when students demonstrated care for their teacher.

(ii) Sessions 3-5: Positive Emotions about the Past

The objective of sessions is to create positive interpretation of past events and the goal of session 5 is to test the feelings, comments and feedback of teachers about the intervention.

(iii) Sessions 6-10: Positive Emotions about the Present

The main aim of sessions is to discuss about the positive emotions related to the present by involving students in activities through which they practice, interpret and identify by using character strengths.

(iv) Session 11: Positive Emotions about the Future

The objective of the session is to improve students' positive emotions of the future by increasing goal-directed thinking and hope.

(v) Session 12: Termination

The aim of the final session is to summarize about the meetings and improve students continued use of the strategies learned throughout the program implementation

Procedures

Participants completed a brief survey of demographics and SWB for pre-test after the recruit mentation process was finished. The Grade 6 teachers who participated in this study completed survey of their students' internalizing and externalizing behavior. Based on the baseline measurement results, students were randomly selected for control group and experimental group. Then PPI program was implemented in the experimental group. It took 16 weeks (one hour in a week) for PPI program. After this intervention, post-test that is the same questionnaire with pre-test was examined.

Results**Comparison of Pre-test Results Between Control Group and Experimental Group**

Preliminary data analyses included calculating descriptive statistics (i.e., means, SD) for all variables in pre-test. In order to know the equivalency or not between control and experimental groups before the intervention, the pre-test result for both groups were tested. The independent samples t test was calculated comparison of the differences between two group. The analyses showed that the mean value of control group in students' negative affect was slightly lower than other group whereas the mean values of control group in students' life satisfaction and positive affect were slightly higher than experimental group.

Table 1 The Independent Samples *t* test Results of Pre-test for Life Satisfaction, Positive Affect and Negative Affect

Variables	Groups	Mean	SD	t	Df	p
Life Satisfaction	Control	30.45	3.29	1.38	74	.17
	Experimental	30.32	5.05			
Positive Affect	Control	13.61	0.97	.21	74	.83
	Experimental	13.32	1.74			
Negative Affect	Control	9.13	1.55	.42	74	.67
	Experimental	8.24	1.15			

To make more detailed investigation on the control group and experimental group, the independent samples t test was conducted (see Table 1). According to Table 1, there were no significant differences of life satisfaction, positive affect and negative affect between control group and experimental group. It can be said that students from both groups had the same level of subjective well-being before positive psychology intervention.

The mean value of student internalizing behavior for control group was higher than experimental group while the mean value of student externalizing behavior for experimental group was higher than control group. To make more detailed investigation on the control group and experimental group, the independent samples t test was conducted (see Table 2). According

to Table 2, there were no significant differences between control group and experimental group for student internalizing and externalizing behaviors of pre-test.

Table 2 The Independent Samples t test Results of Pre-test for Student Internalizing and Externalizing Behavior

Variables	Group	Mean	SD	t	df	p
Internalizing Behavior	Control	9.74	1.41	.22	74	.88
	Experimental	9.71	1.45			
Externalizing Behavior	Control	10.03	1.75	-.15	74	.88
	Experimental	10.31	1.40			

Comparison of Post-test Results Between Control Group and Experimental Group

To make more detailed investigation on the control and experimental group difference of post-test in the variables (i.e., life satisfaction, positive affect, negative affect, internalizing and externalizing behavior), the independent samples t test was conducted.

Results indicated that the mean values of the experimental group for life satisfaction and positive affect were higher than the control group whereas the mean value of the control group for negative affect was higher than the experimental group. To make more investigation on the difference between control group and experimental group, the independent samples t test was conducted. The results of t test stated that there was a significant difference of life satisfaction between control group and experimental group at 0.001 level. The mean value of life satisfaction for control group was higher than experimental group (see Table 3). The results showed that the level of students' life satisfaction who received positive psychology intervention (experimental group) was significantly higher than students who participated in control group ($df = 74$, $p < .001$). This result is consistent with previous researches of Mercer (2014) that he found that primary students who participate in experimental group experienced a significant increase in life satisfaction than those in control group in the Well-Being Program.

Table 3 The Independent Samples t test Results of Post-test for Life Satisfaction, Positive Affect and Negative Affect

Variables	Groups	Number	Mean	SD	t	df	p
Life Satisfaction	Control	38	29.79	2.61	-6.36***	74	.000
	Experimental	38	33.47	2.44			
Positive Affect	Control	38	14.21	2.16	-4.70***	74	.000
	Experimental	38	16.24	1.56			
Negative Affect	Control	38	9.00	1.79	5.67***	74	.000
	Experimental	38	7.05	1.14			

Note. *** Mean difference is significant at the 0.001 level.

The result showed that there were significant differences in positive and negative affect between control and experimental group at 0.001 levels ($df = 74$, $p < .001$). According to Table 3, the mean value of positive affect for experimental group ($M = 16.24$) who received positive psychology intervention was higher than control group ($M = 14.21$) while the mean value of

negative affect for experimental group ($M = 7.05$) was lower than control group ($M = 9.00$). These findings showed significant increase in positive affect and decrease in negative affect among older students in treatment group than those in control group in PPI program which consistent with previous studies (Roth, Suldo & Ferron, 2017).

Table 4 The Independent Samples t test Results of Post-test for Internalizing and Externalizing Behaviors (Teacher Report)

Variables	Groups	Number	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>
Internalizing Behavior	Control	38	9.58	.83	7.24***	74	.000
	Experimental	38	8.05	.77			
Externalizing Behavior	Control	38	9.47	1.08	8.33***	74	.000
	Experimental	38	7.97	.75			

Note: ***Mean difference is significant at the 0.001 level.

The results indicated that there were significant differences of internalizing and externalizing behavior between control group and the experimental group (see Table 4). The results revealed that students in the experimental group who received positive psychology intervention had lower internalizing and externalizing behavior than students who did not receive intervention program ($df = 74$, $p < 0.001$). This study finding is consistent with the recent study of the promoting student's well-being program with secondary school students demonstrated a significant decrease in externalizing and externalizing behaviors and showed statistically decrease among the intervention group than those in control.

Comparison of Pre-test and Post-test Results for Control Group

The mean scores and standard deviations of life satisfaction, positive affect, and negative affect of pre-test and post-test for control group are described in Table 5. According to the Table 5, there were no significant differences of all variables (life satisfaction, positive affect, negative affect) between pre-test and post-test results in the control group.

Table 5 The Paired Samples t test Results for Life Satisfaction, Positive Affect and Negative Affect (Control Group)

Variables	Groups	Number	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>
Life Satisfaction	Pre-test	38	30.45	3.29	1.00	37	.32
	Post test	38	29.79	2.61			
Positive Affect	Pre-test	38	13.61	0.97	-1.51	37	.14
	Post test	38	14.21	2.16			
Negative Affect	Pre-test	38	9.13	1.55	.41	37	.68
	Post test	38	9.00	1.79			

The mean score for pre-test and post-test results of internalizing and externalizing behavior are described in Table 6. Findings indicated that there was no significant difference between pre-test and post test results of internalizing behavior in the control group but there was a significant difference between pre-test and post-test results of externalizing behavior at 0.05 level.

Table 6 The Paired Samples t test Results for Students' Internalizing and Externalizing Behaviors (Control Group)

Variables	Groups	Number	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>
Internalizing Behavior	Pre-test	38	9.74	1.41	0.80	37	.43
	Post test	38	9.58	0.83			
Externalizing Behavior	Pre-test	38	10.03	1.75	2.17*	37	.04
	Post test	38	9.47	1.08			

Note. * Mean difference is significant at the 0.05 level.

Comparison of Pre-test and Post-test Results for Experimental Group

The mean scores and standard deviations of life satisfaction, positive affect, negative affect of pre-test and post-test for the experimental group are described in Table 7.

The results of t test stated that there were significant differences for all variables at 0.01 and 0.001 levels (see Table 7). Findings showed that the mean values for life satisfaction and positive affect of post-test were higher than pre-test and the mean value of negative affect of post-test was lower than pre-test in the experimental group. Therefore, after the positive psychology intervention, students in the experimental group had higher level of life satisfaction and positive affect in post-test than pre-test whereas they had lower level of negative affect.

Table 7 The Paired Samples t test Results for Life Satisfaction, Positive Affect and Negative Affect (Experimental Group)

Variables	Groups	Number	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>
Life Satisfaction	Pre-test	38	30.32	5.05	-3.53**	37	.001
	Post test	38	33.47	2.44			
Positive Affect	Pre-test	38	13.32	1.74	-8.15***	37	.000
	Post test	38	16.24	1.55			
Negative Affect	Pre-test	38	8.24	1.15	5.57***	37	.000
	Post test	38	7.05	1.14			

Note. ** Mean difference is significant at the 0.01 level.

*** Mean difference is significant at the 0.001 level.

There were significant differences of internalizing and externalizing behavior between pre-test and post test results of experimental group (see Table 8). The results showed that the mean values of internalizing and externalizing behavior of experiment group at post-test were lower than pre-test results. The finding stated that students who participated in experimental group showed lower internalizing and externalizing behaviors at post-test results. This suggests the effectiveness of positive psychology intervention program on promoting happiness.

Table 8 The Paired Samples t test Results for Internalizing and Externalizing Behaviors (Experimental Group)

Variables	Groups	Number	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>
Internalizing Behavior	Pre-test	38	9.71	1.45	6.32***	37	.000
	Post test	38	9.58	0.83			
Externalizing Behavior	Pre-test	38	10.31	1.40	7.74***	37	.000
	Post test	38	9.47	1.08			

Note. *** Mean difference is significant at the 0.001 level.

Discussion

The current study has discussed the existed research literature by making an investigation into the efficiency of a positive psychology intervention on lower secondary school students' subjective well-being and psychopathology. This study especially made a comparison between levels of life satisfaction, positive affect, and negative affect, internalizing and externalizing behaviors between students in treatment group who took part in PPI that focused on a numerous way of positive psychological constructs which include hope, gratitude, positive relationship, character strengths and kindness with their parent and teacher to those who are in control group.

According to the results of post-test, students involved in the positive psychology intervention program demonstrated apparent improvement in life satisfaction, positive affect, negative affect, internalizing and externalizing behaviors than students in the control group. This result is the similar finding of the studies of Savage and Mercer (2014) and Roth et al., (2017) that they found a significant increase in life satisfaction of students in experimental group. Students involving in the intervention group have a significant decrease in negative affect and increase in positive affect than other group in this study. This finding is similar of the study of Roth et al., (2017). The results give suggestion on the intervention which was possibly most efficient for school children who experienced in the fluctuation of their emotions at the beginning of school year and students can get the effectiveness of PPI program.

Limitations and Future Research

In this study, a purposive sampling with a school which stakeholder showed an interesting in PPI program. Therefore, the sampling in this study cannot represent accurately the general population of secondary school students. Second limitation of this study is that the differences made during the initial plan to keep session 1b, parents to give a provision of discussion and answer questions. Due to the attendance of parents at the session 1b, information was only distributed to parents through written format.

Future studies should use with a large sample to obtain more dependable, validity of findings and lead to the inferences drawn to explore the improvement in the outcomes of student's subjective well-being and psychopathology with PPI program. Furthermore, the future directions could present further analysis on the groups of students such as other graders, high vs. low socio-economic status of lower secondary school students) so as to get better results.

Conclusion

To sum up, it is more consistent with emphasizing on youth happiness with making efforts to view children. It is more effective focusing only to mental health problems of students. School-based mental health providers can be able to assess the psychological functioning and evaluate the needs of students by assessing positive indicators of well-being. Thus, intervention

support can be designed to target with the absence of subjective well-being and presence of mental health problems to improve optimal outcomes for students.

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A STUDY ON THE EXECUTIVE FUNCTIONS OF YOUNG CHILDREN

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Abstract

The main aim of the present study is to study the executive functions of young children. In this study, qualitative approach was used. The participants were 5 children (age 4-10) from Katha Township. Observation, reflection and performance-based tasks were used as the instruments in this study. The performance-based tasks are divided into three tasks; (a) Completion of mazes to measure working memory skills, (b) Head-Thigh-Toe (HTT) task to measure inhibition skills, and (c) Tasks that require sorting cards based on various criteria to measure cognitive flexibility (shifting) skills. The overall results showed that (4-10) year-old children's executive functions start to develop and can be improved as much as they can. And then, there was no general pattern based on age or gender. This is an important finding because it highlights that difference in executive functions is not necessary due to age or gender.

Keywords: Executive Functions, Inhibition, Cognitive Flexibility, Working Memory.

Introduction

Executive functions (EFs) are the cognitive abilities that control and regulate most of what we do in day to day life (Diamond, 2013). Executive functions are not only an essential component of self-regulation (Moffitt et al., 2011) but also broadly applied across a wide range of daily-life activities (Diamond, 2013). Executive functions are the staple of every students' learning. These are like any other skills and can be improved with training and exercises (Lee & Shute, 2010).

Executive functions play both direct and indirect parts in classroom learning. Executive functions design to help students sit still, pay attention, recall and follow rules, and flexibly adopt new perspectives. Children who well-practiced executive functioning skills may learn more easily, and this may initiate a positive cascade of indirect effects, such as preferring school and being motivated to work hard and get along with educators and peers. Differently, weak executive functioning skills may intervene with children's own (and others') learning and may lead to behavior problems, suspension, expulsion, or being held back (U.S. Department of Education, 2014). So, parents and educators should pay special attention to the importance of executive functions and promote these vital skills from early childhood for future success.

Purposes of the Study

The main aim of the present study is;

- to study the development of the young children's executive functions.

The specific objectives are;

- ✓ to examine the development of executive functions of young children by gender.
- ✓ to examine the development of executive functions of young children by age.

Definitions of Key Terms

Executive Functions : Executive functions are the cognitive abilities that control and regulate most of what we do in day to day life (Diamond, 2013).

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Inhibition : Inhibition is the ability to focus on the information that are important or relevant to the task and ignoring or inhibiting distractions or behaviors that are not important or relevant to task (Miyake et al., 2000).

Cognitive flexibility : Cognitive flexibility refers to shifting one's attention between or otherwise managing multiple tasks, goals, rules, or perspectives (Miyake et al., 2000).

Working memory : Working memory involves holding and working with information in one's mind (Miyake et al., 2000).

Review of Related Literature

When considering and understanding the various individual executive functions, discussion of the development of these skills is imperative. Levine (2002) had broken down development of executive functions into four periods: (1) preschool through first grade, (2) grades 1 through 3, (3) grades 4 through 8, and (4) adolescence.

There is a growing body of research that suggested executive functions develop substantially during the school years (Romine & Reynolds, 2005) with seeds being planted early in the preschool years (Best et al., 2009) that will become more fully developed in the later years. And then, Holler and Greene (2010) had described the development of executive functions as beginning even before birth.

According to Piaget's cognitive development model, 2 to 7 years old is the pre-operational stage. In this stage, object permanence is firmly established and symbolic thoughts develop. And then, 7 to 11 years old is the concrete operational stage. In this stage, the child can understand the principle of conservation, can use to manipulate, transform and then return an object to its original state.

Although the construct of executive functions was first introduced by Luria in 1966, theoretical consensus about the construct has been slow to develop. According to Luria (1966), the brain consists of three functional units, and it is the third unit in which EFs mechanisms operate. The first functional unit is located mainly in the brain stem and is responsible for regulating and maintaining arousal of the cortex. The second functional unit is responsible for encoding, processing, and storage of information and encompasses the temporal, parietal, and occipital lobes. The third functional unit is located in the anterior region of the brain (frontal lobes) and its functions include programming, regulating, and directing behavior. Within the third unit, the prefrontal cortex is considered by Luria as a superstructure that regulates or controls mental activity and behavior.

Developmental theorists have constructed theoretical frameworks of executive functions that delineate the component as having different developmental trajectories. Diamond (2006) supported a componential view of executive functions development, noting that working memory, inhibition, and cognitive flexibility (shifting) show different developmental trajectories and are unique sub-components in children ages 3-6 years old. Core executive functions (EFs) include inhibition (controlling one's behavior, attention, thoughts, emotions), working memory (temporarily holding and using information), and cognitive flexibility (effectively switching between tasks) (Diamond, 2013; Zelazo et al., 2013; Miyake et al., 2000).

Inhibition is the ability to focus on the information that are important or relevant to the task and ignoring or inhibiting distractions or behaviors that are not important or relevant to task (Miyake et al., 2000). Inhibition is a foundational executive function (EFs)—it allows students to control dominant responses in their attention, thoughts, emotions, and behaviors, and do what is right to meet the task and context demands. An example in a classroom context is overcoming the desire to blurt out an answer without raising one's hand. Older children utilize inhibition to

rally their attention to the task at hand, even when the task is not intrinsically interesting. For example, they curb the desire to pursue competing interests, such as getting on Facebook, rather than completing an online study quiz. Working memory involves holding and working with information in one's mind (Miyake et al., 2000). Working memory entails simultaneously storing and processing information. In mental math, for example, students have to keep two numbers in mind, bring to the forefront of their memories the rules for multiplication, use all this information to make the calculation, and generate a solution. As such, working memory underlies reasoning and problem solving. Cognitive flexibility, or the ability to shift mental sets, allows students to manage changing demands in classrooms. Cognitive flexibility refers to shifting one's attention between or otherwise managing multiple tasks, goals, rules, or perspectives (Miyake et al., 2000). At the simplest level, cognitive flexibility enables students to seamlessly switch between classroom activities—from individual note taking to collaborative problem solving. Cognitive flexibility also enables applying novel strategies to the task.

Method

Sampling

The participants were 5 children (age 4-10) from Katha Township. They are 5 children in the sample: one 4 year old male, one 5 year old female, one 6 year old female, one 8 year old male and one 9 year old male.

Research Method

In this study, qualitative approach was used.

Research Instrumentation

Observation. Wragg (2002) also noted that observations can take a qualitative lens that “[tells] the whole story” not just the frequency of an event. Gestures, movement, body language can all be an important part of the classroom (Wragg, 2002). The researcher observed children in the classroom for the following categories related to executive functions: inhibitory control, working memory, and cognitive flexibility. As each child was observed, the specific dialogue, expressions, interactions, and behavior were recorded. Some relevant pictures of the children were also taken as they related to the three categories.

Within the observation session, which typically was an hour to an hour and half, the researcher attempted to observe each participant for five to twenty minutes. While observing the participant, the researcher observed for the three components of executive functions and then recorded the details of each behavior. The time was not held constant for each participant. When the researcher observed a participant, the aim was to watch an entire event or process. In some cases, this meant that a participant was observed for 10-30 minutes.

Reflection. As observation were documented, the researcher spent time writing down reflection on patterns and thoughts about the daily and weekly observation in a reflective journal throughout the study. This is an important aspect of the qualitative study as insights and emerging patterns were tracked throughout the study.

Performance-based measures with tasks that tap core Executive Functions. There are many performance-based measures with tasks that tap core executive constructs. Among them, the researcher chooses the suitable three tasks. They are; (a) Completion of mazes to measure working memory skills, (b) Head-Thigh-Toe (HTT) task to measure inhibition skills, and (c) Tasks that require sorting cards based on various criteria to measure shifting skills.

Qualitative Data Collection Procedure

Observation. After gaining consent from the parents, the researcher began observation in the following categories for executive functions: working memory, inhibitory control, and cognitive flexibility. Over a five week period, the participants were observed from an hour to an hour and half. The researcher spent on average four to five hours per week during the morning hours of the days observing five children. The details of the participant's behavior as well as any dialogue, actions, facial expression were recorded as well as any pertinent pictures were taken of the participants in observation sessions by using checklist related to the three constructs of executive functions.

Reflection. After the observation session, reflective journal for any personal observation and thoughts were documented. Throughout each day, any observation from the environment were noted concerning the children's behavior and recorded reflection for later use. This is an important aspect of the qualitative study as insights and emerging patterns were tracked throughout the study.

Performance-based measure with tasks that tap core Executive Functions. (a) Completion of mazes procedure. When completing the maze, participants are expected to trace and complete a maze without crossing the maze line, backtracking or going over the same path twice, or entering a dead-end of "blind alley". If these requirements are at any point violated, the participants are given a new copy of the same maze to complete but for a reduced score. The participants are expected to complete a certain number of mazes, all of which increase in difficulty as the test progresses.

(b) Head-Thigh-Toe task procedure. The researcher used a revised version of the Head-Thigh-Toe (HTT) task considering its difficulty level for young children. The Head-Thigh-Toe (HTT) task, modified from the Head-Toes-Knees-Shoulders task (HTKS) to adjust the level of difficulty for children was administered to examine children's inhibition. This task has been successfully used to measure inhibition in preschool and primary school children (Chung, 2015).

Children were instructed to perform 'unnaturally' in response to three paired behavioral commands. For example, children were required to touch their toes when they heard the command to 'touch your head;' to touch the head when they heard the command to 'touch your thigh;' and to touch their thigh when they heard the command to 'touch your toes.' Feedback was only given for the practice items. The test commands were presented in a random order and the children were asked to respond as fast as they could. Children received two points for a correct response; one point for a self-corrected response; and zero points for an incorrect response.

(c) Tasks that require sorting cards based on various criteria procedure. Card sorting is a great, reliable and inexpensive method for finding patterns in how users would expect to find content or functionality, the cards sorting is usually used in young children (Frye, Zelazo, 1995). Those patterns are often referred to as the users' mental model.

There are two primary methods for performing card sorts. In open card sorting procedure, participants are given cards showing site content with no pre-established groupings. They are asked to sort cards into groups that they feel are appropriate and then describe each group. Open card sorting is useful as input to information structures in new or existing sites and products.

In closed card sorting, participants are given cards showing site content with an established initial set of primary groups. Participants are asked to place card into these pre-established primary groups. Closed card sorting is useful when adding new content to an existing structure, or for gaining additional feedback after an open card sort. This task measures the ability to integrate feedback as the rules and requirements of tasks often change and a shift in mental set is required.

Findings

Throughout the five weeks of observation, reflection, pictures and performance-based tasks were gathered and organized to gain a better understanding of pattern in the research procedure. The qualitative observation were typed into word documents by individual each week to aid in content analysis by using Hyper Research 450 Qualitative Analysis Software. The performance-based tasks were organized into five individual charts by Executive Functions constructs. The researcher ensures reliability and validity in the data analysis and in the findings by using Hyper Research 450 Qualitative Analysis Software. And then, the researcher generalized an overview of the final steps.

(a) Reflection for the Observation (Word Documents for Content Analysis)

Child 1

1. Child 1 thinks and acts before doing something.
2. Child 1 speaks and acts fluently based on various conditions and also know various things.
3. Child 1 can clearly explain the rules of the games when playing with friends.
4. Child 1 knows what to do and what not to do to get a job done.
5. Child 1 can do something from start to finish. (E.g., painting, drawing, building blocks, sorting cards and etc.)

Child 2

1. Child 2 first thinks about what to do before doing a tasks.
2. Child 2 can be categorized into the same and different things.
3. Child 2 can have fun playing rules games with friends.
4. Child 2 works until a task is completed.
5. When child 2 is asked something by the adults, he is able to respond accurately to the subject matter, he also knows how to do to complete the tasks.

Child 3

1. Child 3 often thinks and asks adults what he does not understand how to start the tasks and asks until he understands.
2. Child 3 can be categorized into the same and different things.
3. Child 3 can also play games with rules.
4. Child 3 can also complete the tasks.
5. Child 3 repeats a task over and over until it is completed.

Child 4

1. Child 4 is a good listener to her parents, adults and friends and always thinks the tasks before she acts.
2. Child 4 can also distinguish between similarities and differences of objects or conditions.
3. Child 4 also plays games with rules.
4. Child 4 also works until the job is done.
5. Child 4 is sure to get the job done step by step.

Child 5

1. Child 5 tends to focus on tasks.
2. Child 5 can also be categorized into the same and different things.
3. Child 5 can also pay clear instruction for the rules of the games when playing with friends.

4. Child 5 is able to do something successfully.
5. Child 5 can prepare for the task at hand to get the job done.

(b) Findings for Content Analysis of Observation

The results of the content analysis for the reflection of the observation by using Hyper Research 450 Qualitative Analysis Software are shown in the following frequency graph and pie chart: facts from the text document are represented and correlated in the form of frequency expressed as an actual number of the main constructs of Executive Functions. According to the results of content analysis, the mean percent of cognitive flexibility, inhibition and working memory are 28%, 46% and 26% respectively. So, the result has shown that selected (4-10) year-old children are most likely to use inhibition skill (46%).

Table 1 Frequency Analysis for Content Analysis of Observation

Executive Functions	Total	Min	Max	Mean	SD	Mean %
Cognitive Flexibility	10	10	10	10	0	28%
Inhibition	16	16	16	16	0	46%
Working Memory	9	9	9	9	0	26%

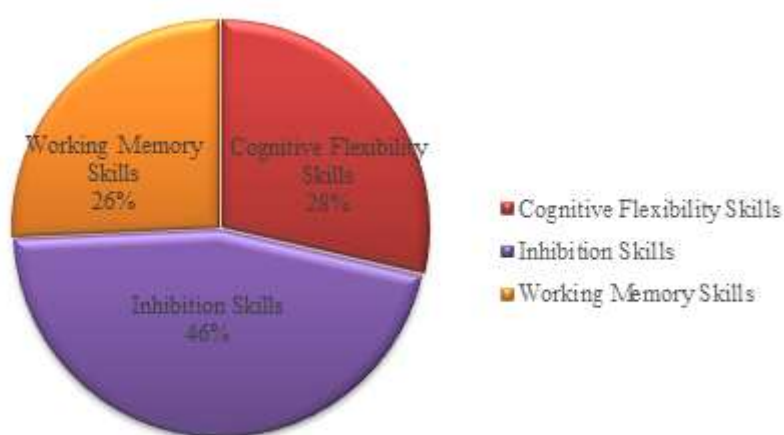


Figure 1 Pie chart for Content Analysis of Observation

(c) Findings for Inhibition Task

Sample	Inhibition (Head-Thigh-Toe)
Child 1	Sufficient attention, respond as fast as he can, get correct respond.
Child 2	Comfortable feeling, respond correctly in order to instruction.
Child 3	Special attention, repeated practice, get correct respond.
Child 4	Repeated instruction, complete the tasks with support, special attention.
Child 5	Sufficient attention, respond the tasks' instruction conveniently.

(d) Findings for Cognitive Flexibility Task

Sample	Cognitive Flexibility (Sorting cards)
Child 1	Sorting the cards according to the rules and requirements of tasks completely (e.g., shape or color).

Sample	Cognitive Flexibility (Sorting cards)
Child 2	Based on various criteria, sort the cards so fast.
Child 3	Sufficient sorting skills based on various criteria.
Child 4	Sorting the cards according to the rules and requirements of tasks completely.
Child 5	Based on various criteria, sort the cards so clever.

(e) Findings for Working Memory Task

Sample	Working Memory (Completion of mazes)
Child 1	When child 1 crosses the alley to the destination, he first uses his/her index finger to try to reach the goal without drawing pencil. If he/she has a clear idea of the path, child 1 can use the pencil to get to goal only. So that the tasks can be completed without error.
Child 2	Child 2 goes first with the intention of reaching the goal. Then draw and trace a line to the goal using a pencil. Child 2 can also carry out the tasks smoothly.
Child 3	Child 3 uses the first pencil to draw the path at once, but the path is blocked and a new duplicate is obtained. Because child 3 was careful not to make another mistake, he carefully guided the path and reached for it with a pencil, so the task was successful.
Child 4	Child 4 carefully completes the task by carefully looking at the path of the goal and then using the pencil to get to the right path.
Child 5	Child 5 is able to draw a path and then follow the path of imagination, so that she can draw the right path and succeed.

Discussion

In this study, child 1 can pay sufficient attention and respond Head-Thigh-Toe task to measure inhibition skills of executive functions as fast as he can and get the correct respond. In sorting cards task to measure cognitive flexibility skill, child 1 can sort the cards according to the rules and requirements of tasks completely (e.g., shape or color). In working memory task, child 1 can also get good completion of mazes.

And then, child 2 has comfortable feeling for inhibition task and respond correctly in order to instruction. Child 2 can sort the cards so fast based on various criteria of cognitive flexibility task and well done the working memory task.

Child 3 can pay special attention for inhibition task. Although child 3 is the youngest child in the sample population, he can get correct respond with the help of researcher's repeated instruction. And he has sufficient sorting skills based on various criteria. In working memory task, he can also complete the mazes correctly.

Child 4 can also pay special attention and complete the inhibition task with the instruction. Child 4 can sort the cards according to the requirements of task completely and well done the working memory task.

Finally, child 5 can respond the task's instruction conveniently and pay special attention. Based on the various criteria, child 5 can sort the cards so clever. And then, she can finish the working memory task correctly.

In brief, according to the results of this study, all children can pay good respond to the all performance-based tasks of the executive functions regardless of gender or age group. It is found that young children can do well like older children and females can do well with males by the results of this study. According to the observation, reflection and performance-based tasks, child 1 has the best inhibition skills among the children so child 1 has sufficient attention and gets special support from the parents.

In cognitive flexibility task and working memory task, all children can complete the tasks correctly and conveniently because they can pay special attention, have comfortable feeling and sufficient support from their family.

Conclusion

This study followed up qualitative study and results. As a result of the study, (4-10) year-old children's executive functions start to develop and can be improved as much as they can. And then, there was no general pattern based on age or gender according to this research findings. This is an important finding because it highlights that difference in executive functions is not necessary due to age or gender. The difference could be due to individual developmental needs or personality. The finding is consistent with the results of Ashley Darcy (2014).

Chavelier et al. (2012) found the component of executive functions develops at different ages (Chavelier et al., 2012, cited in Darcy, 2014). Burrage et al. (2008) found that the development of executive functions was based on experience, not on age or gender. In a classroom, experience does play a part in children's behavior in the classroom. For example, the newer the child is to the room, the more information the child needs to be successful.

This study highlights the need for more information of executive functions, how to support children ages of four to ten as well as the need for comparative executive functions studies within other children age levels.

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Appendix

Sample mazes to measure Cognitive Flexibility Skills



ball



kite



carrot



corn



cauliflower



apple

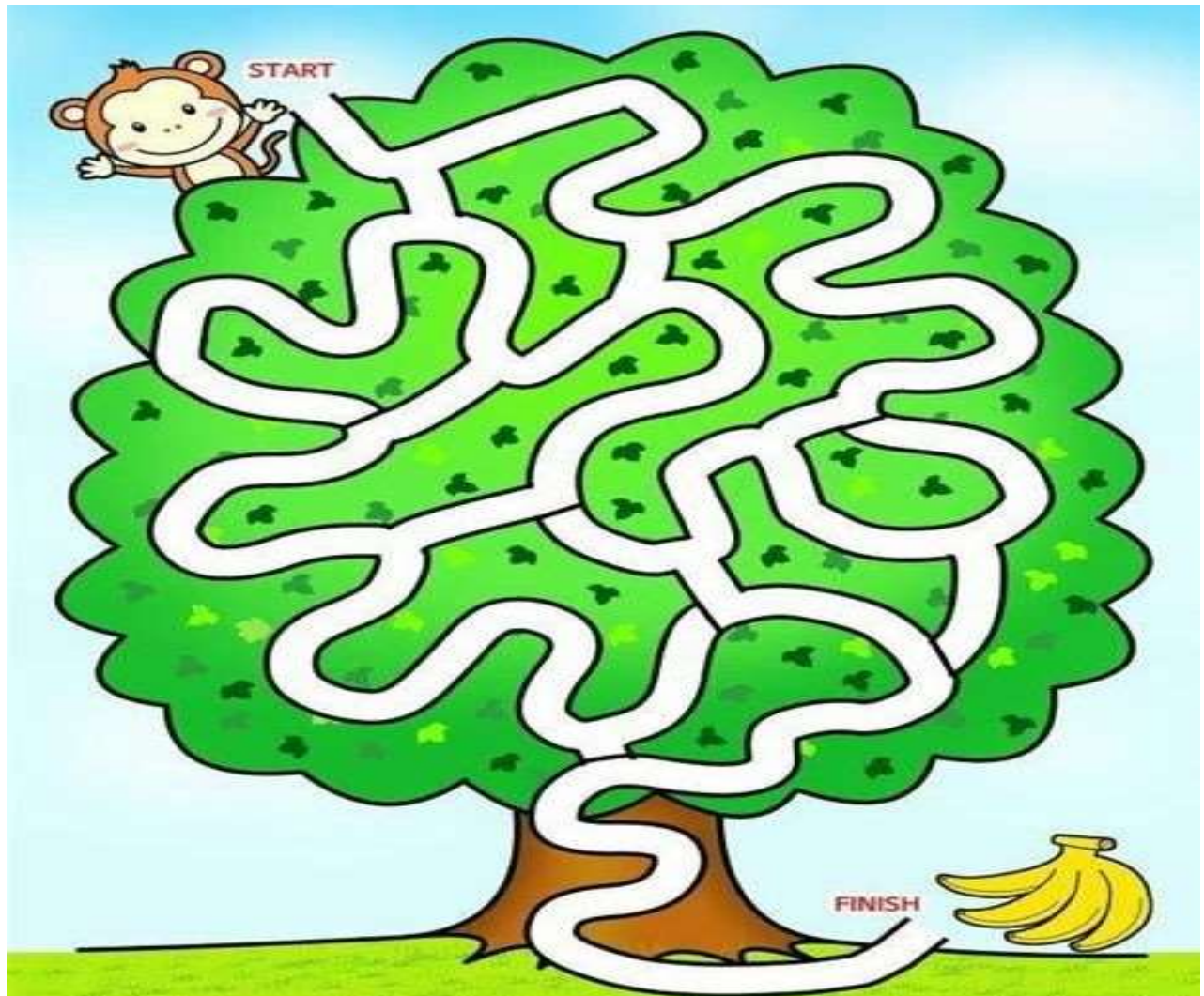


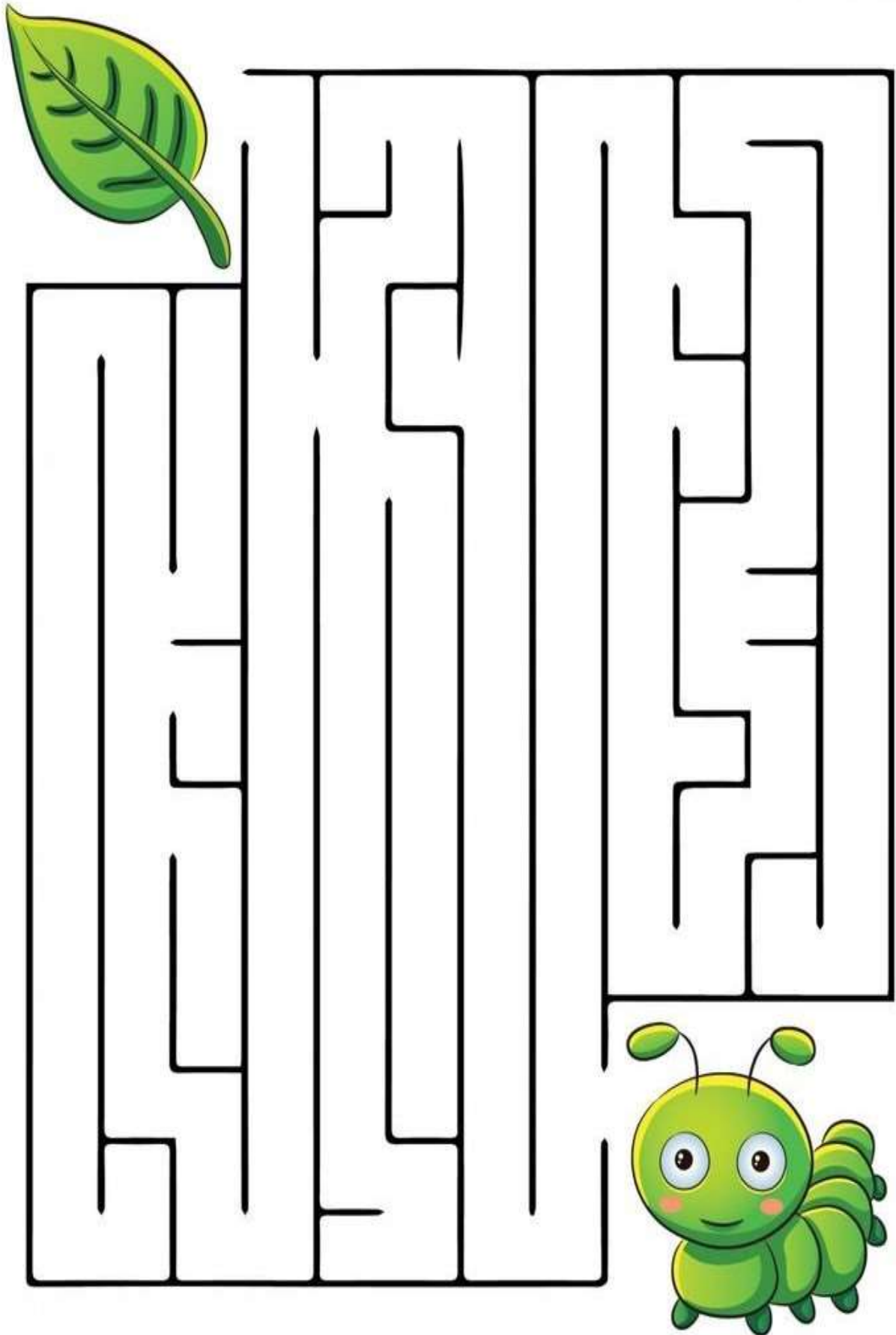
doctor



teacher

Sample cards to measure Working Memory Skills





VALIDATION OF BASIC PSYCHOLOGICAL NEEDS AT WORK SCALE

Wah Wah Aye¹, May Cho Min²

Abstract

This study aimed at investigating whether the Basic Psychological Needs at Work Scale can be used to measure work motivation of teacher educators in Myanmar. Based on self-determination theory, the Basic Psychological Needs at Work Scale had been developed by Deci and Ryan (2000) to assess work motivation. It contains three subscales: autonomy (6 items), competence (7 items) and relatedness (8 items). The importance of the basic psychological needs for autonomy, competence and relatedness are the central concepts in understanding the motivational process going on in the workplace. The purpose of the study was to validate the Basic Psychological Needs at Work Scale in a sample of teacher educators from Education Degree Colleges. A total of 450 teacher educators from Education Degree Colleges participated in this study. The results of the confirmatory factor analysis indicated that the model fits with the three-factor structure model (RMSEA = 0.060., TLI = 0.903, CFI = 0.911, SRMR = 0.057, $p < 0.001$). Moreover, this study confirmed the convergent and discriminant validity of the scale. Furthermore, the internal consistency of scale and subscales were satisfactory results. Therefore, the Basic Psychological Needs at Work Scale is valid and reliable to measure work motivation of teacher educators in Myanmar.

Keywords: Basic Psychological Needs at Work Scale, Work Motivation, Teacher Educators, Education Degree Colleges, Confirmatory Factor Analysis

Introduction

Motivation is essential everywhere to improve human behavior, to guide the behavior and maintain it. Moreover, motivation plays an important role in any organization because it increases the productivity and capability of workers and the goals of the organization can be achieved efficiently and actually. Humans' behaviours and attitudes can be changed by giving motivation in the organization. According to the situation and circumstances, the level of motivation differs within human beings. Lack of motivation among teacher educators occurs in teacher unwillingness to participate in school activities, poor work productivity, less work satisfaction, late responsive behaviours, lack of additional training, uncreative and non-stimulating teaching, lack of interest in their professional development, and negative attitudes in their workplaces.

From a psychological point of view, work is an important resource of human identity, self-esteem and self-confidence. Work makes a sense of fulfillment and satisfaction for an employee by defining one's value to the society. Increasing motivation, commitment and engagement levels are essential in today's work environment. The process of motivation usually starts when someone encounters an unsatisfied need and to handle someone's attitudes and behaviours. Rewards and incentives motivated people to better accomplish the given goals. The social context will also affect the motivation level of someone. This context consists of organizational values and culture but it also includes leadership and management as well as the influence of the group or team in which a person works.

Gorham and Millete (1997) stated that teachers with low levels of motivation tend to perceive their students' motivation levels as low. If the teachers do not have sufficient motivation in schools, they are less competent which directly influences the students and the education system. Moreover, teachers with low motivation are not interested in their

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professional life, reduce their efforts, get more stress and lose their identification in their roles and profession.

In Myanmar, none or previous studies have investigated the validation of Basic Psychological Needs at Work Scale (BPNWS) in order to assess work motivation of teacher educators. To address this gap, this study aimed at investigating the validation of Basic Psychological Needs at Work Scale.

Purposes of the Study

The main purposes of this study were to investigate whether the Basic Psychological Needs at Work Scale (BPNWS) can be used to measure work motivation of teacher educators and to validate the Basic Psychological Needs at Work Scale (BPNWS).

Definition of Key Term

Work motivation. Work motivation is a set of energetic forces that originate both within as well as beyond an individual's being, to initiate work-related behaviour and to determine its form, direction, intensity and duration (Latham & Pinder, 2008).

Autonomy. Autonomy is the need to feel ownership of one's behaviour (Connell & Wellborn, 1991).

Relatedness. Relatedness is the need to feel connected and belongingness with others (Connell & Wellborn, 1991).

Competence. Competence is the need to produce desired outcomes and to experience mastery (Connell & Wellborn, 1991).

Review of Related Literature

Basic Psychological Needs in the Workplace

Work motivation plays an important role only to improve the teaching and learning process in the classroom but to reinforce teachers' behaviours and attitudes in their profession. Generally, motivated teachers help to reinforce their students more in the classroom, implement educational reforms well and give the feelings of satisfaction and fulfillment for their students. Although teacher motivation is fundamental to the teaching and learning process, several teachers are not highly motivated. According to Dai and Sternberg (2004), high levels of job dissatisfaction, stress, and burnout can negatively influence motivation and job performance.

Teachers are the essential professional group for our nation's future. Ford et al.(1992) found that large class size, double-shifting, rural location, high educational attainment and active parental involvement negatively correlated with teacher job satisfaction in these countries. Moreover, her study indicated that the level of communication between teachers and school managers had no statistically significant impact on teacher job satisfaction.

Voluntary Service Overseas (VSO) in the United Kingdom in 2002 noted that one of the main findings was that teachers' motivation was fragile and declining. The report noted that there is a strong link between teachers' motivation and performance, and education quality, but improving teachers' motivation is not uniformly prioritized as a major concern of national and international policy-makers. Motivation and performance are very important factors in terms of organization success and achievements. If changes occur in an external environment, it is necessary for an organization to adopt that change may motivate them to gain a competitive advantage. Thus, the main thing they require is skilled and competent employees (Latt, 2008). To understand the motivational process going on in the workplace, the importance of the basic psychological needs for autonomy, relatedness and competence are the central concepts. First,

the need for autonomy (deCharms, 1968) refers to the feeling of choice and concurrence with one's actions. Second, the need for competence (White, 1959), refers to the feeling of being effective and capable. Third, the need for relatedness (Baumeister & Leary, 1995) refers to the feeling of a connection to, caring for, and being cared for by other individuals and groups. A central underpinning of self-determination theory is the basic psychological needs.

Self-determination Theory

Self-determination theory represents a powerful framework that taps into different questions of human motivation and is used in a wide range of different contexts such as sports, education, health and work. Ryan and Deci (2000) developed the self-determination theory, a framework that illuminates the relationship between extrinsic and intrinsic motivation along a continuum that reflects the level of internalization. In this theory, the fundamental needs are competence, autonomy, and relatedness that really need to motivate the workers. The three fundamental needs interact with the internal (or personal) and external factors. The more a person is satisfied by their needs for competence, autonomy, and relatedness, the more the source of motivation is intrinsic.

Feelings of competence, relatedness, and autonomy at work were found to positively predict job satisfaction and negatively predict emotional exhaustion, which in turn explained variance in the employees' turnover intentions. However, satisfying a single need, such as competence, does not indicate intrinsic motivation without the presence of the other needs, such as autonomy (Ryan & Deci, 2000).

The more autonomous forms of motivation teachers also perceive towards their work are related to more autonomy support for their pupils (Pelletier et al., 2002). Much of the research with self-determination theory has focused on environmental factors (or external factors) that can hinder or undermine self-motivation and researchers have found that these factors can be described as thwarting the three basic needs of competence, autonomy, and relatedness (Ryan & Deci, 2000).

Factors that foster competence, autonomy, and relatedness enhance self-determined motivation and factors that impair these basic needs negatively affect self-determined motivation (Grouzet et al., 2004). Competence is a person's ability to use appropriate means to attain the relevant goal or the desired result (Ford, 1992) and has an effect on a teacher's motivation for professional development. Jesus and Lens (2005) combine multiple theories of motivation in an attempt to develop an integrated model for the study of teacher motivation. Pelletier, Seguin-Levesque, and Legault (2002) found that the more teachers perceive pressure from above (e.g., performance standards, complying with curriculum) and below (e.g., students unmotivated to learn), the less they are self-determined to teach.

Therefore, Vallerand and Ratelle (2002) reported that teachers who took ownership over their learning and decision making during professional development activities had a stronger level of change. Relatedness or the need to feel as if one belongs and connects with others, is important for facilitating internalization (Ryan & Deci, 2000). Relatedness can include teachers belonging or connections to other school staff as well as the mathematics content they teach.

Self-determination theory is that human beings have deeply evolved psychological needs to be competent, autonomous, and related to others, such that in contexts where these needs are satisfied people evidence more volitional, high-quality motivation and greater well-being, and when these psychological needs are thwarted people display various forms of diminished motivation and more symptoms of ill-being. Self-determination theory proposes

that environments supportive of people's needs for competence, autonomy, and relatedness promote better work performance and better adjustment at work. In the present study, the researcher used the basic psychological needs at work scale to measure teacher work motivation in which self-determination theory is the theoretical framework to assess teacher work motivation.

Method

Participants of the Study

Teacher Educators from Education Degree Colleges were selected as the participants of the study. The participants were chosen by using stratified random sampling technique. Firstly, 60% of states and regions in Myanmar (four states: Shan, Mon, Chin and Kayah State, five regions: Yangon, Magway, Ayeyarwaddy, Sagaing and Bago Region) was selected. Therefore, altogether 9 education degree colleges were chosen and then nearly 45 teacher educators from each education degree college were selected. Finally, a total of 450 teacher educators participated in this study. All participants were recruited from Education Degree Colleges by the researcher, given a thorough explanation about the study, and asked if they wished to participate in the questionnaire response voluntarily with informed consent.

Instrument

Basic Psychological Needs at Work Scale (BPNWS): The Basic Psychological Needs at Work Scale (BPNWS) is an instrument developed by Ryan and Deci (2000) to assess work motivation. The theoretical framework of this instrument is self-determination theory (Deci & Ryan, 2000). It is 21-item instrument and consists of three factors: (1) Autonomy (6 items) - the feeling one has choice and willingly endorsing one's behaviour (Sample Item; "I am free to express my ideas and opinions on the job."), (2) Relatedness (7 items) - the need to feel connected and belongingness with others (Sample item; "People at work are pretty friendly towards me.") and (3) Competence (8 items) - the experience of mastery and being effective in one's activity (Sample item; "I pretty much keep to myself when I am at work."). The items were rated on a five-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = strongly agree).

Instrumentation

The Basic Psychological Needs at Work Scale (BPNWS) used in this study was adapted to the Myanmar version. After preparing the measuring scale, expert review was conducted for face validity and content validity by 14 experts who have special knowledge and close relationship in the field of educational psychology and educational test and measurement. Next, revisions in item length, the wording of items, and content were made during preliminary administrations of the questionnaire.

Data Collection Procedure

According to the Covid-19 pandemic situation, data were collected via online survey by using a Qualtrics form. Then, to investigate the factor structure of 21-item Basic Psychological Needs at Work Scale (BPNWS), confirmatory factor analysis was undertaken to test the model data fit by using SPSS-AMOS software (version 24). In order to determine the validity and reliability of the scale, reliability and confirmatory factor analysis was conducted.

Result

Result of Confirmatory Factor Analysis

Confirmatory factor analysis was used to establish the three factors of Basic Psychological Needs at Work Scale (BPNWS) to measure work motivation of teachers.

Confirmatory factor analysis is a hypothesis testing method which tests whether the obtained data set is suitable for a model (Schriesheim, Hurley, & Scandura, 1997). Confirmatory factor analysis is a multivariate statistical procedure that is used to test how well the measured variables represent the number of constructs.

With confirmatory factor analysis (CFA), the researchers use a variety of fit indices to determine whether the model fit is acceptable or not. These indices include measures of global fit, or fit of the entire model to the data, such as the Goodness of Fit Index (GFI), chi-square, Tucker-Lewis Index (TLI) which is the same as Non-normed Fit Index (NNFI), Root Mean Square Error of Approximation (RMSEA), the Standardized Root Mean Square Residual (SRMR) and Comparative Fit Index (CFI). Hu and Bentler (1999) recommended that the maximum cutoff value of 0.8 for RMSEA and the cutoff value of 0.6 for SRMR and the minimum cutoff value of 0.90 for TLI and CFI and a p-value for the Chi-square less than 0.005 can be considered as the model is a good fit. The fit indices for assessing the goodness of fit in CFA are described in Table 1 (Bentler, 1990)

Table 1 Fit Indices for Assessing the Goodness of Fit in Confirmatory Factor Analysis (CFA) (Bentler, 1990)

Name	Index	Level of acceptance
Discrepancy chi-square	Chisq	0.000
Root Mean Square of Error of Approximation	RMSEA	<0.08
Standardized Root Mean Square Residual	SRMR	<0.08
Comparative fit index	CFI	>0.09
Tucker-Lewis Index	TLI	>0.09

Model Fit Statistics

The maximum likelihood confirmatory factor analysis was conducted to examine the underlying latent variable structure of 21-item Basic Psychological Needs at Work scale (BPNWS).

Based on the data in Table 2, a confirmatory factor analysis with changes yielded the fit indices as a p -value < 0.001, CFI = 0.911, TLI = 0.903, and RMSEA = 0.060, TLI=0.0903 and SRMR= 0.057 showed a relatively good fit. The results indicated that the model fit indices were acceptable and the model fits to the data.

For a model to have acceptable fit, the standardized regression weights (R^2) on each item were greater than 0.4. Moreover, Hooper, Cough and Mullen (2008) expressed that it is good to remove the items with low R^2 values (less than 0.2) from the analysis to remove the better model fit. In this study, the R^2 values of all items were greater than 0.4. Therefore, there were no items to remove.

Table 2 Model Fit Statistics for Basic Psychological Needs at Work Scale (BPNWS)

Model	p -value	RMSEA	CFI	TLI	SRMR
Basic Psychological Needs at Work Scale	0.000	0.060	0.911	0.903	0.057

Convergent Validity of Basic Psychological Needs at Work Scale (BPNWS)

Further assessment of validity involved an assessment of construct validity: convergent and discriminant validity. Convergent validity for the subscales was assessed by estimating the composite reliability (construct reliability) for each subscale and an assessment of the factors' average variance extracted (AVE). Hair, Black, Babin, and Anderson (2009) stated that an item factor loading ≥ 0.5 and $p < .05$, $AVE \geq 0.5$, and $CR \geq 0.6$. AVE is often too strict, and convergent validity can be established through CR alone.

To establish convergent validity, factor loading of the indicator variables, composite reliability (CR) and average variance extracted (AVE) should be used. AVE and CR values were computed by the formula using Microsoft Excel. The results of AVE and CR of Basic Psychological Needs at Work Scale (BPNWS) (see Table 3).

Table 3 Construct Reliability (CR) and Average Variance Extracted (AVE) of Basic Psychological Needs at Work Scale (BPNWS)

Factor	CR	AVE
Autonomy	0.74	0.35
Relatedness	0.62	0.51
Competence	0.75	0.40

According to Table 3, The AVE values for the model ranged from 0.35 to 0.51. The CR values range from 0.62 to 0.75. According to Hunang et al. (2013), AVE should be above 0.5 and CR should be 0.6 and above 9 (as cited in Bentler, 1990). According to Table 3, some AVE values were above 0.5 and CR values were above 0.6 so that convergent validity was achieved for this construct. Therefore, Basic Psychological Needs at Work Scale (BPNWS) was assumed to be a valid instrument to measure teachers' work motivation in Myanmar.

Discriminant Validity of Basic Psychological Needs at Work Scale (BPNWS)

Discriminant validity was used to show that the construct is actually different from one another empirically. Discriminant validity was evaluated by the correlation coefficients of the factors and the square root of AVE (see Table 4).

Table 4 Factor Correlation Matrix with Square Root of the AVE on the Diagonal

Factors	Autonomy	Relatedness	Competence
Autonomy	0.625		
Relatedness	0.574	0.714	
Competence	0.558	0.607	0.632

Note. The diagonal numbers in bold letters are the square root of AVE values.

According to Table 4, all the square root of AVE values was greater than 0.5 and these values were greater than all the inter-latent factor correlations for all factors in the relevant rows and columns. According to Fornell and Larcker (2011), the square root of AVE should be above 0.5. Then, according to Hair et al. (2011), the square root of AVE values was greater than the inter-latent factor correlations.

Thus, the results of the discriminant validity of BPNWS were congruent with Fornell and Larcker (2011) and Hair et al. (2011). According to Table 4, discriminant validity can be

accepted for the measurement model and the discriminant model and the discriminant validity between the constructs.

Reliability of Basic Psychological Needs at Work Scale (BPNWS)

One of the most popular estimates of internal consistency is reliability coefficient. Therefore, the internal consistency of the basic psychological needs at work scale (BPNWS) was assessed.

Based on Table 5, reliability coefficients of each subscale ranged from 0.701 to 0.761 and the reliability coefficient of the BPNWS was 0.794. Thus, the BPNWS was reliable to measure teachers' work motivation.

Table 5 Number of Items and Reliability Coefficient for each Subscale of Basic Psychological Needs at Work Scale (BPNWS)

Factors	Number of items	Reliability Coefficient
Autonomy	6	0.701
Relatedness	7	0.761
Competence	8	0.704
BPNWS	21	0.794

Discussion

In this study, the psychometric properties of Basic Psychological Needs at Work Scale (BPNWS) for assessing work motivation of teachers were presented. All the model fit indices (RMSEA = 0.060, CFI = 0.911, TLI = 0.903, SRMR = 0.057 and $p < 0.001$) indicated a good fit between the measurement model tested and the data. The convergent validity of BPNWS was indicated by good composite reliability values and acceptable AVE values. The discriminant validity of the model was also indicated by the AVE values. As the internal consistency reliability, the reliability coefficient for Basic psychological Needs at Work Scale (BPNWS) pointed out the satisfactory results. Therefore, Basic Psychological Needs at Work Scale (BPNWS) can be used to measure teacher educators' work motivation in Myanmar. Based on the results of validation processes, the BPNWS was reliable and valid in measuring work motivation of teacher educators.

This study was mainly a measurement study and the findings demonstrated that the instrument has adequate psychometric properties (valid and reliable). The finding of this study has expanded the existing body of knowledge on the development of a measurement scale to evaluate the work motivation of teacher educators. Hence, the model reported here might be useful in the educational psychology context and may be interested in assessing the teachers' work motivation. In summary, it is expected that there will be a great value for the policy makers and the principals to assess the motivation levels of teachers and reinforce to be more positive behaviours and attitudes in their workplace.

Conclusion

Education is a dynamic field that continuously changes and expands. Therefore, teacher educators must consider themselves as a lifelong learner and engage themselves in the continuing learning process, where they can develop the skills and knowledge essential to meet an ever-evolving and increasingly complex world. Today many challenges and changes are also causing in education. To face these situations, teacher educators need to have strong professional minds and high professional identity and strong work motivation.

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CONSTRUCTING ENGLISH READING COMPREHENSION ABILITY TEST FOR HIGH SCHOOL STUDENTS BY USING AN IRT MODEL

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Abstract

Although the mastery of reading comprehension in English is becoming more important day by day, a large number of students in Myanmar seem to suffer from poor reading comprehension. Appropriate assessment is the essential to assess the English reading comprehension ability of students so as to provide them with necessary feedbacks and instructions. So, the main aim of this study is to construct the standardized English Reading Comprehension Ability Test (ERCAT) for Myanmar High School students. In this study, descriptive survey design and quantitative approach was used. Snow and the RAND Reading Group's (2002) Framework of Reading Comprehension was used as the primary framework for constructing the test in this study. Barrett's Taxonomy of Reading Comprehension (Barrett, 1976) was used to define the cognitive demand level of the tasks included in the ERCAT. Initial item pool of the test consists of 74 items related to 25 reading passages of various lengths. Then, the pilot testing was conducted with 316 high school students from B.E.H.S Intagaw, Bago. Some items were revised and eliminated according to IRT calibration. The final version of the ERCAT included 40 items related to 15 reading passages. Then, as the field testing, the data was collected from 1026 high school students by using stratified random sampling technique. The results revealed that all items' difficulties and discriminations were between the acceptable ranges. The empirical reliability of the ERCAT is 0.9354 and the maximum test information of the test $I(\theta)$ was 19 at $\theta = 0.25$. The test had smaller standard error across the ability scale from -1.25 to +1.75 and thus, the test was informative for the average ability range as it was predicted.

Keywords: Test Construction, Reading Comprehension Ability, IRT Model, High School Students

Introduction

Reading comprehension has started to receive a special focus in foreign language teaching since it can be considered as the most important skill for getting information, and exploring and broadening academic knowledge (Azeroual, 2013). Above of all, English reading comprehension is increasingly important in creating a successful society because English is the language of information in many professional areas including science, technology, medicine, etc. It is also the main language of books, academic conferences, international business, diplomacy and sport.

Cain and Oakhill (2006) found out in their research that children who showed superior comprehension ability would later have greater educational success and their finding highlighted the importance of acquiring good comprehension skills. However, students in general encounter challenges in reading with meaning (National Reading Panel, 2000). The percent of the struggling readers in the high school context have reached about 70% in the USA. The problem of reading comprehension is a world-wide educational issue and especially, when reading in English as a foreign language, the challenge of comprehension gets worse.

At the same time, in Myanmar, most students are focusing on learning the vocabulary by heart, finding the main ideas and retrieving facts with shallow understanding of the content while they read in English. Current assessment system for high school level almost emphasizes on the memorization of the contents prescribed in the English textbook rather than the acquisition of reading comprehension ability.

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Due to the lack of standardized English reading comprehension tests in Myanmar, most high school students seem to encounter difficulty in assessing their comprehension ability. Moreover, the most popular reading tests such as TOEFL junior, etc., are unaffordable to most Myanmar high school students. The present study intended to fill this gap by constructing standardized English reading ability test for Myanmar high school students. The results of this study will hopefully help to provide the high school teachers with the knowledge of constructing a standardized test using an IRT model.

Purposes of the Study

The main aim of the present study is

- to construct the English Reading Ability Test for high school students by using an IRT model

The specific objectives are

- to construct the English Reading Ability Test for students with average ability, and
- to differentiate the qualities of the items included in the test.

Definitions of Key Terms

Test Construction. Test construction refers to the science and art of planning, preparing, administering, scoring, statistically analyzing, and reporting results of test (Downing, 2010).

Reading Comprehension Ability. Reading comprehension ability is the ability to utilize lower order reading processes (including decoding and vocabulary knowledge) and higher order reading processes (including relation of text content to schema and conscious controllable processing) to understand concepts and ideas from text (Pressley, 2000).

IRT Model. An Item Response Model shows the relationship between the ability or trait measured by the instrument and an item response (DeMars, 2010).

Related Literature Review

Reading Comprehension Process

Reading is a complex cognitive skill involving many sub-skills and processes ranging from basic lower-level visual processes involved in decoding the print to higher level skills involving skills of text comprehension and higher-level thinking. According to the comprehensive theory of the reading process presented by Grabe and Stoller (2002), both lower-level decoding skills and the higher-level comprehension interact to produce successful comprehension of texts.

The lower-level processes are mostly automatic and involve linguistic skills, such as vocabulary for lexical access, grammar for syntactic parsing, and the combination of meaning and structural information for semantic proposition formation. Higher-level processes involve the coordination of ideas from a text in order to form a meaningful representation of the text. Background knowledge and reading strategies are also used for the interpretation of the text. These higher-level processes interact in more complex ways and require higher cognitive abilities (Grabe & Stoller, 2002).

Using an IRT Model in Test Construction

Whenever a test is constructed, development of test specifications, item writing, field testing the items and calibrating the items should be done first. Then, the good items are selected for the final test (Baker, 2001). A test can generally be constructed by using one of the two test theories, namely, classical test theory (CTT) and item response theory (IRT).

The major advantage of IRT models over classical test theory is that classical item and test characteristics (statistics) vary depending upon the group of candidates but IRT item and test

characteristics do not. Classical indices of item difficulty, point-biserial correlation and reliability may all change if candidate differ in ability distribution (Hathaway, Houser, & Kingsbury, 1985). An IRT model compares the difficulty of the item with the ability of the candidate and estimates the probability that the candidate will correctly answer the item. If an IRT model is used in constructing a test, a measure of the precision of the item calibration and ability estimate is available for each item and each candidate and thus, it can provide additional valuable statistical information.

Method

Sampling

The participants for this study were chosen by using stratified random sampling technique. Firstly, two states (Kachin and Rakhine) and three regions: (Mandalay, Ayeyarwaddy, and Bago) (30% of total states and regions) were selected. And then, 2 high schools under Department of Basic Education from each selected state and region were chosen. Therefore, altogether 10 high schools were chosen and then nearly 100 high school students from each high school were selected. Finally, 1026 students were chosen for this study.

Research Method

In this study, descriptive survey design and quantitative approach were used.

Research Instrumentation

Theoretical Framework Used for Constructing Reading Comprehension Ability Test

In present study, the framework used in constructing English reading comprehension ability test for high school students was Snow and the RAND Reading Group's (2002) Framework of Reading Comprehension which defined reading comprehension as the joint outcome of three combined sources of influence: the reader, the text and the activity or task for reading.

Reader: A reader brings a number of reader factors to reading, which can include motivation, prior knowledge, and other cognitive abilities.

Text: Reading necessarily requires material for the reader to read. In an assessment, that material which may be a piece of text or a set of texts related to a particular task must include sufficient information for a proficient reader to engage in meaningful comprehension and resolve the problem posed by the task.

Tasks: Task factors include the potential time and other practical constraints, the goals of the task, and the complexity or number of tasks to be completed.

A reading comprehension test is for enabling to measure the comprehension ability of students by manipulating task and text factors. Based on this framework, the selection process of text passages to be included in the present study was carried out. The researcher adapted the reading passages from Preparation Book for TOEFL Junior Test (Reading Comprehension Advanced) and The B level (B1 and B2) Exam in English (Student's Book). The consideration was taken to select the text passages with appropriate context and difficulty for the Myanmar high school students.

To ensure a broad coverage of reading comprehension domain, a broad range of text types including descriptive, narrative and expository texts were used in this study. According to the length of the text, there were 25 reading passages of different lengths of which, specifically, were 20 single and short passages with the mean length of 41 words, 4 medium passages with the mean length of 159 words, and a long passage of 5 paragraphs with the length of 411 words.

Then, a table of specifications was developed in order to construct the items with high content validity. Initial item pool of the test consists of 74 items. Many educationists and

researchers use different taxonomies to categorize the levels of comprehension tasks (Umalusi, 2011). In this study, Barrett's taxonomy of reading comprehension was used to define the intended cognitive demand level of each item.

Taxonomy Used to Define the Cognitive Demand Level of Reading Tasks

Barrett's Taxonomy of Reading Comprehension, as shown in Table 1, was used to define the cognitive demand levels of various types of reading comprehension questions in this study.

Table 1. Barrett's Taxonomy of Reading Comprehension (Barrett, 1976)

Type of cognitive demand	What questions require of the student/examinee
1.Literal Comprehension Recognition or recall of <ul style="list-style-type: none"> - details - main ideas - a sequence - comparison - cause and effect relationships - character traits 	To locate or identify any kind of explicitly stated fact or detail (for example, names of characters or, places, likeness and differences, reasons for actions) in a reading selection/text/ material
2. Reorganization <ul style="list-style-type: none"> - classifying - outlining - summarizing - synthesizing 	To organize, sort into categories, paraphrase or consolidate explicitly stated information or ideas in a reading selection/text/material
3.Inferential Comprehension <ul style="list-style-type: none"> - main ideas - supporting details - sequence - comparisons - cause and effect relationships - character traits - predicting outcomes -interpreting figurative language 	To use conjecture, personal intuition, experience, background knowledge, or clues in a reading selection/text/ material as a basis of forming hypotheses and inferring details or ideas (for example, the significance of a theme, the motivation or nature of a character) which are not explicitly stated in the reading selection/ text/ material
4. Evaluation – Judgment of <ul style="list-style-type: none"> - reality or fantasy - fact or opinion - adequacy or validity - appropriateness -worth, desirability and acceptability 	To make evaluative judgment (for example, on qualities of accuracy, acceptability, desirability, worth or probability) by comparing information or ideas presented in a reading selection/text/material using external criteria provided (by other sources/authorities) or internal criteria (students' own values, experiences, or background knowledge of the subject)
5. Appreciation <ul style="list-style-type: none"> -Emotional response to content -Identification with characters -Reactions to author's language use -Imagery 	To show emotional and aesthetic/ literary sensitivity to the reading selection/text/material and show a reaction to the worth of its psychological and artistic elements (including literary techniques, forms, styles, and structuring)

Source: Barrett, 1976

Scoring Rubrics for English Reading Comprehension Ability Test

To assess the student's responses on various types of reading tasks, scoring rubric was developed as a scoring guide. Each item with multiple-choice format was worth one point. The tasks which require the students to select a summary or a title for each passage in a given text were in the form of matching items and all these items were worth one point per item. Each item included in a cloze procedure was also worth one point. It was worth one point for each true or false items. For the reorganization item, the students had to reconstruct the reading passage of 8 lines in correct sequential order. If half of the given sentences (4 lines) and above can be correctly reorganized, it was worth one point and if not, it would be zero.

Then, for each open-ended extended response, each student's answer must be classified with respect to the coverage of the important parts present within the answer. Depending on whether the students can identify and locate the required information in given piece of text, or not, each response was worth one point or zero. This scoring rubric was designed according to the Snow and RAND's (2002) framework of reading comprehension.

After designing the test items and planning the scoring procedures, expert review was conducted for face validity and construct validity by 18 experts in the field of English, methodology, educational psychology, and educational test and measurement from Yangon University, University of Distance Education, Yangon University of Education, Sagaing University of Education. According to the suggestions of experts, revisions in item length and wording of items were made. Next, the test was administered to 316 Grade 10 students during 2019-2020 AY. Some items were revised and eliminated according to IRT calibration. Then, the test was administered to 1241 high school students across Myanmar for the field testing. The data obtained were analyzed by using two-parameter logistic model (2PLM) of IRT with the application of BILOG-MG 3 software. Firstly, in order to use item response theory (IRT), the assumptions of unidimensionality, local independence, and model data fitness were checked.

Data Analysis and Research Findings

Checking the Assumption of Unidimensionality

The assumption of unidimensionality means that the model has single θ for each examinee (DeMars, 2010). In order to determine whether the assumption of unidimensionality was met, eigenvalue plot of the inter-item correlation matrix for the test was studied. Figure 1 showed the scree plot of the eigenvalues for all items included in the test.

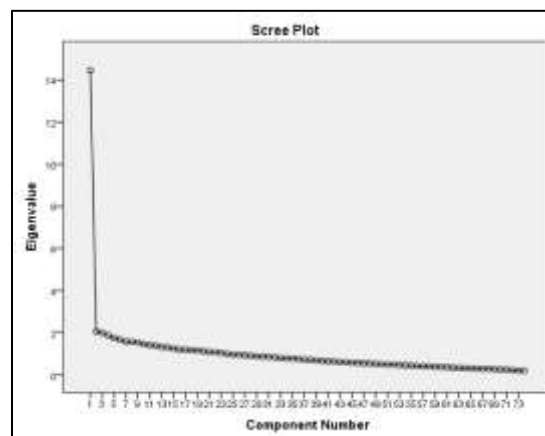
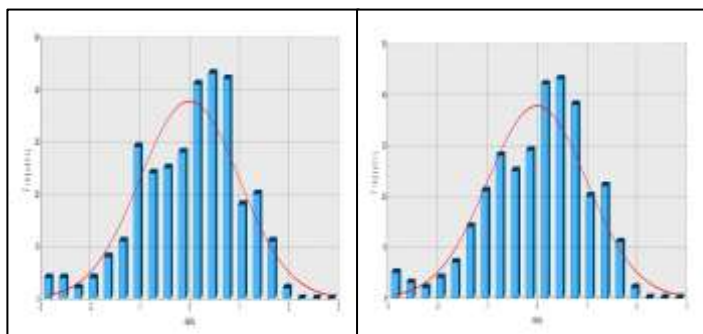


Figure 1. Scree Plot of the Eigenvalues for All Items of the Test

The dominance of the first factor can be observed in Figure 1. The largest eigenvalue of the correlation matrix for all items in the test is over three times larger than the second largest eigenvalue. Thus, it could be assumed that it has the unidimensionality. When the assumption of unidimensionality is met, so is the assumption of local independence (Lord, 1980).

Checking the Assumption of Model Data Fitness

In order to check the assumption of model data fitness, the obtained data were firstly analyzed by all three popular models. According to sample size, one-parameter and two-parameter models could be used with the obtained data but three-parameter model was not fit with the observed data.





Note:  = observed proportion,  = expected proportion

Figure 2. Observed and Expected Proportion of the Test by Applying One-Parameter Logistic Model and Two-Parameter Logistic Model

Then, goodness of the Model Data Fit was checked by Lord's Chi-square method. According to the Chi-square results, it was found that the number of model data fit items were 59 items when one-parameter logistic model was applied. Analyzing with two-parameter logistic model, the number of model data fit items were 72 items. Thus, it could be clearly observed that the number of modal data fit item was larger by using two-parameter logistic model. In addition, the difference between observed and expected proportion of the test by utilizing one-parameter and two-parameter models can be found in Figure 2.

As it can be seen in Figure 2, the residuals were greater while utilizing the one-parameter logistic model (1PLM). It could be assumed that many of the items in the test would not fit with 1PLM. The observed proportion correct was closed to the model expectation when the two-parameter logistic model (2PLM) was applied. Therefore, 2PLM is the best fit with the data of the test.

Analyzing Item Parameters of the Items in English Reading Comprehension Ability Test

Most items in the test had good discrimination and some items had moderate discrimination. But, the item no. 15, 17, 20, 22, 41, 47, 53 and 58 has discrimination less than 0.4 and so these items should not be included in the operational test. Most of the items in the test had the difficulties between the range of -2 to +2 with the exception of item no 15, 17, 22, 41, 47, 53, 58, 68, and 74. The item difficulty values of these items were so high that they were considered to be too difficult for the intended population.

Revising the Table of Specification for the ERCAT

Based on the results from IRT calibration, a table of specifications was reconstructed for the final selection of the items to be included in the test in order to ensure the content coverage of the test. Revised table of specifications for the ERCAT was described in Table 2 as follow.

Table 2. Table of Specifications for English Reading Comprehension Ability Test

Content	Literal				Inferential			Evaluative		Total Items	Total Marks
	MC Q	Re	T/F	S.Q	MC Q	T/F	Mat	MC Q	S.Q		
Reading Single & short passages (11 Passages)	4 (1)	-	-	-	5 (1)	-	-	2 (1)	-	11	11
King Bayintnaung (Narrative)	-	1 (1)	-	-	-	-	-	-	-	1	1
School Announcement (Description)	2 (1)	-	-	-	2 (1)	-	-	-	-	4	4
Daily Diet (Expository)	-	-	2 (1)	-	1 (1)	-	5 (1)	-	-	8	8
Reading Medium Passages (1+2+3)	2	1	2	-	3	-	5	-	-	13	13
Reading Long Passage The Great Fire of London (Mixed)	2 (1)	-	5 (1)	2 (1)	1 (1)	-	3(1)	1 (1)	2(1)	16	16
Total Items	8	1	7	2	9	-	8	3	2	40	
Total Marks	18				17			5			40

Note: MCQ = Multiple Choice Questions,

Re = Rearrange,

T/F = True or False,

SQ = Short Questions

The numbers in parentheses represent the marks allocated to each item.

Final Selection of Items for the ERCAT

In order to select the items for the operational test, the purpose of the test was defined first. The ERCAT was intended to measure the average ability students (i.e., $\theta = -2 \sim +2$). Therefore, a greater number of middle-difficulty items were selected to be able to measure most of the examinees precisely (i.e., $\theta = -2 \sim +2$). Moreover, items with fair and high discrimination were also selected so as to distinguish between low and high performing students. Item parameters of selected items included in the ERCAT were shown in Table 3.

Table 3. Item Parameters of the Selected Items in the ERCAT

Item	Item Response Theory		Item	Item Response Theory	
	<i>a</i>	<i>b</i>		<i>a</i>	<i>b</i>
Item 1	1.532	0.255	Item 21	0.835	-0.21
Item 2	1.172	0.197	Item 22	0.891	-0.286
Item 3	0.946	-0.022	Item 23	0.757	-0.042

Item	Item Response Theory		Item	Item Response Theory	
	<i>a</i>	<i>b</i>		<i>a</i>	<i>b</i>
Item 4	0.762	-0.041	Item 24	0.713	-0.143
Item 5	0.636	0.73	Item 25	0.564	0.104
Item 6	0.632	0.294	Item 26	0.606	0.391
Item 7	0.589	0.382	Item 27	0.944	0.024
Item 8	0.578	-0.115	Item 28	1.245	-0.292
Item 9	0.513	0.57	Item 29	1.053	-0.207
Item 10	0.603	0.103	Item 30	1.061	0.031
Item 11	0.546	-0.287	Item 31	0.794	-0.338
Item 12	0.662	0.652	Item 32	0.517	0.174
Item 13	0.748	-0.096	Item 33	0.899	0.417
Item 14	0.732	0.223	Item 34	0.962	0.598
Item 15	0.746	0.156	Item 35	0.793	0.662
Item 16	0.705	0.461	Item 36	0.718	0.769
Item 17	0.849	-0.094	Item 37	0.78	0.336
Item 18	0.735	0.659	Item 38	0.612	0.73
Item 19	1.314	0.63	Item 39	1.255	1.143
Item 20	0.995	0.65	Item 40	1.021	0.492

According to the Table 3, it was found that the item parameters of the selected items to be included in the ERCAT were heterogeneous, i.e., the item difficulty (*b*) values ranged from easy to difficult level (-0.338 to + 1.143). The item discrimination (*a*) values of all items in the test ranged from 0.513 to 1.532.

Item Characteristic Curves (ICCs) for the ERCAT

The item characteristic curves of all items in the ERCAT were graphed in Figure 3 in order to present the probability of choosing the correct answer to an item as a function of the level of the attribute being measured by the test. According to the figure 3, it can be seen clearly that the higher the student's ability level, the greater the probability of getting the correct answer. Then, it was also observed that most item characteristic curves in the test were almost parallel which is meant that most items of the test had similar discrimination. Moreover, the item characteristic curves were placed according to their difficulty, i.e., from easy to difficult, and they were closed together due to small variance in difficulty.

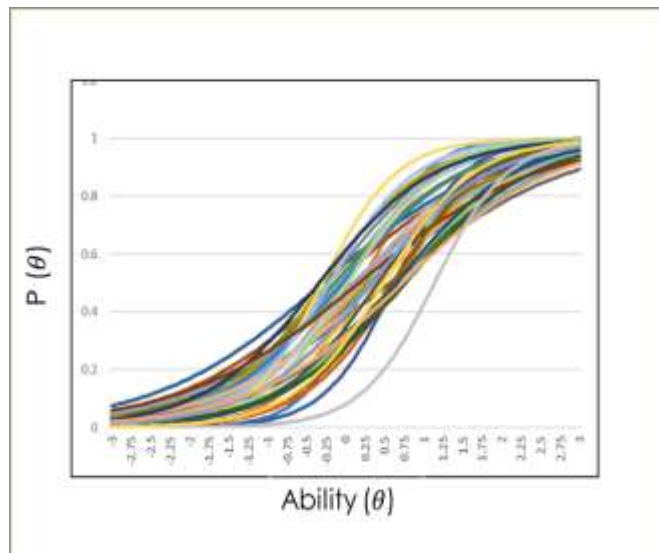


Figure 3. Item Characteristic Curves of All Items in the ERCAT

Test Information Function (TIF) of the ERCAT

In order to know the maximum amount of information obtained by the ERCAT precisely, the test information function of the ERCAT was illustrated in Figure 4.

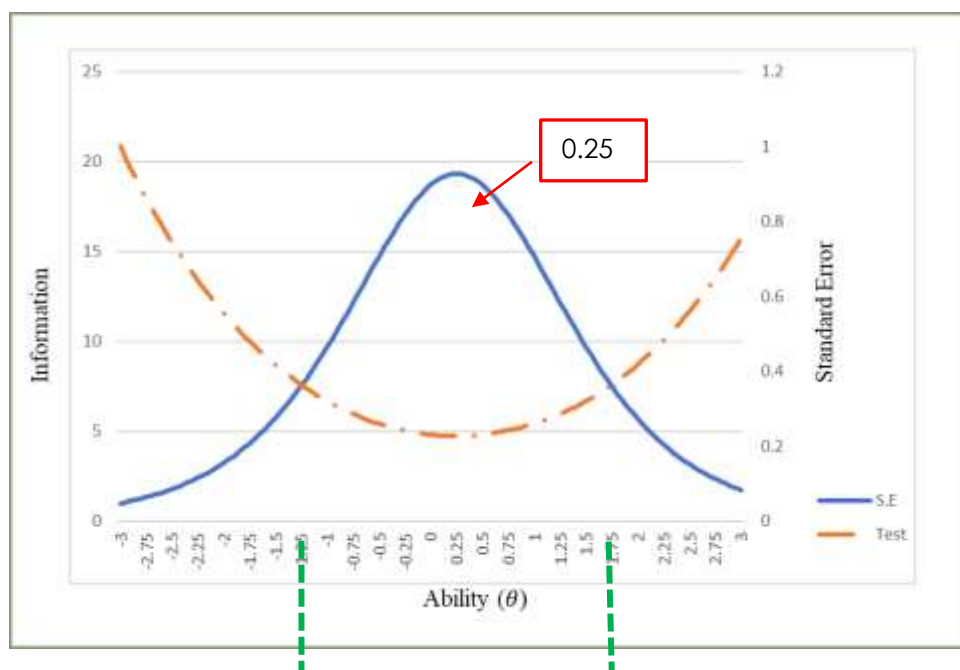


Figure 4. Test Information Function (TIF) for the ERCAT

As shown in Figure 4, the maximum information of the test $I(\theta)$ was 19 at $\theta = 0.25$. In other words, this test gave the maximum information about the students who had ability $+0.25$. The test had smaller standard error across the ability scale from -1.25 to $+1.75$. Thus, it can be concluded that the test was informative for the average ability range as it was predicted. In addition, it could be interpreted that the ERCAT could be used to determine the student group whose average ability is $\theta = 0$ ($-2 < \theta < +2$).

Discussion and Recommendations

In this study, English Reading Comprehension Ability Test (ERCAT) for Myanmar high school students was constructed by applying the two-parameter logistic model (2PLM) of IRT. Initially, the 74-item test with 25 reading passages was relatively difficult and so, it was restored as the item pool. New optimal developed test was reconstructed with 40 items which were related to 15 reading passages for the target test information function. The developed test would provide enough information for high school students with average English reading comprehension ability. By using the ERCAT, the educators, teachers and test administrators can assess and predict the general English reading comprehension ability of high school students.

There are some research limitations and several extended studies that can be further undertaken. Firstly, according to test information function curve, it was found that the test composed of 40 items could be suitable for high school students whose reading comprehension ability range is from -1.25 to +1.75, but it cannot discriminate well for the high school students with higher ability levels (above $\theta = +2$) and lower ability levels (below $\theta = -1.5$). It is still necessary to fill more easy items and to arrange them from the difficult items to easy items across the ability scale, until the test information function range -3 to +3 is achieved.

Secondly, the number of 1026 students from 10 high schools were selected from two states (Kachin and Rakhine) and three regions (Mandalay, Ayeyarwaddy, and Bago) to participate in this study. It will be necessary to replicate with larger sample size from different regions and states. Moreover, further studies should be carried out to construct more items that can be added to the item bank for assessing reading comprehension ability of high school students. Finally, the test developed in this study can only be administered to the high school students and so it cannot provide any evidence on the reading comprehension ability of students with different education levels. Thus, it was calling for the further researches to develop similar tests that can be administered to students of different education levels.

Conclusion

In order to estimate the quality of education and the achievement of the students, various types of tests are used in educational fields. Teachers can get valuable information about how well their students are learning from the test results. Besides providing feedback to their students, the test results can also help the teacher to be able to reflect themselves on their own teaching methods and curriculum materials. Therefore, systematically constructed tests that can provide reliable evaluation or results are the essential core of the assessment system and so as to deliver the quality education to students.

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DEVELOPMENT OF A WORKING MEMORY TEST AND A WORKING MEMORY STRATEGIES PROGRAMME FOR MIDDLE SCHOOL STUDENTS

Wit Yi Ei¹, Cherry Zin Oo², Khin Hnin Nwe³

Abstract

In educational sectors, interest in working memory has been increasing in society because it can predict academic achievement and professional success. However, in Basic Education, there has been little discussion about the importance of working memory for students and the way to improve their working memory. To address this gap, a working memory test and a working memory strategies programme were developed for middle school students in Myanmar. Working Memory Test was developed based on Baddeley's Working Memory Model. A total of 122 Grade 8 students (60 males and 62 females) from Magway Region participated in this study. Classical test theory (CTT) was applied in developing the working memory test. Then, developing a working memory strategies programme to train middle school students' working memory is of interest. By applying what students know about how their memory works, teachers can concentrate on the learning aspects of the teaching-learning process. In addition, students' working memory will be improved by applying working memory strategies systematically and, as a result, can enhance the teaching-learning process.

Keywords: Working memory, working memory test, working memory strategies, teaching learning process

Introduction

As technology continues to place endless amounts of information at our fingertips, working memory has become even more essential to our ability to function successfully. Since working memory allows us to focus our attention and organize the things, we do every day, it plays as central factor in everyday activities especially the three phrases: social, academical, and professional. Socially, we use working memory in the moment we are meeting someone and hearing their name, phone number for the first time. Academically, it is used when we perform in all aspects of the classroom such as lecturing, taking notes, etc. Professionally, working memory is what drives our ability to concentrate and not lose our train of thoughts.

Memory is the process of storing and retrieving information in the brain. It is the process of memory that is central to our learning and thinking. Human beings are continually learning throughout their lifetime. Only some of this massive volume of information is selected and stored in the brain, and is available for recall later when required. Learning is the acquisition of new knowledge, and memory is the retention of this knowledge. The combination of learning and memory, therefore, is the basis of all our knowledge and abilities. It is what enables us to consider the past, exist in the present and plan for the future.

Working memory means from the educational viewpoint as that part of the brain where holding the information, working upon it, organizing it, and shaping it, before storing it in long-term memory for further use (Johnstone, 1984). The working memory space is very limited in terms of both its capacity (amount of information it can hold) and its duration (length of time it can hold information). Furthermore, working memory space depends on the age of the individual. As Miller (1956) showed in his memory experiments, the average capacity is about seven plus or minus two (7 ± 2) separate chunks. Chunking is the process of grouping into units which could be

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a single number, a letter, or many pieces of information, and the nature of the items plays a major role in the capability to recall (Miller, 1956). This chunking process plays a key role in training working memory to improve.

In the field of education, many of the learning activities that children are engaged with in the classroom, whether related to reading, mathematics, science, or other areas of the curriculum, impose quite considerable burdens on working memory. Mentally changing occurs while holding some information to the child who is doing something different activities. The children with poor working memory fail the activity that they should make completely because of losing working memory, the crucial information needed to guide their activity. As a result, the rate of learning will be slow down.

Living with a poor working memory would be like running many software programmes simultaneously on a computer with little random-access memory (RAM) - it would be slow, frustrating and very inefficient. In short, it wouldn't work the way it needs to actually. Also, some students forget the instruction before the task is completed because of their working memory strength that controls what to do after another. That is why, poor working memory makes the students fail to follow the classroom activities in normal rate (Holmes, 2012).

In this research, Baddeley's (2000) model, the multi component model, is of most essential. This model consists of four parts: the phonological loop, the visuospatial sketchpad, the episodic buffer and the central executive. The phonological loop manages auditory information. The phonological loop consists of two parts. The first one is a passive storage where holding the information a few seconds and then disappear. In order to retain information, the phonological loop's second part, the articulatory system, is activated. This system provides a description of how memory actually works accurately when we handle auditory information (Baddeley, 2000).

The visuospatial sketchpad handles visual and spatial information. Information are transformed into visual impression and spatial code. The visuospatial sketchpad is also necessary for our ability to create and manipulate mental image. The sketchpad can be divided into two parts: a visual part that takes care of information about objects, shapes and colours and a spatial part that manages information about movement and direction.

The latest addition to Baddeley's working memory model is the episodic buffer. It is a temporary storage, where information from the incoming impressions, the phonological loop and the visuospatial sketchpad are integrated with information from long-term memory. The episodic buffer is considered important for learning because it can use multimodal code to integrate information from different systems into a single representation.

The central executive also called the executive system coordinates and monitors the other systems in working memory. In addition, several aspects of how we use our attention are guided by the executive system. Firstly, the executive system determines our ability to focus attention and our ability to close our impressions that compete for our attention. This system also controls our ability to divide attention between several tasks simultaneously (Grant, 2011).

In developing a test, most important considerations are validity and reliability of a test. Validity in test items refers to reliability of test items in measuring students' ability. Validity refers to the degree to which assessment scores can be interpreted as a meaning indicator of the construct of interest. It consists of several results: content validity, item difficulty and item discrimination. Content validity is defined as any attempt to show that the content of the test is a representative sample from the domain that is to be tested (Fulcher & Davidson, 2007). To analyze content validity, the area is about what is measured by the test and make judgments about content validity. Content validity is the most common validation that the researcher uses to ascertain if a test provides an accurate assessment of instructional objectives (Miller, 2008).

Item difficulty refers to items with one correct alternative worth a single point; the item difficulty is simply the percentage of students who answer an item correctly. Item difficulty is relevant for determining whether students have learned the concept being tested. It also plays an important role in the ability of an item to discriminate between students who know the tested material and those who do not. Item discrimination refers to the ability of an item to differentiate among students on the basis of how well they know the material being tested. In item discrimination, it is related to discriminate between strong and weak students in other words we can say that the upper group and the lower group. Strong students or upper group mean the test takers who have many correct answers in their test. The weak students or the lower group is the test takers that have less correct answers in their test (Fulcher & Davidson, 2007). Reliability in test refers to test items which have consistent result in measuring students' achievement. The standard of reliability is answers to test questions that will be consistently trusted to represent what students know (Clay, 2001).

Based on the above literature review, recognizing the essential of working memory and the lack of working memory test for middle school students, this study is an attempt to develop a working memory test for middle school students. Then, developing a working memory strategies programme is also done sequentially.

Aim and Objectives

The primary aim of this study is to enhance the teaching learning process in basic education by exploring and training middle school students' working memory.

The specific objectives were:

- (1) To develop a working memory test for middle school students
- (2) To explore middle school students' working memory
- (3) To develop a working memory strategies programme to train middle school students' working memory

Definitions of Key Terms

Working Memory	: the brain system that provides temporary storage and manipulation of the information necessary for such complex cognitive tasks as language, comprehension, leaning and reasoning (Baddeley, 1992)
Working Memory Test	: an assessment instrument designed to measure a wide range of information-processing functions such as encoding, storing, and retrieving data (Operational Definition)
Working Memory Strategies	: a program of training action designed to achieve a goal (higher working memory) or accomplish a task (APA Dictionary of Psychology)

Method

Research Design

The design used in this study was quantitative research design. Descriptive survey method was utilized in the present study.

Sample of the Study

By using random sampling technique, the schools and students were selected from Pakokku District, Magway Region. The number of the students administered by schools was 122 (60 males and 62 females).

Planning the Test

The objective of the test is to measure working memory of middle school students. Working memory is the brain system that provides temporary storage and manipulation of the information necessary for such complex cognitive tasks as language, comprehension, learning and reasoning (Baddeley, 1992). The first step is to prepare a table of test content specification.

There are numerous techniques to measure the capacity of working memory space. In the present study, Working Memory Test was developed by the researcher, based on the working memory models and Pickering's Digit Span Test, Corsi's Block Recall Test, Pascual-Leone and Smith's Standardized Figural Intersection Test and Books on memory tests (Carter, 2009). At first, the sample items were carefully studied and an item pool of 94 was developed with respect to the age of the students. Number of items in each subtest are different depending on the time taken for answer.

In working memory test, there are seven subtests that assess the central executive, phonological loop and visuospatial sketchpad components of working memory. These tests are: Digit Span Test, Digit Backward Test, Word Memory Test, Letter Memory Test, Picture Memory Test, Figural Intersection Test, and Block Recall Test.

1. Digit Span Test

In this task, the examiner reads a sequence of digits in a rate of time one item per second (e.g., "3, 5, 9, 4") and the students must immediately repeat them back and write down the answer sheet. The sequential digits are read to students in an even monotone, in order to discourage any grouping likelihood of the items on the basis of intention and prosodic information (Pickering, 2006).

2. Digit Backward Test

In this task, the examiner reads to the students a series of digits and asks them to write them in reverse order (Alenezi, 2008). For example, 38975 would return as 57983. Every digit is read to the students in a rate of one digit per second and the same time is given to recall after the reading of the whole series is over. After the students finish the task, they will receive a new task with a great number of digits and so on.

3. Word Memory Test

In this task, the examiner shows the list of words with the projector and asks the students to write the words as they can (Batt et al., 2008).

4. Letter Memory Test

In this task, the examiner shows the list of letters and asks the students to write down the answers for each question (Greub & Suhr, 2006).

5. Picture Memory Test

In this task, the examiner shows the similar and various pictures and asks the different questions about the pictures to the students (Carter, 2009).

6. Figural Intersection Test

In every task, the students are asked to find the overlapping area of a set of simple shapes, which intersect to form a complex design. As the number of figures increases, the task becomes more complex (Pascual-Leone & Smith, 1969).

7. Block Recall Test

In this task, a sequence is tapped out on the blocks with the projector by the examiner and then, the students are required to repeat the sequence in the same order as they have been shown (Corsi, 1972).

With respect to the ambiguity of meaning and the conformity, the editorial review of items by ten experts from Department of Educational Psychology, Yangon University of Education for face validity and content validity. Based on this review, some wording and instructions were revised and then used for piloting. The table of content specifications for Working Memory Test was detailed as shown in Table 1.

Table 1. Content Specification of Working Memory Test

No.	Subtests	Number of Items	Given marks for each item	Total Marks	Time Allowed	Estimated Items
1.	Digit Span Test	20	1	20	10 min	7
2.	Digit Backward Test	20	1	20	10 min	6
3.	Word Memory Test	3	10	30	10 min	1
4.	Letter Memory Test	23	1	23	10 min	7
5.	Picture Memory Test	13	1	13	10 min	4
6.	Figural Intersection Test	9	1	9	10 min	3
7.	Block Recall Test	6	1	6	10 min	2
Total		94		121	70 min	30

There are 94 items in the piloting. The most relevant 30 items out of them were utilized to examine middle school students' working memory. Each item in this test will be scored 1 for correct answer and 0 for incorrect answer.

Piloting Results

This pilot study was conducted with a sample of 122 Grade-8 students (61 boys and 61 girls) in Basic Education High School, Yesagyo during the first week of March in 2020. The test takes 70 minutes to complete. Item analysis, editing and selection procedures were performed.

At this stage, difficulty index and the discrimination index for each item were calculated. The difficulty index is used to assess item difficulty and the discrimination power is used to assess item quality. The difficulty index is the proportion of examinees who answer the items

correctly and its value may range from 0 to +1. The discrimination power is the degree to which success or failure on an item indicates possession of the ability being measured. It determines the extent to which the given item discriminates among examinees in the function or ability measured by the item. This value ranges from -1 to +1. For reliability in test items, the researcher calculated the internal consistency (Cronbach's Alpha). The value of this test was 0.88. The values of difficulty and discrimination for each selected item were mentioned in Table 2.

Table 2. The Values of Difficulty Index and Discrimination Power of Selected 30 Items

Item Number	DI	DP	Item Number	DI	DP
Item 1	0.75	0.39	Item 16	0.52	0.39
Item 2	0.64	0.42	Item 17	0.61	0.39
Item 3	0.49	0.45	Item 18	0.51	0.52
Item 4	0.50	0.39	Item 19	0.70	0.33
Item 5	0.32	0.30	Item 20	0.55	0.48
Item 6	0.42	0.48	Item 21	0.70	0.45
Item 7	0.39	0.45	Item 22	0.58	0.45
Item 8	0.68	0.48	Item 23	0.73	0.36
Item 9	0.61	0.61	Item 24	0.63	0.36
Item 10	0.73	0.45	Item 25	0.72	0.24
Item 11	0.70	0.42	Item 26	0.63	0.21
Item 12	0.61	0.52	Item 27	0.56	0.21
Item 13	0.64	0.61	Item 28	0.88	0.21
Item 14	0.63	0.58	Item 29	0.74	0.36
Item 15	0.73	0.42	Item 30	0.62	0.39

Note. DI = difficulty index, DP = discrimination power

In conducting the item analysis, it was found 18 items having high DI values more than 0.90, 16 items having high DI values more than 0.75 and 2 items having low DI values less than 0.20. The high DI value implies that the item was very easy and the answer was probably too obvious for the examinee groups. The low DI value implies that the item was very difficult to answer for the examinee. So, they were discarded from the test.

Moreover, there were 27 items having DP values less than 0.20 and 1 item having negative DP value. This means that low performing students selected the correct answer more often than high scores. Thus, these items were rejected. According to the result, 30 items that were between 0.30 and 0.75 DI value and equal to or greater than 0.21 DP value were chosen. Among these items, some items having DP value less than 0.40 will be improved by the researcher. Therefore, these 30 items out of 94 items were used to explore students' working memory.

The revised working memory test of 30 items consists of 7 items for digit span test, 6 items for digit backward test, 1 item for word memory test, 7 items for letter memory test, 4 items for picture memory test, 3 items for figural intersection test and 2 items for block recall test. Each participant had 45 minutes to complete the working memory test. As 10 subtest items contained in word memory test, there were 39 items in total including main items and sub-items.

Data Analysis and Results

Working Memory Level of Middle School Students

According to the second objective of this study, the working memory level of middle school students was explored. The descriptive analysis revealed that the mean and standard deviation for the whole sample are 24.39 and 7.30 (see Figure 1).

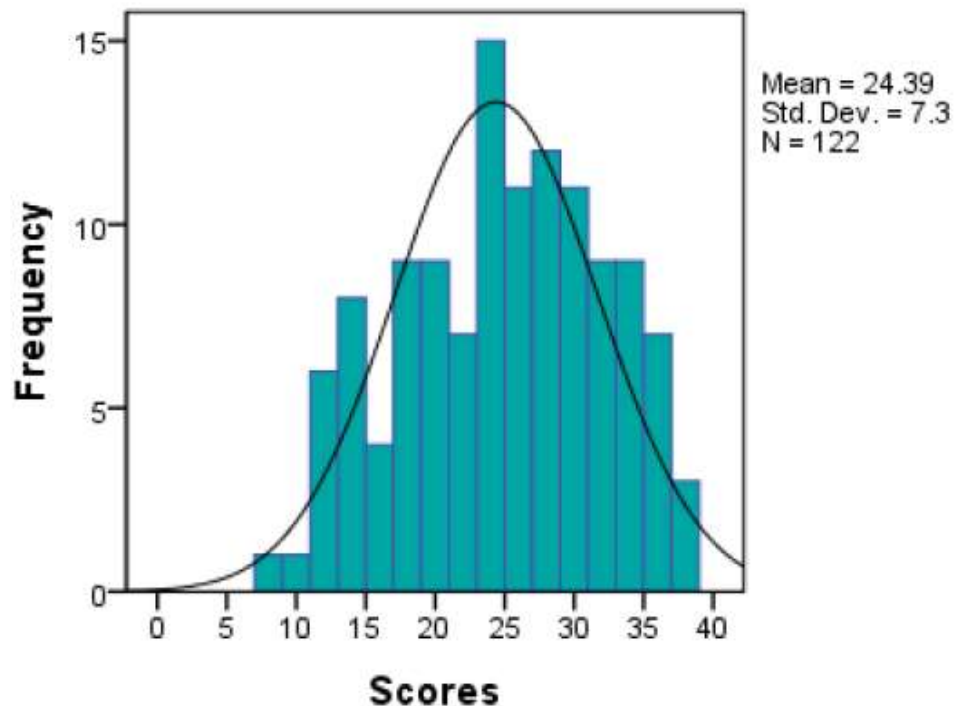


Figure 1. Working Memory Level of Middle School Students

The following Table 3 presented the level of students' working memory according to the scoring system which is based on the method of scoring of memory test (Carter, 2009).

Table 3. Frequency Distribution for Middle School Students' Working Memory Scores

Range of Scores	Students	
	Frequency	Percentage (%)
35-39	10	8
27-34	41	34
20-26	38	31
12-19	28	23
below 12	5	4
Total	122	100

According to the result table, 8% of students (range of scores 35-39) were exceptional in working memory level. Moreover, 34% of students (range of scores 27-34) have very good working memory. There were 31% of students (range of scores 20-26) who got good above average level of working memory. Among them, 23% of students (range of scores 12-19) were at

average level of working memory and 4% of students got scores below 12. It might be interpreted that they were below average level of working memory.

According to descriptive analysis, middle school students could be identified into 3 groups: 42% of students who have high level working memory, 31% of students who have middle working memory level and 27% of students who have low working memory. (See Figure 2)

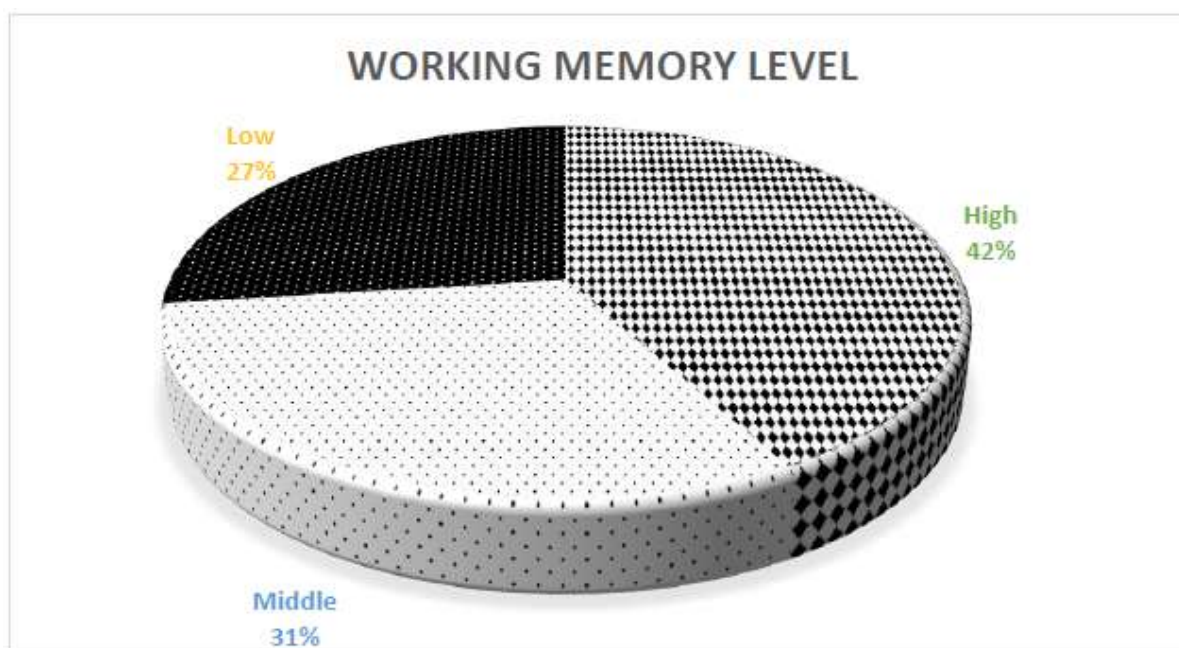


Figure 2. Three Groups of Middle School Students' Working Memory

Based on the results, the researcher implements a working memory strategies programme for middle school students. By applying this programme systematically, students' working memory will be higher and higher.

Working Memory Strategies Programme for Middle School Students

Working memory is a fundamental cognitive function that is necessary for us to perform a number of mental activities, such as reading, counting and problem-solving. With the help of working memory, we can maintain and process a limited amount of information for a short time. In other words, working memory is our ability to keep things in mind in real time. We use working memory in daily activities for example, when we remember a phone number or when we follow an instruction, we use working memory essentially. With good working memory, we can better concentrate and deal with distractions. Many of the working memory programmes including computer training (Backman & Truedsson, 1967) and classroom strategies (Gathercole & Alloway, 2007) suggest that working memory training can lead to improve working memory and then successive learning ability (Newby, 1991).

There are many working memory training programmes including computer trainings but in basic education of Myanmar, the uses of computers are very much little. So, in this research, based on the memory games, working memory improving strategies and training (Truedsson & Strohmayer, 2010), working memory strategies programme was explored by the researcher. In this research, working memory training programme consists of a number of memory exercises that should be completed at each training session.

With respect to the ambiguity of meaning and the conformity, the editorial review of items by ten experts from Department of Educational Psychology, Yangon University of Education for face validity and content validity. And, 10 Grade 8 students in Yesagyo participated in pre- piloting. Based on the experts' review and the test taker's review, some wording, items and instructions were revised.

The training periods take place for six weeks, five days per week and forty-five minutes per day. Thirty sessions are included in this programme. Working memory strategies programme was developed based on four principles – chunking (C), visualization (V), association (A) and concentration (C). Chunking means the process of taking individual pieces of information (chunks) and grouping them into larger units. Visualization means changing the information into a picture or movie with your mind. Association means linking the information with an image or prior knowledge together. Concentration means focusing on the information you want to record or remember.

1. Procedures for Chunking Method

At the beginning of the working memory training, the students are explained about the training programme thoroughly. The benefits of the training programme are also explained, for example, improving the memory at the end of the training. In addition, the rules and principles followed, and the assessment and reward section are explained to the participants. The goal of this method is to remember the numbers easily and sequentially without forgetting easily and to store into long term memory and retrieve in future time.

First session, the researcher introduces the participants a very important phenomenon, namely chunking method. The number of items that normal person can memorize is about seven (Miller, 1956). So, when we have to memorize something, we had to try to encode the information in as few units as possible. We try to the group the information into larger chunks.

As the number of chunks we can remember are limited according the age groups (children, adult), we try to gather as much information as possible in each chunk to maximize the amount of information we can remember. For example, the phone number 256356835, instead of memorizing these nine digits as one chunk, three digits 256-356-835 as three chunks should be memorized. And then, a large numbers of items pool will be practiced together with the researcher by chunking and repeating methods.

2. Procedures for Visualization Method

The goal of this method is to focus on visualization (V). At the end of the training period, the participants had to possess the ability changing the information into a picture, or movie with their mind in memorizing the information. According to the literature, a normal person can memorize much data 25 times by visual than by auditory. And the proverb "a picture speaks a thousand words" is confirmed.

In these sessions, the participants are given many pictures and memorized them. After a few seconds, a pair of similar pictures is given and the participants are asked to choose the former picture. The participants are expected to choose the correct picture. Then, the participants are made the information change the image and memorize. In the last sessions, the participants are tested with visual exercises.

3. Procedures for Association Method

The purpose of this method is to have the sense to link the information together with the image or with the previous knowledge and memorize the information. Association (A) means chaining the information and thus one point is retrieved and the other information is remembered automatically. Creativity and imagination are very important in association process. In this session, the participants are talked to memorize the information by association.

The examples of the words are:

- | | | |
|------------|----------------|--------------|
| 1. Bicycle | 7. Sun | 13. Computer |
| 2. Pencil | 8. Flower | 14. Apple |
| 3. Stove | 9. Park | 15. T-shirt |
| 4. Shark | 10. Spider Man | 16. Horse |
| 5. Dolphin | 11. Bread | 17. Tissue |
| 6. Whale | 12. Cycle | 18. Coffee |

The above 18 words are memorized in normal way. After a few minutes, the participants are asked these words. Most students will answer 7-10 words. The first word (bicycle), the last word (coffee), the strange word (spider man) and the same group (shark, dolphin, whale) will be remembered most. And other words will be missed. The researcher will discuss the participants why don't we memorize these random words correctly in short time. Then, the researcher makes the participants link these words in image and create an image. In this way, these 18 words are memorized correctly and sequentially. That is why, association becomes one of the suitable strategies we use to memorize.

In the last sessions, the participants are given the items and memorizing and practicing will be conducted by using the association strategy.

4. Procedures for Concentration Method

In this session, the participants are guided to focus on the information they want to record (Concentration, C). Like camera, our memory can memorize by focusing clearly the information we want. We can't remember what we didn't see or hear in the first place. So, concentration power is very important in promoting memory. In the second session, to make the images in our head memorable, the factors - Size, Color, Sound, Quantity, Touch, Smell, Movement, Emotion are considered.

During the training period, the participants are memorized the information by considering the above factors. They are practiced several times in remaining sessions. The reward (extrinsic motivation) is included. These sessions aim the participants to apply the principles of good working memory.

Finally, the following visual-spatial memory games are tested and practiced based on the 'CVAC'.

- Session (1) – Symmetry
- Session (2) – Color Challenge
- Session (3) – Right Square
- Session (4) – Shopping List
- Session (5) – Find the new
- Session (6) – Risky Road

Moreover, the researcher introduces the participants with the concept map or mind map. With the head of the researcher, the information people want to memorize creates a mind map and memorize. In this session, the participants are given pieces of information and made them create his or her concept map. Creating concept map is one of the methods making good memory. After each week of the training, one of the participants followed the instructions and involved actively in this programme was also rewarded.

Discussion

In this research, a working memory test was developed to measure middle school students' working memory level. The test items were analyzed systematically by applying the classical test theory (CTT) analysis. In CTT, items were compared according to the characteristics (item difficulty, item discrimination, reliability).

For item difficulty, the mean of item difficulty was 0.61 which means that the result was in moderate index. This result in line with theory from Miller (2008), who stated that most test developers recommend 0.30 to 0.70 difficulty range with an average item difficulty.

For item discrimination, the result was 0.41 means that item discrimination power was in satisfying index. This result supported by Kubiszyn and Borich (2006), who stated that item discrimination should be at least 0.30. After related the finding and the theory, the researcher concluded that this working memory test was acceptable as test items with high discrimination power because the index was in positive value and the index still 0.41 (Pradana et al., n.d.).

The reliability of test items in the working memory test for middle school students covered several aspects. According to the internal consistency value, the findings showed 0.88 means that test items already good for measuring working memory and mark as reliable test reliability.

The good test reliability starts from index 0.70 until 0.90 and above. Thus, it is concluded that the interpretation is reliable test.

In observing the students' working memory, some of the students have high working memory level. But most of students have moderate level and nearly one third of the students have low level. Thus, to improve their working memory level, the researcher develops a working memory programme. This strategies programme was in line with Wilson's Research. In his research, several strategies were applied by several researchers. Macaulay used Association (Macaulay & Cree, 1999); Alloway, Chunking (Alloway, 2009); Zambo (2006), Visualization respectively (McNamara, 2001). Thus, the researcher assumes that the programme in this study was suitable for training middle school students' working memory.

Conclusion

For the test construction, item difficulty, item discrimination and reliability already showed good index and so, the test items were valid enough in order to use in measuring middle school students' working memory.

Working memory is a system responsible for providing the temporary storage and manipulation required for any mental process. Thus, the role of working memory cannot be neglected in teaching-learning process. By knowing students' working memory level, the teacher can train their students by applying memory strategies to improve working memory. Systematically used, middle school students' working memory will be higher and higher in some degree. To sum up, in this paper, a working memory test for middle school students was developed and explored their working memory level. And then, a strategies programme was also developed. However, the test has some limitations. The sample was selected from Magway Region and so, participants from other Regions and States in Myanmar should be chosen for further research.

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A CRITICAL ANALYSIS OF THE EFFECTS OF PARENTAL PSYCHOLOGICAL CONTROL ON INTERNALIZED BEHAVIORS OF HIGH SCHOOL STUDENTS

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Abstract

The purpose of this study was to explore the effects of parental psychological control on internalized behaviors of high school students. A total of 480 high school students (240 males and 240 females) from 8 selected schools in Sagaing Region and 6 selected schools in Mandalay Region. The required sample was selected by using random sampling technique. Quantitative research approach was used in this study. Questionnaire survey method was used to measure parental psychological control and internalized behaviors of high school students. This study was conducted at Sagaing Region and Mandalay Region. As the research instruments, Psychological Control Scale-Youth Self- Report (PCS-YSR) by Barber (1996) and Psychological Control-Disrespect Scale (PCDS) by Barber et al., (2012) were used to measure parental psychological control and Child Behavior Checklist (Child-Report Form, Achenbach, 2001, revised form) was used to measure internalized behaviors of high school students. In the analysis of data, descriptive statistics, independent samples *t*-test, one-way ANOVA, Post Hoc Test, correlation and stepwise multiple regression analysis were used in this study. The overall results showed that most of high school students fell into moderate parental psychological control level group. The results revealed that gender difference was found on parental psychological control. Analysis of the results indicated that female students had high level of parental psychological control than that of male students. The result of ANOVA indicated that there were statistically significant differences among parental psychological control levels on internalized behaviors of high school students.

Keywords: parental psychological control, internalized behaviors, high school students

Introduction

Adolescence is characterized by many changes that are related to adolescents' perceptions of themselves and their family life (White & Renk, 2012). An overview of adolescence reveals that during this stage of development young people are "in an active, purposeful 'flight' away from attachment relationships with parents". If parental control is not diminished it results in increased conflict between adolescents and parents, such as the breaking of rules and antisocial behavior.

Adolescence is a critical period of development. Adolescents are continuously changing mentally, physically, and psychologically (Santrock, 2004). They are learning more about the 'real world' and trying to strive for both independence from parents and inclusion in social groups (Santrock & Yussen, 1984). Adolescents want to be perceived as adults with capable decision-making skills, but also want to remain members of a large peer group. As children move into adolescence, monitoring becomes an important aspect of parenting.

Additionally, these young people desire support and structure from their parents, though they project an indifferent demeanor and challenge the supportive measures of their parents. Whether parents are involved in and support their adolescents' school life can directly affect their personal and social development as well as their academic success (Jeynes, 2007).

Researchers have demonstrated that the single most consistent predictor of adolescent emotional and psychological well-being is the quality of the parent-child relationship (Steinberg & Silk, 2002). Furthermore, parental psychological control is a parenting practice that manipulates children and adolescents by inducing guilt and instilling anxiety, sometimes leading

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to low levels of self-esteem and high levels of internalizing problems in children and adolescents (Grolnick, 2003).

Psychological control was viewed as distinct from behavioral control in that it involved attempts to control the child's psychological world (e.g., feelings, aspirations, and identity choices). Specifically, Barber (1996) defined psychological control as "socialization pressure that is non-responsive to the child's emotional and psychological needs stifles independent expression and autonomy". Psychologically controlling parents would intrude on the psychological and emotional development of the child through internally controlling and emotionally manipulative means such as guilt induction, love withdrawal and invalidating feelings (Barber & Harmon, 2002).

Many adolescents experience adjustment problems including internalizing and externalizing problems. During this developmental stage, internalizing symptoms can also develop, and they occur with a higher prevalence in girls. Parents can be very important allies and useful alternatives in the identification of several aspects of internalizing problems in childhood and adolescence.

Therefore, in early childhood, internalizing problems are the most reliably diagnosed types of psychopathology. Data suggest that these problems are closely related and are likely to co-occur not only in childhood, but also in adolescence. Internalizing symptoms are directed to oneself and thus may be more difficult to identify. The internalizing behaviors which are the focuses of this study include depression, anxiety and withdrawal. Furthermore,

children with internalizing problems are more likely to experience sadness, low impulsivity, and exhibit less social contact.

Purpose of the Study

The purpose of this study was to explore the effects of parental psychological control on internalized behaviors of high school students.

Definition of Key Terms

Parental Psychological Control. Parental psychological control as intruding upon, manipulating, and constraining children's and adolescents' psychological worlds and as "a type of interpersonal interaction in which the parent's psychological status and relational position to the child is maintained and defended at the expense and violation of the child's development of self" (Barber, 2002).

Internalized Behaviors. Internalized behaviors directed towards individual, over-controlled and inner-directed patterns of disturbing to individual (White & Renk, 2012).

High School Students. High school students mean public school students enrolled in any of grades 9 through 12 and they are in full-time attendance at a high school (Smetana et al., 2005).

Review of Related Literature

Parents who are psychologically controlling have been characterized as controlling their children's attitudes, behaviors, feelings, and thoughts through manipulative means, and using psychological tactics such as conditional approval and shaming (Barber, 1996). More specifically, parental psychological control has been characterized as a form of insensitive parenting which undermines the child's sense of self by inducing guilt, arousing anxiety, provoking shame, and withholding affection and love by making them contingent upon the child's behaviors (Doyle & Markiewicz, 2005).

Grolnick (2003) has given a clear example of parental psychological control by depicting three different parental approaches to the same situation. In her example, a child comes home with three Cs on her report card and her parents are upset and concerned. Her parents want their daughter's grades to improve on the next report card. The three different parental approaches are as follows: (a) a positive controlling approach, where the parents use positive reinforcement (monetary reward) as an incentive for the daughter to improve her grades in the future; (b) a psychological controlling approach, where the parents tell their daughter that they are disappointed in her and that she let them down again (i.e., use of guilt induction) and they are cold to her for a few days speaking only to answer questions in order to prove to her how upset they are (i.e., love withdrawal); and (c) an autonomy-supportive approach, where the parents sit down together with their daughter and ask her what she thinks went wrong with her grades this period and then brainstorm with her about what she thinks might help improve her grades in the future (i.e., involving their daughter in the decision-making process).

Grolnick (2003) has explained that the first two approaches are both controlling and have a similar goal – coercing the child into changing her behavior. In both situations, the daughter feels pressure from her parents – in the first case, pressure from the desired reward, and in the second case, pressure from fear of losing her parents' love, as well as their disappointment and anger. Grolnick (2003) has further explained that in the first two approaches, the child will be changing her behavior for external reasons - to either obtain money or to avoid parental hostility. However, in the third case, the daughter does not feel pressure and feels that she is the one who can initiate changes in her own behavior.

Although psychological control was initially theorized to be quite specifically linked to internalizing problems in children and adolescents, many studies have demonstrated associations with externalizing problems as well, although these associations were found somewhat less consistently than associations with internalizing problems (Barber & Harmon, 2002).

Perceived parental psychological control was predictive of depression and antisocial behavior and was salient in all cultures studied (Barber et al., 2005). Parental behavioral control was associated with lower levels of antisocial behavior, but was not predictive of depression and social initiative, supporting the previously noted need to separate parental control into behavioral and psychological. Barber and colleagues (2005) research supported that parental psychological control was related to internalized psychological problems, externalized behavioral problems, was relevant in many cultures, and was harmful to children and adolescents' future development.

When it comes to parenting, negative parenting practices have been shown to be associated with increased internalizing behavior in children of varied ages. They found that harsh parenting is related to increases in internalizing and externalizing behavior in toddlers. They found that poor supervision and inconsistent discipline are correlated with more internalizing and externalizing by pre-adolescents. One possibility is that the effect of psychological control on internalizing problems depends on the child's personality or temperament.

Lee, Lee, and August (2011) found that poor communication between parents and their child, less parental involvement, a parent's lack of confidence in parenting, and overall poor parent-child relations were related to increases in internalized and externalized behavior in children. Adding to the research that supports a relationship between specific parenting practices and internalizing behavior, this study focused on parental use of psychological control and the relationship this practice has with internalizing behavior.

On the basis of these characteristics, it could be hypothesized that whereas undercontrolled children and adolescents would typically react to parental control and pressure by acting out and by rebelling against parental authority (kind of behavior that is predominant in

their behavioral repertoire), overcontrolled individuals may respond to pressure in a different fashion. They may be more likely to turn the external pressure inward, thereby slavishly complying with parental authority and behaving on the basis of introjected parental demands.

Some preliminary evidence for this type of interactions between adolescent personality and parenting was found by Prinzie et al., (2004), who showed that children low on conscientiousness (characteristic of the undercontrolled prototype), when exposed to coercive parenting, showed increased levels of internalizing problems.

Similarly, Morris et al., (2002) found that children low on effortful control -- defined as the capacity to inhibit impulsive behavioral responses and to adequately regulate one's behaviors and emotions -- displayed increased internalizing problem behaviors in response to hostile parenting. Further, undercontrolled adolescents experiencing high levels of restrictive parental control also displayed increased levels of depressed affect and internalizing problems, indicating that undercontrolled adolescents may respond to parental control and coerciveness with both internalizing and externalizing problems.

Methodology

Research Design

Quantitative perspective and questionnaire survey method was used to measure the parental psychological control and internalized behaviors of High School Students.

Participants of the Study

First of all, the sample for 5 Basic Education High Schools and 3 Basic Education High Schools (Branch) from Sagaing Region and 3 Basic Education High Schools and 3 Basic Education High Schools (Branch) from Mandalay Region. A total of 480 Grade 10 students participated in this study. Participants of this study were Grade 10 students from selected regions in the academic year of 2020-2021. Out of 480 Grade 10 students, 240 (50%) are boys and 240 (50%) are girls and their ages range from 14 to 17 years.

Research Instruments

Parental Psychological Control Scale was adapted from Psychological Control Scale-Youth Self-Report (PCS-YSR) by Barber (1996) and Psychological Control-Disrespect Scale (PCDS) by Barber et al., (2012). PPCS consists of 41 items: constraining verbal expression (5 items), invalidating feelings (6 items) and personal attack on child (5 items), guilt induction (6 items), love withdrawal (5 items), erratic emotional behavior (4 items), achievement-oriented psychological control (5 items) and separation-anxious psychological control (5 items). It is 5-point Likert Scales ranging from never (1), rarely (2), sometimes (3), Often (4) and Always (5).

There are three forms of checklist (Parent Report Form, Teacher Report Form and Child Report Form) to measure the internalized and externalized behaviors of adolescents. This checklist was first formulated by Achenbach (1991) to examine behavioral and emotional problems. Among them, Child Report Form (Achenbach, 2001, revised form) was utilized to measure the internalized behaviors of high school students in this study. In the original checklist, there are 118 items and it is assessed by the child himself/ herself and small number of items was dropped to reduce the potential difficulties with children.

After constructing the instruments, face validity and content validity were ensured by seven experts from Department of Educational Psychology, Yangon University of Education and 2 experts who have more teaching experiences, retired lecturers from Department of Educational Psychology, Yangon University of Education.

Pilot testing was done with a sample of 160 high school students (Grade 10) from No.2, Basic Education High School, Myinmu in third week of January, 2020 to test whether the wording of items, statements and instructions were appropriate, relevant and clear for them. And then, the wordings and phrases of some items were modified to adapt with students' understanding levels. After conducting the pilot study, reliability coefficients for PCS-YSR (0.86) and PCDS (0.84) were established for Parental Psychological Control Scale and Child-Behavior Checklist was 0.82 in this study.

Data Analysis and Research Findings

Analysis of Parental Psychological Control Level of High School Students

Descriptive Statistics of Parental Psychological Control

Descriptive analyses revealed that the mean and standard deviation of high school students' parental psychological control were 106.84 and 17.03 respectively. The maximum possible score is 176 and minimum possible score is 0. The respondents' scores ranged from a low of 5 to a high 205. Respondents with scores in the range of 0 to 75 were considered low parental psychological control. Scores in the range of 76 to 150 represented moderate parental psychological control in respondents. Students with high parental psychological control scores ranged from 151 to 205.

Table 1 Descriptive Statistics of High School Students' Parental Psychological Control

	<i>N</i>	Minimum	Maximum	Mean	<i>SD</i>
Parental Psychological Control	480	56	184	106.84	17.03

The results indicated that 10.5% of the students had low level of parental psychological control and 18.2% of students had high level of parental psychological control. But, the majority of respondents were scored as possessing moderate parental psychological control (N=342, 71.3%) (See Table 2). Figure 1 illustrates the distribution of the respondents PPCS scores in range of low, moderate and high.

Table 2 Frequency and Percentage of High School Students' Parental Psychological Control Levels

Parental Psychological Control Level	Percentage	Number
Low	10.5%	51
Moderate	71.3%	342
High	18.2%	87

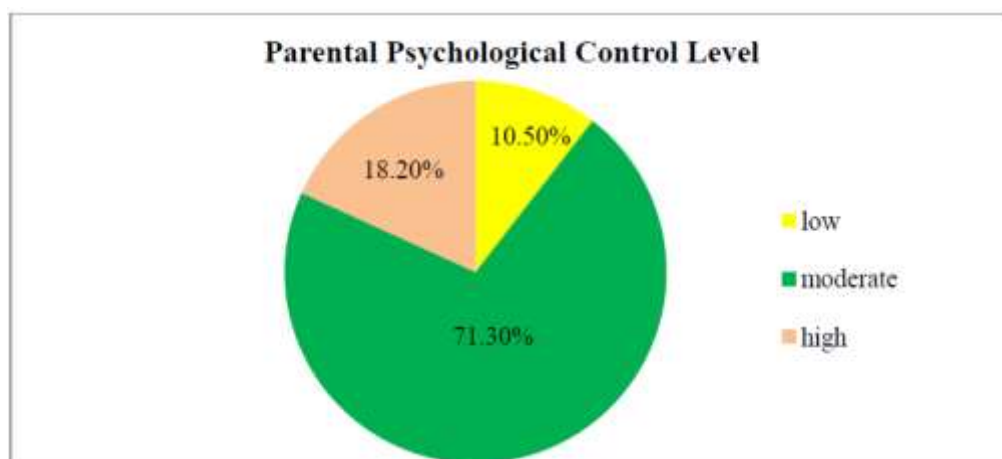


Figure 1 Percentage of High School Students on Parental Psychological Control Level

Comparison of Parental Psychological Control Level by Gender

Table 3 Number and Percentage of High School Students on Parental Psychological Control Level by Gender

Parental Psychological Control Level	Gender		Total
	Male	Female	
Low	36 (15%)		15 (6.25%)
Moderate	169 (70.42%)	173 (72.08%)	342 (71.3%)
High	35 (14.58%)	52 (21.67%)	87 (18.2%)
Total (N)	240		240

Table 3 revealed that the number and percentage of male students in low parental psychological control level was more than the number and percentage of female students in low parental psychological control level. But the number and percentage of female students in high parental psychological control level was more than the number and percentage of male students in high parental psychological control level.

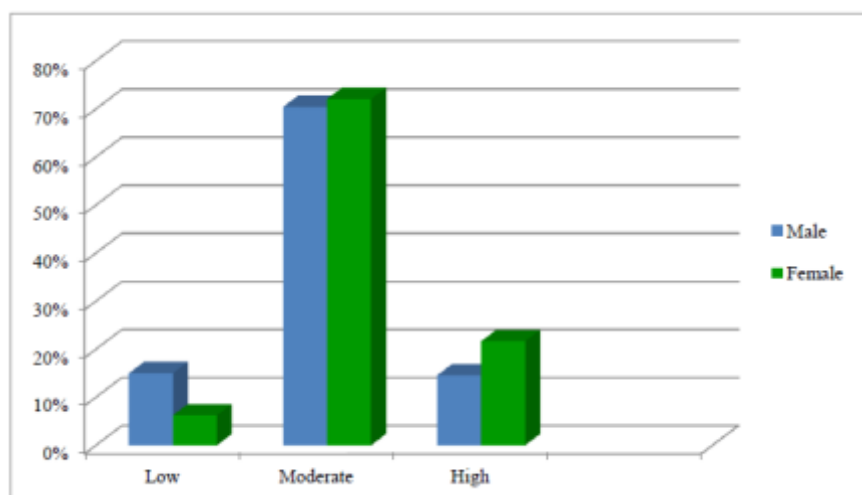


Figure 2 Percentage of High School Students on Parental Psychological Control Level by Gender

Comparison of Parental Psychological Control of High School Students by Gender

According to Table 4, the mean score of female students was more than that of male students. It was concluded that parents of female students used more parental psychological control than parents of male students. To confirm the result, the independent samples t-test was used. The result indicated that gender difference was found to be on parental psychological control. This finding was consistent with the findings of Lue et al., (2010) that girls felt their parents more psychologically controlled than boys.

Table 4 Mean Comparison of High School Students' Parental Psychological Control by Gender

	Mean	SD	<i>t</i>	<i>p</i>
Male	104.623	12.82	-3.928***	.000
Female	108.210	15.46		
Total	106.84	17.03		

Note. *** $p < 0.001$ level

Moreover, the differences between eight components of parental psychological control on gender were investigated. Table 5 indicated that the mean differences between parental psychological control components on gender. Among these eight components, the mean scores of female students were significantly higher than that of male students in constraining verbal expression, guilt induction, love withdrawal, erratic emotional behavior and separation-anxious psychological control. It was concluded that female students expressed that their parents more used constraining verbal expressions, guilt induction, love withdrawal, erratic emotional behavior and separation-anxious psychological control than male students.

Table 5 Mean Comparison of High School Students' Parental Psychological Control Components by Gender

PPC Components	Gender	Mean	SD	<i>t</i>	<i>df</i>	<i>p</i>
Constraining verbal expressions	Male	13.495	3.23	3.130**	478	.002
	Female	14.420	2.64			
Invalidating feelings	Male	17.370	3.71	-.629	478	.729
	Female	16.995	3.83			
Personal attack on Child	Male	13.300	3.17	-2.372	478	.421
	Female	12.993	3.01			
Guilt Induction	Male	10.45	3.68	-6.342***	478	.000
	Female	11.47	3.63			
Love Withdrawal	Male	10.635	2.94	-6.521**	478	.001
	Female	11.18	2.96			
Erratic Emotional Behavior	Male	9.905	2.90	-.231**	478	.034
	Female	10.17	2.99			
Achievement-oriented Psychological Control	Male	17.35	2.99	-2.953	478	.526
	Female	15.80	3.14			
Separation-anxious Psychological Control	Male	13.34	3.32	3.41**	478	.003
	Female	14.46	3.21			

Note. * $p < 0.05$ level, ** $p < 0.01$ level, *** $p < 0.001$ level

Analysis of Internalized Behaviors of High School Students Descriptive Statistics of High School Students' Internalized Behaviors

Descriptive analyses revealed that the mean and standard deviation of high school students' internalized behaviors were 136.79 and 16.09 respectively.

Table 6 Descriptive Statistics of High School Students' Internalized Behaviors

	<i>N</i>	Minimum	Maximum	Mean	<i>SD</i>
Internalized Behaviors	480	86	108	136.79	16.09

Moreover, Table 7 showed that the mean percentage of anxiety was the highest compared with other internalized behaviors components.

Table 7 Descriptive Statistics of High School Students' Internalized Behavior Components

IB Components	Mean	Mean %	<i>SD</i>
Depression	15.11	45.33%	2.68
Anxiety	17.77	84.92%	2.92
Social Withdrawal	13.28	78.68%	2.24
Somatic Complaints	9.64	62.53%	1.69
Shame	7.26	58.72%	1.64

Anxiety is a state of excessive worry and may include restlessness, irritability, difficulty concentrating, fatigue, muscle tension and sleep disturbances and occurs when an individual perceives a high level of threat (Derakshan & Eysenck, 2009). Anxiety disorders common among children include: separation anxiety, selective mutism, reactive attachment disorder and generalized anxiety.

Comparison of High School Students' Internalized Behaviors by Gender

The results indicated that the mean score of female students (138.32) was significantly higher than that of male students (135.19). To investigate the differences of internalized behaviors by gender, independent samples t-test was utilized. According to the result, there was significant difference between male and female students on internalized behaviors. It was found that female high school students had more internalized behaviors than male high school students. So, female students had more internalized behaviors than male students (See Table 8).

Table 8 Mean Comparison of High School Students' Internalized Behaviors by Gender

Gender	<i>N</i>	Mean	<i>SD</i>	<i>t</i>	<i>p</i>
Male	240	135.19	15.36	-3.199**	.002
Female	240	138.32	13.42		
Total	480	136.57	12.78		

Note. ** $p < 0.01$ level

And then, the differences between five internalized behaviors components on gender were investigated. Table 9 showed that the mean differences between internalized behaviors components on gender. Among five components, the mean scores of female students were significantly higher than that of male students in depression, anxiety, social withdrawal and shame. This finding evidently pointed out that female students' depression, anxiety, social

withdrawal and shame about their behavioral and social problems are significantly more than male students.

Table 9 Mean Comparison of High School Students' Internalized Behaviors by Gender

IB Components	Gender	Mean	<i>t</i>	<i>df</i>	<i>p</i>
Depression	Male	14.74	-2.19***	478	.002
	Female	15.52			
Anxiety	Male	17.58	-2.72***	478	.000
	Female	17.97			
Social Withdrawal	Male	12.89	-4.244**	478	.014
	Female	13.71			
Somatic Complaints	Male	9.65	.103	478	.918
	Female	9.63			
Shame	Male	7.29	.306**	478	.032
	Female	7.22			

Note. ** $p < 0.01$ level, *** $p < 0.001$ level

Moreover, to examine more detailed information for internalized behaviors of particular group according to parental psychological control levels, One-way ANOVA was utilized (See Table 10).

Table 10 Comparison of High School Students' Internalized Behaviors by Parental Psychological Control Levels

PPC Levels	<i>N</i>	Mean	<i>SD</i>	<i>F</i>	<i>p</i>
Low PPC	51	124.23	13.48	142.58***	.000
Moderate PPC	342	132.14	10.57		
High PPC	87	145.47	12.36		

Note. *** $p < 0.001$ level

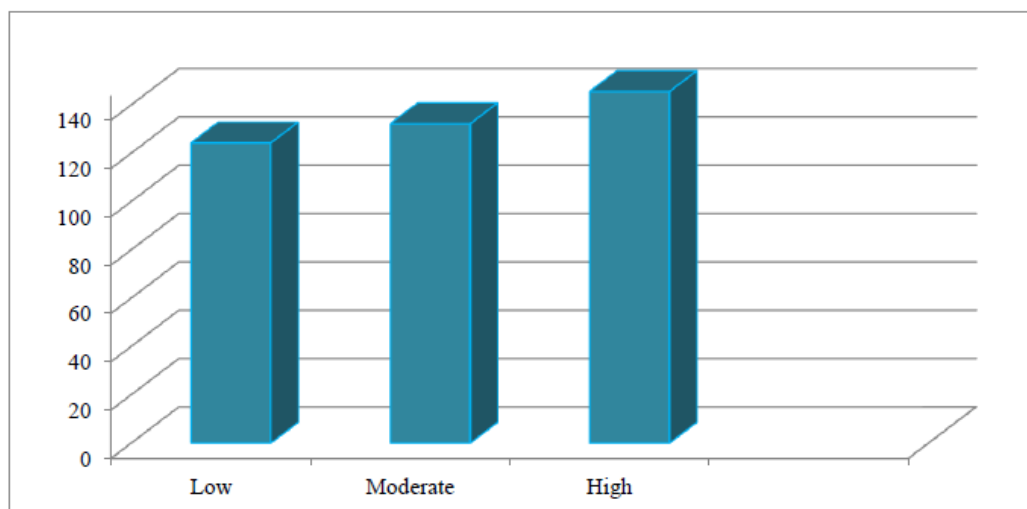


Figure 3 Mean Comparison of High School Students' Internalized Behaviors by Parental Psychological Control Levels

Relationship of Parental Psychological Control and Internalized Behaviors of High School Students

To investigate how parental psychological control were correlated with the components of internalized behaviors, correlation was calculated.

Table 11 Correlation between Components of Parental Psychological Control and Components of Internalized Behaviors

	PPC	Depression	Anxiety	SW	SC	Shame
PPC	1	.438**	.647**	.426**	.416**	.625**
Depression		1	.329**	.591**	.471**	.527**
Anxiety			1	.327**	.319**	.421**
SW				1	.351**	.619**
SC					1	.312**
Shame						1

Note. ** $p < 0.01$ level

PPC - Parental Psychological Control

SW - Social Withdrawal

SC - Somatic Complaints

As already mentioned above, parental psychological control were significantly positively correlated with depression, anxiety, social withdrawal, somatic complaints and shame.

The following regression analyses were conducted to measure the influence of parental psychological control on internalized behaviors of high school students. An eight step stepwise multiple regression analysis was used to assess how much additional variance in internalized behaviors can be explained by incrementally additional variance in internalized behaviors can be explained by incrementally adding predictor variables to the equation. Variables that explained internalized behaviors were entered eight steps.

In Step 1, internalized behavior was the dependent variable and constraining verbal expression was the independent variable. In Step 2, invalidating feeling was entered into the Step 2 equation. The process was repeated at Step 3 with personal attack on child, at Step 4 with guilt induction, at Step 5 with love withdrawal, at Step 6 with erratic emotional behaviors, at Step 7 with achievement-oriented psychological control and at Step 8 with separation-anxious psychological control.

Before the stepwise multiple regression analysis was performed, the independent variables were examined for collinearity. Results of inflation factor VIF (all less than 2.1) and collinearity tolerance (all greater than .57) suggested that the estimated β s are well established in the following regression model.

Table 12 Standardized Beta Coefficients from Stepwise Multiple Regression Analysis of Parental Psychological Control Components on Internalized Behaviors

Predictors	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7	Step 8
1.CVE	.189***	.243**	.178**	.153**	.089**	.081**	.024	.011*
2.IF		.251**	.175**	.116**	.104**	.092**	.071**	1.48
3.PAC			.308**	.231*	.192**	.156**	.129**	2.52**
4.GI				.329**	.216**	.152**	.134*	4.48***
5.LW					.275**	.219**	.198**	5.72***
6.EEB						.312**	.249**	6.15**
7.APC							2.51**	7.29***
8.SPC								6.821**
9. R^2	.072	.085	.098	.132	.164	.231	.267	.289
10.Adj R^2	.072	.082	.095	.128	.160	.228	.265	.285
11. R^2 Change	.072**	.056**	.025**	.067*	.059**	.031***	.029**	.019**
12.F value	$F(1,478)$ =125.32 $p<0.002$	$F(2,477)$ =94.85 $p<0.001$	$F(3,476)$ =72.68 $p<0.000$	$F(4,475)$ =102.12 $p<0.002$	$F(5,474)$ =98.43 $p<0.000$	$F(6,473)$ =68.37 $p<0.000$	$F(7,472)$ =116.21 $p<0.000$	$F(8,471)$ =108.54 $p<0.000$

Note. * $p < 0.05$ level, ** $p < 0.01$ level, *** $p < 0.001$ level

The results of the regression analysis showed that constraining verbal expression was able to account for 7.2 % of the variance in internalized behaviors when entered at Step 1, $R^2=.072$, $F(1,478) = 125.32$, $p < 0.002$. Invalidating feeling was able to account for 8.2 % of the variance in internalized behaviors when entered at Step 2, $R^2=.085$, $F(2,477) = 94.85$, $p < 0.001$. Personal attack on child was able to account for 9.5% of the variance in internalized behaviors when entered at Step 3, $R^2 = .098$, $F(3,476) = 72.68$, $p < 0.000$. Guilt orientation was able to account for 12.8 % of the variance in internalized behaviors when entered at Step 4, $R^2=.132$, $F(4,475) = 102.12$, $p < 0.002$. Love withdrawal was able to account for 16 % of the variance in internalized behaviors when entered at Step 5, $R^2=.164$, $F(5,474) = 98.43$, $p < 0.000$. Erratic emotional behavior was able to account for 22.8 % of the variance in internalized behaviors when entered at Step 6, $R^2=.231$, $F(6,473) = 68.37$, $p < 0.000$. Achievement-oriented psychological control was able to account for 26.5 % of the variance in internalized behaviors when entered at Step 7, $R^2=.267$, $F(7,472) = 116.21$, $p < 0.000$. Separation-anxious psychological control was able to account for 28.5% of the variance in internalized behaviors when entered at Step 8, $R^2=.289$, $F(8,471) = 108.54$, $p < 0.000$.

At Step 8, the β results revealed that personal attack on child ($\beta = 2.52$, $p<0.01$), guilt induction ($\beta = 4.48$, $p<0.001$), love withdrawal ($\beta = 5.72$, $p<0.001$), erratic emotional behaviors ($\beta = 6.15$, $p<0.01$), achievement-oriented psychological control ($\beta = 7.29$, $p<0.001$) and separation-anxious psychological control ($\beta = 6.821$, $p<0.01$) were positive and significant predictors of high school students' internalized behaviors.

Based on the results, the R-square increased from .072 into .289 with the addition of subsequent sets of variables. The multiple R^2 was .289, which means that the total contribution by the combined set of parental psychological control accounted for approximately 28.9 % of the variance of internalized behaviors. Thus collective relationship between internalized behaviors and the set of predictor variables can be characterized as moderately strong. The β results showed that constraining verbal expression, personal attack on child, guilt induction, love withdrawal, erratic emotional behavior, achievement-oriented psychological control and separation-anxious

psychological control were key predictors on internalized behaviors. However, invalidating feeling was not significant predictor on internalized behaviors (See in Table 12).

		Adj R^2
Model 1	CVE***	.072
Model 2	CVE** IF**	.082
Model 3	CVE** IF** PAC**	.095
Model 4	CVE** IF** PAC* GI**	.128
Model 5	CVE** IF** PAC** GI** LW**	.160
Model 6	CVE** IF** PAC** GI** LW** EEB**	.228
Model 7	CVE IF** PAC** GI* LW** EEB** APC**	.265
Model 8	CVE* PAC** GI*** LW*** EEB** APC*** SPC**	.285

Figure 4 Predictive Models of Components of Parental Psychological Control on Internalized Behaviors of High School Students

Conclusion

In this study, there were significant differences in parental psychological control and internalized behaviors by gender. Female students were higher in parental psychological control and internalized behaviors than male students. Moreover, there was a significant difference in internalized behaviors by parental psychological control levels. The components of parental psychological control would be significantly correlated with internalized behavior components. It predicted that students who possessed high parental psychological control had more internalized behaviors. This finding was consistent with the findings of Nuttall, I. R. (2017).

Adolescence is a critical period for the development of internalizing disorders, even for persons who have never displayed problem behavior during childhood. According to self-determination theory, the frustrations of three basic psychological needs (autonomy, competence and relatedness) underlie the relationship between parental psychological control and adolescents' externalized behavior. The frustration of these needs may also be the reason that adolescents' internalized behaviors mediate the relationship.

The results of this study could provide important information for parents and teachers. Specifically for the adolescents, if they are engaging in internalized and externalized behavior, both adolescents and their parents should receive assistance through intervention. This study recommended that parents and teachers should ensure that the friendly, closely and warmly relationships should be supportive to the children for decreasing students' internalized behaviors.

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A CONFIRMATORY FACTOR ANALYSIS OF THE STUDENT BUOYANCY INVENTORY AMONG THE STUDENT TEACHERS

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Abstract

The Student Buoyancy Inventory is a self-report survey instrument that measures the students' ability of navigating the academic challenges, setbacks and pressures of their everyday school life. The original scale to measure the academic buoyancy of the students had been developed by Martin and Marsh (2006) and it has 4 items only. Based on the Martin and Marsh (2010) theoretical framework, Comerford (2017) developed the revised scale. It contains 5 factors and 39 items according to the results of the exploratory factor analysis. The objective of the study is to validate the factor structure of the student buoyancy inventory in a sample of education degree college student teachers by using confirmatory factor analysis. The scale has five-factors involving 39-items with 4-point Likert scale. Data from 400 student teachers from the Education Degree Colleges were subjected to examine the psychometric properties of the scale. The results of the confirmatory factor analysis on the re-specified 30-items scale showed that the model fits with the five factors structure of the student buoyancy inventory (RMSEA = 0.50, TLI = 0.87, CFI = 0.90, $p = 0.00$). Besides, the convergent and discriminant validity and internal consistency supports the accuracy of the 30-items student academic buoyancy inventory to use in Myanmar Education Degree College Student Teachers.

Keywords: Academic Buoyancy, Student Buoyancy Inventory, Student Teachers, Confirmatory Factor Analysis

Introduction

Today, according to the social necessity, education system is one of the great and complex social organizations in every country. The very basic functionalities training institutions in each country play a very important role in the development and progress of the various communities. Among the primary institutions, teaching institution is a well-known organization and includes training human resources efficiently and effectively by considering the main tasks of the education.

To attain the goals of the training program, the education system must be empowered. According to the predetermined educational purposes, the desired changes and academic achievement can be found in three forms; cognitive, emotional and psychological impact on students and also cause a change in the behaviors of the students. Educational institutions have to change and to bring the learners on a societal context that will inspire and make them involved as they grow (Espejo, 2018). With the complex array of the academic demands in various educational institutions, the professional requirements of the younger generations were remained to be a challenging task for principals, teachers, counselors and psychologists.

As the student teachers, they are being trained to expose with a diverse set of performance requirements for the development of the education. In this process, they have to pursue goals to different extents and to gain broaden professional competences. Moreover, with the changing world, they need to try to fulfill their qualities, especially the 21st century skills. An emphasis on students' cognitive development and achievement has become the focus of the education system. Then, the state-holders were important to aware of the importance of education for examining their development.

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Academic environment is one of the environments that require conformity and compatibility. Academic life is among the most important periods of life that plays a role in the effective and successful education and learning of people. During this period, the students will be able to obtain merits and capabilities and achieve scientific progress. However, in everyday academic life, students face with different challenges, obstructions, and period-specific pressures including poor grades, levels of stress, threats to self-confidence and consequently threats to performance, and reduction in motivation and interactions (Reisy, Dehghani, Javanmard, Shojaei, & Monfared, 2014).

Therefore, some research programs focused on assessing the role of positive psychological constructs and pay attention to the numerous factors affecting the students' academic progress. Moreover, the school sites are places where the students can face academic challenges, setbacks and pressures. Academic buoyancy has been described as one factor that assists students to deal with academic risk (Martin & Marsh, 2009), particularly risk that occurs relatively frequently and on an ongoing and 'everyday' basis. Hence, academic buoyancy has been suggested to be a factor that practitioners might consider sustaining on an ongoing basis to help students deal with relatively ongoing academic difficulty.

Accordingly, effective investigation about the issues highlighted above requires a valid and reliable measure of academic buoyancy of the student teachers. The present study reports the result of a confirmatory factor analysis to validate the factor structure of the academic buoyancy.

Purpose of the Study

The main purpose of the study is to validate the factor structure of the Student Buoyancy Inventory among the student teachers of Education Degree Colleges.

Definition of Key Terms

Buoyancy: Buoyancy was defined as the individuals' ability to successfully response with setbacks, pressures and challenges that are typical of the ordinary course of life (Martin & Marsh, 2008).

Academic Buoyancy: Academic buoyancy is defined as students' capacity to successfully overcome difficulties and challenges that are typical of the ordinary course of everyday academic life (Putwain, Connors, Symes, & Douglas-Osborne, 2011).

Student Teacher: Student teacher is a college or university student who is studying under the supervision of a certified teacher in order to qualify for a degree in education (Princeton University, 2007).

Confirmatory Factor Analysis: Confirmatory factor analysis is a hypothesis testing method which tests whether the obtained the data set is suitable for a model (Schriesheim, Hurley, & Scandura, 1997).

Review of Related Literature

As important as it is to understand the many ways in which people's lives are adversely affected by unfavorable circumstances, it is just as important to try to learn from the experiences of those who succeed despite such circumstances. Such people are resilient to their adversity. The concept of resilience has its origins over forty years ago in psychology, founded on

studies of schizophrenia. The rationale for examining resilience is that in understanding the challenges which some people recover, mechanisms of adaptation and coping will be revealed that can be used to guide interventions with others at risk (Comerford, 2017).

While the major adversities are the essential factors on academic resilience concept, there is an important new term in education area, called the academic buoyancy (Collie, 2016). It is also a relatively new psychological construct grounded in the resilience literature and originating in the work of Martin and Marsh. Martin and Marsh (2009) argued that because resilience typically refers to the person's capacity for responding constructively to major challenges and setbacks, "academic buoyancy is limited the ability of everyday academic difficulties and challenges and the which is consistent with most of the students. Martin and Marsh (2009) therefore proposed the concept of buoyancy as the student's response to the academic setbacks, challenges, and pressures which are distinct from resilience in difference of kind (i.e., are relevant to most students) and difference of degree (i.e., found in typical rather than extreme circumstances) (Putwain, Connors, Symes, & Douglas-Osborne, 2011).

Academic buoyancy also refers to individual differences in the ability to withstand and respond successfully to the types of challenges and setbacks associated with routine school life, such as competing deadlines, examination pressure and poor grades (Putwain, Daly, Chamberlain, & Sadreddini, 2015). More exactly, buoyancy refers to the considerations of feelings to the everyday adversities (Collie, Martin, Bottrell, Armstrong, Ungar, & Liebenberg, 2016).

In contrast to academic resilience, which refers to students' ability to successfully deal with chronic and acute academic adversities in their school settings, academic buoyancy primarily focuses on bouncing back from daily, somewhat low, and mild adversities (Martin & Marsh, 2006). Thus, academic buoyancy applies to a greater number of students who may experience relatively frequent and ongoing frustrations and challenges on a daily basis compared to fewer students who may have more severe, chronic issues of underachievement (e.g., frequent academic failures, test stress, difficult school tasks etc.).

Martin and Marsh (2009) have identified numerous examples of academic buoyancy including the capacity to deal with patches of poor performance and isolated poor grades, recovering from dips in motivation and engagement, resolving minor or infrequent negative interactions with teachers, dealing with study pressure and stress, and effectively responding to clashing deadlines (Martin & Marsh, 2009). Martin and Marsh also contended that academic buoyancy gives rise to a capacity to deal with more major academic setback and adversity and Martin has demonstrated this to be the case.

As important as motivation is to academic life, if students cannot respond successfully to their everyday pressures, stress, and difficulties related to their academic settings, the progress will be declined. Therefore, the students must need to have both motives and resilience; especially a suitable level of buoyancy (Strickland, 2015). Although there is no formal theorizing about the relative roles of buoyancy, Martin's research led to the development of the factors of academic buoyancy. Several theories and constructs were developed to highlight the foundations for the academic buoyancy construct. Self-worth, self-efficacy, expectancy-value, motivation orientation, and self-determination theory were included as the foundational constructs of the academic buoyancy (Martin, 2012). These foundational motivation theories provide considerations about how and why students do what they do and also provide insights about students' efficacy to bounce back after challenges (Martin, 2012).

Previous recommendations for intervention with academic buoyancy have been driven by research identifying factors that predict students' capacity to bounce back from academic

setback. One line of research by Martin and Marsh (2006) and subsequently validated in longitudinal research identified five psycho-educational factors underpinning buoyancy construct. In consistence with the foundational motivation theories, the constructs for academic buoyancy were identified as the “5Cs,” these factors have been shown to express the academic buoyancy:

1. confidence,
2. coordination,
3. commitment,
4. composure, and
5. control.

The factors have been assumed to predict the motivational sets of academic buoyancy ability and each of these factors is psychologically important in nature.

It was found that the academic buoyancy was assessed using various types of academic buoyancy measures with different reliabilities through the systematic review on academic buoyancy and most of these were constructed on the basis of Martin and Marsh's Theoretical Framework. The most recent psychometric evaluation and only exploratory factor analysis of Academic Buoyancy Scale was undertaken by Comerford (2015 & 2017).

Guided by the competencies (5Cs), existing literature on resilience and academic buoyancy (Martin et al., 2006, 2008, 2009, & 2014), Comerford and colleagues (2015) and Comerford (2017) assembled the items and developed the instrument to measure the students' academic buoyancy following principal component analysis. The results of the administration were that 44.71% of the total variance was observed in five factors. The names of the factors and the variance observed for each factor were as follows: Confidence (18.64%), Composure (9.42%), Planning (7.115%), Control (5.144%) and Persistence (4.397%). By using a Spearman's Rho analysis, the convergent validity between the items in each scale was also examined and then it was found to be significant at the 0.01 level (Comerford et al., 2015). In 2017, they conducted to examine the extent which items in the factors related to each other. The values of Cronbach's Alpha and variance for each factor were observed as followed: Confidence (0.802 & variance accounted for 18.64%), Composure (0.708 & 9.42%), Planning (0.734 & 7.115%), Control (0.67 & 5.144%) and Persistence (0.79 & 4.397%) (Comerford, 2017). By their administration, the results were found to be acceptable.

For the construct validity of the personality questionnaire, the researchers often make use of confirmatory factor analysis, especially when the test are supposed to be multidimensional (Prudon, 2015). Therefore, in this study, the researcher will report the confirmatory factor analysis results of the Student Buoyancy Inventory which is originally developed by Comerford (2015 & 2017). The exploratory factor analysis has been done by the developer in their study. Therefore, the purpose of the study has been to cross validate the factor structure of this scale on a new and larger sample in consistence with Myanmar student teachers.

Method

Design of this study is cross sectional in nature and descriptive survey method.

Participants of the Study

Student teachers from Education Degree Colleges were selected as the participants of the study. Due to the Pandemic situation, the participants who involved in online survey were selected as the sample of the study. There were 400 student teachers (124 males and 276

females) from 17 Education Degree Colleges. Tabachnick and Fidell (1996) offered a guideline for sample size in conducting the factor analysis that a data set must include at least 300 cases to return a reliable factor (Mertler & Vannatta, 2002). Therefore, the sample size of the study was sufficiently large for confirmatory factor analysis.

Instrument

The 39 items Student Buoyancy Inventory is an instrument developed by Comerford (2017) and designed to assess the academic buoyancy of the students. It consists of five factors: (1) Confidence (9 items), (2) Coordination (8 items), (3) Commitment (8 items), (4) Control (8 items), and (5) Composure (6 items). The items were rated on four-point Likert Scale (1 = strongly disagree to 4 = strongly agree). It took students approximately 10 minutes to complete all the items.

Data Collection Procedure

After the approval of the 14 experts in the field of educational psychology for the expert validity, the items were prepared as a google form for online survey. The respondents were invited through email to participate in the study. Data were collected from May 2020 to December 2020. Then, to investigate the factor structure of 39-items Student Buoyancy Inventory, confirmatory factor analysis was undertaken to test the model data fit by using SPSS-AMOS software (version 24).

Findings

Criteria for Confirmatory Factor Analysis

With CFA, the researchers use a variety of fit indices to determine whether the model fit is acceptable or not. These indices include measures of global fit, or fit of the entire model to the data, such as the Goodness of Fit Index (GFI), chi-square, Tucker-Lewis Index (TLI) which is the same as Non-normed Fit Index (NNFI), Root Mean Square Error of Approximation (RMSEA), the Standardized Root Mean Square Residual (SRMR) and Comparative Fit Index (CFI). Hu and Bentler (1999) recommended that the maximum cutoff value of 0.08 for RMSEA and the cutoff value of 0.6 for SRMR and the minimum cutoff value of 0.95 for TLI and CFI and a p -value for the Chi-square less than 0.05 can be considered as the model is a good fit.

Further assessment of construct validity involved an assessment of construct validity: convergent validity and discriminant validity. Convergent Validity for the subscales was assessed by estimating the composite reliability (construct reliability) for each subscale and an assessment of the factors' average variance extracted (AVE). Hair, Black, Babin, and Anderson (2009) stated that an item factor loading ≥ 0.5 and $p < .05$, $AVE \geq 0.5$, and $CR \geq 0.7$ show the evidence of convergent validity and discriminant validity (Fornell & Larcker, 1981).

Model Fit Statistics

The maximum likelihood confirmatory factor analysis was conducted to examine the underlying latent variable structure of 39 items Student Buoyancy Inventory (SBI). The data fit indices of the models of academic buoyancy were examined in Table 1.

Table 1 Model Fit Statistics for the 39 items Student Buoyancy Inventory

Model	χ^2	<i>p</i> -value	RMSEA	CFI	TLI
Five factors 39-items Student Buoyancy Inventory	952.41	0.000	0.061	0.67	0.65

According to Table 1, the results obtained the fit model with $\chi^2 = 952.41$; $p < 0.001$; RMSEA = 0.061; CFI = 0.67 and TLI = 0.65. These results show that the model fit indices were highlighting a poor fit between the hypothesized model and the model data. Based on the Table 1, CFI and TLI did not reach adequate value. So, the model was re-specified.

For a model to have acceptable fit, the standardized regression weights (R^2) on each item were greater than 0.4. Moreover, Hooper, Cough and Mullen (2008) expressed that it is a good to remove the items with low R^2 values (less than 0.2) from the analysis to remove the better model fit. In the present analysis, the R^2 values of nine items were less than 0.2. Therefore, these items were removed from this study.

Moreover, according to Gerbing and Anderson (1984), another way of improving model fit is through the correlation of error terms. The correlated error terms showed that there is additional information in the data that has not exploited in the current model. It also means that the observed covariation between a given pair of indicators has not been adequately accounted for by the factors present in the model. Positive values of correlated error terms mean that the model under predicts the particular indicator covariance whereas negative values mean that the model over predicts this covariance. Then, after checking the correlated error terms, the analysis was run again to get a perfect model fit. The final model for academic buoyancy with 30 items was shown in Table 2.

Table 2 Model Fit Indices for the 30 items Student Buoyancy Inventory

Model	χ^2	<i>p</i> -value	RMSEA	CFI	TLI
Five factors 30-items Student Buoyancy Inventory	938.04	0.000	0.05	0.90	0.87

Based on the data presented in Table 2, a new confirmatory factor analysis with changes yielded the fit indices as a p -value = 0.000, CFI = 0.90, TLI = 0.87, and RMSEA = 0.05. The TLI value is close to 0.9, which shows a relatively good fit. The results indicated that the model fit indices were acceptable and the revised model fits to the data.

Convergent Validity and Reliability

Convergent validity is also an evidence to test construct validity. To establish convergent validity, factor loading of the indicator variables, composite reliability (CR) and average variance extracted (AVE) should be used. AVE and CR values were computed by the formula using Microsoft Excel. Table 3 shows that the results of AVE and CR of academic buoyancy scale.

Table 3 Composite Reliability (CR) and Average Variance Extracted (AVE) of Student Buoyancy Inventory

Factors	CR	AVE
Confidence	0.77	0.49
Coordination	0.78	0.52
Commitment	0.77	0.49
Control	0.71	0.48
Composure	0.70	0.59

According to Table 3, the composite reliability or construct reliability for each factor, which indicated whether items within the same factor measured the same construct were greater than 0.7: CR(Confidence) = 0.77, CR(Coordination) = 0.78, CR(Commitment) = 0.77, CR (Control) = 0.71 and CR(Composure) = 0.70. Moreover, the values of AVE were also around 0.5. The results showed that the five factor 30-items SBI demonstrated convergent validity.

Discriminant Validity

Discriminant validity was used to show that the construct is actually differing from one another empirically. Discriminant validity was evaluated by the correlation coefficients of the factors and the square root of AVE. The results were shown in Table 4.

Table 4 Factor Correlation Metrix with Square Root of the AVE on the Diagonal

Factors	Confidence	Coordination	Commitment	Control	Composure
Confidence	0.70				
Coordination	0.54	0.72			
Commitment	0.55	0.58	0.70		
Control	0.26	0.51	0.51	0.69	
Composure	0.18	0.27	0.27	0.36	0.78

Note: The diagonal numbers in bold letters are the square root of AVE values.

In the table, the square root of average variance extracted values were greater than the correlation coefficients of the factors. The results show the sufficient discriminant validity of the scale.

Internal Consistency Reliability

One of the most popular estimates of internal consistency is Cronbach's alpha. Therefore, the researcher assessed the internal consistency of the SBI with Cronbach's alpha. The results in Table 5 showed that reliability coefficient of each factor ranged from 0.59 to

0.73 and the reliability coefficient of the whole scale was 0.85. Thus, SBI was considered to be reliable to measure academic buoyancy of the student teachers.

Table 5 Number of Items Retained and Reliability Coefficient for each Subscale of SBI

Factors	Number of items	Cronbach's Alpha
Confidence	7	0.67
Coordination	7	0.73
Commitment	7	0.68
Control	5	0.59
Composure	4	0.66
SBI	30	0.85

Discussions

This study was mainly a measurement study and the findings demonstrated that the instrument has adequate psychometric properties (valid and reliable). The finding of this present study has expanded the existing body of knowledge on the development of a measurement scale to evaluate the academic buoyancy of student teachers. Hence, the model reported here might be useful in the psychology context and may be interested in assessing the students' buoyancy to academic learning, providing feedback and training to the ability improving. In summary, it is expected that there will be a great value for the teachers and the counselors to know the ability of students' academic buoyancy and provide feedback to improving their learning.

Conclusion

In this study, the first confirmatory analysis did not support the model fit indices and the overall construct validity of the original 39-item version of Student Buoyancy Inventory. Therefore, the original 39 items scale was re-specified as 30 items SBI according to the standard regression weights less than 0.4 and error items. The psychometric properties of a new SBI for assessing academic buoyancy presented that the scale can be said that to be successfully cross-validated. All the model fit indices (RMSEA=0.50, CFI=0.90, TLI=0.87, $p=0.00$) indicated a good fit between the measurement model tested and the data. The convergent validity of SBI was indicated by high composite reliability values and acceptable AVE values. The discriminant validity of the model was also indicated by the AVE values. As for the internal consistency reliability, the values of Cronbach's alpha pointed out the satisfactory results for reliability of Student Buoyancy Inventory.

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AN INVESTIGATION INTO THE IMPACT OF INSTRUCTIONAL DESIGN FOR CONTEXTUALIZED INSTRUCTION ON STUDENTS' CONCEPTUAL UNDERSTANDING IN LEARNING PHYSICS*

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Abstract

The main purpose of this study is to investigate the impact of instructional design for contextualized instruction on students' conceptual understanding in learning physics. The research design adopted was one of the mixed methods designs, namely, the explanatory sequential mixed methods design (QUAN→qual design). For the quantitative study, nonequivalent control group design was used. To follow up on quantitative results, descriptive case study design was used. The research instruments were pretest, posttest, materials including unit plans, lesson plans and contextualized workbook, questionnaires, classroom observational guide and interview. By using the simple random sampling method, four basic education high schools from Yangon Region were selected for the quantitative study. Purposive sampling was used to select the students and the teachers in the experimental groups for the qualitative study. In quantitative research findings, the findings of physics achievement on conceptual understanding showed that experimental groups who received the instructional design for contextualized instruction were significantly higher than the control groups who did not. There was a strong relationship between students' physics achievement and their attitudes towards the instructional design. The stronger the students' attitudes towards the instructional design were established, the higher the physics achievement. The predicting factors for physics achievement were experience, preference and academic value. Concerning qualitative research findings, the results of questionnaires, observation and interview revealed that teachers and students preferred, well performed and are willing to apply this instructional design. The qualitative research findings also supported the quantitative research findings. Therefore, the research findings proved that the instructional design for contextualized instruction had a positive impact on high school physics teaching and learning.

Keywords: Instruction, Instructional Design, Contextualized Instruction, Conceptual Understanding, Physics

Introduction

The ultimate aim of education or pedagogy is to grow not just physically, but in greater insight into and control over oneself and over one's environments (Khin Zaw, 2001). To achieve this aim and successfully cope with the novelty of future and its still-unknown problems, pedagogues must teach their wards to think. Therefore, it is necessary to develop an innovative instruction that can cultivate students' higher-order thinking skills and scientific processing capacity. Out of many innovative strategies in teaching physics, contextualized instruction is student-centered and encourages student learning through observation, connection and authentic instead of factual memorization. It allows students to develop a deeper understanding of the concepts and gives students practice in defining problems, gathering data to solve the problems, and helps develop higher-order thinking skills. Therefore, this study attempts to successfully implement the instructional design for contextualized instruction which aims to develop students' conceptual understanding, problem solving and inquiring mind and scientific attitudes towards physics.

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Objectives of the Research

1. To develop an instructional design for contextualized instruction that can enhance students' physics learning through their conceptual understanding.
2. To investigate the impact of instructional design for contextualized instruction on teaching and learning high school physics.
3. To make suggestions and recommendations based on the research results for the improvement of teaching and learning physics.

Research Questions

1. Are there any significant differences in physics achievement of the students who received instructional design for contextualized instruction and those who did not?
2. Are there any significant relationships between students' physics achievement and their attitudes towards instructional design for contextualized instruction?
3. Do students' attitudes towards instructional design for contextualized instruction: experience, preference and academic value predict physics achievement?

Scope of the Research

1. This study is geographically restricted to Yangon Region.
2. Participants in this study are Grade Ten students who are studying physics and physics teachers from the selected schools during the academic year 2019-2020.
3. It is limited only four chapters from Grade Ten physics textbook prescribed by the Basic Education Curriculum, Syllabus and Textbook Committee, 2019.

Definitions of the Key Terms

The definitions of the key terms are presented as follows.

Instruction: Instruction is the intentional facilitation of learning towards identified learning goals (Smith & Ragan, 1990).

Instructional Design: Instructional design is defined as the systematic and reflective process of translating principles of learning and instruction into plans for instructional materials, activities, information resources, and evaluation (Smith & Ragan, 1990).

Contextualized Instruction: Contextualized instruction is a way to introduce content using a variety of active learning techniques designed to help students connect what they already know to what they are expected to learn, and to construct new knowledge from the analysis and synthesis of the learning process (Hudson & Whisler, 2007).

Conceptual Understanding: Conceptual understanding is an understanding of a concept. When students have an understanding of concept, they can think with it, use it in area other than that in which they learned it, state it in their own words, find a metaphor or an analogy for it or build a mental or physical model of it (Moran & Page, 2015).

Physics: Physics is defined as the scientific study of matter and energy and the relationships between them, including the study of forces, heat, light, sound, electricity and the structure of atoms (Hornby, 2015).

Statement of the Problem

Problem in students' conceptual understanding of physics are common in Myanmar. Students' conceptual understanding in physics would be incomplete without having mathematical problem solving skills. However, if the students view understanding physics as applying formulae to solve problems, little will be gained in terms of conceptual understanding. Therefore, this study attempts to develop an instructional design to cultivate the students' problem solving attitude of mind and scientific inquiry skills instead of merely transmitting information to them. In addition, all the students have misconceptions about physics. They acquired many of the physics concepts early in life by inadequate observation and false assumptions that do not reflect reality. As pointed out by Victor (1989), a good physics program should take advantage of the fact that students have inquiry minds, and it will encourage them to look for the cause and effect of things that are happening to them. Therefore, in conducting this study, physics concepts, laws and facts are taught by using contextualized practical activities with the help of contextualized worksheets and workbook to overcome these misconceptions in physics.

The analysis of the study content of high school physics in Myanmar shows that syllabi are quite dense and overloaded with many topics. At the end of the lessons, the teachers can only give problems to solve and homework assignments. As a result, the quality of physics teaching, in particular, its practical, experimental component, dramatically decreased and the students fail to see the inter-dependent relationship that exists between the academic contents of physics subjects offered in school and their applicability in real life. Consequently, there is low transfer of what is learned in the school to the real-world. This is the gap that this study is construed to fill. Finally, one of the objectives of learning physics in Myanmar is not only to solve a physics problem, but also to know and understand the application of the basic knowledge and skill of physics to daily-life phenomena and national production. In order to implement this objective, this study mainly emphasizes the experiencing contextualized activities for the students not only in the classroom but also in the laboratory. Therefore, this study would be beneficial to both high school physics teachers and students who are studying physics as this study would provide an instructional design for contextualized instruction by which students are prepared to develop the 21st century skills for learning.

Review of Related Literature

Philosophical Considerations: Pragmatism, progressivism, contextualism and constructivism are deeply taken into philosophical consideration for developing an instructional design for contextualized instruction. From the pragmatic perspective, education ought to be dominated by real-life tasks, challenges, theory and facts were to be learned through activity (Ozman & Craver, 1986). And, from the progressive perspective, the students would have to exercise their brain by problem solving and thinking critically, resulting in learning (Armstrong, Henson & Savage, 1989). Then, from the contextualistic perspective, ideas are verified by human experiences with an idea's meaning essentially defined by its practical consequences and its truth by the degree to which those consequences reflect successful action. Additionally, from the constructivist perspective, students need to be actively investigating and experimenting to develop meaningful understanding.

Therefore, in implementing contextualized instruction, students are provided with the learning experiences that build on understanding of content in context and this context mediates their understanding of content.

Learning Theories: In developing the instructional design for contextualized instruction, Kohler's learning theory, Piaget's cognitive learning theory, Vygotsky's socio-cultural learning theory, Bruner's concept formation and Ausubel's learning theory are also taken into considerations. Kohler theorized that insight is the mental ability which helps an individual to perceive all of a sudden, the relationship of the elements in the environment that would provide a way to solve the problem. Piaget (1950) indicated that learning involves reconciling newly encountered ideas and reasoning such as those in a new experience or lesson with the learner's existing ideas and reasoning (Sang, 2003). Vygotsky's socio-cultural learning theory emphasizes the social contexts of learning and that knowledge is mutually built and constructed. According to Bruner, cognitive structures that provide understanding to experiences allow the individual to explore new discoveries. Accordingly, Ausubel believed that knowledge is hierarchically organized, that new information is meaningful to the extent that it can be related to what is already known.

Therefore, in this contextualized instruction, the new physics concepts and propositions to be learned is designed to incorporate into a hierarchically arrangement framework in cognitive structure so as to use the insight to solve learning problems.

Background Teaching Models. There are four background teaching models that support the proposed instructional design for contextualized instruction. They are Glaser's basic teaching model, Dr. Khin Zaw's multimodal model, Landa's algorithmic model and Roth's conceptual change instructional model. The conceptual framework for this study is derived in part from Hung's 3C3R (3C – content, context, connection and 3R – researching, reasoning, reflecting) Problem Design Model. The instructional design for contextualized instruction and the learning materials are devised if the heart, the hand as well as the head are to be influenced.

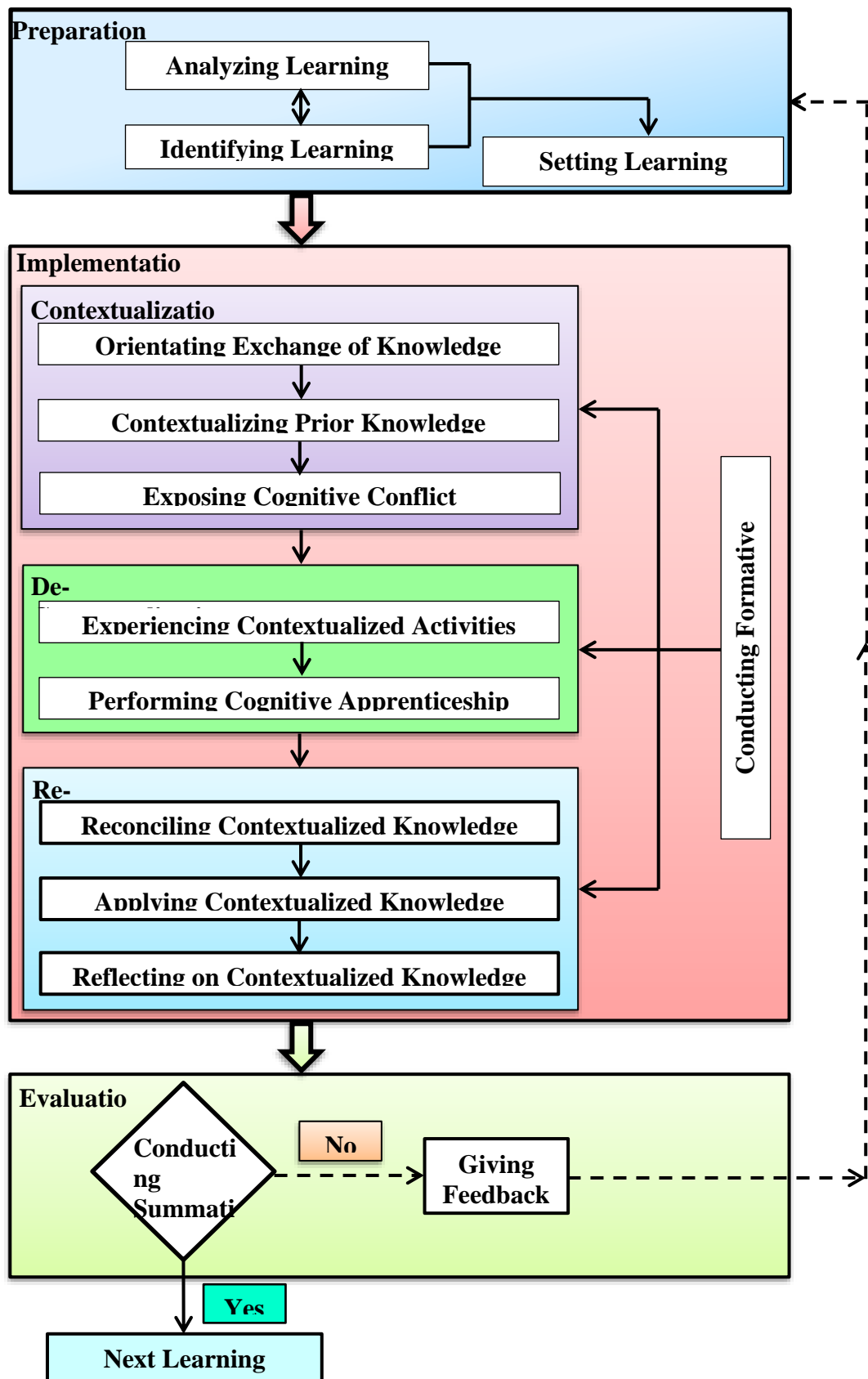


Figure 1 Proposed Instructional Design for Contextualized Instruction

Methods

Research Design. One of the mixed methods design, the explanatory sequential mixed methods design (QUAN→qual) was employed for this study. The framework for the design is depicted in the following Figure 2.

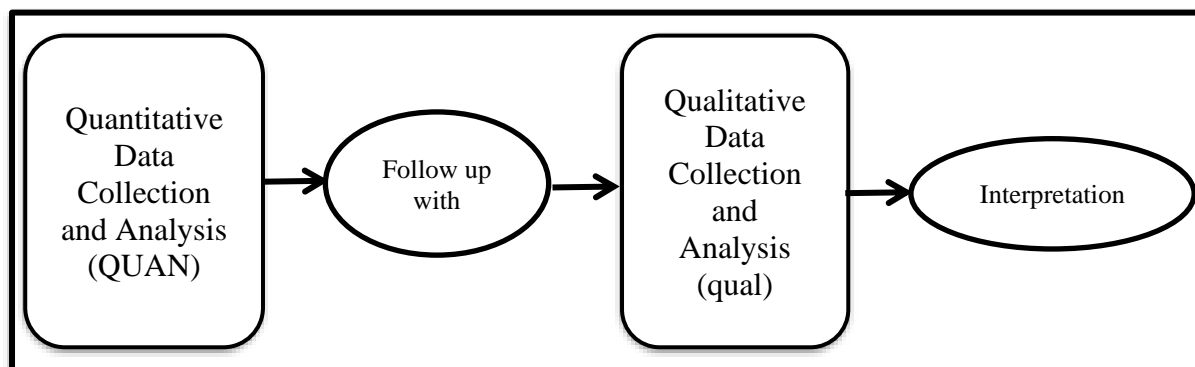


Figure 2 Explanatory Sequential Mixed Methods Framework

Source: From Creswell, (2014), p.541.

Quantitative Research Design. The quantitative research design used in this study was one of the quasi-experimental designs, nonequivalent control group design.

Population and Sample Size. Simple random sampling method was used in the quantitative study. The population and sample size is depicted in Table 1.

Table 1 Population and Sample Size for Quantitative Research

Region	District	Township	Name of School	No. of Population	No. of Sample
Yangon	East	South Okkalapa	No. (1) Basic Education High School, South Okkalapa	205	105
	West	Hlaing	No. (1) Basic Education High School, Hlaing	172	101
	South	Dala	No. (1) Basic Education High School, Dala	310	115
	North	Mingaladon	No. (12) Basic Education High School (Branch), Mingaladon	100	100
Total				787	421

Qualitative Research Design. The adopted qualitative research design for this study was one of the case study designs, descriptive case study design.

Population and Sample Size. The population and sample size of the qualitative study was four physics teachers and 210 physics students from experimental groups.

Instruments. Quantitative research instruments were pretest, materials including sample unit plans, lesson plans which are based on the instructional design for contextualized instruction and posttest. As qualitative research instruments, questionnaires, observation and interview guides were used.

Analysis of Data. The Statistical Package for the Social Sciences (SPSS) Version 22 was used to analyze the data. The quantitative data were analyzed by using one-way analysis of covariance,

Pearson's product moment correlation, multiple regression analysis, descriptive statistics and the qualitative data were analyzed by thematic analysis.

Findings

Quantitative Research Findings

In an attempt to answer the first research question, one-way analysis of covariance (ANCOVA) was used to analyze the data from posttest. According to the selected quasi-experimental design, the two intact groups from each school were selected as the experimental group who received instructional design for contextualized instruction and the control group who did not. Using ANCOVA allowed the researchers to adjust for any pretreatment differences that existed between the experimental groups and the control groups (McMillan & Schumacher, 2006). The following Table 2 shows the results of pretest scores in the four selected schools.

Table 2 Results of Pretest Scores on Conceptual Understanding in Four Schools

School	Group	N	M	SD	MD	F	p
S1	Experimental	53	13.0	3.11	1.75	9.743	.002**
	Control	52	11.25	2.61			
S2	Experimental	50	17.10	3.82	-.21	.092	.762 (ns)
	Control	51	17.31	3.22			
S3	Experimental	57	11.49	2.97	.20	.120	.729 (ns)
	Control	58	11.29	3.14			
S4	Experimental	50	14.90	3.62	-.06	.007	.934 (ns)
	Control	50	14.96	3.57			

Note. S1 = No. (1) Basic Education High School, South Okkalapa; S2 = No. (1) Basic Education High School, Hlaing; S3 = No. (1) Basic Education High School, Dala; S4 = No. (12) Basic Education High School (Branch), Mingaladon.

ns = not significant. ** $p < .01$.

Analysis of the Posttest Scores on Conceptual Understanding in S1. The following Table 3 shows the analysis of covariance results for posttest scores in S1.

Table 3 Analysis of Covariance (ANCOVA) Results for Posttest Scores in S1

Level	Group	N	M	SD	MD	F	p
Knowledge	Experimental	53	2.66	.99	0.33	3.38	.069 (ns)
	Control	52	2.33	1.04			
Comprehension	Experimental	53	10.02	3.07	1.64	7.39	.008**
	Control	52	8.38	3.08			
Application	Experimental	53	10.85	1.09	1.77	38.59	.000***
	Control	52	9.08	1.77			
Analysis	Experimental	53	3.85	.79	1.96	176.63	.000***
	Control	52	1.88	.68			
Synthesis	Experimental	53	3.68	.85	1.93	151.51	.000***

Level	Group	N	M	SD	MD	F	p
	Control	52	1.75	.74			
Evaluation	Experimental	53	3.45	.97	1.57	70.41	.000***
	Control	52	1.88	.86			
Total	Experimental	53	35.60	3.29	10.29	195.23	.000***
	Control	52	25.31	4.24			

Note. ns = not significant. ** $p < .01$. *** $p < .001$.

As described in Table 3, there was no significant difference in the posttest mean scores between the experimental group and the control group at the knowledge level questions in S1. Therefore, it can be interpreted that the formal instruction could improve the knowledge level posttest scores like the instructional design for contextualized instruction in S1. But at the comprehension, application, analysis, synthesis and evaluation level questions, there was a significant difference between the experimental group and the control group. Therefore, it can be interpreted that the use of instructional design for contextualized instruction significantly enhanced students' higher-order thinking skills in S1.

Analysis of the Posttest Scores on Conceptual Understanding in S2. The following Table 4 describes the analysis of covariance results for posttest scores in S2.

Table 4 Analysis of Covariance (ANCOVA) Results for Posttest Scores in S2

Level	Group	N	M	SD	MD	F	p
Knowledge	Experimental	50	3.22	.86	.32	4.29	.061 (ns)
	Control	51	2.90	.64			
Comprehension	Experimental	50	11.10	1.27	.65	8.07	.005**
	Control	51	10.45	.923			
Application	Experimental	50	11.72	1.18	3.21	137.36	.000***
	Control	51	8.51	1.52			
Analysis	Experimental	50	3.94	.84	2.31	222.28	.000***
	Control	51	1.63	.66			
Synthesis	Experimental	50	3.66	.82	1.69	79.10	.000***
	Control	51	1.97	1.06			
Evaluation	Experimental	50	3.90	.84	1.98	104.65	.000***
	Control	51	1.92	.94			
Total	Experimental	50	37.59	2.73	10.17	375.26	.000***
	Control	51	27.37	2.54			

Note. ns = not significant. ** $p < .01$. *** $p < .001$.

According to the results from Table 4, it can be interpreted that the formal instruction could improve the knowledge level posttest scores like the instructional design for contextualized instruction in S2. Because, there was no significant difference in the posttest mean scores between the experimental group and the control group at the knowledge level questions. For the comprehension, application, analysis, synthesis and evaluation level questions, there was a significant difference between the experimental group and the control group. Therefore, it can be interpreted that the use of instructional design for contextualized instruction significantly enhanced students' higher-order thinking skills in S2.

Analysis of the Posttest Scores on Conceptual Understanding in S3. The following Table 5 shows the analysis of covariance results for posttest scores in S3.

Table 5 Analysis of Covariance (ANCOVA) Results for Posttest Scores in S3

Level	Group	N	M	SD	MD	F	p
Knowledge	Experimental	57	3.02	.95	.42	5.97	.016*
	Control	58	2.60	.88			
Comprehension	Experimental	57	10.00	1.46	.91	8.60	.004**
	Control	58	9.09	1.86			
Application	Experimental	57	10.16	2.86	4.07	61.77	.000***
	Control	58	6.09	2.67			
Analysis	Experimental	57	3.44	.14	1.41	64.43	.000***
	Control	58	2.03	.12			
Synthesis	Experimental	57	3.82	.93	1.77	93.24	.000***
	Control	58	2.05	1.03			
Evaluation	Experimental	57	4.02	.77	2.00	167.89	.000***
	Control	58	2.02	.88			
Total	Experimental	57	34.46	3.54	10.65	185.16	.000***
	Control	58	23.81	4.70			

Note. * $p < .05$. ** $p < .01$. *** $p < .001$.

Comparison of the posttest mean scores of the experimental and control groups using one-way ANCOVA showed that there was a significant difference between the performances of the two groups at the knowledge, comprehension, application, analysis, synthesis and evaluation level questions. Therefore, it can be interpreted that the use of instructional design for contextualized instruction significantly enhanced students' lower-order and higher-order thinking skills in S3.

Analysis of the Posttest Scores on Conceptual Understanding in S4. The following Table 6 shows the analysis of covariance results for posttest scores in S4.

Table 6 Analysis of Covariance (ANCOVA) Results for Posttest Scores in S4

Level	Group	N	M	SD	MD	F	p
Knowledge	Experimental	50	2.02	.89	.38	5.96	.063 (ns)
	Control	50	1.64	.63			
Comprehensi	Experimental	50	9.96	1.41	1.06	10.26	.002**
	Control	50	8.90	1.85			
Application	Experimental	50	10.32	2.51	5.32	109.64	.000***
	Control	50	5.00	2.60			
Analysis	Experimental	50	3.18	.98	1.42	69.45	.000***
	Control	50	1.76	.69			
Synthesis	Experimental	50	3.12	.92	1.30	49.60	.000***

Level	Group	N	M	SD	MD	F	p
	Control	50	1.82	.92			
Evaluation	Experimental	50	3.52	1.05	1.82	110.20	.000***
	Control	50	1.70	.61			
Total	Experimental	50	32.12	3.69	11.30	211.85	.000***
	Control	50	20.82	4.11			

Note. ns = not significant. ** $p < .01$. *** $p < .001$.

The results in Table 6 showed that there were no significant differences in the posttest mean scores between the experimental group and the control group at the knowledge level questions. But for the comprehension, application, analysis, synthesis and evaluation level questions, there was a significant difference between the experimental group and the control group. Therefore, it can be interpreted that the use of instructional design for contextualized instruction significantly enhanced students' higher-order thinking skills in S4. The following Figure 3 shows the comparison of posttests scores on conceptual understanding in the selected schools.

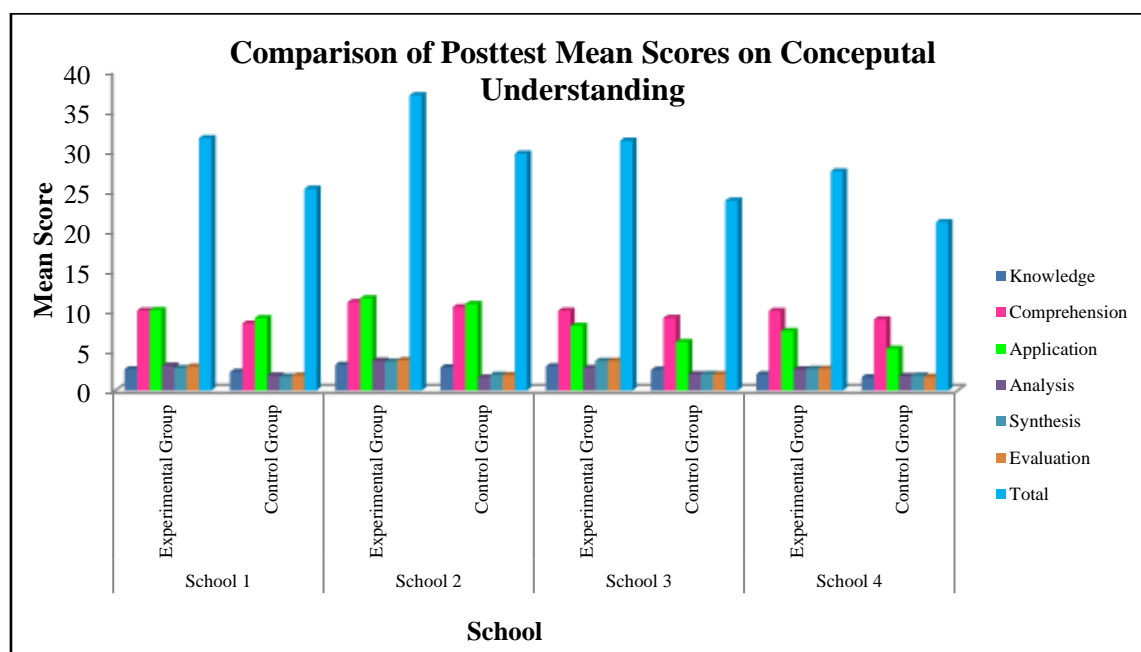


Figure 3 Comparison of Posttest Mean Scores on Conceptual Understanding

Relationship between Students' Physics Achievement and their Attitudes towards Instructional Design for Contextualized Instruction: In an attempt to answer the second research question, Pearson product-moment correlation was used. The correlation between physics achievement and three variables are shown in Table 7.

Table 7 Correlation between Students' Physics Achievement and their Attitudes towards Instructional Design for Contextualized Instruction

Variable	Physics Achievement	Experience	Preference	Academic Value
Physics Achievement	1	.643**	.693**	.558**
Experience		1	.683**	.507**
Preference			1	.622**
Academic Value				1

Note. ** Correlation is significant at the 0.01 level (2 – tailed).

According to the results presented in Table 7, students' physics achievement was significantly correlated with their attitudes towards the instructional design for contextualized instruction: experience ($r = .643, p < .01$), preference ($r = .693, p < .01$) and academic value ($r = .558, p < .01$). Therefore, it could be generally interpreted that the stronger the experience, preference and academic value towards the instructional design for contextualized instruction were received, the higher the physics achievement.

Regression Analysis of Predictions for Physics Achievement from Students' Attitudes towards Instructional Design for Contextualized Instruction: In an attempt to answer the third research question, multiple regression analysis was used to see what impact multiple variables have on an outcome.

Table 8 Regression Analysis Summary for the Variables Predicting Physics Achievement

Variable	<i>B</i>	β	<i>t</i>	<i>R</i>	<i>R</i> ²	Adj <i>R</i> ²	<i>F</i>
Physics Achievement	32.364		13.166***	.742	.551	.545	84.333***
Predictor Variables							
Experience	.852	.291	4.510***				
Preference	.758	.390	5.478***				
Academic Value	.504	.168	2.792***				

Note. Constant = Dependent variable: Physics Achievement, *** $p < .001$.

The above summary Table 8 shows that the multiple correlation coefficient (*R*), using all the predictors simultaneously is .742 ($R^2 = .551$) and the adjusted R^2 is .545. It means that 54.5 % of the variance in physics achievement can be predicted from experience, preference and academic value towards the instructional design for contextualized instruction. According to the results from Table 8, among the variables from students' attitudes towards the instructional design for contextualized instruction, the best predictor was preference ($\beta = .390***, p < .001$). Then, the second predictor was experience ($\beta = .291***, p < .001$) and the last predictor was

academic value ($\beta = .168^{***}$, $p < .05$). Based on these regression findings, the regression equation can be defined as follows:

$$PA = 32.364 + .852 X1 + .758 X2 + .504 X3$$

Where: PA = Physics Achievement

X1 = Experience

X2 = Preference

X3 = Academic Value

The multiple regression model for predicting physics achievement from students' attitudes towards the instructional design for contextualized instruction obtained from applying regression analysis was shown in the following Figure 4.

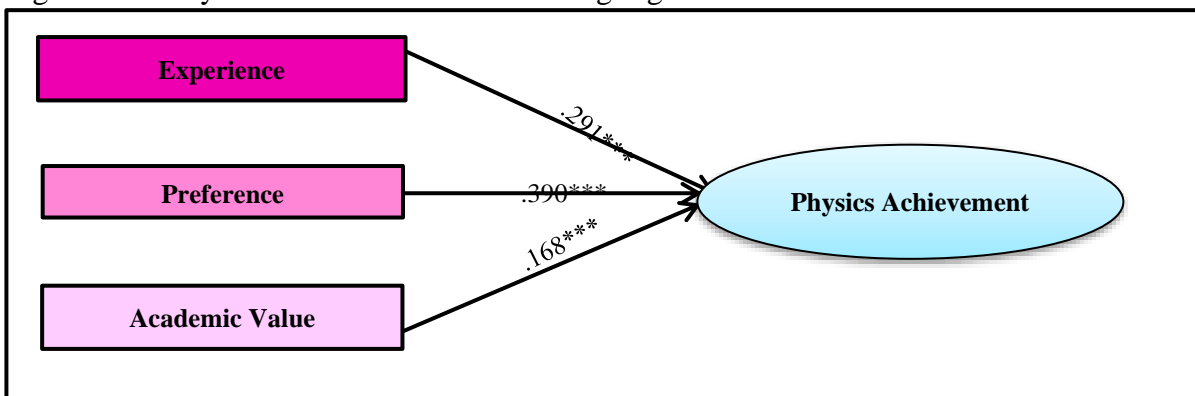


Figure 4 Multiple Regression Model for Predicting Physics Achievement from Students' Attitudes towards Instructional Design for Contextualized Instruction

Pallant (2013) stated that multicollinearity exists when the independent variables are highly correlated ($r = .9$ and above). In this study, multicollinearity was avoided because none of the correlation coefficients of the independent variables are highly correlated, the tolerance value for each independent variable is not less than .10 and the value of variance inflation factor (VIF) is well below the cut-off of 10. In the Normal P-P Plot, points lied in a reasonably straight diagonal line from bottom left to top right. This would suggest that no major deviations from normality is seen in this research. Since there is no multicollinearity problem and normality, it is reasonable to conclude that the multiple regression model to explain physics achievement is stable, good and quite respectable. Therefore, it can also be interpreted that the students who had high experience, preference and academic value towards the instructional design for contextualized instruction had high conceptual understanding in learning physics.

Qualitative Research Findings

Findings of Observational Guide: The graphical illustration of results from classroom observational guide for physics teachers and students is presented in Figure 5.

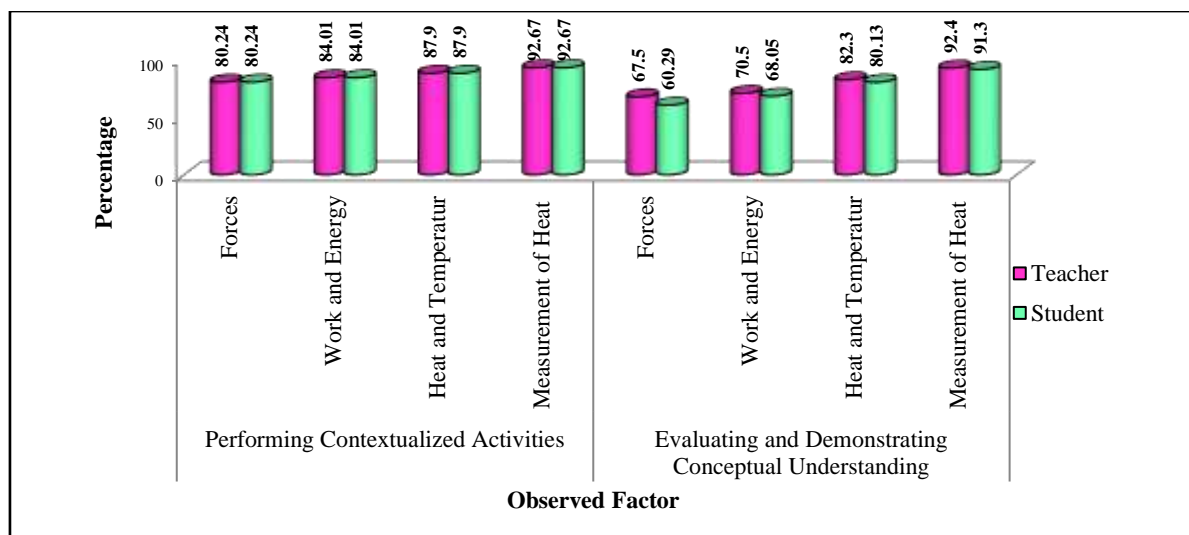


Figure 5 Results from Classroom Observational Guide

According to the results from observation guide, at the very first lesson, the students experienced difficulty in communication within group works and demonstrating their conceptual understanding with the developed contextualized workbook. However, they eventually performed well in performing contextualized activities and demonstrating their conceptual understanding with the help of the proposed instructional design for contextualized instruction. And also, the experimental teachers are gradually able to prepare, implement and evaluate the contextualized lessons.

Findings of Questionnaires: The following Table 9 shows the results from the questionnaires.

Table 9 Attitudes of Teachers and Students towards Instructional Design for Contextualized Instruction

No	Item	Participant	Number	Percentage (%)				
				Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
1.	Contextualized instruction is an active learning technique designed to help students connect what they already know to what they are expected to learn.	Teacher	4	0	0	0	0	100
		Student	210	0	0.3	11.4	16.3	72
2.	Students' contextualized practical activities are guided by means of modeling, coaching and fading in this instruction.	Teacher	4	0	0	0	0	100
		Student	210	0.3	0.1	2.5	19.1	78
3.	Contextualized practical activities are guided through reports, worksheets and posters in this instruction.	Teacher	4	0	0	0	25	75
		Student	210	1	1.1	8.4	20.5	69
4.	Contextualized learning activities are conducted in learning environment which allows to use physics dictionary, work book, practical apparatus and samples.	Teacher	4	0	0	0	25	75
		Student	210	1	0.2	4.5	19.3	75
5.	I prefer this instruction to formal instruction because it can develop the quality of assessment and evaluation of instructional activities.	Teacher	4	0	0	0	0	100
		Student	210	0	0.5	10.3	21.2	68

No	Item	Participant	Number	Percentage (%)				
				Strongly Disagree	Disagree	Uncertain	Agree	Strongly Agree
6.	I prefer this instruction to formal instruction because students' thinking skills can be developed under the teacher's guidance by means of the proposed instructional design.	Teacher	4	0	0	0	25	75
		Student	210	0	1	9.5	24.5	65
7.	I prefer this instruction to formal instruction since it allows the students to reflect the acquired physics concepts and process skills.	Teacher	4	0	0	0	50	50
		Student	210	0	0.1	11.5	16.4	72
8.	I prefer this instruction to formal instruction since it allows the students to learn within small group and to share the learning experiences from group work.	Teacher	4	0	0	0	50	50
		Student	210	0	1.3	10.2	27.5	61
9.	Students' admiration towards the physicists were developed since the biography of physicists, observations and generalizations of physicists were learned through the charts, video and contextualized workbook by means of the proposed instructional design.	Teacher	4	0	0	0	25	75
		Student	210	0.2	1	8.5	25.3	65
10.	Students' memorization and retention were increased in contextualized learning environment which allows the students to derive the relationships between physical concepts and generalizations by themselves.	Teacher	4	0	0	0	25	75
		Student	210	1	0.5	6.3	20.2	72
11.	Students' thinking skills were developed in this instruction since the students learned the physical concepts and problems through contextualized practical activities.	Teacher	4	0	0	0	0	100
		Student	210	1	1.1	10.5	18.4	69
12.	This instruction creates meaningful physics learning since it connects the students' daily life phenomena and physical concepts.	Teacher	4	0	0	0	0	100
		Student	210	0.5	0.1	2.5	18.9	78

According to the results from the descriptive statistics on questionnaires, it can be interpreted that the participated teachers and students had positive attitudes towards the proposed instructional design for contextualized instruction.

Findings of Interview: According to the results from interview data, the participated teachers and students agreed that the instructional design for contextualized instruction made the physics content more meaningful because it is directly related to an authentic context. Generally, the participants were positive about the sequencing of the phases in the proposed instructional design. They expressed that learning physics by means of this instructional design will help them to see how concepts are related to each other, and to relate the new concepts to their prior knowledge. Therefore, it can be said that these qualitative findings were also in agreement with the quantitative findings.

Discussion

Regarding the results from the one-way ANCOVA for posttest scores in all schools, it can be interpreted that the use of the instructional design for contextualized instruction had a significant positive effect not only on lower-level thinking skills but also on higher-order thinking skills of students in all schools. This result is in line with the study of Johnson (2002)

that in order to help students develop their intellectual potential, contextual learning teaches the cognitive processes that can be used in critical and creative thinking and provide opportunities to use high level thinking skills in real-life situations. Understanding of concepts as a result of this instructional design leads to the generation of problem solving skills. According to Doctor et al. (2015), integrating conceptual knowledge with problem solving is a desirable goal in physics instruction. Therefore, this result pointed out that the instructional design for contextualized instruction can achieve the desirable goal of physics instruction.

Regarding the results from the Pearson-product moment correlation, a statistically significant relationship was found between the dimensions of students' attitudes towards the instructional design for contextualized instruction and physics achievement. In examining the predicting factors of students' attitudes towards the instructional design for contextualized instruction, the best predictor was preference, the second predictor was experience and the last predictor was academic value. As students are interested and preferred in what they are learning, their conceptual understanding will be gradually improved. The follow-up results of the qualitative study also supported the findings of the quantitative study. Therefore, it can be concluded that the application of the instructional design for contextualized instruction had a positive impact on students' conceptual understanding in teaching and learning physics.

Suggestions

Actually, physics is not only learning about the facts, the concepts, principles and postulate but also to learn how to gain information, to use scientific method, science and technology application. Depending on the interviews and questionnaires findings, most of the students stated that they enjoy physics more when they can learn through contextualized practical activities with a lot of variety. As pointed out by Ministry of Education, MOE (2016), the practical component of the high school physics curriculum complement the theoretical component. As such it is an essential and integral part of the whole curriculum and is equally important. Therefore, it is suggested that students' learning physics should be promoted through a variety of activities such as experiments not only in physics laboratory but also in the classrooms. According to the results of the regression findings for students' attitudes towards instructional design for contextualized instruction predicting physics achievement, the best predictor was experience in contextualized instruction and the last predictor was academic value. These results revealed that physics is one of the courses which are disliked by the students. This result is in agreement with the interview results. This possibly stems from the current emphasis on rote memorization of factual information during teaching and learning in schools. Therefore, it is suggested that students should be provided with contextualized instructional activities which is one of the student-centered learning.

All the interviewed students claimed that they were more actively involved in contextualized learning environment. In general, they are very positive about contextualized learning materials such as contextualized workbook, worksheets, practical guidelines, printed materials, video and real teaching aids. Tekbiyik and Akdeniz (2010) pointed out in their study that contextualized materials increased students' learning and affected students' attitudes positively. Most of the students perceived that conducting assessment and instruction using contextualized workbooks and worksheets for each lesson promotes their thinking skills and conceptual understanding. Therefore, it is suggested that students should be provided with contextualized materials to learn abstract concepts and eliminate misconceptions in physics.

Recommendations

It is hoped that this study will make a number of contributions to the improvement of physics teaching methodology at the high school level in Myanmar. However, this study is not perfect in all situations. This study could accommodate only four schools in Yangon Region. It is recommended that further replication of this study with larger class sizes, classes operating during the same academic year and classes at other basic education high schools would yield results more generalizable to the typical high school course.

The generalizability of the research is limited to Grade Ten students on the content areas of describing motion, forces, work and energy from Mechanics module and heat, temperature, measurement of heat from Heat module. It is recommended that further research should be carried out by using wide content areas of physics such as, light, waves and optics, electricity, and modern physics. There are also some other methodologies which show the effectiveness on students' achievement in conceptual understanding, problem solving and physics process skills. Therefore, it is recommended that the instructional design for contextualized instruction should be investigated and compared with other methodologies for further studies for the improvement of physics education in Myanmar.

Conclusion

By providing the instructional design for contextualized instruction in learning physics, it was found that it helps the students in looking for the meaning of what they are learning through synchronizing the physics and the context of their daily life. In other words, it motivates the students to direct their own learning and to connect between the knowledge and its application with every context found in their life. Besides, the students are expected to learn through experiencing not by memorizing the learning materials. Therefore, it can be concluded that the instructional design for contextualized instruction is an instructional system which is based on the philosophy that the students learn when they get the meaning in academic materials and then they connect the new information with their prior knowledge and the environment.

Regarding the data obtained through statistical computation, observation and interview, it is obvious that the instructional design for contextualized instruction is useful to help the students to get better physics achievement. By applying the instructional design for contextualized instruction, the teacher can relate the materials with the real-world situation outside the classroom, and motivate the students to link the knowledge they learn to its application in their lives. Therefore, the research findings highlighted that the instructional design for contextualized instruction is an effective instructional design for teachers and students to develop physics achievement especially conceptual understanding in teaching and learning physics in Myanmar.

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A SURVEY OF TEACHER EDUCATORS ON THE IMPLEMENTATION OF ACTION RESEARCH IN EDUCATION COLLEGES

Aye Myat Mon¹ and Johnny Than²

Abstract

The purpose of this study was to survey teacher educators on the implementation of action research in Education Colleges. A survey method, which is one of the descriptive designs, was employed to collect the relevant data from the respondents. The subjects were (300) teacher educators in Monywa Education College, Mandalay Education College, Magway Education College, Pakokku Education College and Sagaing Education College. The questionnaire includes (40) Likert-scale items. Descriptive statistics such as percentage and mean were used to analyze the data. Furthermore, one-way analysis of variance (ANOVA) and independent samples *t*-test were also used to compare statistically significant difference among the sample Education Colleges, degree and teaching experiences. The results of the study revealed that most of the teacher educators possessed positive perceptions on the implementation of action research in Education Colleges, but knowledge, skills and experience of teacher educators in the selected Education Colleges were insufficient. The level of principal's encouragement to conduct action research was insufficient in such areas as establishing action research clubs in Education College, allocating budget to conduct action research, providing reference materials for their research activities and arranging research training in Education Colleges. Therefore, teacher educators are highly affected by the factors that hinder them to conduct action research. It was found that, a commitment in fulfilling and supplying sufficient reference materials for continuous trainings, workshops and action research competitions is a necessity.

Keywords: action research, teacher educators, perception

Introduction

Action research has become a required component of teacher education programs because the goal of educators conducting action research as: gaining insight, developing reflective practice, effecting positive changes in school environment (Hine & Lavery, 2014). Therefore, it can provide teacher educators with the opportunities to examine a practical problem within classroom or school setting. Moreover, it offers many benefits for educators committed to take risks and make changes related to teaching and learning, to enhance student achievement, professional development and schools become more effective learning communities. This study was conducted to investigate the perceptions of teacher educators on the implementation of action research in selected Education Colleges. This will provide critical information on how action research can improve the teaching and learning process.

Purposes of the Study

- To investigate the perceptions of teacher educators on the implementation of action research in selected Education Colleges.
- To compare the perceptions of teacher educators on the implementation of action research in terms of Education College, degree and teaching experience.
- To give suggestions and recommendation based on the results of the study.

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Research Questions

1. How do teacher educators perceive on the implementation of action research in Education Colleges?
2. Is there any significant difference in the perceptions of teacher educators on the implementation of action research in terms of Education College?
3. Is there any significant difference in the perceptions of teacher educators on the implementation of action research in terms of degree and teaching experience?

Definition of Key Terms

Action Research: Action research is a process of systematic inquiry that enables people to find effective solutions to real problems encountered in daily life (Ferrance, 2000).

Teacher Educators: Teacher educators are defined as people who provide instruction or who give guidance and support to student teachers and who thus render a substantial contribution to the development of students into competent teachers (Celik, 2011).

Perception: Perception is the act of perceiving, opinions, beliefs, attitudes, and judgement toward something around environment (Jannah, 2019).

Scope

This research was conducted in five Education Colleges of twenty-five Education Colleges. The subjects were confined to (300) teacher educators in the selected Education Colleges. To survey teacher educators on the implementation of action research in the selected Education Colleges, this study was delaminated into three factors such as teachers' perceptions, principal's encouragement and factors that hinder or enable teachers in conducting action research.

Review of Related Literature

Action Research in Education

Action research is to improve the practice of the individual teacher by building reflective practitioners with new knowledge and understanding about how to improve educational practices or resolve significant problems in classrooms and schools consider (Mills, 2011 cited in Hine, 2013). Sagor (2000) cited in Ary, Jacobs & Sorensen, (2010) made the case that the focus on action research can help to professionalize teaching, enhance teacher motivation and efficacy, better meet the needs of diverse learners by searching for solutions to ever-changing problems, and help schools to achieve success in a standards-based environment.

Johnson (1995) cited in Erba, (2013) noted that teachers may gain a better perspective into their own teaching and students' learning by doing their own action research because the changes made in instruction are based on a teacher own research. Action research is so relevant for all teacher educators since it can help to find out the best way for their teaching and refine their teaching skills. It also helps the teachers to develop new knowledge directly related to the classroom, promote reflective teaching and thinking, expand pedagogical repertoires and reinforce the link between practice and student achievement. Moreover, action research is a process for improving educational practice. Its method involves action, evaluation and reflection. It is a process to gather evidence in implement change in practices.

Action research also provides administrators with an opportunity to better understand what happens in their school. Creating the need for research and establishing an environment for conducting action research is the responsibility of a school administrator. A principal's support of any new initiative is crucial for the practice to be sustained and impact student learning (Hewitt & Little, 2005).

Mill (2003) cited in Gay & Airasian, (2003) described that there were five components of action research such as commitment, collaboration, concern, consideration and change:

- **Commitment:** The time commitment is a factor for that all participants should consider carefully as the participants need time to get to know and trust each other and to observe practice, consider changes, try new approaches, and document, reflect and interpret the results.
- **Collaboration:** In an action research, the power relations among participants are very important. Collaboration involves a cyclical process of sharing, of giving, and of taking the ideas and suggestions of each person.
- **Concern:** The interpretive nature of action research means that the participants will develop a support group of "critical friends". Trust in each other and in the value of project is important.
- **Consideration:** Reflective practice is the mindful review of professional actions and it requires concentration and careful consideration and relationships that will generate meaning within the investigation.
- **Change:** For humans, especially teachers, growing and changing are part of developmental cycle of life. Change is ongoing and, at times, difficult, but it is an important element in remaining effective as a teacher.

Research Method

Subjects

To get the perceptions of teacher educators on the implementation of action research, five education colleges were selected by using a random sampling method. A sample of (300) teacher educators in Monywa, Mandalay, Magway, Pakokku and Sagaing Education Colleges were participated as the subjects.

Research Design

A survey method which is one of the descriptive methods was used. Descriptive research is also used as it involves collection data in order to test hypothesis or to answer questions concerning the current status of the subject of the study.

Instrument

A questionnaire was constructed on the basis of the questionnaires of Erba (2013) and Horeto (2013). It included five point Likert-scale items such as (1) Strongly Disagree, (2) Disagree, (3) Undecided, (4) Agree and (5) Strongly Agree for three factors: Teachers' Perception, Principal's Encouragement and Factors that hinder or enable teachers in conducting action research. There were (40) Likert-scale items in this instrument.

Procedure

Firstly, the relevant data and information were collected from the library and Internet sources to make literature review. Secondly, in order to get the required data, the researcher constructed an instrument under the guidance of the supervisor. The instrument was validated by three experienced teachers from Sagaing University of Education. After that, the pilot test was held on 7th December, 2017 with fifty teacher educators at Meiktila Education College. According to Cronbach's alpha technique, the reliability coefficient of the questionnaires was (0.889). After the pilot test, the instrument was revised according to the results of the pilot test. And then, the major survey was conducted on 11th December, 2017. It was completed in three weeks and held with (300) subjects. Then the collected data were statistically analyzed and interpreted.

Analysis of the Data

The responses of teacher educators to the questionnaires were analyzed and calculated by using Statistical Package of the Social Science (SPSS) version 20, independent samples *t*-test was used to compare the perceptions of teacher educators in terms of teaching experience. One-way (ANOVA) was used to compare the perceptions of teacher educators in terms of Education College and the degree of teacher educators.

Findings

Findings of the Perceptions of Teacher Educators towards Action Research

The first-dimension deals with the perceptions of teacher educators towards action research. The responses of teacher educators for each question were analysed by descriptive statistics. Table 1 shows the response rates of teacher educators for each item.

Table1. The Responses of the Perceptions of Teacher Educators on the Implementation of Action Research in Education Colleges

Item	Description	Response (N = 300)				
		SDA	DA	UD	A	SA
1.	Teachers should conduct action research to improve their knowledge and skills.	1%	5%	4%	77%	13%
2.	Teachers should conduct action research to solve teaching learning problems.	0%	9%	7%	75%	9%
3.	The contribution of action research is low to solve the actual classroom problems.	2%	39%	20%	36%	3%
4.	Action research plays a great role in improving teachers practice in research activities.	1%	5%	10%	76%	8%
5.	Action research contributes a lot in improving the practice of teaching and learning process.	0%	6%	13%	72%	9%
6.	Action Research can build a good relationship among colleagues.	1%	12%	25%	58%	4%

Item	Description	Response (N = 300)				
		SDA	DA	UD	A	SA
7.	Action Research can develop positive teaching learning atmosphere.	0%	3%	14%	76%	7%
8.	Teachers can find out solution for educational problems by conducting action research.	0%	4%	8%	76%	12%
9.	Action Research can expand teacher role in teaching.	0%	6%	12%	72%	10%
10.	Teacher should conduct action research although there are challenges and constraints in education colleges.	2%	5%	15%	72%	6%
11.	Action research can improve students' achievement.	0%	11%	14%	68%	7%
12.	Teachers have high interest in conducting action research.	2%	23%	34%	40%	1%
13.	Action research is helpful for planning and decision making in college.	0%	13%	29%	53%	5%
14.	Teachers can improve their profession through conducting action research.	0%	7%	11%	74%	8%
15.	Action research should be conducted not only by higher education, but by basic schools.	1%	11%	20%	55%	13%

According to the results, most of the teacher educators accepted that the teachers should conduct action research in order to improve their knowledge and skills (90%), to find out solution for educational problems (88%), to solve teaching-learning problem (84%) and, action research can develop positive teaching learning atmosphere (83%) and contributes a lot in improving the practices of teaching and learning process (81%). Therefore, most of the teacher educators positively perceived on action research.

Findings of Teacher Educators' Responses on the Level of Principal's Encouragement in Conducting Action Research

Teacher educators' responses on the principal's encouragement in conducting action research were analysed by descriptive statistics. Table 2 shows the rates of teacher educators' responses for each item.

Table 2. The Responses of the Perceptions of Teacher Educators on the level of Principal's Encouragement

Item	Description	Response (N = 300)				
		SDA	DA	UD	A	SA
1.	The principal encourages teachers through arranging research training in Education College.	2%	26%	12%	55%	5%
2.	The principal encourages teachers through allocating budget to conduct action research.	5%	28%	28%	36%	3%
3.	The principal encourages teachers to undertake action research cooperatively.	1%	7%	9%	76%	7%
4.	The principal supports teachers through establishing action research club in the Education College.	3%	25%	29%	38%	5%
5.	The principal encourages teacher by providing recognition to conduct action research activities.	2%	8%	12%	72%	6%
6.	The principal supports teachers through providing reference materials for their research activities.	5%	19%	22%	49%	5%
7.	There is a good relationship between teacher and the principal to conduct action research.	3%	5%	25%	62%	5%
8.	The principal gives high priority to action research.	2%	10%	22%	59%	7%
9.	The principal is highly committed to achieve research activities in Education College.	0%	10%	26%	52%	12%
10.	The principal uses different mechanisms to motivate teachers for better performance in conducting action research.	0%	13%	24%	57%	6%

Based on the results, most of teacher educators agreed that the principal encourages teachers to undertake action research cooperatively (83%) and the principal encourages teachers by providing recognition to conduct action research activities (78%).

On the other hand, more than half of teacher educators disagreed with the items namely the principal encourages teachers through allocating budget to conduct action research (61%) and the principal supports teachers through establishing action research club in the Education College (57%) respectively. Therefore, many teacher educators' perceptions were not satisfied on the level of principal's support to teacher educators in order to undertake action research.

Findings of Teacher Educators' Perceptions on the Factors that Hinder or Enable Teachers in Conducting Action Research

The responses of teacher educators on the factors that hinder or enable teachers in conducting action research for each question were analysed by descriptive statistics.

Table 3. The Responses of the Perceptions of Teacher Educators on the Factors that Hinder or Enable Teachers in Conducting Action Research

Item	Description	Response (N = 300)				
		SDA	DA	UD	A	SA
1.	There is a shortage of training and seminar on research activities.	0%	8%	13%	65%	14%
2.	There is an insufficient budget in Education Colleges to undertake action research.	0%	7%	19%	53%	21%
3.	I do not feel confident in undertaking action research due to lack of research knowledge and skill.	3%	23%	17%	49%	8%
4.	Teachers lack interest to conduct action research.	1%	26%	34%	33%	6%
5.	There is an insufficient reference material (journals, research books, research reports and etc.) in the library.	1%	28%	18%	46%	7%
6.	There is lack of recognitions to conducted research activities.	1%	33%	34%	27%	5%
7.	Teaching load affects the practice of action research.	1%	10%	25%	60%	4%
8.	Teachers are not encouraged to carryout action research due to lack of incentives.	1%	18%	36%	38%	7%
9.	Teachers' involvement in action research should be a criterion of promotion.	6%	28%	29%	33%	4%
10.	Teachers need enough time to carry out action research in Education Colleges.	1%	10%	17%	54%	18%
11.	Recognition and reward from Education College and education department motivate teachers to involve in action research.	1%	12%	25%	56%	6%
12.	Education College has regular schedule to engage in research activities.	3%	20%	34%	42%	1%
13.	There is lack of clear role of teacher educators in Education College to conduct action research.	1%	14%	35%	42%	8%
14.	There is lack of complete data/ information to undertake research activities.	1%	15%	22%	51%	11%
15.	There is lack of moral support from principal.	1%	23%	39%	25%	12%

Table 3 showed that many teacher educators agreed with the shortages of trainings and seminars to conduct action research (79%), lack of enough time to carry out action research(72%), insufficient budget to undertake action research (64%), lack of complete data/ information to undertake research activities (63%).

Based on the findings, more than half of participants had lack of interest to conduct action research, lack of recognitions, lack of incentives and lack of clear role to conduct research activities. Therefore, they were affected by the factors that hinder to conduct action research in Education Colleges.

Descriptive Statistics of the Perceptions of Teacher Educators on the Implementation of Action Research on each Dimension

To examine the perceptions for each dimension, descriptive statistics was used. Table 4 shows the mean, standard deviation, minimum and maximum scores of each dimension.

Table 4. Means and Standard Deviations of the Perceptions of Teacher Educators on the Implementation of Action Research in Education Colleges

No	Dimension	N	Minimum	Maximum	M	SD
1	Perception	300	29	72	55.33	6.099
2	Encouragement	300	14	49	34.68	5.676
3	Enablers	300	32	67	51.21	5.540

According to the results, the mean of teacher educators' perceptions on the implementation of action research (55.33), the mean of teacher educators' responses on the level of principal encouragement (34.68) and the mean of the factors that hinder or enable teachers in conducting acting research (51.21). The level of means for each dimension was illustrated in Figure 1.

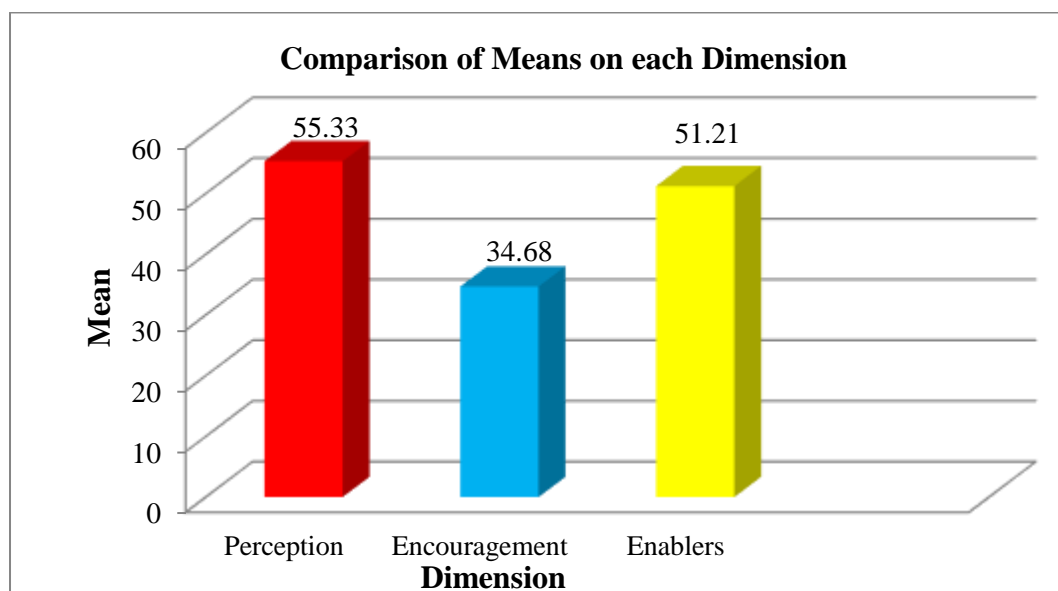


Figure 1. Comparison of Means on each Dimension

Findings of the Perceptions of Teacher Educators on the Implementation of Action Research in terms of Education College

Comparison of Means on each Dimension in terms of Education College

In order to compare the means and standard deviations on each dimension, the subjects were divided into five Education Colleges. Data were analyzed by descriptive statistics.

Table 5. Comparison of Means and Standard Deviations on each Dimension in terms of Education College

Category	N	M/SD	Dimension		
			Perception	Encouragement	Enablers
COE 1	60	M	55.55	34.28	49.32
		SD	5.956	5.548	6.315
COE 2	60	M	55.3	35.98	50.42
		SD	5.067	4.451	4.806
COE 3	60	M	54.7	34.28	51.3
		SD	6.368	4.971	5.679
COE 4	60	M	54.3	33.52	53.18
		SD	7.529	7.006	5.694
COE 5	60	M	56.8	33.75	51.82
		SD	5.138	6.947	4.386

Note. COE 1= Monywa EC COE 2=Mandalay EC COE 3=Magway EC

COE 4=Pakokku EC COE 5=Sagaing EC

In the first dimension, COE 5 had the highest mean and COE 4 had the lowest mean. In the second dimension, the mean of COE 2 was the highest and that of COE 4 was the lowest. In the third dimension, the mean of COE 4 was the highest and COE 1 was the lowest. Based on the results, teacher educators in COE 4 had the lowest perception on the implementation of action research in the Education Colleges.

ANOVA Results of the Perceptions of Teacher Educators on the Implementation of Action Research in terms of Education College

In order to determine the significant difference in the perceptions of teacher educators, the collected data was analyzed by using one-way analysis of variance (ANOVA).

Table 6. ANOVA Results of the Perceptions of Teacher Educators on the Implementation of Action Research in terms of Education College

Dimension		Sum of Squares	df	Mean Squares	F	Sig. (2-tailed)
Perception	Between Groups	220.08	4	55.02	1.489	0.206 (ns)
	Within Groups	10902.3	295	36.975		
	Total	11122.3	299			
Encouragement	Between Groups	331.333	4	82.833	2.627	.035*
	Within Groups	9301.58	295	31.531		
	Total	9632.92	299			

Dimension		Sum of Squares	df	Mean Squares	F	Sig. (2-tailed)
Enablers	Between Groups	509.053	4	127.363	4.332	.002**
	Within Groups	8666.13	295	29377		
	Total	9175.19	299			

Note. * $p < .05$, ** $p < .01$ ns = not significant

According to Table 6, the perceptions of teacher educators on action research had no significant differences among Education Colleges. Teacher educators' responses on the level of principal's encouragement; $F(4,295) = 2.627$ had significant differences among Education Colleges, * $p < .05$ and perceptions of teacher educators on the factors that hinder or enable teacher educators in conducting action research; $F(4,295) = 4.332$, ** $p < .01$ had significant differences among Education Colleges. Based on the findings, it can be interpreted that there were significant differences among five Education Colleges except for the perceptions of teacher educators on action research.

Findings of the Perceptions of Teacher Educators on the Implementation of Action

Research in terms of Degree

Comparison of Means on each Dimension in terms of Degree

In order to explore the perceptions of teacher educators on the implementation of action research in terms of degree, the obtained data was analyzed by using a descriptive statistic. The subjects were divided into three groups such as B.Ed degree, M.Ed degree and M.A/ M.Sc degree. Table 7 shows the comparison of means and standard deviations on each dimension.

Table 7. Comparison of Means and Standard Deviations on each Dimension in terms of Degree

Category	N	M/SD	Dimension		
			Perception	Encouragement	Enablers
B.Ed	99	M	53.91	34.68	51.95
		SD	7.53	6.061	5.659
M.Ed	52	M	56.19	34.98	49.65
		SD	4.468	4.492	5.729
M.A/ M.Sc	149	M	55.97	34.58	51.26
		SD	5.514	5.811	5.316

In the first dimension, M.Ed teacher educators had the highest mean and B.Ed teacher educators had the lowest mean. In the second dimension, M.Ed teacher educators had the highest mean and M.A/ M.Sc teacher educators had the lowest mean. In the last dimension, B.Ed teacher educators had the highest mean and M.Ed teacher educators had the lowest mean. The findings of this study indicated that, M.Ed teacher educators had the most positive perceptions on the

implementation of action research among three types of degrees. The comparison of means on each dimension in terms of degree was also presented in Figure 2.

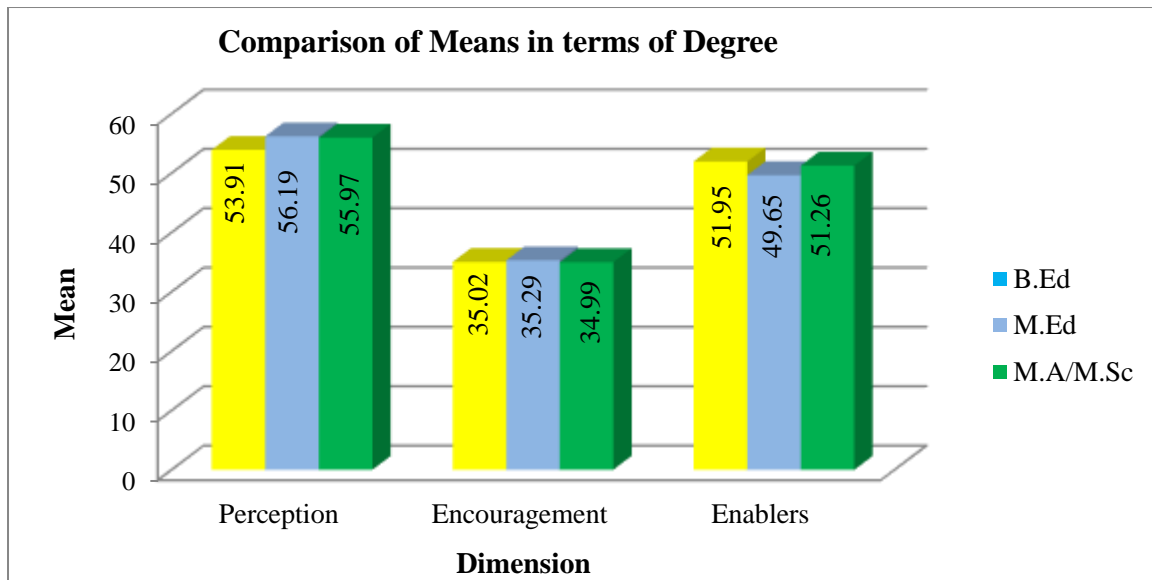


Figure 2. Comparison of Means in terms of Degree

ANOVA Results of the Perceptions of Teacher Educators on the Implementation of Action Research in Education Colleges in terms of Degree

In order to determine the significant difference in the perceptions of teacher educators on the implementation of action research in terms of degree, the data was analysed by using one-way analysis of variance (ANOVA). The results of ANOVA are presented in Table 8.

Table 8. ANOVA Results of the Perceptions of Teacher Educators on the Implementation of Action Research in Education Colleges in terms of Degree

Dimension		Sum of Squares	df	Mean Squares	F	Sig. (2. tailed)
Perception	Between Groups	300.179	2	150.089	4.119	.017*
	Within Groups	10822.2	297	36.438		
	Total	11122.3	299			
Encouragement	Between Groups	6.078	2	3.039	0.094	.911 (ns)
	Within Groups	9626.84	297	32.414		
	Total	9632.92	299			
Enablers	Between Groups	180.361	2	90.181	2.978	.052 (ns)
	Within Groups	8994.83	297	30.286		
	Total	9175.19	299			

Note. * $p < .05$, ns = not significant

The results showed that the perceptions of teacher educators on the implementation of action research in Education Colleges were significantly different among three types of degree; $F(2, 297) = 4.119$, $*p < .05$. However, the perceptions of teacher educators on the level of encouragement of the principal and the factors that hinder or enable teachers in conducting action research were not significantly different.

According to the findings, it can be interpreted that there was no significant difference in the perceptions of teacher educators on the implementation of action research in Education Colleges in terms of degree except for the first dimension.

Findings of the Perceptions of Teacher Educators on the Implementation of Action Research in terms of Teaching Experience

The results of *t*- values for the perceptions of teacher educators on the implementation of action research in terms of teaching experience were presented in Table 9.

Table 9. *t*- Values for the Perceptions of Teacher Educators on the Implementation of Action Research in Education Colleges in terms of Teaching Experience

Dimension	Teaching Experience	<i>N</i>	<i>M</i>	<i>SD</i>	<i>MD</i>	<i>t</i>	<i>df</i>	Sig. (2-tailed)
Perception	<15 years	178	55.57	6.03	.59	.833	298	.873
	≥15 years	122	54.98	6.21		.829	298	(ns)
Encouragement	<15 years	178	34.35	6.05	-.81	-1.215	298	.092
	≥15 years	122	35.16	5.07		-1.256	298	(ns)
Enablers	<15 years	178	51.14	5.57	-.16	-.250	298	.574
	≥15 years	122	51.30	5.51		-.250	298	(ns)

Note. ns = not significant

In the first dimension, the mean of under fifteen years' teaching experience of the teacher educators was (55.57) and the mean of over fifteen years' teaching experience of the teacher educators was (54.98). In the second dimension, the mean of over fifteen years' teaching experience of the teacher educators was (35.16) and the mean of under fifteen years' teaching experience of the teacher educators was (34.35). In the third dimension, the mean of over fifteen years' teaching experience of the teacher educators was (51.3) and the mean of under fifteen years' teaching experience of the teacher educators was (51.14).

It can be interpreted that the perceptions of teacher educators were not significantly different though they had different teaching experience. The comparison of means on each dimension of the perceptions of teacher educators in terms of teaching experience was also presented in Figure 3.

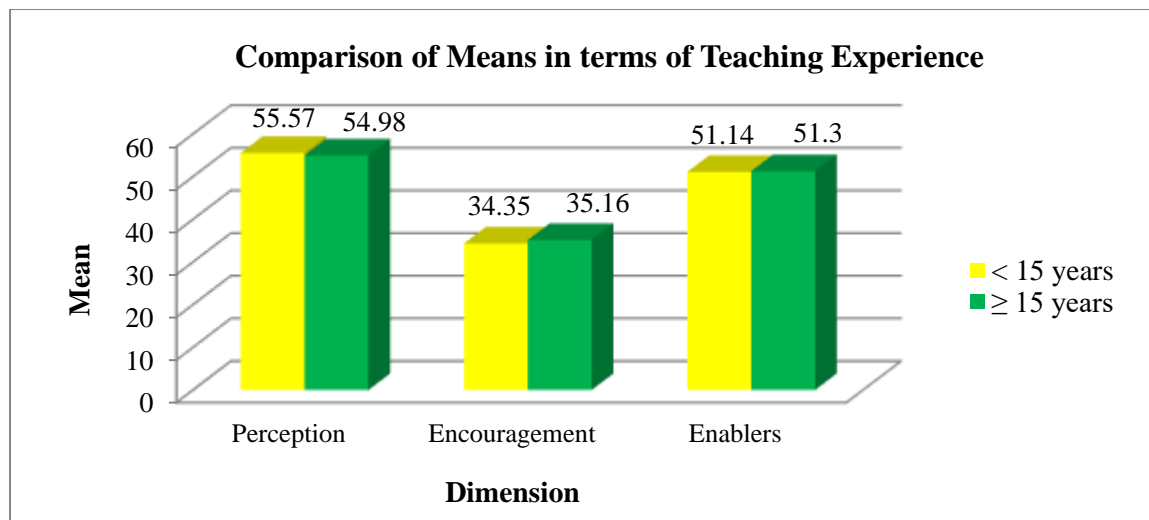


Figure 3. Comparison of Means in terms of Teaching Experience

Discussion and Suggestions

Discussion

This study was conducted to investigate the perceptions of teacher educators on the implementation of action research in the selected Education Colleges.

According to the responses, most of the teacher educators had positive perceptions on the implementation of action research in Education Colleges. However, many teacher educators' perceptions were not satisfied on the level of principal's encouragement to teacher educators in order to undertake action research. Therefore, teacher educators were affected by the factors that hinder to conduct action research. When analyzing the collected data, it was found that there were significant differences among five Education Colleges except for the perceptions of teacher educators on action research.

Ferrance (2000) stated that school administrators must help their teachers by working collaboratively and it helps in their professional development. Therefore, the principals of Education Colleges have to encourage teacher educators by establishing research club and by providing sufficient reference materials and motivating teachers to involve in action research by giving incentives.

According to the results, M.Ed teacher educators had the most positive perceptions on conducting action research and nearly all of B.Ed teacher educators had lack of research experience, knowledge and skills. Leta (2014) argued that teachers should have enough knowledge, a reasonable degree of competence, possess the appropriate skills and experience in action research itself. Therefore, B.Ed teacher educators should be encouraged to attend M.Ed course, trainings and seminars on research activities to get research knowledge and skills.

There was no significant difference between the perceptions of teacher educators in terms of teaching experience. In education Colleges, teacher educators have little experience in conducting action research in comparison with their teaching experience. Moreover, they are untrained and unskilled in conducting action research. Therefore, the majority teacher educators do not have enough knowledge and experience in action research and their perception on the

implementation of action research are not significantly different. This finding was consistency with Sela & Harel (2012).

Suggestions

Based on the findings of this research, the following suggestions were made. Teacher educators should conduct action research to find out the solutions for educational problems, to improve the quality of teaching and learning, to promote their knowledge and skills. Principals of Education Colleges should encourage teacher educators by arranging research training, allocating budget and providing sufficient reference materials. Moreover, action research competition should be held annually and recognition and reward should be given to teacher educators according to their performance.

This research study was conducted with teacher educators from five Education Colleges. According to this perspective; it should be expanded to all Education Colleges across the country. This research study was limited to three dimensions. Other studies indicating other dimensions should be extended. The present study compared only three variables. Therefore, further research should be carried out by using other variables and by exploring the differences between teacher educators' perceptions and principals' perceptions. Finally, this research cannot entirely perfect and highly contribute to the quality of teacher educators and education areas. Therefore, additional studies should be performed to upgrade the quality of teacher educators and education.

Conclusion

The main purpose of this study was to investigate the perceptions of teacher educators on the implementation of action research in the selected Education Colleges. Based on the findings, there were significant differences among five Education Colleges except for the perceptions of teacher educators on action research. However, there was no significant difference in the perceptions of teacher educators in terms of degree except for the first dimension and the perceptions of teacher educators were not significantly different in terms of teaching experience.

Therefore, this study provides an insight to teacher educators that they should have reasonable degree of knowledge, competence and experience in action research and the principals of Education Colleges and the administrators of education departments should focus their attention and efforts on the development of the perceptions of teacher educators on the implementation of action research by providing teacher educators with adequate encouragement and fulfilling research facilities in conducting action research.

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A STUDY OF THE RELATIONSHIP BETWEEN STUDY SKILLS AND MATHEMATICS ACHIEVEMENT AMONG MIDDLE SCHOOL STUDENTS

Ei Phyu Thwe¹ and Lae Lae Win²

Abstract

The purpose of this study is to study the relationship between study skills and mathematics achievement among middle school students. Quantitative research design, descriptive survey method was used to find out study skills and mathematics achievement. In terms of geographical area, three Basic Education High Schools, one Basic Education High School (Branch) and one Basic Education Middle School in Tada-U Township were selected by using simple random sampling technique. The population in this study consisted of (400) Grade 8 students. In the collection of data, two instruments: questionnaire for students' study skills and an achievement test for Grade 8 students were employed. In the analysis of data, descriptive statistics, one-way ANOVA, independent samples *t*-test, and Pearson product-moment correlation were used. One-way ANOVA was performed to ascertain whether there were differences in study skills and mathematics achievement among the selected schools. The result showed that there were differences in study skills and mathematics achievement among the selected schools. Independent samples *t*-test was used to find out the differences between mean scores of study skills and mathematics achievement in term of gender. According to the results, the female students were higher than the male students in study skills and there was significant difference between male and female students' mathematics achievement. Pearson product-moment correlation was used to assess the correlation between study skills and mathematics achievement. The results showed that there were also significant correlations between study skills and mathematics achievement. This indicated that if the study skills of the students are good, the mathematics achievement of these students will be high.

Keywords: study skills, mathematics, achievement

Introduction

Education is the process of facilitating learning. Education frequently takes place under the guidance of educators, but learners may also educate themselves in a process called autodidactic learning. Education is the process of learning and acquiring knowledge at school from a teacher, receiving knowledge at home from a parent, a family member, and even an acquaintance. Education makes them capable of interpreting things, among other things (Wikipedia, 2015).

Mathematics is an important part of ones' lives, because in the future they will get a job that deals with mathematics. Mathematics is necessary for even the most basic of life functions (Jasmine, 2008). Study skills or study strategies are approaches applied to learning. They are generally critical to success in school considered essential for acquiring good grades, and useful for learning throughout one's life (Wikipedia, 2015). The successful students not only possess knowledge of good study skills but also the ability to select appropriate skills and monitor their usage while studying. Students who possess poor study skills, on the other hand, struggle to apply good study skills to their academic tasks, particularly those skills that involve cognitive and metacognitive processes such as monitoring comprehension while reading. Study skills are

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strongly related to learning and achievement, and students should be taught basic study skills to increase their academic performance (Yip, 2007 cited in Thorpe, 2010).

Purposes of the Study

- To describe the study skills that can improve student's learning mathematics.
- To find out the mathematics achievement of the students from selected schools.
- To study the relationship between study skills and mathematics achievement of the students from selected schools.
- To give suggestions for improving study skills of students at the middle level.

Research Questions

1. Is there any significant difference in Grade 8 students' study skills in their respective schools?
2. Is there any significant difference in Grade 8 students' study skills in terms of gender?
3. Is there any significant difference in Grade 8 students' mathematics achievement in their respective schools?
4. Is there any significant difference in Grade 8 students' mathematics achievement in terms of gender?
5. Is there any significant relationship between Grade 8 students' study skills and their mathematics achievement?

Definition of Key Terms

Study Skills	-	Study skills are learning strategies that help students organize, process, and use information effectively (Kerka, 2007).
Mathematics	-	Mathematics is a way to settle in the mind of children a habit of reasoning (Locke, n. d. cited in Zubair, 2012).
Achievement	-	Achievement means an accomplishment or proficiency of performance in a given skills or body or knowledge (Sasikala, 2012).

Scope

This study is geographically restricted to Tada-U Township in Mandalay Region. The populations in this study were all Grade Eight Students from the selected schools in the academic year (2015-2016). This study is only concerned with the relationship between study skills and mathematics achievement of these students. The content area of the subject is limited to ten chapters from Mathematics Textbook Volume I and four chapters from Mathematics Textbook Volume II to find out students' mathematics achievement.

Review of Related Literature

Constructivism

Learning theory of constructivism incorporates a learning process wherein the student gains their own conclusions through the creative aid of the teacher as a facilitator. The best way to plan teachers' worksheets, lesson plans, and study skills for the students, is to create a

curriculum which allows each student to solve problems while the teacher monitors and flexibly guides the students to the correct answer, while encouraging critical thinking. Teachers and parents alike are encouraged to envelop the "scaffolding" method of communication which is a strategy aimed to simplifying tasks within learning by making smaller steps, all leading to the final outcome. This aids in maintaining any frustration while keeping in mind what is important throughout the learning process.

When evaluating study skills of the child, Bruner's theory suggests that the teachers be explicit regarding organization, help the learner to focus on the larger task at hand as well as the goals, instead of getting caught on minor details or frustrations. They are encouraged to praise the efforts put out by the learners while reminding them, helping them focus on relevant items, and encouraging them to practice and rehearse what they have learned (Teachnology, 2014).

Need and Significance of Learning Mathematics

Mathematics is regarded as the mother of all science. If our students are to function effectively at this time of rapid technological advancement and globalization, they must be mathematically literate. Those who lack mathematical competence will find such doors and options closed.

Mathematics is the only subject that encourages and develops logical thinking. It enables the student to discriminate between essentials and non-essentials. Therefore, knowledge of mathematics is very essential for training rational, trustworthy and useful citizens in a democratic society (Zubair, 2012).

Nature of Study Skills

Study skills are strategies and techniques that enable students to make the most efficient use of their time, resources, and academic potential. Developing and improving their study skills can help them:

- To make more efficient use of students' study time - get more work done in less time.
- To make their learning easier, and help retain what they have learned for longer.
- To feel the work and effort involved is worthwhile; it 'pays dividends' (Donoghue, 2006).

The use of operative study skills is linked to academic proficiency. Moreover, high-achieving students employ a variety of study tactics in a purposeful manner and that low-achieving students use a restricted range of study skills. Therefore, not only is it important for students to have a variety of study skills in their repertoires; they must also apply the skills purposefully (Gettinger and Siebert, 2002 cited in Banks, 2015).

Research Method

The research design for the study was a quantitative research design, in which the researcher seeks to determine whether, and to what degree, a relationship exists between two variables (study skills and mathematics achievement). In this study, data were mainly collected through a quantitative method. Quantitative method was used to find out study skills and mathematics achievement (Gay, 1987).

Subjects

All participants in the sample were Grade 8 students. This study was conducted in Tada-U Township, Mandalay Region. The sample schools for the study were selected by using simple random sampling technique. Three Basic Education High Schools, one Basic Education High School (Branch) and one Basic Education Middle School were included in this study. Grade 8 students from the selected schools were selected as the sample of the subject. The number of the students was 400. Participant students in this study were selected by using simple random sampling technique (see Table 1).

Table 1. Population and Sample Size

No.	Township	School	Population	No. of Students		
				Male	Female	Total
1	Tada-U	BEMS (Sar Kar Inn)	64	32	26	58
2	Tada-U	BEHS (Tada-U)	274	46	46	92
3	Tada-U	BEHS, Branch (Taung Be Lu)	117	40	60	100
4	Tada-U	BEHS (Chaung Kwa)	190	44	46	90
5	Tada-U	BEHS (Myin The)	75	31	29	60
Total				193	207	400

Note. BEMS = Basic Education Middle School, BEHS = Basic Education High Schools,

BEHS, Branch= Basic Education High School, Branch

Instrumentation

In this study, a questionnaire for students' study skills and an achievement test for Grade 8 students were used as the instruments.

Questionnaire for Students' Study Skills and Mathematics Achievement Test for Students

In this study, this questionnaire is used to measure the study skills of Grade 8 students under five dimensions. They are (1) time management, (2) concentration and memory, (3) note taking, (4) test strategies and test anxiety and (5) motivation.

Each component contains eight items. There are forty items in this questionnaire. Questionnaire on five-point Likert-scale was developed; strongly disagree, disagree, undecided, agree and strongly agree. In order to measure the mathematics achievement of the students, an instrument was conducted. It was based on the content area of Grade Eight mathematics textbook. This test is a (30) item multiple choice test and each item consists of four alternatives. This test covers (14) chapters: (10) chapters from mathematics textbook volume I (Basic Education Curriculum, Syllabus and Text Book Committee, 2015-2016) and (4) chapters from mathematics textbook volume II (Basic Education Curriculum, Syllabus and Text Book Committee, 2015-2016).

After preparing the questionnaire and the test, experts review was conducted by five expert teachers from SUOE. After that, the questionnaire and the test were modified. The questionnaire and the test validated through pilot testing on a non-sample group of (30) Grade 8

students including boys and girls from Practicing High School, Sagaing. The internal consistency for the questionnaire and that of the test were determined to be (0.795) and (0.615) using Cronbach's Alpha.

Procedure

First, in order of the required data, the instruments were constructed under the guidance of the supervisor. Content validity was determined by expert judgment. After getting the validity of these instruments, a pilot testing was conducted. The pilot testing for the instruments was conducted in October 12, 2015. The modified instruments were distributed to all participants of the five sample schools and administered with the help of the teachers of those schools in November, 2015. After two weeks all the instruments were returned, and then the data were entered into a computer data file and were analyzed using the Statistical Package for the Social Science (SPSS 20).

Data Analysis

The data were analyzed by using descriptive statistics. Moreover, one-way ANOVA, independent samples *t*-test and Pearson product-moment correlation were used to analyze students' study skills and their mathematics achievement.

Findings

Analysis of Grade 8 Students' Study Skills in terms of Schools

Table 2. Mean Scores and Standard Deviations of Student's Study Skills in the Selected Schools

Schools	N	Mean	Standard Deviation	Minimum	Maximum
S1	58	159.72	14.799	125	184
S2	92	163.88	13.893	126	191
S3	100	167.81	11.728	131	195
S4	90	160.84	13.441	130	185
S5	60	168.67	12.112	143	197
Total	400	164.29	13.534	125	197

Note. S1= BEMS, Sar Kar Inn, S2= BEHS, Tada-U, S3= BEHS Branch, Taung Be Lu

S4= BEHS, Chaung Kwa, S5= BEHS, Myin The

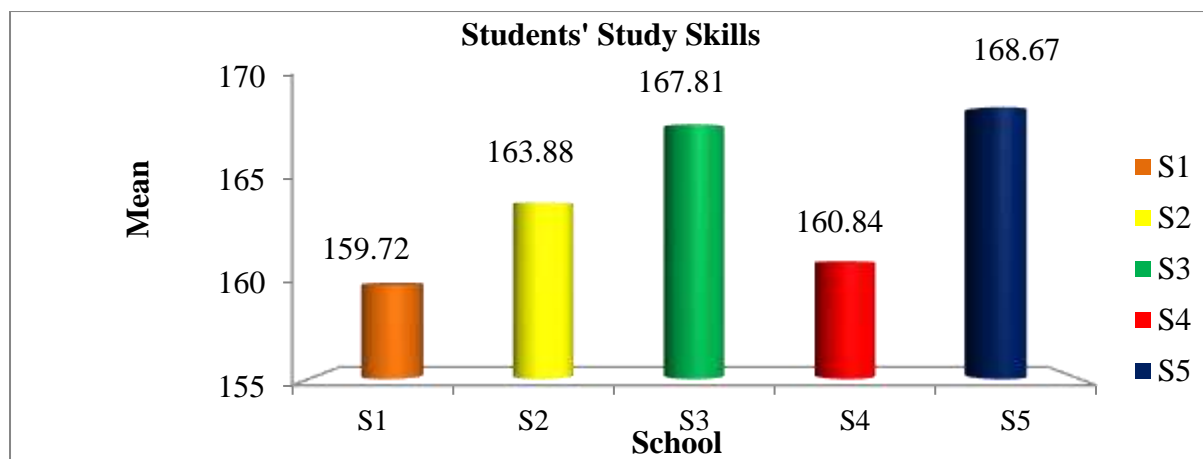


Figure 1. The Comparison of Mean Scores for Students' Study Skills by Schools

Figure 1 shows the comparison of the mean scores of students' study skills by the selected schools. According to the results, the lowest mean score and the highest mean score were (159.72) and (168.67) respectively. It was found that students' study skills of Basic Education Middle School, Sa Kar Inn were the lowest and students' study skills of Basic Education High School, Myin The were the highest among the selected schools (see Table 2).

Moreover, it is necessary to measure whether there is significant difference in students' study skills among the selected schools. Therefore, a one-way ANOVA was used to examine the differences among the selected schools. It was found that there were significant differences among the schools concerning the students' study skills, ($F = 6.759$, $p < .001$) (see Table 3). This means that study skills of Grade 8 students differ among the selected schools.

Table 3. ANOVA Results of Student' Study Skills in the Selected Schools

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4681.373	4	1170.343	6.759	.000***
Within Groups	68399.817	395	173.164		
Total	73081.190	399			

Note: *** $p < .001$

Analysis of Grade 8 Students' Study Skills in terms of Gender

Table 4. t Values for Students' Study Skills in terms of Gender

Gender	No. of Students	Mean	Standard Deviation	Mean Difference	t	df	Sig. (2-tailed)
Male	193	161.67	14.208	-5.07	-3.803	398	.000***
Female	207	166.74	12.417				

Note: *** $p < .001$

According to Table 4, the mean scores for study skills of male and female students were (161.67) and (166.74). From the two groups' means, it indicated that the average mean score of study skills of the female students was higher than the average mean score of study skills of the

male students. It can be interpreted that the study skills of the female students were higher than the study skills of the male students. Thus, the female students can always motivate and well manage time themselves in studying more than the male students. When concentration and taking note, the female students can do more than the male students. Moreover, the female students can control test anxiety more than the male students. This finding indicated that there was significant difference between male and female in study skills, ($t = -3.803, p < .001$). Figure 2 illustrated the comparison of mean scores for the male students' study skills and the female students' study skills based on the results of t -values.

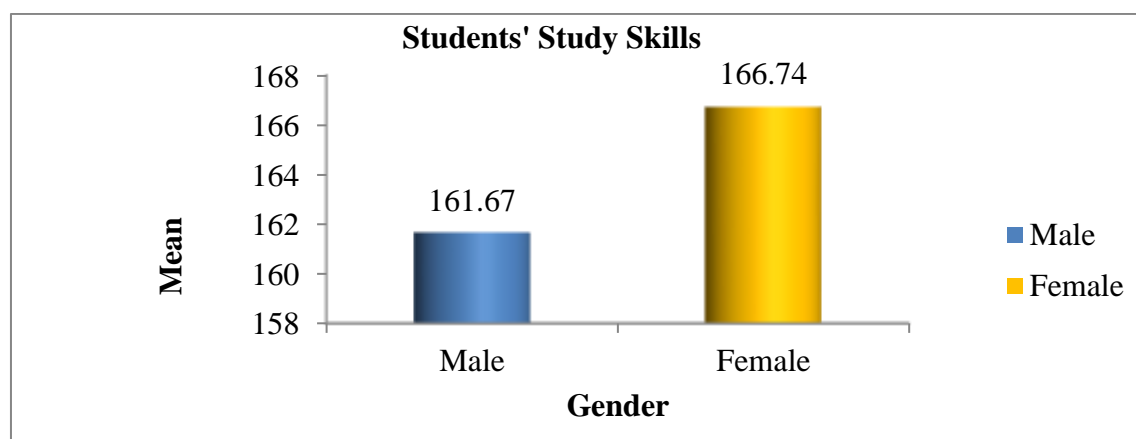


Figure 2. The Comparison of Mean Scores for Students' Study Skills in terms of Gender

Analysis of Grade 8 Students' Mathematics Achievement in terms of Schools

Table 5. Mean Scores and Standard Deviations of Students' Mathematics Achievement in the Selected Schools

Schools	N	Mean Scores	Standard Deviation	Minimum	Maximum
BEMS, Sar Kar Inn	58	23.28	3.397	15	28
BEHS, Tada-U	92	24.23	2.594	17	29
BEHS Branch, Taung Be Lu	100	24.67	1.364	19	28
BEHS, Chaung Kwa	90	24.31	2.448	18	29
BEHS, Myin The	60	24.52	1.944	20	28
Total	400	24.26	2.394	15	29

Based on the result of the mean scores, Figure 3 is illustrated. It shows the comparison of the mean scores of students' mathematics achievement for the selected schools. According to the results, the lowest mean scores and the highest mean scores were (23.28) and (24.67) respectively (see Table 5). It was found that the achievement level of Basic Education Middle School, Sar Kar Inn was the lowest and the achievement level of Basic Education High School (Branch), Taung Be Lu was the highest among the selected schools. In order to see clearly, Figure 3 presents the mean scores of all the selected schools.

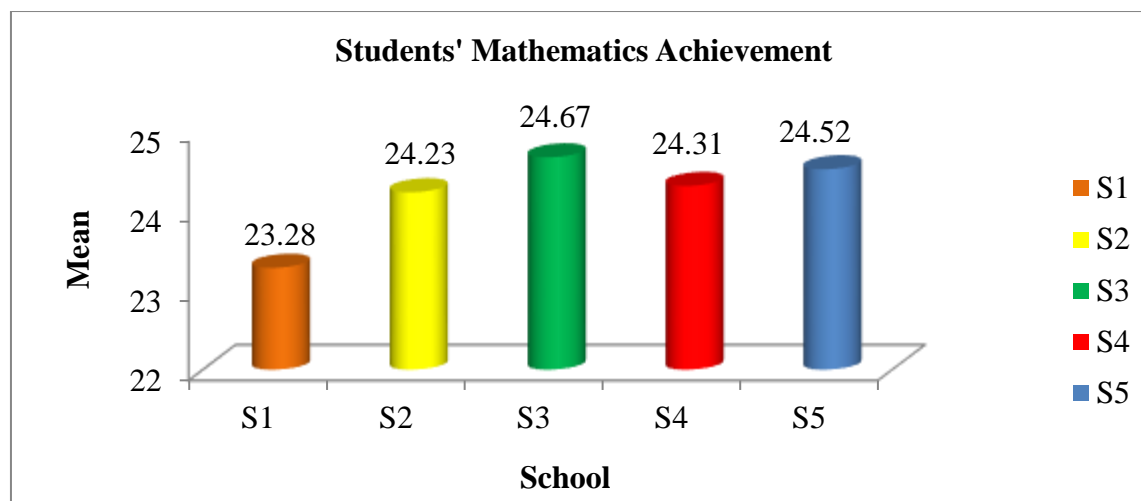


Figure 3. The Comparison of Mean Scores for Students' Mathematics Achievement by Schools

Moreover, it is necessary to measure whether there is significant difference in students' mathematics achievement among the schools. Therefore, a one-way ANOVA was used to examine the differences among the schools. It was found that there was significant difference among the schools concerning the students' mathematics achievement, ($F = 3.452$, $p < .01$) (see Table 6).

Table 6. ANOVA Results of Student's Mathematics Achievement in the Selected Schools

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	77.263	4	19.316	3.452	.009**
Within Groups	2210.175	395	5.595		
Total	2287.438	399			

Note: ** $p < .01$

Analysis of Grade 8 Students' Mathematics Achievement in terms of Gender

Table 7. t Values for Students' Mathematics Achievement in Terms of Gender

Gender	No. of Students	Mean	Standard Deviation	Mean Difference	t	df	Sig (2-tailed)
Male	193	23.9	2.487	-0.7	-2.939	398	.003**
Female	207	24.6	2.260				

Note: ** $p < .01$

According to Table 7, the mean scores for mathematics achievement of male and female students were (23.9) and (24.6). From the two groups' means, it indicated that the average mean score of mathematics achievement of the female students was higher than the average mean score of mathematics achievement of the male students. It can be interpreted that mathematics achievement of the female students was higher than mathematics achievement of the male students. Moreover, the female students more calculate in mathematical problems and use better study strategies than the male students. This finding indicated that there was significant

difference between male and female students' mathematics achievement, ($t = -2.939$, $p < .01$). Figure 4 illustrated the comparison of mean scores for the male students' mathematics achievement and the female students' mathematics achievement based on the results of t -values.

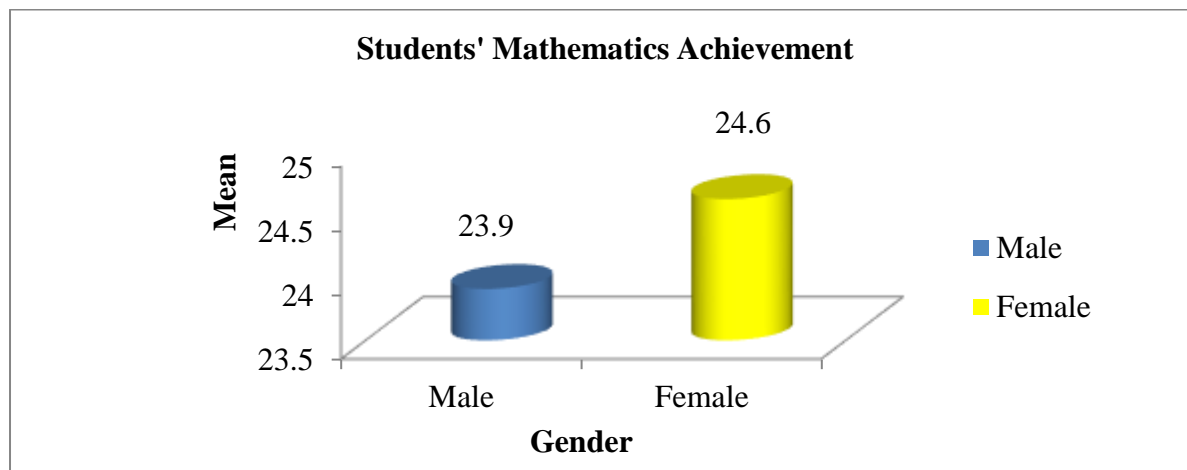


Figure 4. The Comparison of Mean Scores for Students' Mathematics Achievement in terms of Gender

Analysis of the Relationship between Grade 8 Students' Study Skills and Their Mathematics Achievement

Table 8. Correlation between Students' Study Skills and Mathematics Achievement

Correlations			
		Study Skills	Mathematics Achievement
Study Skills	Pearson Correlation	1	.439**
	Sig. (2-tailed)	-	.000
	N	400	400
Mathematics Achievement	Pearson Correlation	.439**	1
	Sig. (2-tailed)	.000	-
	N	400	400

Note: ** Correlation is significant at the 0.01 level (2-tailed)

According to Table 8, there was a significant, positive relationship between students' study skills and their mathematics achievement. It can be interpreted that if students' study skills are good, their mathematics achievement will be high.

Discussion and Suggestions

Discussion

Many researchers have documented that study skills of students can influence their mathematics achievement. So, the purpose of this study was to study the relationship between study skills and mathematics achievement among Grade 8 students. Specifically, five dimensions of study skills and mathematics achievement of students were highly correlated.

Students who have a high level of study skills can perform well for their achievement in mathematics. By analyzing the statistical result, there were significant differences among the selected schools concerning students' study skills. By comparing the mean scores of students' study skills, it was found that the mean score of students' study skills of Basic Education Middle School, Sa Kar Inn were the lowest and students' study skills of Basic Education High School, Myin The were the highest among the selected schools.

According to the obtained data, male and female students have statistically significant differences in study skills. By comparing the mean scores, it was found out that the mean score of the female students' study skills was significantly higher than that of the study skills of the male students. Fazal (2012) asserted that there was significant difference between male and female that was found in his study in which the mean study skills score of female students was higher than that of male participants. Therefore, it can be concluded that the female students were higher than the male students in study skills level according to the findings of this study.

The obtained data indicated that there were significant differences among the selected schools concerning students' mathematics achievement. By comparing the mean scores of students' mathematics achievement, it was found that the mean scores of students from Basic Education Middle School, Sar Kar Inn was the lowest and the mean scores of students from Basic Education High School (Branch), Taung Be Lu was the highest among the selected schools.

Results regarding gender and mathematics achievement are parallel to those of Chudgar and Sankar (2008) who found that the performance of males was better than females in overall in mathematics achievement. However, Schoenfeld (1992) concluded that females had higher achievement in mathematics than males. In the study conducted by Zaman (2011), there was no significant difference in achievement though females were slightly better course grades. In the present study, according to the results of *t*-test, mathematics achievement of the female students was slightly higher than that of the male students. Therefore, the result of the present study is consistent with the result of Schoenfeld (1992).

The descriptive result indicated that there was a positive and significant correlation between students' study skills and their mathematics achievement. It is also suggested that statistical analysis showed study skills and mathematics achievement of students positively correlated with each other. This means that if the study skills level of the students is high, the mathematics achievement level of these students will be high. Thus, study skills are more related to mathematics achievement. The study conducted by Nouhi et al. (2008) stated that there was a positively significant correlation between two variables. Therefore, findings of this study are consistent with their study according to Pearson *r*.

Suggestions

It was found that study skills of the students play an important role in students' mathematics achievement according to the research study. Thus, the students should always motivate and should well manage time themselves to learn and study. Moreover, the students should concentrate in studying and memorizing the lessons and should systematically take note. When sitting the test, students should reduce anxiety about the test. As the parents, they should practice their children to be good at study skills and should train to well manage these skills. And

then, according to the results of this study, further research into other dimensions of study skills significantly correlate with student's academic achievement should be done in other subjects. Further studies should also explore the relationship between students' study skills and their mathematics achievement using other grade levels. Further research conducted in different regions of the country would provide greater perspective to the results. The small size of the sample population shed doubt on the reliability of the results. Thus, the larger size of the sample population would increase the statistical power of the results and should be extended with other subjects in order to obtain reliable and generalizable results. Further research should be conducted to explore the ways and means of developing students' study skills that would obtain high mathematics achievement.

Conclusion

Nouhi et al. (2008) stated that study skills are important factors influencing academic achievement of students. The main purpose of this study is to study the relationship between study skills and mathematics achievement among the middle school students. According to the research findings, there was a positive correlation between students' study skills and their mathematics achievement. Thus, study skills can be applied to any learning situation. These skills are important not just for academic learning, but also for everyday life (Kerka, 2007). Fazal (2012) pointed out the use of a range of study skills would have positive effect on academic achievement. Therefore, today mathematics teacher should emphasize improving and using the wide range of study skills in mathematics. Moreover, students should also realize that study skills are mainly influential in achievement in mathematics and if students have good study skills, they will achieve higher mathematics achievement.

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THE EFFECTIVENESS OF COLLABORATIVE LEARNING FOR DEVELOPING THE WRITING SKILL IN ENGLISH OF HIGH SCHOOL STUDENTS

Eaint Myet Thwe¹ and Tin Maung Toe²

Abstract

The main purpose of the study is to study the effectiveness of collaborative learning for developing the writing skill in English of high school students. The effectiveness of collaborative learning in English teaching was tested in two high schools in Mandalay Region. The design adopted in this study was one of the true experimental designs, namely, the pretest-posttest control group design. The students from two sample schools from Mandalay Region were selected by simple random sampling method. The randomly assigned experimental group (n=60) was instructed based on collaborative learning and the control group (n=60) was taught by traditional method. The instruments used in this study were a pretest and a posttest. Research findings proved that collaborative learning has positively contributed to the improvement of English teaching at the high school level and could reinforce the improvement of the students' writing skill.

Keywords: collaborative learning, process approach, effectiveness, writing skills

Introduction

Language is the system of communication in speech and writing that is used by people use of a particular country or area (Hornby, 2015). Although English is not the language with the largest number of native or first-language speakers, it has become a lingua franca. Therefore, it is important to learn English if students want to communicate with other people around the world. When students learn English, they learn to communicate with other people: to understand them, talk to them, read what they have written, and write to them.

English language teachers in Myanmar face many difficulties in teaching the four skills of English. However, learners find writing skill is difficult. This issue generally arises from incompetence in syntax, coherence, idea expression, content selection, topic sentence, rhetorical conventions, mechanics, organization, lack of vocabulary, and inappropriate use of vocabulary (Fareed, Asharf & Bilal, 2016). The process approach can solve this issue to some extent.

According to Badger and White (2000), the approach includes linguistic writing skills, namely planning, revising, drafting, and editing, rather than linguistic writing knowledge, namely structure and mechanics. In order to teach students for developing writing skill through process approach, collaborative learning is appropriate. Collaborative learning refers to a group of writers working in small groups as a team to produce and complete a shared piece of writing. In collaborative learning, students can work together cooperatively to accomplish shared learning goals, share one's ideas with another, check each other's mistakes, and produce more efficient learning outcomes (Li & Lam, 2013). According to the benefits of collaborative learning, this study was carried out to see whether collaborative learning is effective in developing the writing skill of high school students.

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Purposes of the Study

- To study the theoretical considerations of collaborative learning
- To express the steps of the process approach to writing in English
- To compare the English writing skill of students who are taught by collaborative learning with those who are not taught by collaborative learning, and
- To provide suggestions and recommendations based on the results of the study

Research Questions

- (1) Are there significant differences between the English writing skill of the students taught by collaborative learning and those who do not receive it?
- (2) Are there significant differences between the achievement of the students taught by collaborative learning and those who are not in relation to focus and details criteria of the essay?
- (3) Are there significant differences between the achievement of the students taught by collaborative learning and those who are not in relation to organization criteria of the essay?
- (4) Are there significant differences between the achievement of the students taught by collaborative learning and those who are not in relation to voice criteria of the essay?
- (5) Are there significant differences between the achievement of the students taught by collaborative learning and those who are not in relation to word choice criteria of the essay?
- (6) Are there significant differences between the achievement of the students taught by collaborative learning and those who are not in relation to sentence structure, grammar and spelling criteria of the essay?

Definitions of the Key Terms

Collaborative Learning: Collaborative learning is an umbrella term for a variety of educational approaches involving joint intellectual effort by students, or students and teachers together (MacGregor & Smith, 1992).

Process Approach: Process approach includes linguistic writing skills, namely planning, revising, drafting, and editing, rather than linguistic writing knowledge, namely structure and mechanics (Badger & White, 2000).

Effectiveness: A measure of the match between stated goals and their achievement (Fraser, 1994).

Writing Skills: Specific abilities which help writers put their thoughts into words in a meaningful form and mentally interact with the message (Harmer, 2007).

Scope

The following points indicate the scope of the study.

- (1) The study is geographically restricted to Sinkgaing Township, Mandalay Region.

- (2) Participants in the study are all Grade-Nine students from the selected schools during the period within the academic year 2017-2018.

Review of Related Literature

Writing Approaches

Although there are many approaches to teaching writing, the following three are the most adopted; (i) the product approach that is concerned with the form, (ii) the process approach that concentrates on the writer, and (iii) the genre approach that pays attention to the reader (Raimes, 1983). Since this research aimed to study the influence of collaborative learning in improving English as a Foreign Language learners, the main focus is on the process approach to writing, which consists of the pre-writing, drafting, revising, and editing stages and the activities associated with these stages.

The writing process usually involves several steps. A typical sequence is comprised of three steps: pre-writing, drafting, and revising. Some sequences, however, use four steps, such as pre-writing, drafting, revising, and editing, while others use five steps; pre-writing, drafting, revising, editing, and evaluating. According to Badger and White (2000), the process approach to writing also places more emphasis on writing skills (planning, revising, and drafting) than on linguistic knowledge (spelling, grammar, punctuation and vocabulary). Therefore, students have to be taught writing through its process and stages such as planning, drafting, revising, editing, and publishing in order to write freely and arrive at a product of good quality.

Theoretical Framework of the Collaborative Learning

The main theory that underpins collaborative learning refers to social constructivism advanced by Lev Semyonovich Vygotsky (1896-1934). He considered that the roles of culture and society, language, and interaction are important in understanding how humans learn. Vygotsky assumed that knowledge is cultural; he took a socio-cultural approach in his study with children. This approach can be briefly described as cooperative and cultural. One of the most important theories of Vygotsky involves the zone of proximal development. He proposed that children, in any given domain, have actual developmental levels, which can be assessed by testing them individually. He further contended that there is an immediate potential for development within each domain. The difference between the two is called the zone of proximal development.

Meaning and Nature of Collaborative Learning

Collaborative learning is a kind of teaching strategy that is commonly used in the classroom. Sometimes it refers to as cooperative learning. The term collaborative learning refers to an instructional method in which students of different ability levels learn together in a group where each group member is responsible for his own progress and the progress of other members in the group towards a common goal. In other words, in a collaborative learning environment, the success of a person in the group will support the other members to succeed together (Gokhale, 1995 cited in Togatorop, 2015). Since collaborative learning gives the chance to each member to share his or her own perspective and to receive the other members' viewpoints that may lead to enriching each one's own horizon (Kolodner & Guzdial, 1996 cited in Togatorop, 2015). Lisi and Golbeck (1999 cited in Togatorop, 2015) agreed with the idea that each individual in a collaborative group may distribute significant value that is beneficial to all members. Such kind

of process will give the students communication experiences that lead to the improvement of their thinking skills and metacognition.

Advantages of Collaborative Learning

Collaborative learning (CL) is supported by one of the strongest research traditions in education, with thousands of studies conducted across a wide range of subject areas, age groups, ability levels, and cultural backgrounds. The results, in general, suggest that CL develops high-order thinking skills, enhances motivation, and improves interpersonal relations as well as enhancing motivation and peer relations (Salvin, 1985, cited in Li & Lam, 2013). Students can be learning-independent and can learn how to by their own groups. Most important is that CL exploits the diversified abilities of students to increase their cognitive, psychological, and social performance, and as such, it is an effective way to address the problem of individual differences.

Limitations of Collaborative Learning

One of the greatest challenges of CL is its reliance on a positive group dynamic to function at its highest efficiency. The conflict between individuals can diminish or stall a group's ability to work together, which raises a significant problem when group members are too young to have fully formed conflict-resolution skills. According to Bartsch (2015), beyond personality conflicts, CL can also result in an uneven distribution of the workload. While many of CL's limitations affect the students, the strategy can also provide difficulties for educators. For students to work together, they must talk to one another. Any teacher who has managed a classroom of 20 to 30 students knows that children with permission to converse with one another invariably speak increasingly louder, which can become a distraction from the learning process. It is also impossible for one teacher to constantly monitor each group, which can result in off-topic chatter.

Research Method

Subject

The required sample schools were selected by using simple random sampling method. The sample schools were Basic Education High School, Paleik, and Basic Education High School (Branch), Seywa. The sample size for two selected schools was presented in Table 1.

Table 1. Population and Sample Size

Name of School	No. of Population	No. of Subject
BEHS, Paleik	303	60
BEHS (Branch), Seywa	100	60

Design

The design used in this study was one of the true experimental designs, via, the pretest-posttest control group design (see Table 2).

Table 2. Research Design

Group	Assignment	No. of subjects		Pretest	Treatment	Posttest
		School (1)	School (2)			
Control	Random	30	30	Writing Skill	Conventional Method	Writing Skill
Experimental	Random	30	30	Writing Skill	Collaborative Learning	Writing Skill

Research Instrument

The pretest and posttest were used as instruments for this study. The pretest was conducted to measure the basic writing skill of the students. The posttest was conducted to measure the development of the students' writing skill. Both of the tests consisted of an essay topic. The allocated time for each test was thirty minutes, and given marks were 20. To establish the reliability of the instrument, a pilot test is administered to forty Grade-Nine students from Practising High School of Sagaing University of Education. To show the internal consistency of the test, the reliability coefficient Cronbach's Alpha was computed. Its value is 0.783.

Procedure

First of all, the permission of headmistresses was requested and English teachers who teach Grade Nine were discussed to carry out the research work. After that, pilot testing was conducted in Practising High School of Sagaing University of Education. Then, the pretest and posttest were constructed. The main study was conducted in Basic Education High School, Paleik and Basic Education High School (Branch), Seywa in November, 2017. Both experimental and control groups were administered a pretest before the treatment was provided. The pretest was conducted to measure the basic writing skill of the students. After that, the experimental groups were given treatment by using collaborative learning while the control groups were taught by the traditional method. The procedure for the control group was first the teacher introduced the four stages of the process approach and asked each student to write an essay they would like to write. The students got ninety minutes to write the essay through the stages of the writing process. In the pre-writing stage, the students got thirty minutes to brainstorm and collect ideas, collect appropriate vocabulary, and produce outlines for essays. In the drafting and writing stage, the students got thirty minutes to write their essays. In the revising stage, the students had fifteen minutes to read what they had written during the drafting stage. In the final stage, the students got fifteen minutes to edit their drafts. The teacher provided positive feedback and reinforcement for students. The procedure for the control group was first the teacher introduced the four stages of the process approach and then the students were divided into small groups. Each group got ninety minutes to write the essay they would like to write through the stages of writing. In the first stage, each group got thirty minutes to discuss their ideas, appropriate vocabulary and organize their ideas, and produce outlines for the essay. In the second stage, each student wrote their own essay for thirty minutes without asking the other member of the group for help. In the third stage, each group had fifteen minutes to revise their essays collaboratively. In the final stage, the students were allowed fifteen minutes to edit their essays collaboratively. The teacher provided positive feedback and reinforcement for each group. The treatment period lasted two weeks and instructional time was five hours per week in each school. The groups of students

were taught according to the lesson plan. One period lasted one hour. Therefore, the total time taken for the treatment was ten hours in each school. At the end of the treatment period, both groups were also administered a posttest.

Data Analysis

The quantitative data were analyzed by using Statistical Package for the Social Science (SPSS) by using descriptive statistics, mean, standard deviation, and independent samples *t*-test.

Findings

Findings of Pretest

Table 3. The results of *t*-test for Independent Samples on Pre-test

School	Group	N	<i>M</i>	<i>SD</i>	<i>MD</i>	<i>t</i>	<i>df</i>	Sig. (2-tailed)
S1	Experimental	30	5.3	2.06	0.1	0.26	58	.791 (ns)
	Control	30	5.2	2.72				
S2	Experimental	30	4.2	1.21	0.3	0.59	58	.557 (ns)
	Control	30	3.9	1.79				

Note. ns = not significant

S1 = BEHS (Paleik)

S2 = BEHS (Branch), Seywa

According to the results, the mean scores of the pretest were 5.3 for the experimental group and 5.2 for the control group in S1 and 4.2 for the experimental group, and 3.97 for the control group in S2. So, the means of the experimental group and control group were nearly the same. The probability (*p*) values were .791 and .557 (see Table 3). These data showed that there were no significant differences between the experimental group and the control group in English writing skill before the treatment. This means that the two groups were equivalent. They are shown graphically in Figure 1.

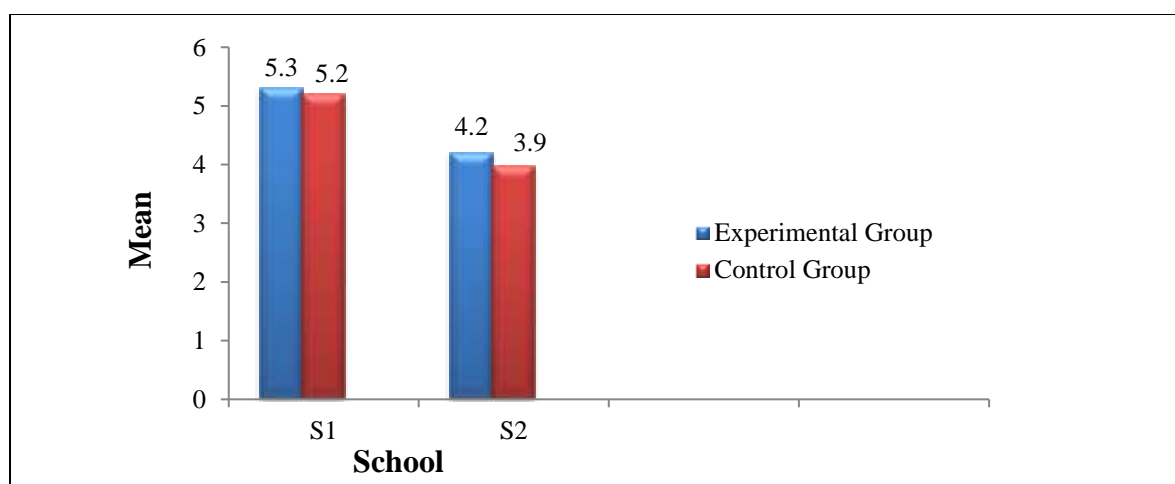


Figure 1. The Comparison of Means on Pretest

Findings on Research Question (1)

Table 4. The results of *t*-test for Independent Samples on Post-test

School	Group	N	<i>M</i>	<i>SD</i>	<i>MD</i>	<i>t</i>	<i>df</i>	Sig. (2-tailed)
S1	Experimental	30	9.8	2.00	4.1	9.90	58	.000***
	Control	30	5.7	1.09				
S2	Experimental	30	7.2	1.91	3.1	8.11	58	.000***
	Control	30	4.1	0.77				

Note. *** $p < .001$

According to the results, the mean scores of the pretest were 9.8 for the experimental group and 5.67 for the control group in S1 and 7.2 for the experimental group, and 4.13 for the control group in S2. The mean score of the experimental group is higher than that of the control group in both schools (see Table 4). The results show that there were significant differences in the writing skill of the students between the experimental groups and the control group. The results can be interpreted that the use of collaborative learning positively contributed to the writing skill of high school students. They are shown graphically in Figure 2.

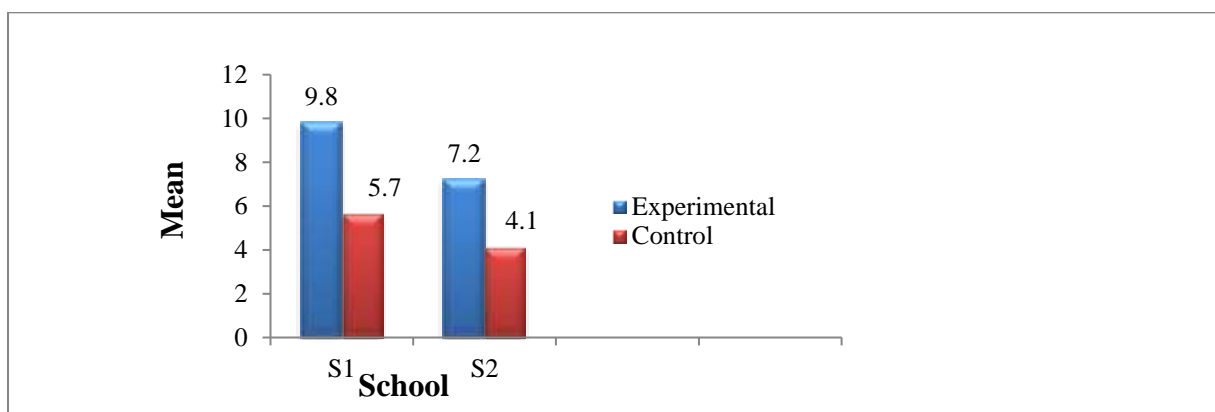


Figure 2. Comparisons of the Mean of the Two Groups on the Posttest

Finding on Research Question (2)

Table 5. The results of *t*-test for Independent Samples on Focus and Detail Criteria

School	Group	N	<i>M</i>	<i>SD</i>	<i>MD</i>	<i>t</i>	<i>df</i>	Sig. (2-tailed)
S1	Experimental	30	2.2	0.46	0.9	7.65	58	.000***
	Control	30	1.3	0.45				
S2	Experimental	30	1.8	0.61	1.0	7.58	58	.000***
	Control	30	0.8	0.43				

Note. *** $p < .001$

According to the results, the mean scores of the pretest were 2.17 for the experimental group and 1.27 for the control group in S1 and 1.8 for the experimental group, and 0.77 for the control group in S2. The mean score of the experimental group is higher than that of the control group in both schools (see Table 5). The results show that there were significant differences between the experimental groups and the control group. It can be interpreted that collaborative learning could bring the students' achievement on the focus and detail criteria of the essay. They are shown graphically in Figure 3.

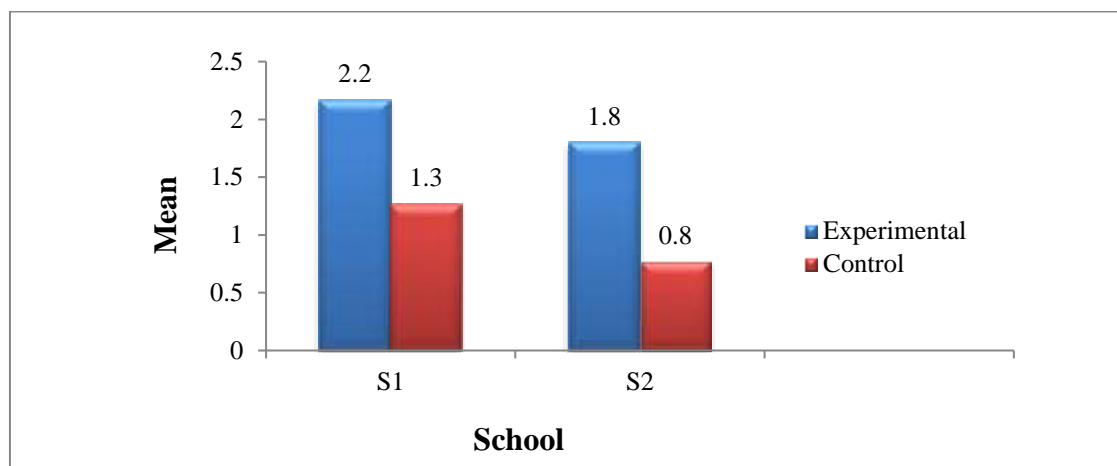


Figure 3. Comparisons of the means of the Two Groups on Focus and Detail Criteria

Findings on Research Question (3)

Table 6. The results of *t*-test for Independent Samples on Organization Criteria

School	Group	N	M	SD	MD	t	df	Sig. (2-tailed)
S1	Experimental	30	1.9	0.71	0.6	5.76	58	.000***
	Control	30	1.3	0.41				
S2	Experimental	30	1.0	0.74	0.4	2.45	58	.017*
	Control	30	0.6	0.49				

Note. *** $p < .001$, * $p < .05$

According to the results, the mean scores of the pretest were 1.9 for the experimental group and 1.3 for the control group in S1 and 1 for the experimental group, and 0.6 for the control group in S2. The mean score of the experimental group is higher than that of the control group in both schools (see Table 6). The results show that there were significant differences between the experimental groups and the control group. It can be interpreted that the use of collaborative learning positively contributed to the organization criteria of the essay. They are shown graphically in Figure 4.

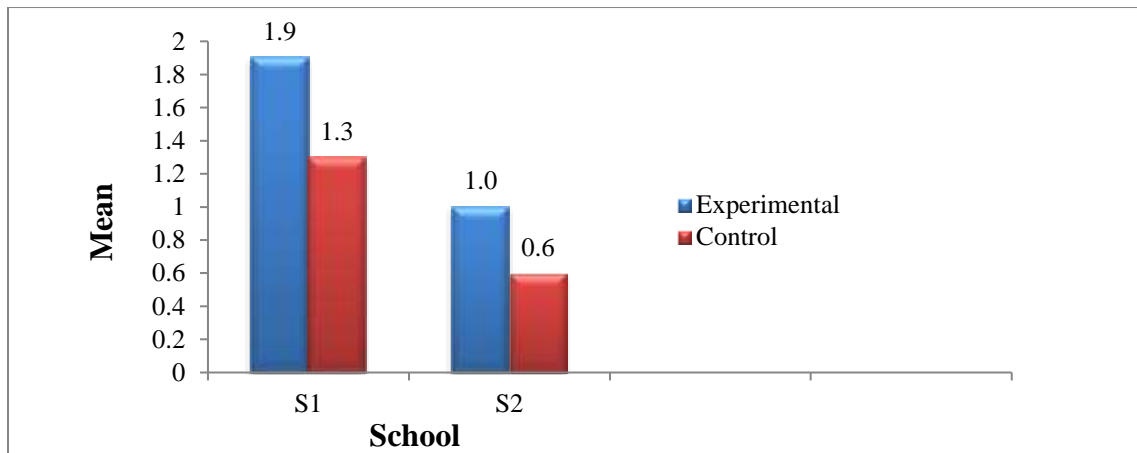


Figure 4. Comparisons of the Means of the Two Groups on the Organization Criteria of the Essay

Findings on Research Question (4)

Table 7. The results of *t*-test for Independent Samples on Voice Criteria

School	Group	N	<i>M</i>	<i>SD</i>	<i>MD</i>	<i>t</i>	<i>df</i>	Sig (2-tailed)
S1	Experimental	30	1.8	0.55	0.7	5.64	58	.000***
	Control	30	1.1	0.45				
S2	Experimental	30	1.6	0.56	0.7	5.03	58	.000***
	Control	30	0.9	0.50				

Note. *** $p < .001$

According to the results, the mean scores of the pretest were 1.8 for the experimental group and 1.07 for the control group in S1 and 1.57 for the experimental group, and 0.87 for the control group in S2. The mean score of the experimental group is higher than that of the control group in both schools (see Table 7). The results show that there were significant differences between the experimental groups and the control group. It can be interpreted that collaborative learning could bring the students' achievement on the voice criteria of the essay. They are shown graphically in Figure 5.

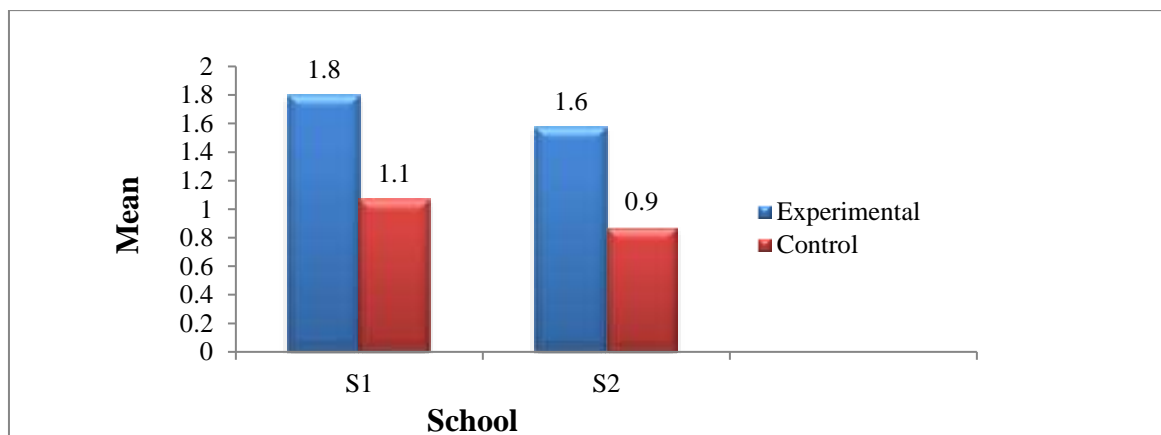


Figure 5. Comparisons of the Means of the Two Groups on the Voice Criteria of the Essay

Findings on Research Question (5)

Table 8. The results of *t*-test for Independent Samples on Word Choice Criteria

School	Group	N	<i>M</i>	<i>SD</i>	<i>MD</i>	<i>t</i>	<i>df</i>	Sig. (2-tailed)
S1	Experimental	30	1.6	0.49	0.8	4.89	58	.000***
	Control	30	0.8	0.69				
S2	Experimental	30	1.0	0.49	0.4	3.16	58	.003**
	Control	30	0.6	0.49				

Note. *** $p < .001$, ** $p < .01$

According to the results, the mean scores of the pretest were 1.6 for the experimental group and 0.83 for the control group in S1 and 1.03 for the experimental group, and 0.63 for the control group in S2. The mean score of the experimental group is higher than that of the control group in both schools (see Table 8). The results show that there were significant differences between the experimental groups and the control group. It can be interpreted that collaborative learning could bring the students' achievement on the word choice criteria. They are shown graphically in Figure 6.

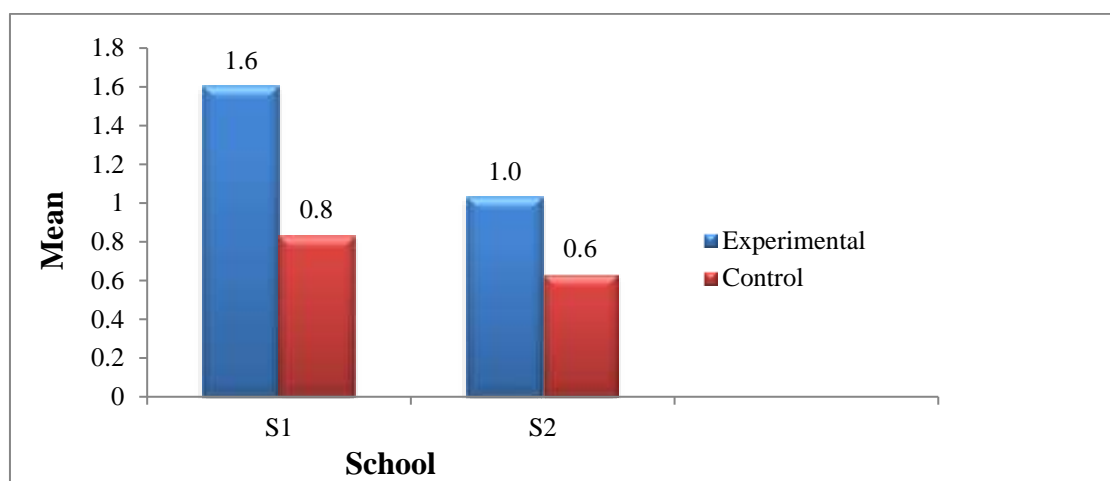


Figure 6. Comparisons of the Means of the Two Groups on the Word Choice Criteria

Findings on Research Question (6)

Table 9. The results of *t*-test for Independent Samples on Sentence Structure, Grammar, and Spelling Criteria

School	Group	N	<i>M</i>	<i>SD</i>	<i>MD</i>	<i>t</i>	<i>df</i>	Sig. (2-tailed)
S1	Experimental	30	2.3	0.60	0.8	6.00	58	.000***
	Control	30	1.5	0.51				
S2	Experimental	30	1.8	0.66	0.5	3.46	58	.001**
	Control	30	1.3	0.52				

Note. *** $p < .001$, ** $p < .01$

According to the results, the mean scores of the pretest were 2.33 for the experimental group and 1.47 for the control group in S1 and 1.8 for the experimental group, and 1.27 for the control group in S2. The mean score of the experimental group is higher than that of the control group in both schools (see Table 9). The results show that there were significant differences between the experimental groups and the control group. It can be interpreted that collaborative learning could bring the students' achievement on sentence structure, grammar, and spelling criteria. They are shown graphically in Figure 7.

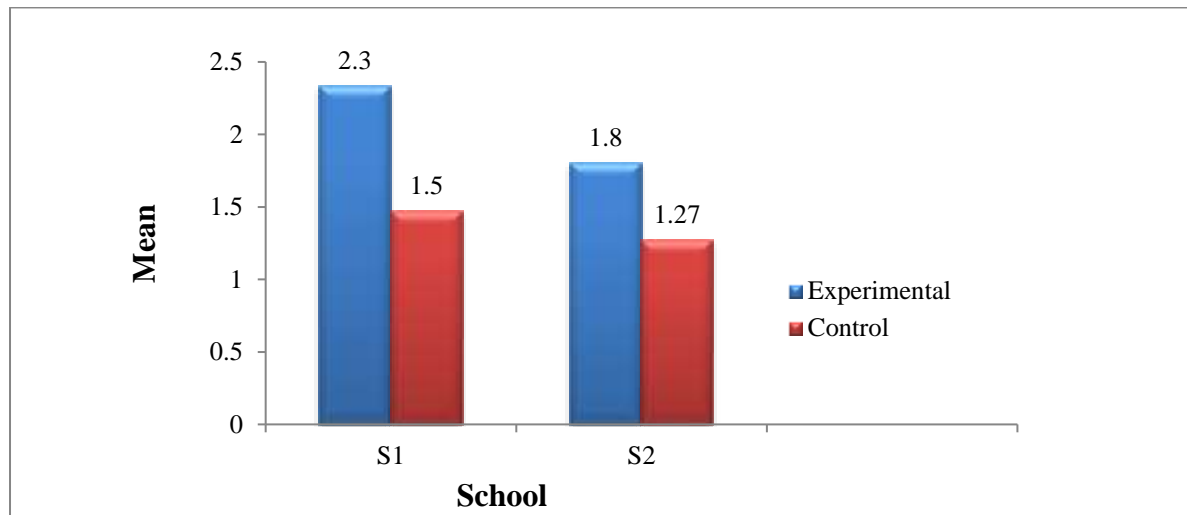


Figure 7. Comparisons of the Mean Scores of the Two Groups on the Sentence Structure, Grammar, and Spelling Criteria of the Essay

Discussion and Suggestions

Discussion

The present study examined the effects of collaborative learning in developing the writing skill of high school students. There were two groups in each school: the experimental group where students were taught by collaborative learning and the control group where students were not taught by collaborative learning. The independence samples *t*-test was used to find the differences between the achievements of the two groups.

The results of the research indicated the effectiveness of collaborative learning. According to the findings, the values *t*-test revealed that there were significant differences in the writing skill of the students between the experimental groups and control groups in all the selected schools on the post-test. The students in the experimental group have the chance to interact with each member of the group and discuss the topic. Hence, they have the opportunity to get many ideas for writing the essay. The students in the control group have to think about the topic individually. Therefore, it can be concluded that collaborative learning is effective for the development of writing skill. This result supports research question No. (1). This result is consistent with the findings of Albeshir: collaborative learning is more effective for the development of writing skill. According to the findings, the values of *t*-test pointed out that there were significant differences between the experimental groups and control groups in all the selected schools in relation to the focus and detail criteria of the essay. The students in the experimental group revise together all the drafts produced by each member. Therefore, they can discuss the appropriate ideas and suggest a more efficient way to use these ideas. Hence, it can be

interpreted that collaborative learning is effective for collecting and generating ideas. This result supports research question No. (2). This result is consistent with the findings of Storch: collaborative learning enabled the students to collect and generate ideas and use them effectively.

Based on the results of the finding, the value of *t*-test showed that there were significant differences between the experimental groups and control groups in all the selected schools in relation to the organization criteria of the essay. The students in the experimental group are allowed to discuss how to organize their ideas and produce an outline for the essay. The students in the control group have to organize and produce an outline individually. Therefore, it can be concluded that the organization of the essay of the students in the experimental groups is better than that of the students in the control groups. This result supports research question No. (3). This result is consistent with Albeshier's findings: the organization in the essay of the students in the experimental groups is better than that of the students in the control groups. According to the findings, the value of *t*-test showed that there were significant differences between the experimental groups and control groups in all the selected schools in relation to the voice criteria of the essay. The students revise together the consistency of the sentences of the essay in the experimental group. Therefore, they can criticize and suggest better ideas to present their voice more clearly. Hence, it can be concluded that collaborative learning is effective for expressing the voice clearly. This result supports research question No. (4). This result is consistent with the findings of Amel: collaborative learning could bring the students to express their voices more clearly.

Due to the results of the findings, the means of the students who are taught by collaborative learning is significantly higher than that of students who are not in relation to the word choice criteria of the essay. The students in the experimental group are brainstorming together to collect ideas and vocabulary and words that could be used in their essays. The students brainstorm and collect appropriate vocabulary and words individually. Therefore, it can be concluded collaborative learning can help students to improve their vocabulary. This result supports research question No. (5). This result is consistent with Albeshier's findings: the vocabulary used in the students' essays will be significantly different after their involvement in collaborative learning. According to the findings, the means of the students who are taught by collaborative learning is higher than that of students who are not taught in relation to sentence structure, grammar, and spelling criteria of the essay. The students in the experimental group revise together to correct inappropriate vocabulary and reorganize and rearrange any unclear sentences and paragraphs. Therefore, it can be concluded that collaborative learning can bring students to produce better-written texts. This result supports research question No. (6). This result is consistent with the findings of Storch: collaborative learning could help students to produce accurately written texts more than working individually.

This study showed that the achievement of the students taught by collaborative learning is better than that of students who are not. Therefore, it can be generalized that collaborative learning is more appropriate than traditional methods. Thus, English language teaching teachers should not only use traditional methods but also use collaborative learning in the classroom.

Suggestions

In this study, the sample schools were restricted to two high schools in Sinkgaing Township, Mandalay Region. Therefore, further research should be conducted in other regions to be more representative. As this study was carried out over two weeks, the duration was too short to be able to yield reliable and valid results. Therefore, further research should be carried out over a longer period to validate the results. Further research should be investigated both the students' and teachers' attitudes toward the effectiveness of collaborative learning. The sample size limits the extent to which conclusions can be generalized. Therefore, further research should be carried out with a large sample.

Conclusion

The main purpose of this study was to study the effectiveness of collaborative learning in developing the writing skill of high school students. The quantitative research method was used to compare the students' writing skill between the two groups. The design used in this study was one of the true experimental designs, namely, the pretest-posttest control group design. The instruments for this study were pretest and posttest. Independent samples *t*-test was used to examine whether there were significant differences between the two groups. By these results, interpretations were made whether there were significant differences between the two groups. Based on the findings of the research, the English writing skill of the high school students taught by collaborative learning was better than that of students who were not taught by it. Therefore, it can be concluded that collaborative learning can significantly improve the English writing skill of high school students.

Writing in a foreign language is one of the most challenging skills for almost all learners. Developing the writing skill is thought to be highly complex if not the most complex in comparison to listening, speaking, and reading. What makes writing a very troublesome task for English as a foreign language learner is the fact that it requires some criteria of acceptability relative to different aspects of writing which include content, organization, vocabulary, language use, spelling, punctuation, and actual capitalization and paragraphing (Hamadorche, 2010 cited in Sheir, Zahran & Koura, n.d.). In order to solve these problems, the teacher must consider using the process approach to writing in the classroom.

Moreover, by cooperating with the process approach and collaborative learning in the classroom, it can improve the students' writing skill to some extent. Johnson and Johnson (1999 cited in Tuan, 2010) contend that collaborative learning is the instructional use of small groups so that students work together to maximize their own and each other's learning. According to the benefits of collaborative learning, this method is mostly used in language teaching. Therefore, English language teachers should use collaborative learning in their classrooms in order to improve their students' writing skill.

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PERCEPTIONS OF EXPERIENCED SENIOR TEACHERS AND PRE-SERVICE TEACHERS ON CLASSROOM INSTRUCTIONAL PLANNING IN SAGAING TOWNSHIP

Nwe Oo Mon¹

Abstract

The purpose of this study is to find out the difference in perceptions of experienced senior teachers and pre-service teachers on classroom instructional planning in Sagaing Township. Quantitative methodology was used to find out the perceptions of experienced senior teachers and pre-service teachers on classroom instructional planning. The design adopted in this study was a survey research design. This study was limited to all experienced senior teachers in Sagaing Township and all pre-service teachers, B.Ed. Fourth Year Senior Students who are studying in Sagaing Institute of Education in (2013-2014) academic year. There were (184) senior teachers and (248) pre-service teachers. Therefore, the total population was (432) enough to allow census and the sampling procedure was not adopted. A questionnaire consisting of (44) items with one open-ended item was [used](#) developed by Ibrahim (2000). The data yielded from the questionnaire was analyzed by using the Statistical Package for the Social Science (SPSS) for collection of data. Research hypotheses were analyzed by using independent samples *t* test. The findings of this study of experienced senior teachers and pre-service teachers of Sagaing explained that perceptions of male and female of both groups were, more or less, same. Some differences were found in the perceptions of the groups. This indicated that teaching experience has an impact on the perceptions of teachers on classroom instructional planning, and the gender has no impact on it.

Keywords: instruction, planning, instructional planning, experienced teachers, and pre-service teachers

Introduction

Successful education depends upon many factors such as effective teachers, suitable teaching methods, advance planning, hard-working students, suitable buildings, good discipline, attractive textbooks, audio-visual aids, etc. Viewed from the standpoint of teachers, however, the main concern of teachers is their instructional task. They must understand the instructional process and should be able to manipulate it to make it effective and productive.

The word instruction is similar to the word teaching. Therefore, instructional planning is primarily the task of the teacher. Teachers try their best to plan their lesson in advance. Instructional planning is the process teachers use to decide how to select, organize, and deliver a learning experience to maximize both teacher and student achievement, and satisfaction. In other words, before they begin teaching, good teachers consider what to teach and how to teach it so that teaching and learning are worthwhile for all (Bainer, Cruickshank & Metcalf, 1999).

Instruction is the main activity in a school but good and successful instructions cannot be carried out without planning. Instruction is the process whereby the environment of an individual is deliberated to enable him to learn to emit or engage in specified behavior under specified conditions or as responses specified situation (Corey, 1976). Instructional planning includes not only planning what students will learn, but how they will learn it. Instructional planning may include considerations of academic content, assistive or augmentative technology needs, scaffold supports, specific teaching strategies, and adaptations of or modifications to content.

Learning is not exclusive to the domain of an education system. Learning begins a very long time before school; continues for even longer after school; and happens rapidly, and in parallel with school in a great number of different ways and settings. Teachers are good at providing excellent opportunities for allowing children's learning to progress. Often, without

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fully understanding the reasons why, teachers encourage learning in their charges which works well, and is a good approach at a particular time with a particular child or group of children. With greater insight into what is currently known about the processes of learning and about individual learning preferences, teachers are able to provide even better learning situations which are more likely to lead to effective learning (Pintchard, 2009).

Schools were created by society to provide an environment where learning can be organized effectively and economically. To discharge his responsibility well, the teacher in today's school must be better prepared and must plan more effectively than ever before. An increase in numbers and heterogeneity of the school population, rapid expansion of all fields of knowledge, newer developments in teaching methods, and an increasing volume of instructional materials of all types has compounded the complexity of instructional planning. The teachers of today must plan or perish professionally.

Purposes of the Study

- To find out the difference in perceptions of experienced senior teachers and pre-service teachers on classroom instructional planning
- To study the perceptions of experienced senior teachers and pre-service teachers on classroom instructional planning
- To explore the difference between the perceptions of male and female experienced senior teachers on classroom instructional planning
- To compare the perceptions of male and female pre-service teachers on classroom instructional planning
- To give suggestions to improve teaching and learning based on the results of the study

Research Questions

- To what extent is it different in the perceptions of experienced senior teachers and pre-service teachers on classroom instructional planning?
- To what extent is it different in the perceptions of male and female experienced senior teachers on classroom instructional planning?
- To what extent is it different in the perceptions of male and female pre-service teachers on classroom instructional planning?

Definition of Key Terms

Instruction

Instruction is defined as the set of planned external events which influence the process of learning and thus promote learning (Ibrahim, 2000).

Planning

Planning is a design, scheme, program or method marked out before hand for the accomplishment of an objective, a plan of attack, a proposed or tentative project (Ibrahim, 2000).

Instructional Planning

Instructional planning is the process teachers use to decide how best to select, organize, and deliver a learning experience to maximize both teacher and student achievement and satisfaction (Bainer, Cruickshank & Metcalf, 1999).

Experienced Teachers

Experienced teachers are those teachers who were teaching in secondary schools, trained or untrained (Ibrahim, 2000).

Pre-service Teachers

Pre-service teachers are those teachers who were under teachers' training in training colleges (Ibrahim, 2000).

Scope of the Study

This study is limited to all experienced senior teachers in Sagaing Township and all pre-service teachers, B.Ed. Fourth Year Senior Students who are studying in Sagaing Institute of Education in (2013-2014) academic year.

Review of Related Literature

Theoretical Framework of Instructional Planning

Preparation in the form of instructional planning, termed lesson planning by some educators and researchers, is the basis for effective teaching and student learning (Reiser & Dick, 1996). In support of this premise, Sung (1982) found that students who were taught using more structured instructional plans had significantly higher achievement than those taught with less structured plans.

Additionally, teacher planning improves the likelihood of a successful class session through the use of proactive strategies (Bond & Peterson, 2004), and instructional planning provides the teacher —with some control over what is going to happen as opposed to reacting only to what has happened (Duke & Madsen, 1991). As such, an important goal of teacher preparation programs is to assist pre-service teachers in developing a systematic process for instructional planning and to embrace the concept of writing instructional plans (Baylor & Kitsantas, 2005).

Importance of Instructional Planning

Men do many things in their lives, but some faces with success and some with failure although failures work with great effort. It seems that success and failure totally depends on the well planned structure, since planning is an important aspect and it plays a significant role in daily life. Planning is preparation for action (Barge, 2013).

The authorities of the government invest billions on education and they spent on the desired educational results. Thus, planning becomes an important role for the authority concerned. Educational planning at all levels has been growing importance with the passing of time. Best planning assures adequate return on the educational investment. Planning is the best guarantee of unity and proper emphasis in the complex educational world of today so that education can meet the changing needs of the society, and the coordination of the workers in education is possible through proper planning (Ibrahim, 2000).

Planning for education is the task of Government agencies and experts but the planning for instructions mostly depends upon teachers. Teachers are responsible for classroom instructional planning. Classrooms are busy places with many things happening all at once. Teachers are challenged to monitor multiple classroom events simultaneously while at the same time collecting and analyzing data on student performances (Duncan & Met, 2010).

Teaching begins before the teacher steps into the classroom. Prior to each lesson or unit, effective teachers identify what students need to know, understand, and do so as to upgrade curriculum standards. Effective teachers collaboratively determine how mastery of the students will be assessed, prior to planning the lessons. The greatest benefit of instructional planning is that it brings to the teacher a greater versatility in directing the learning situation (Goething, 1955).

Many educators believe that lesson planning is a critical element of effective instruction. As an old adage says, “failing to plan is planning to fail”. Lesson planning helps ensure that classroom instruction aligns with curriculum goals and objectives and therefore enables students to demonstrate their successful learning on unit or curricular assessments (Duncan & Met, 2010).

Elements of Instructional Planning

There are some important elements which should be included in the instructional plan. First of all, the subject matter should be thoroughly studied and then the proper methods of preparation be thought out and noted in the plan (Ibrahim, 2000).

In providing for this part of the lesson to be taught, the nature of the subject matter, individual differences in students, the interests of the students should be considered. Today's classrooms provide unique challenges for teachers. Teachers must know content matter as well as state standards. They are accountable to multiple constituents: students, parents, administrators, and community members, and are expected to demonstrate appropriate yearly progress (Ibrahim, 2000).

When teachers are fully informed about their students, they are better prepared to make appropriate instructional and curriculum decisions, and adapt, as necessary, their teaching practice to ensure success for all students. To learn about their students, teachers must rely on data collected from their students through a variety of methods. Student data must be rich enough in detail to provide teachers with necessary information to connect instructional strategies to their needs and skills. These data must provide information about students' ability and knowledge within the subject matter as well as information about students' interests, learning styles, and pace.

Provision for using concrete materials should be made whenever possible. Questions and topics of discussion should be included in the plan. Many experts explain these elements. A daily lesson plan brings into the focus objectives, contents and methods to be followed in teaching. Certain points like objectives, contents, methods, teaching aids, evaluation techniques are required to be attended to properly in advance for achieving outcomes (Ibrahim, 2000).

Written Lesson Plans

Written lesson plans are said to be good form. Written plan may be a protection against forgetting, reduce the possibilities of digression, encourages exactness and orderly thinking and can provide a written record for future needs and reference. The plan from memory is subject to all the limitations of the memory.

The question is often raised to whether it is necessary to write out lesson plan. The answer is that plans should be written out. However, teacher should not be a slave to his/her lesson plan. A teacher should be ready to depart from his/her plan, whenever sound judgment leads his/her to believe that is right thing to do. Teachers may or may not write the plan of a lesson on paper but they must give a careful thought to each lesson.

The experienced teacher can utilize more mental planning in lieu of the detailed written plans needed in pre-service teaching. Lesson planning in advance can lead to a more relaxed feeling as well as to better performance both in the classroom and in subsequent planning periods. Such an arrangement can contribute to the physical and mental benefits also for the learners. A final benefit to this method of scheduling the planning time can be improved learning (Briggs, 1977, cited in Ibrahim, 2000).

Problems in Instructional Planning

The problem of the selection and organization of instructional activities and materials has become more difficult with the expansion of available materials and teaching aids; the broadening of educational objectives, to meet the needs of all students, not just the college bound; and the increasing heterogeneity of the school population (Brink, 1960). Educational shortage is a common topic in educational circles. Probably the greatest shortage of the average classroom teacher is time. With more students of greater diversity to teach, with more to be

taught, and with more duties outside the classroom and in the community, when does the teacher find time to plan his work adequately?

In planning his work, the busy teacher has several alternatives. He may attempt to teach without plans or use the same plans year after year. However, neither of these alternatives satisfies the professional person. It is obvious that an effective teacher must be a highly organized person who is able to budget time wisely, think clearly, and act decisively.

Another problem in instructional planning at the secondary level is the fact that the teacher may be lacking in perspective. Educated essentially as a subject-matter specialist, he can easily lose sight of the fact that such subject matter is a means to an end, not an end itself. Moreover, maintaining a balance between uniformity and flexibility is also another problem in planning instruction. The need for thorough preplanning has already been stressed. However, to plan does not mean to predetermine everything that happens in the classroom. There are unpredictable variables in every teaching-learning situation.

In conclusion, reading and talking about instructional planning, and even being skilled at planning does not make one a good teacher! Planning is necessary but not sufficient for good teaching. It is a means to an end, not an end in itself (Bainer, Cruickshank & Metcalf, 1999).

Research Method

Subjects

The population of the study consisted of all the experienced senior teachers in Sagaing Township and all the pre-service teachers, B.Ed. Fourth Year Senior Students who were studying in Sagaing Institute of Education in (2013-2014) academic year. There were (184) senior teachers and (248) pre-service teachers. Therefore, the total population was (432) enough to allow census and the sampling procedure was not adopted.

Design

Quantitative method is a research technique that is used to gather quantitative data-information dealing with numbers and anything that is measurable (Gay, 1987). In this study, data were mainly collected through a quantitative method. The research design of the study was survey research design.

Research Instruments

A questionnaire consisting of (45) items with five major dimensions was developed for collection of data based on a Ph.D. dissertation by Ibrahim (2000). The items were modified and reconstructed in Myanmar language according to national culture. There were altogether (44) items on a five point Likert-type scale and one open-ended item in the questionnaire.

The language of the questionnaire was carefully edited in consultation with the experts. The items were drawn from the relevant content on the basis of the review of literature, consultation with the experts, and experience of the investigator. A pilot study was run on a selected sample of (50) participants to refine each item of the questionnaire. Then the wording and the structure of the questionnaire was refined. Internal consistency was the Cronbach's Alpha value of 0.68.

Procedure

First of all, the permission of headmasters and headmistresses was requested. Then the data of experienced senior teachers and pre-service teachers was obtained through questionnaire. This procedure not only ensured 100% return but also elicited responses from the respondents in a framework of clear and full understanding of the whole questionnaire.

Data Analysis

Analytical technique used was quantitative which involved both descriptive and inferential statistical procedures. The three hypotheses were tested using the independent samples *t* test. The data were analyzed using the Statistical Package for the Social Science (SPSS).

Findings

Findings of Mean and Standard Deviation of the Perceptions of Experienced Senior Teachers and Pre-service Teachers on Classroom Instructional Planning

It was found that there was a significant difference between the perceptions of experienced senior teachers and pre-service teachers on the importance of classroom instructional planning, on the elements of classroom instructional planning, on the written classroom instructional planning and on the constraints in classroom instructional planning. But it was found that there was no significant difference between their perceptions on the general questions about classroom instructional planning (see Table 1).

Table 1. *t* Values for the Perceptions of Experienced Senior Teachers and Pre-service Teachers on Classroom Instructional Planning

Dimension	Teacher	<i>N</i>	<i>M</i>	<i>SD</i>	<i>MD</i>	<i>t</i>	<i>df</i>	Sig.
D1	T1	184	4.34	0.375	0.26	3.18	342.67	.002**
	T2	248	4.08	0.302				
D2	T1	184	4.36	0.455	0.19	2.039	430	.042*
	T2	248	4.17	0.433				
D3	T1	184	3.65	0.382	0.38	4.362	349.46	.000***
	T2	248	3.27	0.316				
D4	T1	184	2.61	0.737	-0.35	-5.24	430	.000***
	T2	248	2.96	0.662				
D5	T1	184	3.60	0.337	0.08	0.768	430	.081 (ns)
	T2	248	3.52	0.332				
Overall	T1	184	3.71	0.268	0.11	0.127	370.18	.048*
	T2	248	3.60	0.242				

Note. *** $p < .001$, ** $p < .01$, * $p < .05$, ns = not significant

D1 = Importance of Classroom Instructional Planning

D2 = Elements of Classroom Instructional Planning

D3 = Written Classroom Instructional Planning

D4 = Constraints in Classroom Instructional Planning

D5 = General Questions about Classroom Instructional Planning

T1 = Experienced Senior Teachers, T2 = Pre-service Teachers

In order to see clearly, the comparison of mean scores for the perceptions of the experienced senior teachers and the pre-service teachers on classroom instructional planning was presented in Figure 1. The minimum mean score is 2.61 and the maximum mean score is 4.36.

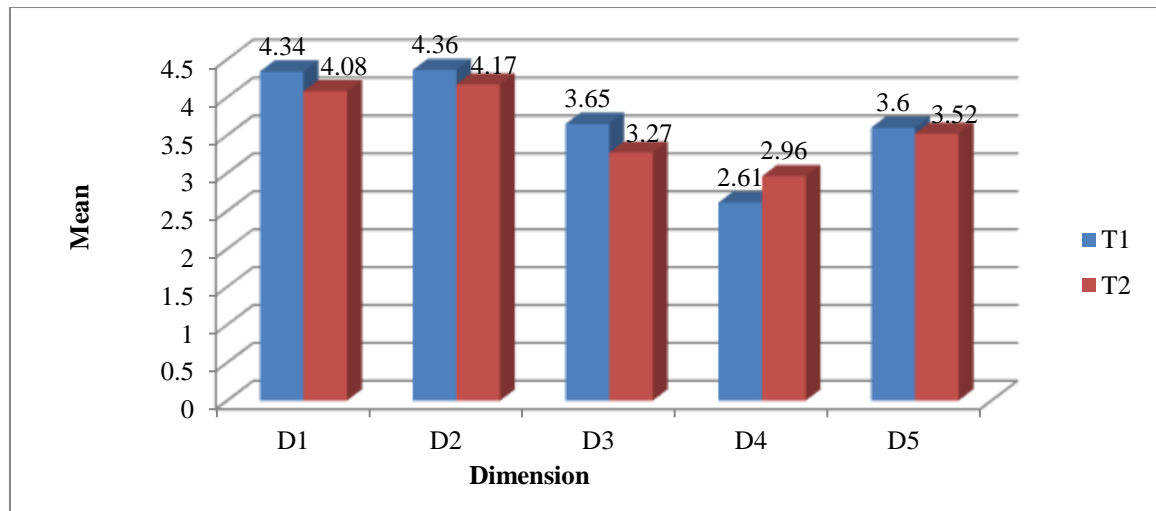


Figure1. The comparison of mean values for the perceptions of experienced senior teachers and pre-service teachers on classroom instructional planning

Findings of Mean and Standard Deviation of the Perceptions of Male and Female Experienced Senior Teachers on Classroom Instructional Planning

No significant difference was found between the perceptions of male and female experienced senior teachers on all dimensions about classroom instructional planning (see Table 2).

Table 2. *t* Values for the Perceptions of Male and Female Experienced Senior Teachers on Classroom Instructional Planning

Dimension	Gender	<i>N</i>	<i>M</i>	<i>SD</i>	<i>MD</i>	<i>t</i>	<i>df</i>	Sig.
D1	Male	34	4.19	0.401	0.01	0.134	182	.894 (ns)
	Female	150	4.18	0.369				
D2	Male	34	4.29	0.526	0.04	0.406	43.95	.686 (ns)
	Female	150	4.25	0.438				
D3	Male	34	3.41	0.470	-0.01	-0.07	182	.942 (ns)
	Female	150	3.42	0.361				
D4	Male	34	2.81	0.839	0.25	1.53	42.41	.133 (ns)
	Female	150	2.56	0.692				
D5	Male	34	3.68	0.451	-0.07	-0.95	182	.345 (ns)
	Female	150	3.75	0.385				
Overall	Male	34	3.68	0.365	0.05	0.688	41.26	.495 (ns)
	Female	150	3.63	0.259				

Note. ns = not significant

D1 = Importance of Classroom Instructional Planning

D2 = Elements of Classroom Instructional Planning

D3 = Written Classroom Instructional Planning

D4 = Constraints in Classroom Instructional Planning

D5 = General Questions about Classroom Instructional Planning

In order to see at a glance, the comparison of mean scores for the perceptions of male and female experienced senior teachers on classroom instructional planning was presented in Figure 2. The minimum mean score is 2.56 and the maximum mean score is 4.29.

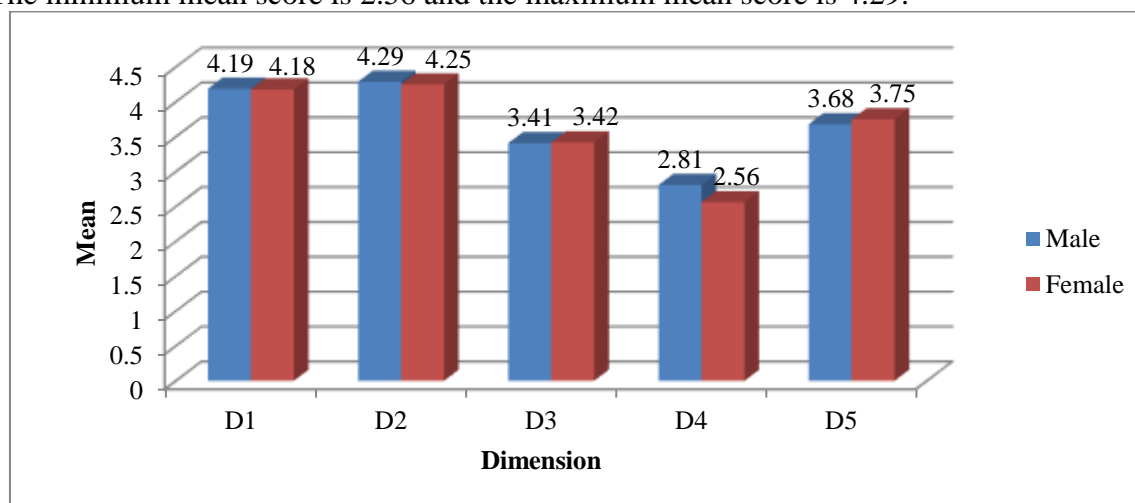


Figure 2. The comparison of mean values for the perceptions of male and female experienced senior teachers on classroom instructional planning

Findings of Mean and Standard Deviation of the Perceptions of Male and Female Pre-service Teachers on Classroom Instructional Planning

It was found that there was a significant difference between their perceptions on the constraints in classroom instructional planning. But, it was found that there was no significant difference between the perceptions of the male and female pre-service teachers on other four dimensions about classroom instructional planning (see Table 3).

Table 3. *t* Values for the Perceptions of Male and Female Pre-service Teachers on Classroom Instructional Planning

Dimension	Gender	<i>N</i>	<i>M</i>	<i>SD</i>	<i>MD</i>	<i>t</i>	<i>df</i>	Sig.
D1	Male	72	4.09	0.334	0.02	0.372	246	.710 (ns)
	Female	176	4.07	0.288				
D2	Male	72	4.11	0.499	-0.09	-1.46	110.38	.146 (ns)
	Female	176	4.20	0.401				
D3	Male	72	3.34	0.381	0.10	1.969	104.34	.052 (ns)
	Female	176	3.24	0.282				
D4	Male	72	3.22	0.770	0.36	3.571	105.79	.001**
	Female	176	2.86	0.583				
D5	Male	72	3.56	0.363	-0.01	-0.38	246	.705 (ns)
	Female	176	3.57	0.351				
Overall	Male	72	3.66	0.284	0.07	1.925	107.08	.057 (ns)
	Female	176	3.59	0.219				

Note. ** $p < .01$, ns = not significant

D1 = Importance of Classroom Instructional Planning

D2 = Elements of Classroom Instructional Planning

D3 = Written Classroom Instructional Planning

D4 = Constraints in Classroom Instructional Planning

D5 = General Questions about Classroom Instructional Planning

In order to see clearly, the comparison of mean scores for the perceptions of male and female pre-service teachers on classroom instructional planning was presented in Figure 3. The minimum mean score is 2.86 and the maximum mean score is 4.2.

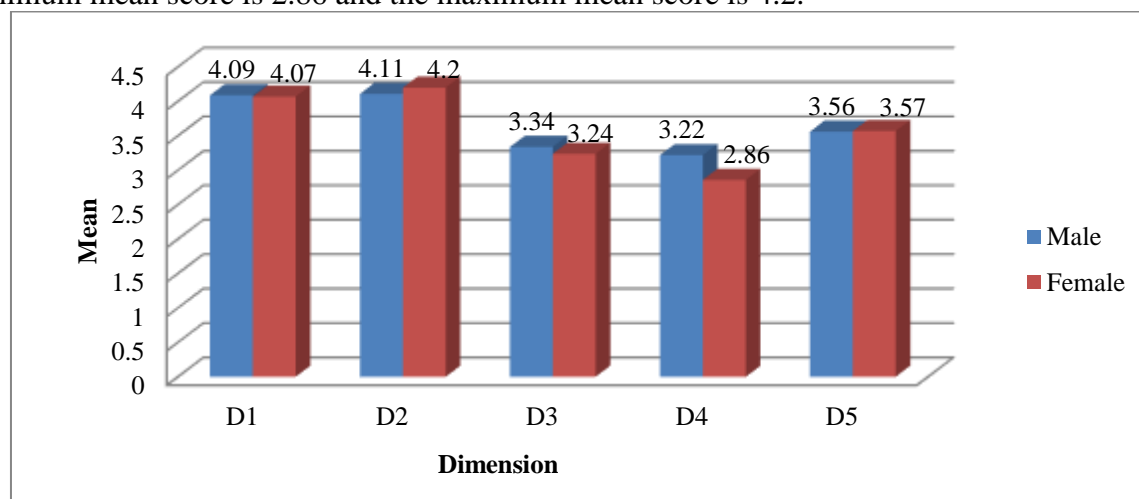


Figure3. The comparison of mean values for the perceptions of male and female pre-service teachers on classroom instructional planning

Discussion and Suggestions

Discussion

The basic purpose of this study was to find out the difference between the perceptions of experienced senior teachers and pre-service teachers on classroom instructional planning. Some other specific purposes were to study the perceptions of experienced senior teachers and pre-service teachers on classroom instructional planning, to explore the difference between the perceptions of male and female experienced senior teachers as well as pre-service teachers and to give suggestions for the improvement of teaching and learning situations based on the results of the study.

The research findings showed that there was a significant difference between the perceptions of experienced senior teachers and pre-service teachers on classroom instructional planning. No significant difference was found between the perceptions of male and female experienced senior teachers as well as pre-service teachers on classroom instructional planning.

Suggestions

Research is an unending process and every research work provides clues for further investigation. Therefore, further investigations may be made on the basis of the result of this study. A longitudinal study is needed to undertake to confirm and validate the findings of the study. A comparative study should be conducted by different ranks of teachers (e.g. senior teachers and junior teachers) and with different townships. This research study was consisted of only five dimensions. Further research should be conducted by many other dimensions. Moreover, there are many other variables affecting the teachers' perceptions on classroom instructional planning. The present study was compared by only two variables (rank and gender). Further research should be carried out by using other variables such as teaching experience, qualification, age and marital status.

Conclusion

This study aims to find out the difference between the perceptions of experienced senior teachers and pre-service teachers on classroom instructional planning. The findings of this study of experienced senior teachers and pre-service teachers of Sagaing explained that classroom instructional planning is very effective aspect of teaching-learning process. The perceptions of male and female of both groups were, more or less, same. Some differences were found in the perceptions of the groups. Therefore, it can also be concluded that teaching experience can affect the perceptions of teachers on classroom instructional planning, but gender has no impact on it.

Therefore, administrators should be alert to the need of effective lesson planning. There should be flexibility in timetable for the use of classroom instructional planning. Conferences and workshops should be held on regular basis for classroom instructional planning. Moreover, in-service programs should be developed to strengthen the planning skills of school teachers.

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First of all, I would like to express my special thanks to all teachers in my life. I would like to express my respectful gratitude to Dr. Myat Myat Thaw, Pro-Rector of Sagaing University of Education for her kind permission to do my study. Then, I would like to express my honorable thanks to Dr. Wai Wai Oo, Professor and Head of Curriculum and Methodology Department, Sagaing University of Education and U Htay Lwin, Associate Professor of Curriculum and Methodology Department for their invaluable advices and necessary information for this study.

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IMPACT OF TEACHERS' CHARACTERISTICS ON THE ACADEMIC ACHIEVEMENT OF GRADE 11 STUDENTS

Zun Phoo Mo¹ and Thida Oo²

Abstract

The main aim of the study was to study the impact of teachers' characteristics on the academic achievement of Grade 11 students. It explored (8) teachers' characteristics (enthusiasm, warmth and humor, credibility, holding high expectation for success, encourage and support, businesslike, adaptability/flexibility and knowledgeability). The participants in the study were 400 Grade 11 students from five Basic Education High Schools and three Basic Education High Schools (Branch) in Salin Township. Survey method was used in the study. The questionnaire used in the study was the teachers' characteristics questionnaire. As for students' academic achievement, the total marks of each student from the first semester examination were used. The collected data were analyzed using descriptive statistics, one-way ANOVA, independent samples *t*-test and Pearson product moment correlation. The results revealed that most of the senior teachers possessed good teachers' characteristics. The ANOVA results showed that teachers' characteristics were significantly different among schools. The independent samples *t*-test results showed students' perceptions of teachers' characteristics were significantly different in terms of gender. Moreover, it was also found that students' perceptions of teachers' characteristics were significantly different, except teachers' adaptability/ flexibility in terms of school type. Pearson product moment correlation showed that teachers' characteristics had a significant positive relationship with students' academic achievement.

Keywords: effective teacher, teacher's characteristics, academic achievement

Introduction

Importance of the Research

Education has played and is still playing an important role in forming and training the individual throughout his existence. Education transforms the life experience of children and young individuals to be better prepared for life, for their integration in society with benefits for the individual as well as for society. The teachers bring the qualitative change and raise the standards of education which ensures the welfare, progress and prosperity of the nation. As teachers in 21st century are responsible for the overall well-being of their students, not only the education they give to their students but also they themselves as teachers must be effective. Therefore, teachers' characteristics are fundamental to become an effective teacher. As students spend a lot of time with their teachers, teachers' characteristics have a lot of influence on their students. Students learn more from teachers with certain characteristics.

Effective teachers' characteristics can have a great importance on students' academic development. Many variables can affect students' achievement. They include family life, community, diet, involvement in extracurricular activities, and the school environment. However, teachers are the most important school-based factor in affecting students' achievement levels (Rockoff 2004; Rivkin et al., 2005; Aaronson et al., 2007 cited in Rockstroh, 2013). When the students possess a good attitude toward teachers' characteristics, they are more inclined to trust and like those teachers and thus are more motivated to succeed. Therefore, it is important to examine which teachers' characteristics may be related to students' academic achievement. Therefore, this research was conducted to study the impact of teachers' characteristics on the academic achievement of Grade 11 students.

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Aim

The aim of the research is to study the impact of teachers' characteristics on the academic achievement of Grade 11 students.

Purposes of the Study

1. To express the characteristics of senior assistant teachers perceived by Grade 11 students
2. To describe the impact of the characteristics of senior assistant teachers on Grade 11 students' academic achievement
3. To give suggestions and recommendations based on the results of the study about the impact of teachers' characteristics on the academic achievement of Grade 11 students

Research Questions

1. Are there any significant differences between the selected schools in characteristics of teachers?
2. Is there any significant difference between male and female students' perception on teachers' characteristics?
3. Is there any significant difference between B.E.H.S and B.E.H.S (Branch) students' perception on teachers' characteristics?
4. Is there any relationship between each characteristic of teachers and students' academic achievement?
5. Is there any relationship between teachers' characteristics and students' academic achievement?

Definition of Key Terms

Teacher's Characteristics : Teacher characteristics are features that distinguish between teachers and include teacher personality, teacher attitudes, teacher expectations (Hanushek, 1971).

Academic Achievement : Academic achievement is a level of proficiency attained in academic work which is represented by percentage of marks obtained by students in examinations (Kohli, 1975 cited in Mehdipour & Balaramulu, 2013).

Effective teacher : Effective teacher is the one who combine professionalism with care, understanding, fairness, and kindness (Rubio, 2010).

Scope

This research is intended to study the impact of teacher characteristics on academic achievement of Grade 11 students from five Basic Education High Schools and three Basic Education High Schools (branch) in Salin Township during 2015-2016 academic year.

Review of Related Literature

Effective Teaching and Effective Teachers

Effective teaching is at the heart of student learning. From the teachers' point of view, "how to teach effectively" is a challenging task. Effective teaching has been broadly understood as teaching that is oriented to and focused on students and their learning (Devlin & Samarawickrema, 2009). According to Hussein (1996) cited in Renmin (2000), effective teachers

are friendly, firm, fair, and humane towards their students. They respect and trust students, are enthusiastic about teaching and learning, can cope with frustration and difficult aspects of teaching, develop self-awareness and self-evaluation skills, are alternative thinkers, explore new possibilities, and evaluate criticism. They are flexible enough to change and possess a sense of humor, are available to students when needed, are well-rounded and have balanced experiences, are academically experts, are professionally competent and demand high standards with moderate expectations, possess good communication skills, are creative and innovative, and are well organized.

Eight Key Characteristics Contributing to Effective Teaching

Early research defined effective teachers as those whose supervisors or administrators rated highly. Researchers in new era begin to define effective teachers as those who help their students learn more than other teachers with similar students. These researchers also observed the classroom and classroom behaviors of effective teachers and found that they share common attributes and abilities which tend to increase students' learning and satisfaction with teaching and to enhance students' self-concept. Cruickshank, Bainer, & Metcalf, (1999) found eight key characteristics that can help students learn more effectively. They are (a) Enthusiasm (b) Warmth and Humor (c) Credibility (d) Holding high expectation for success (e) Encourage and Support (f) Businesslike (g) Adaptability/Flexibility and (h) Knowledgeability.

Relationship between Teachers' Characteristics and Students' Achievement

The influence of teacher's characteristics plays an important role in the academic achievement of students. Teachers' characteristics tend to have a strong potential to influence the lives of students in terms of their academic achievement as well as their behaviors (Palaniandy, 2009). Adu & Olatundun (2007 cited in Kosgei, 2013) contend that teachers' characteristics are strong determinants of students' performance in secondary schools. These sources of evidence conclude that quality teachers are a critical determinant of students' achievement.

Several experimental studies found that teachers' enthusiasm leads to high achievements of students (Wyckoff, 1973; Williams & Ware, 1976, 1977; Land 1980 cited in Orosz et al., 2015). Positive connections between teachers' use of humor and academic achievement even follow students into colleges and beyond (Hickman & Crossland, 2004-2005 cited in Role, 2011). According to Evans (2012), the students' achievement is high when teachers constantly show credibility. According to Smith (1980) cited in Cotton (1989), teachers' expectation has a strong effect on students' learning and achievement. According to Klem & Connell (2004), teachers' support associated highly with student engagement and achievement. Six of the seven studies related to businesslike behavior reported by Rosenshine (1971 cited in Gabrys, 1978) contained significant results relating teacher businesslike behavior and student achievement. Metzler & Woessmann (2010) found a significant effect of teacher subject knowledge on student achievement. Teachers' pedagogical knowledge has been found to positively impact student achievement (Hill et al., 2005). Benjamin (2014) found that teachers' knowledge on individual student has greater influence upon students' learning and achievement.

Research Method

Descriptive research design involves collecting data to test hypothesis or answer questions concerning the status of the subjects of the study (Gay, 1987). In this paper, survey method which is one of the descriptive methods was used.

Subjects

The sample of this study was (400) Grade 11 students (male = 200, female = 200) who were studying at five Basic Education High Schools and three High Schools (Branch) in Salin Township during 2015-2016 academic year. The participants in this study were selected by using simple random sampling method. The numbers of students were equally taken (male = 25, female = 25) from each school.

Instruments

A questionnaire for teachers' characteristics perceived by Grade 11 students was constructed on the basis of the questionnaires of Palaniandy (2009) and Kamal & Hossein (2012). The questionnaire included five points Likert-type items for eight dimensions. They are (1) Enthusiasm, (2) Warmth and Humor, (3) Credibility, (4) Holding High Expectation for Success, (5) Encourage and Support, (6) Businesslike, (7) Adaptability/Flexibility and (8) Knowledgability. There were (48) Likert-type items in the instrument having five alternative options (1. strongly disagree, 2. disagree, 3. undecided, 4. agree, 5. strongly agree) for each statement. The maximum total score was 240 and the minimum was 48. All items were positively stated. As for students' academic achievement, the total marks of each student from the first semester examination were used.

Pilot Testing

A pilot test was administered with 50 high school students at B.E.H.S (1) Sagaing. Based on the findings of the pilot test, internal consistency reliability of the questionnaire is determined by Cronbach's alpha. The Cronbach's alpha internal consistency was (0.886).

Procedure

To get the required data, an instrument was constructed under the guidance of the supervisor. For the validation of the instruments, the questionnaires for teachers' characteristics were distributed to four experts from Sagaing University of Education. The instrument was modified according to the guidance of four experts. After getting the validity from these four experts, pilot testing was conducted with 50 students at B.E.H.S (1) in Sagaing Township. For the internal consistency reliability, Cronbach's alpha coefficient was used. The reliability coefficient of the questionnaire was 0.886. Then, the major survey was conducted at five Basic Education High Schools and three High Schools (Branch) in Salin Township. The questionnaire and demographic data were distributed to Grade 11 students with the request to complete and return as soon as possible. The students were asked to decide about their agreement with the statements and mark the relevant response category honestly.

Analysis of the Data

The data were analyzed by using descriptive statistics, one-way ANOVA, independent samples *t*-test and Pearson product moment correlation. To know mean and standard deviation for perceptions of Grade 11 students on teachers' characteristics and students' academic achievement, descriptive analyses were used. Moreover, one-way ANOVA was used to compare Grade 11 students' perceptions on teachers' characteristics among the selected schools. The independent samples *t*-test was used to compare the perceptions of Grade 11 students on teachers' characteristics by gender and by school type. Then, Pearson's correlation was used to determine whether there is any relationship exists between teachers' characteristics and students' academic achievement.

Findings

The mean comparison of all dimensions and the relationship between teachers' characteristics and students' academic achievement were discussed.

Descriptive Statistics for Mean and Standard Deviations of Overall Teachers' Characteristics Among Eight Schools

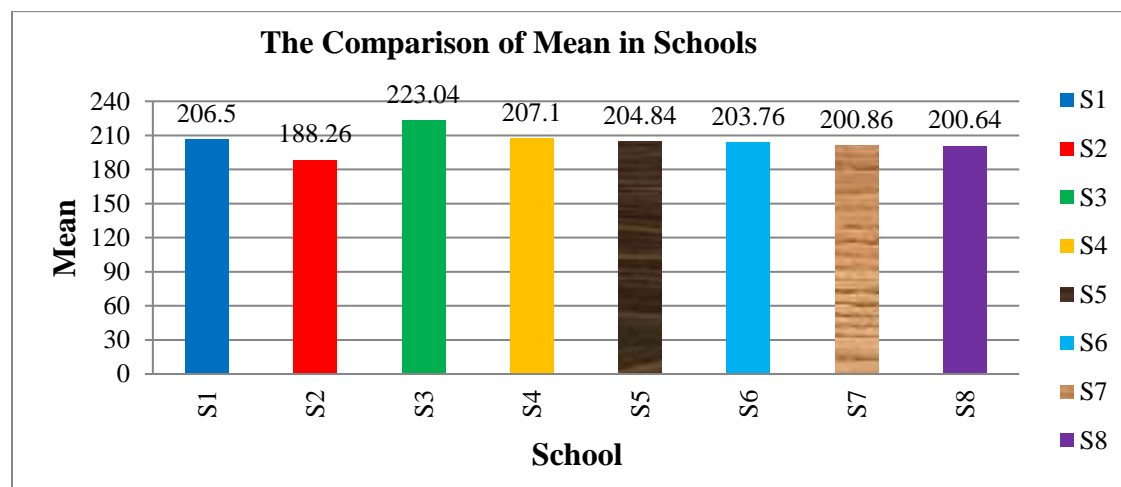


Figure1. Mean Comparison of Teachers' Characteristics Among (8) Schools

Note. S1 = B.E.H.S, Sin Phyu Kyune S2 = B.E.B.H.S, Thayet Chin S3 = B.E.H.S, Pyi Soe Kone
 S4 = B.E.B.H.S, Kya Pin S5 = B.E.B.H.S, Salin S6 = B.E.H.S, Salin
 S7 = B.E.H.S, Zee Phyu Pin S8 = B.E.H.S, Ta Nyoung

According to the Figure (1), it was found that the mean score of B.E.H.S Pyi Soe Kone was the highest and the mean score of B.E.H.S (Branch) Thayat Chin was the lowest. Then, teachers' characteristics perceived by students among eight schools were evaluated and the results were as follow:

Table 1 Mean Comparison of Each Teacher's Characteristic in Schools

Schools	E	W & H	C	H	E & S	B	A/F	K	Total
School 1	4.54	4.15	4.54	4.13	4.41	4.28	4.20	4.20	4.30
School 2	3.96	3.73	4.18	3.76	3.86	3.86	3.92	3.93	3.92
School 3	4.65	4.51	4.76	4.60	4.68	4.65	4.67	4.66	4.65
School 4	4.38	4.18	4.46	4.22	4.30	4.27	4.35	4.36	4.31
School 5	4.42	4.14	4.41	4.19	4.31	4.13	4.31	4.23	4.27
School 6	4.42	3.98	4.54	4.16	4.19	4.08	4.26	4.32	4.25
School 7	4.20	4.17	4.35	4.08	4.16	4.18	4.17	4.18	4.18
School 8	4.35	4.11	4.11	4.09	4.18	4.16	4.20	4.24	4.18

Note. E = Enthusiasm W & H = Warmth and Humor C = Credibility
 B = Businesslike E & S = Encourage and Support K = Knowledgeability
 A/F = Adaptability/ Flexibility H = Holding High Expectation for Success

According to the Table (1), the mean of credibility was the highest. The second highest was enthusiasm and the third one was knowledgeability. The fourth were encourage, support and adaptability/ flexibility, the fifth one was businesslike characteristic and the sixth was holding

high expectation for success. The last one, warmth and humor had the lowest mean. It was found that teachers' credibility had the highest mean in the six schools, except School 5 and School 8.

Descriptive Statistics of Teachers' Characteristics for Each Dimension

The mean comparison of Grade 11 students' perceptions on teachers' characteristics for each dimension was as follow:

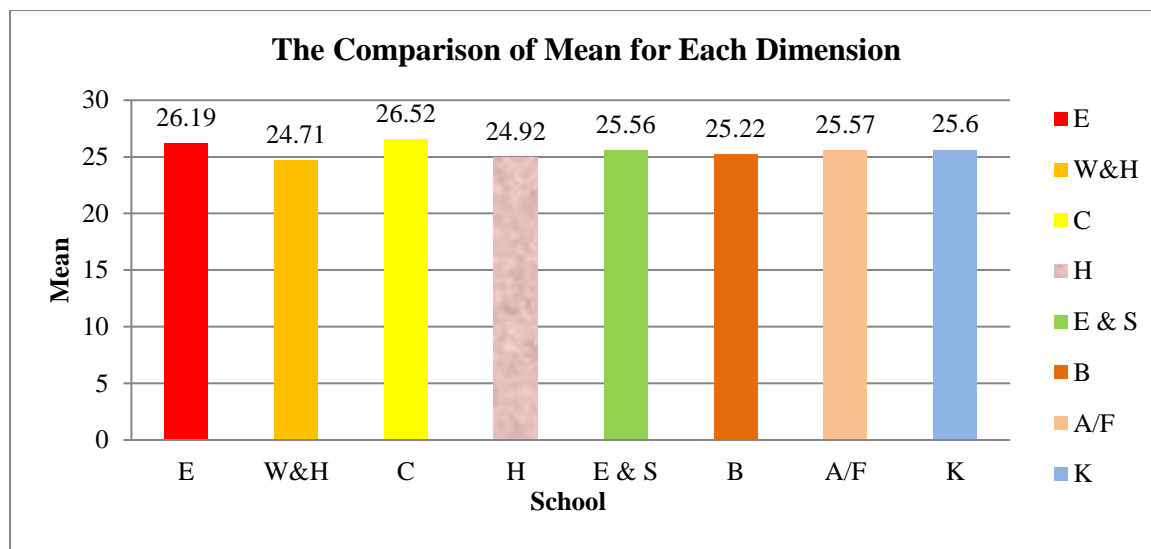


Figure 2. Mean Comparison of Teachers' Characteristics on Each Dimension

According to the Figure (2), it can be seen that credibility had the highest mean score, and warmth and humor had the lowest mean score among eight dimensions. To investigate students' perceptions on teacher characteristics in terms of gender, the independent sample *t*-test was calculated.

Table 2 The Result of *t*-test for Overall Teachers' Characteristics in Terms of Gender

Variable	Gender	N	Mean	Standard Deviation	<i>t</i>	<i>df</i>	<i>p</i>
Teachers' characteristics	Male	200	200.35	24.010	-3.534	398	.000***
	Female	200	208.41	21.543			

Note. *** $p < .001$

The mean scores of perceptions of male and female students on teachers' characteristics were presented in Table (2). There was significant difference between male and female students with respect to teachers' characteristics ($t = -3.534$, $p < .001$).

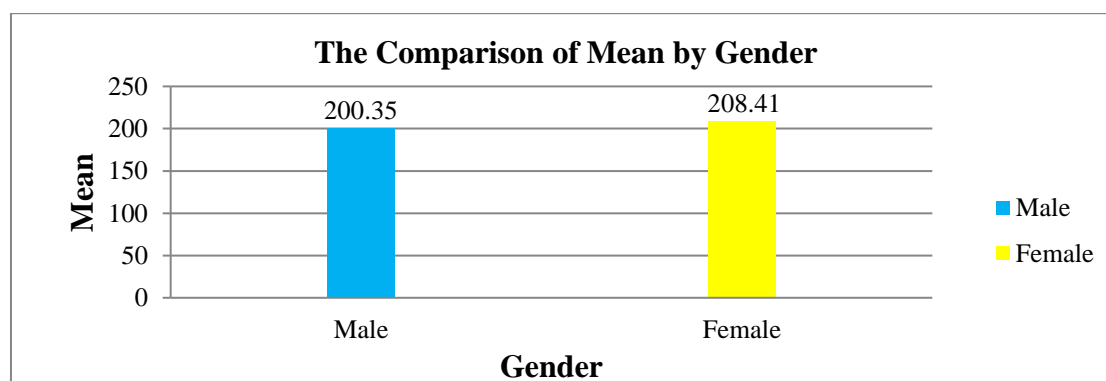


Figure 3. Comparison of Mean of Overall Teachers' Characteristics by Gender

According to the Figure (3), it was found that the mean scores of female students were higher than those of male students. This meant that female students perceived teachers' characteristics more than male students do.

Analysis of *t*-test for Overall Teachers' Characteristics in terms of Gender

To investigate whether there were gender differences in terms of gender for each dimension, the independent samples *t*-test was calculated.

Table 3 The Result of *t*-test for Overall Teachers' Characteristics in terms of Gender for Each Dimension

Dimension	Gender	N	Mean	Standard Deviation	<i>t</i>	<i>p</i>
Enthusiasm	Male	200	25.88	2.919	-2.205	.028*
	Female	200	26.51	2.793		
Warmth and Humor	Male	200	24.13	3.924	-3.081	.002**
	Female	200	25.30	3.652		
Credibility	Male	200	26.16	3.557	-2.325	.021*
	Female	200	26.89	2.657		
Holding High Expectation for Success	Male	200	24.16	3.941	-4.274	.000***
	Female	200	25.69	3.152		
Encourage and Support	Male	200	25.19	3.744	-2.131	.034*
	Female	200	25.93	3.125		
Businesslike	Male	200	24.68	3.872	-2.942	.003**
	Female	200	25.76	3.459		
Adaptability/Flexibility	Male	200	25.02	3.630	-3.197	.002**
	Female	200	26.12	3.242		
Knowledgeability	Male	200	24.99	3.631	-3.525	.000***
	Female	200	26.21	3.282		

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

It was found that the mean of female students were higher than those of male students for each dimension.

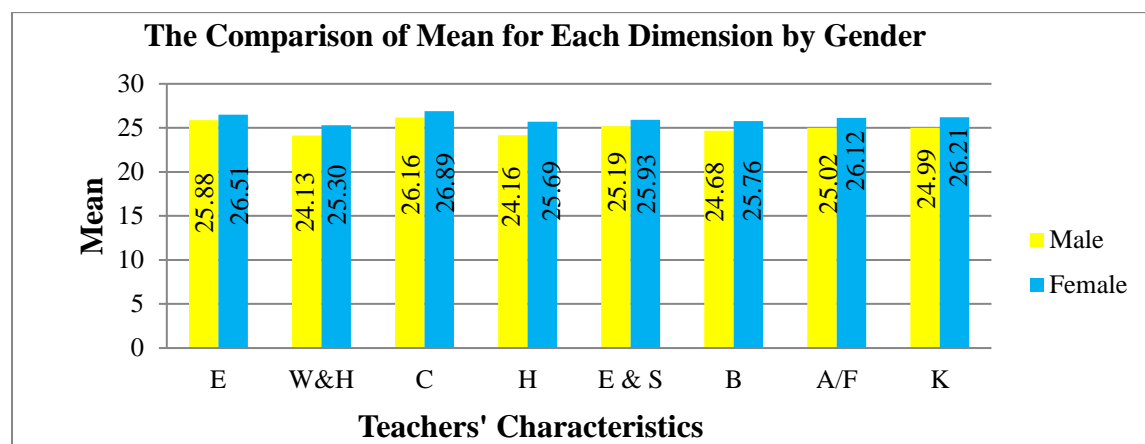


Figure 4. Comparison of Mean of Each Dimension of Teachers' Characteristics by Gender

According to the Figure (4), it can be seen that female students had higher perceptions toward teacher characteristics than male students had.

ANOVA Results for Teachers' Characteristics in Schools

In order to determine whether there is any significant difference in students' perceptions of teachers' characteristics among schools, a one-way (ANOVA) was used.

Table 4 ANOVA Results for the Teachers' Characteristics in Schools

Variable		Sum of Squares	df	Mean Square	F	p
Teachers' Characteristics	Between Groups	32345.880	7	4620.833	9.995	.000***
	Within Groups	181225.920	392	462.311	-	-
	Total	213571.750	399	-	-	-

Note. *** $p < .001$

According to the table (4), it can be seen that there was significant difference among the schools concerning students' perceptions of teachers' characteristics ($F(7, 392) = 9.995$, $p < .01$).

Mean Comparison of Teachers' Characteristics by School Type

Then, the independent samples t -test was calculated to determine whether there was any significant difference in terms of school type among the students' perceptions on teachers' characteristics.

Table 5 The Results of t -test for Overall Teachers' Characteristics by School Type

Variable	School Type	Mean	Standard Deviation	t	df	p
Teachers' Characteristics	B.E.H.S	206.96	22.149	2.912	398	.004**
	B.E.H.S (Branch)	200.07	24.159			

Note. ** $p < .01$

According to the table (5), there was significant difference between high schools and high schools (branch) students' perceptions on teachers' characteristics ($t = 2.912$, $p < .01$).

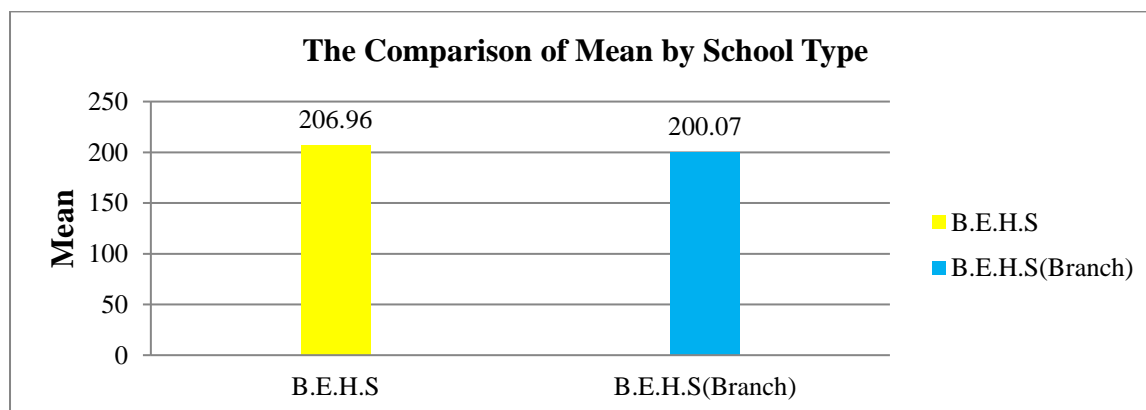


Figure 5. Comparison of Mean of Overall Teachers' Characteristics by School Type

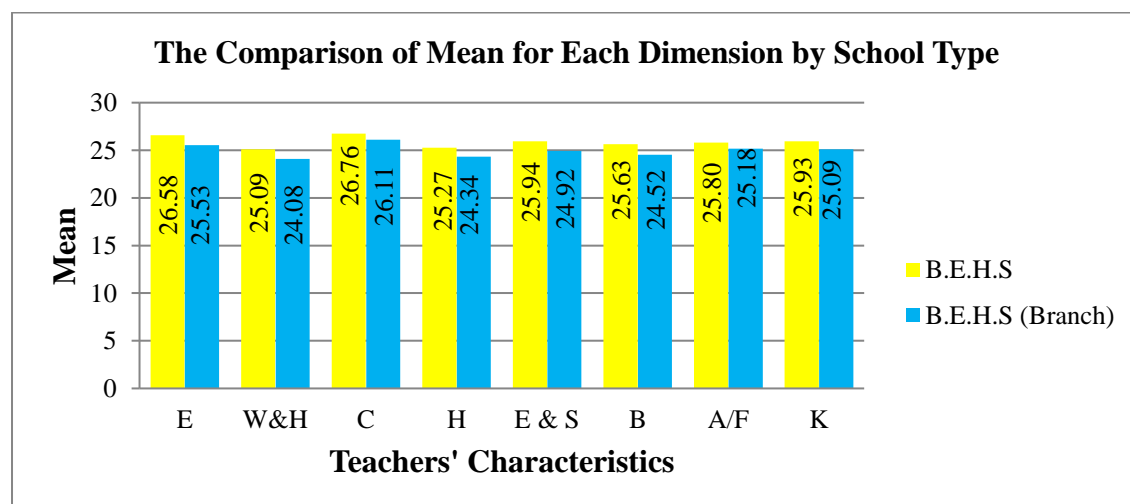
According to the Figure (5), the mean score of perceptions of high school students was higher than that of high school (branch) students on teachers' characteristics.

Table 6 Results of *t*-test for Teachers' Characteristics by School Type for Each Dimension

Dimension	School Type	Mean	Standard Deviation	<i>t</i>	<i>p</i>
Enthusiasm	B.E.H.S	26.58	2.607	3.597	.000***
	B.E.H.S (Branch)	25.53	3.164		
Warmth & Humor	B.E.H.S	25.09	3.749	2.582	.010*
	B.E.H.S (Branch)	24.08	3.870		
Credibility	B.E.H.S	26.76	3.208	2.003	.046*
	B.E.H.S (Branch)	26.11	3.036		
Holding High Expectation for Success	B.E.H.S	25.27	3.647	2.492	.013*
	B.E.H.S (Branch)	24.34	3.578		
Encourage & Support	B.E.H.S	25.94	3.216	2.877	.004**
	B.E.H.S (Branch)	24.92	3.766		
Businesslike	B.E.H.S	25.63	3.472	2.932	.004**
	B.E.H.S (Branch)	24.52	3.983		
Adaptability / Flexibility	B.E.H.S	25.80	3.426	1.740	.083
	B.E.H.S (Branch)	25.18	3.547		
Knowledgeability	B.E.H.S	25.98	3.380	2.458	.014*
	B.E.H.S (Branch)	25.05	3.663		

Note. * $p < .05$, ** $p < .01$, *** $p < .001$

According to the table (6), there was statistically significant difference between high schools and high schools (branch) students' perceptions for each dimension of teacher characteristics. The mean of high school students' perceptions were higher than those of high school (branch) students' perceptions in (7) dimensions of teachers' characteristics, except adaptability/flexibility. The comparison of mean for each teacher's characteristic in terms of school type was presented in Figure (6).

**Figure 6.** Comparison of Mean for Each Dimension of Teachers' Characteristics by School Type

According to the Figure (6), it can be seen that the mean of high school students' perception was higher than high school (branch) students' perception on teachers' characteristics.

Analysis of Students' Academic Achievement in Schools

To reveal the academic achievement in each of the school, the mean and standard deviations for students' academic achievement in each of the schools were presented in the following table.

Table 7 Means and Standard Deviations of Students' Academic Achievement in Five Basic Education High Schools and Three Basic Education High Schools (Branch)

Schools	N	Mean	Standard Deviation	Minimum	Maximum
B.E.H.S Sin Phyu Kyune	50	199.68	36.815	102	254
B.E.H.S (Branch) Thayet Chin	50	159.10	35.238	54	215
B.E.H.S Pyi Soe Kone	50	171.62	31.032	86	235
B.E.H.S (Branch) Kya Pin	50	157.84	33.120	81	222
B.E.H.S (Branch) Salin	50	203.40	20.359	116	246
B.E.H.S Salin	50	222.98	26.458	160	261
B.E.H.S Zee Phyu Pin	50	179.68	26.932	89	210
B.E.H.S Ta Nyounng	50	183.48	27.160	108	232

According to the table (7), the mean of the students' academic achievement of B.E.H.S Salin was the highest and that of B.E.H.S (Branch) Kya Pin was the lowest among five high schools and three high schools (branch). The comparison of mean for students' academic achievement can be seen clearly in Figure (7).

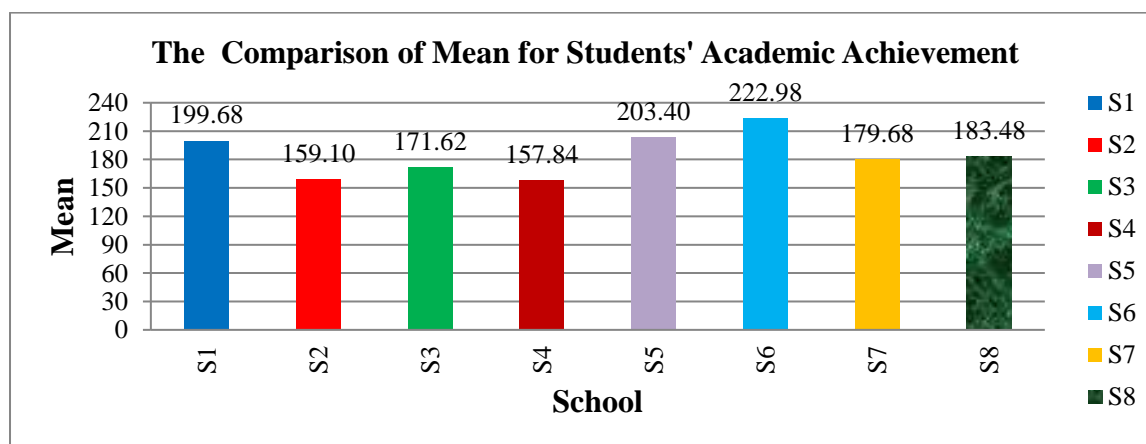


Figure 7. Comparison of Mean for Students' Academic Achievement in Schools

Analysis of the Relationship between Teachers' Characteristics and Students' Academic Achievement

To investigate the relationship between teachers' overall characteristics and students' academic achievement, Pearson product moment correlation was used.

Table 8 The Relationship between Teachers' Overall Characteristics and Students' Academic Achievement

Scale	Teachers' Overall Characteristics	Students' Academic Achievement
Teachers' Overall Characteristics	1	.447**
Students' Academic Achievement	.447**	1

** Correlation is significant at the (0.01) level (2-tailed).

According to the table (8), it was found that teachers' overall characteristics were significantly and positively correlated with students' academic achievement. Thus, it can be said that if teachers' characteristics are high, the academic achievement of their students will be high.

Discussion and Recommendations

The teachers play many roles in the learning process of the students. Effective teaching is an art that requires mastery in a wide variety of areas. The aim of this research was to study the impact of teachers' characteristics on the academic achievement of Grade 11 students. Based on the research findings, the following conclusion was drawn.

1. Most of the senior teachers in Salin Township possessed good teachers' characteristics. It was found that the teachers' characteristics of B.E.H.S Pyi Soe Kone had the highest mean scores and those of B.E.H.S (Branch) Thayat Chin had the lowest mean scores.
2. Among eight schools, teachers' credibility had the highest mean scores in six schools, except B.E.H.S (Branch) Salin and B.E.H.S Ta Nyoung.
3. Among eight dimensions, teachers' credibility had the highest mean scores while teachers' warmth and humor had the lowest mean scores.
4. There were significant differences among (8) schools in teachers' characteristics. It was found that the characteristics of teachers from B.E.H.S Pyi Soe Kone were significantly better than those of teachers from all other schools.
5. There were significant differences in the perception of Grade 11 students on teachers' characteristics in terms of gender. It was found that female students' perception was better than male students' perception on teachers' characteristics.
6. There were significant differences in the perceptions of Grade 11 students on teachers' characteristics except adaptability/flexibility in terms of school type. It was found that high school students' perception was higher than high school (branch) students' perception on teachers' characteristics.
7. It was found that the academic achievement of Grade 11 students from B.E.H.S Salin was found to be the highest mean and that of Grade 11 students from B.E.H.S (Branch) was the lowest mean among (8) schools.
8. There was a positively significant relationship between teachers' characteristics and Grade 11 students' academic achievement. It was found that if the teachers' characteristics are high, the academic achievement of their students will be high and if the teachers' characteristics are low, the academic achievement of their students will be low.

Based on the findings of this study, the following suggestions were discussed. Demonstrating enthusiasm for the course was highlighted as a positive characteristic. Research on enthusiasm of the teacher is strongly connected to student success (Bettencourt et al., 1983; Cabello & Terrell, 1994 cited in Thompson et al., 2007). To be enthusiastic in teaching, teachers should use broad, animated gestures and they should be expressive, and they should also use varied pitch to make the lesson more interesting.

The teacher should communicate personal warmth to students. A rather strong body of research evidence exists to support the hypothesis that teacher warmth is positively correlated to student achievement gains (Rosenshine, 1971 cited in Gabrys, 1978). According to the results of Wilson & Corbett (2001) cited in Bondy & Dorene (2008), teachers' warmth make the students complete the academic tasks necessary for successful futures. To show the warmth on students, the teacher should use day to day actions like a smile, a hand on the shoulder, or the use of a student's name. They should observe students closely to learn more about their interests, experiences, and talents. Students appreciate the sense of humor as a characteristic of effective teaching. It makes for better relationship between the teacher and the students (Delaney et al., 2010). Therefore, the teachers should inject stories, personal experiences, and some humor into their lectures. This not only makes students to think and feel them relax, but also feel happy with laughter.

According to Pogue & Ah Yun (2006) cited in Freeman (2011), the researchers found that credibility significantly influence student learning. Credibility is the ability to be believed. Teachers' credibility is examined in relation to the teachers' credentials, the message they send to their students, and teachers' behaviors. To get credibility from students, the teachers should be honest, equitable and open to their students.

Teachers' expectation levels also affect student learning. The study of Cotton (1989) provided that teachers' expectations can and do influence students' achievement and attitudes. To improve the ways teachers form expectations and communicate them, the teachers should value the ideas and opinions of their students. They should have expectations for all students.

The results indicate teachers' encouragement and support is important to students. Support positive relationships between teachers and students can contribute significantly, not only to students' social-emotional health and well-being, but also to their academic performance (Stipek, 2006). To give effective encourage and support to their students, the teachers should be optimistic about the students and can understand and forgive their misbehaviors. They should provide a variety of activities to help different kinds of learners and taught until the light bulb went on for every student.

Businesslike behavior has a strong research base for being correlated with student achievement. Six of the seven studies related to businesslike behavior reported by Rosenshine (1971) contained significant results relating teacher businesslike behavior and students' achievement. The specific descriptors used to define the variable of business-like behavior are: 1) seriousness, 2) deliberateness, 3) goal orientedness, 4) organization. To be businesslike, the teachers should place classroom materials systematically and create the teaching-learning process where all their students can take part.

Flexibility and adaptability are also strongly correlated with students' achievement. The teacher should have the ability to adapt the learning styles of students, provide different approaches to teaching. They should not have one viewpoint of something. There should also be flexibility regarding due dates for homework and the timing and administration of tests (Delaney et al., 2010).

Students also indicated clearly that they believed effective teachers have strong content knowledge, knowledge about students and expertise on how to teach what they know. The teachers should have the ability to communicate freely about their subject area, possess a strong background in the area; inspire confidence by serving as a student resource, elicit student interest, and the ability to respond students' problems. Those who are interested in their students' learning have a bigger impact on student learning (Delaney et al., 2010). Further studies should be carried out in other states and regions with other factors influencing on students' academic achievement. Besides, longitudinal study should be undertaken to confirm and validate the findings of the study.

As regard with students' perception of teachers' characteristics in terms of gender, the results indicate that female students had higher perception toward teachers' characteristics than male students. The findings obtained in this study confirmed the findings of previous research conducted by Smith et al., (1994 cited in Acikgoz, 2005).

Conclusion

It was found that there was a positively significant relationship between teachers' characteristics and students' academic achievement. It has been proved that teachers' characteristics have an important influence on students' academic achievement. This is consistent to the study of Kimani et al., (2013). Academic achievement is important because it prepares students for future careers. Teachers play a crucial role for boosting students' academic achievement. If the teacher is ineffective, students under the teacher's tutelage will achieve inadequate progress academically. Teacher characteristic is one of the factors that can affect on academic achievement. The extent to which students can get a high level of academic achievement is directly related to the extent to which the teachers bring their characteristics to improve the students' educational attainment. Therefore, based on the study, it was found that the teachers should emphasize strong enthusiasm, apparent credibility, warm, humorous, and supportive relationships, effective adaptability/ flexibility, high and clear expectations, consistent businesslike conduct and deep knowledge of subject, pedagogy, and students to create high-quality academic environments with positive benefits for students.

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AN ANALYTICAL STUDY OF THE IMPACT OF INQUIRY-BASED LEARNING ON STUDENTS' INQUIRY PROCESS SKILLS IN TEACHING HIGH SCHOOL BIOLOGY

Moh Khet Khet Oo¹

Abstract

The main purpose of this study is to investigate the applicability of inquiry-based learning (IBL) that can enhance students' inquiry process skills in teaching and learning high school biology in Myanmar. Inquiry-based learning was implemented using Biological Science Inquiry Model (BSIM). A mix-method: QUAN □ qual design was used. For quantitative research, the research design was nonequivalent control group design. Simple random sampling method was used. This study was conducted in four basic education high schools from Yangon Region. The instruments were pretest, posttest, lesson plans, materials, questionnaires and observation checklists. The quantitative research findings include three main parts. Firstly, there was a significant difference in biology achievement between students who received IBL and those who did not. Secondly, the stronger the inquiry process skills were developed, the higher the biology achievement. Thirdly, the predicting factors were observing, hypothesizing, questioning, communicating, classifying and experimenting. For qualitative research, case study research design was used. Random purposive sampling method was used. Regarding qualitative research findings, teachers and students preferred and well performed on inquiry process skills through IBL according to the results of questionnaires and observation checklists. Therefore, inquiry-based learning contributed a positive impact on teaching high school biology. The research findings suggested that IBL should be used in teaching and learning high school biology in Myanmar.

Key words: Inquiry, Inquiry-based Learning, Inquiry Process Skills, Teaching, Biology

Introduction

The process of education needs to be adapted to the changing needs of the society and the aim of education must be to equip the individual or the nation for the struggle so as to ensure survival. Similarly, the meaning of education is to draw out something and not to put in something. The meaning of education gives educators the concept of learner-centered rather than teacher-centered education. It is necessary to change ideas, thoughts and teaching methods that lead to learner-centered education. Therefore, this research was conducted with more emphasis on learner-centered rather than teacher-centered education.

In Myanmar, pedagogues and teachers need to learn the methodology of teaching students to improve thinking skills. With this in mind, this research is an attempt to develop inquiry process skills with the practical aspects of biological science inquiry activities suggested in this research.

Objectives of the Research

1. To investigate the applicability of IBL that can enhance students' inquiry process skills in teaching and learning high school biology.
2. To explore the attitudes and opinions of teachers and students who participate in this study.
3. To analyze students' inquiry process skills by applying inquiry-based learning and give suggestions for the improvement of teaching and learning biology.

Research Questions

1. Are there any significant differences in biology achievement of the students who received IBL and those who did not?
2. Are there any significant relationships between students' biology achievement and their attitudes towards inquiry process skills?

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3. Do inquiry process skills predict biology achievement?

Scope of the Research

1. This study is geographically restricted to Yangon Region.
2. Participants in this study are Grade Ten biology students from the selected schools in the academic year (2018-2019).
3. As valid content areas, this study deals with seven topics prescribed in Grade Ten biology textbook.

Definitions of Key Terms

Inquiry. Inquiry is the process of defining and investigating problems, formulating hypotheses, designing experiments, gathering data and drawing conclusions about problems (Bybee & Trowbridge, 1990).

Inquiry-based Learning. Inquiry-based learning (IBL) is a pedagogical approach that engages learners actively in a knowledge-building process through the generation of answerable questions (Harada & Yoshina, 2004).

Inquiry Process Skills. Inquiry process skills are involved in the context of the progression of inquiry. Science is about the process of seeking explanations through a progression of inquiry: descriptive modeling, explanatory modeling, and experimental modeling (Abruscato & Derosa, 2010).

Teaching. Teaching refers as an activity or process which is related with the impact of certain specific knowledge or skill, guiding and assessing, with the aim of assisting students to learn effectively (Sang, 2003).

Biology. Biology (bios, life; logos, knowledge) is a science devoted to the study of living organisms (Taylor, Green & Stout, 1997).

Statement of the Problem

Firstly, the major challenges for teachers in Myanmar are to meet the minimum learning standard at the national level and to learn to think critically and creatively. The problem is ‘how to teach’ to develop the thinking skills. Some teachers have fewer opportunities to create teaching-learning activities to develop their students’ higher-order thinking skills. Biology has both biological concepts – the content of biology and inquiry, which is “how students think about what they know, why they know and how they have come to know” – the process of biology (inquiry process skills). This research emphasizes both biological concepts and process by using biological science inquiry activities to develop higher-order thinking skills and inquiry process skills rather than memorization of biological concepts.

Secondly, the first aim of teaching biology at the high school level is to develop an understanding of essential biological principles based upon an elementary knowledge of living organisms. To understand the biological knowledge of plants and animals, biology students recognize the distinction between looking and observing. Observing means using the sense to obtain biological knowledge. It is the most basic inquiry process skills of biology. Based on this requirement, this research highlights inquiry process skills in teaching and learning biology.

Thirdly, the fifth aim of teaching biology at the high school level is to be able to assess and interpret simple biological experiments and data. Therefore, it is essential for biology teachers to develop inquiry process skills such as experimenting skills in students. Based on this requirement, this research emphasizes to enhance all integrated inquiry process skills both in the classroom and in the laboratory. Therefore, biology teachers need to cultivate these inquiry process skills for their students because of the changing nature of biological science and the consequent need for new educational goals.

Based on the nature of biology and the aims of teaching biology at basic education high school level in Myanmar, IBL focuses on not only by means of classroom instruction but also by means of experiments in a laboratory.

Review of Related Literature

Philosophical Considerations: Progressivism, naturalism, pragmatism and constructivism are deeply taken into philosophical considerations for inquiry-based learning.

Firstly, progressivism is taken into philosophical consideration for inquiry-based learning. For progressives, learning is the continual reconstruction of experience. Experience and experiment are two key words for the progressives. According to Jewey, learning was always an active process; the brain was not a passive receiver of knowledge but an active participant in or originator of meanings through problem solving (Dewey, n.d., cited in Ozmon & Craver, 1986). In inquiry-based learning, the implementing phase emphasizes how students should think in teaching and learning biology.

Secondly, education finds its purpose, its process, and its means wholly within the child life and the child experience. Schools seek to provide the ideal environment of freedom for the development of the growing child (Ross, 1941). As pointed by Dhiman (2007), good education can be had only by a direct contact with nature. In methods of teaching, naturalism emphasizes activity and learning by doing. So, learner-centered approach is the characteristics of the naturalists' philosophy. Similarly, inquiry-based learning is an inductive approach and learner-centered approach and a cooperative climate is desired.

Thirdly, pragmatism is a philosophy that stresses the intimate relation between thought and action by defining the meaning of the conceptions in terms of the practical effects and the truth of the beliefs in terms of how successfully they guide the actions (Lawhead, 2011). 'Learning by doing' is an important corollary of pragmatism in educational method (Ross, 1941). In the inquiry-based learning, the implementing phase focuses on learning activities to think about and solve the investigated problem.

Fourthly, constructivist philosophy maintains that only an individual's interpretation of the world matters and that everyone constructs their own view of reality (Alessi & Trollip, 2001). Constructivism is an approach to learning which emphasizes that individuals actively construct knowledge and understanding (Santrock, 2006). In the inquiry-based learning, the implementing phase emphasizes students to construct knowledge and understanding in their own mind.

Learning Theories: Piaget's cognitive learning theory and Vygotsky's cultural-historical theory are deeply taken into considerations for inquiry-based learning.

Firstly, knowledge is a process that is created by the activity of the learner in Piaget's cognitive learning theory (Pufall, 1988, cited in Gredler, 2001). The concepts developed by Piaget can be implemented in classrooms by providing rich activities for student's exploration. Students are encouraged to solve problems in ways that make sense to them, to be able to justify and explain their answers and to participate in class discussion to resolve conflicts and confusion. In inquiry-based learning, students observe their answers by participating learning activities. They identify answers in the investigation.

In Vygotsky's cultural-historical theory, essential in classroom instruction to develop higher cognitive functions is the collaboration between teacher and student (Gredler, 2001). Inquiry-based learning focuses on human interaction by carrying out inquiry and students are grouped during instruction.

Inquiry-based Learning. Inquiry-based learning was implemented using Biological Science Inquiry Model (BSIM). This model has four phases: plan, assess, implement and evaluate.

Biological Science Inquiry Model

In Biological Science Inquiry Model, there are four main components (see Figure 1).

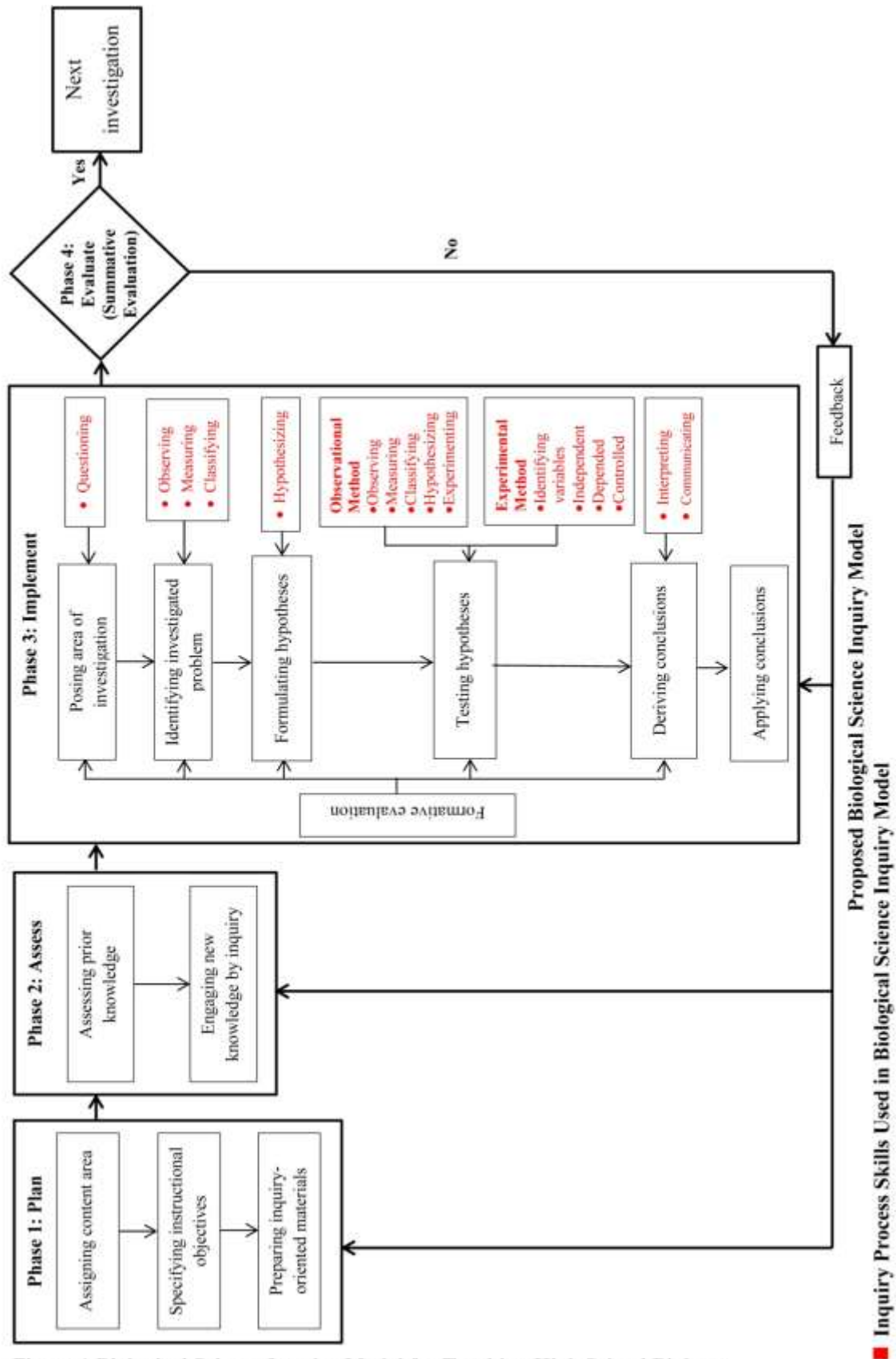


Figure 1 Biological Science Inquiry Model for Teaching High School Biology

Methods

Research Design. The research design adopted in this study was explanatory sequential (QUAN → qual) design, one of the three basic mixed methods designs.

Quantitative Research Design. The research design used in this study was nonequivalent control group design.

Population and sample. Simple random sampling method was used. Table 1 shows population and sample of the quantitative study.

Table 1 Population and Sample for Quantitative Research

Region	District	Township	Name of School	No. of Population	No. of Sample
Yangon	East	Yankin	No.(2) Basic Education High School, Yankin	201	107
	West	Kamayut	No.(5) Basic Education High School, Kamayut	178	105
	South	Kyauktan	No.(2) Basic Education High School, Kyauktan	142	107
	North	Hlegu	Basic Education High School, Hlegu	145	100
Total				666	419

Qualitative Research Design. The research design used in this study was case study research design. Random purposive sampling, one of the qualitative sampling approaches, was used for this qualitative study.

Instruments. Pretest, materials or lesson plans, posttest, questionnaires and observation checklists were used as instruments. The instruments based on inquiry process skills.

Analysis of Data. The Statistical Package for the Social Sciences (SPSS) Version 22 was used to analyze the data. The data were analyzed by using one-way analysis of covariance, Pearson product-moment correlation and multiple regression.

Findings

Quantitative Research Findings

Findings of Biology Achievement

Findings of biology achievement include three research questions.

Analysis of the Posttest Scores. The first research question is “Are there any significant differences in biology achievement of the students who received IBL and those who did not?” To answer this research question, one-way ANCOVA was used to analyze the data from posttest scores.

From each school, the two intact groups were selected as the experimental group who received IBL and the control group who did not. As pointed out by Pallant (2013), ANCOVA is used when the study has been unable to randomly assign the participants to the different groups, but instead has had to use existing groups.

Table 2 shows the results of pretest scores in the four selected schools.

Table 2 Results of Pretest Scores in Four Schools

School	Group	N	M	SD	MD	MS	F	p
S1	Experimental	53	19.87	2.01	-.72	14.05	2.300	.132 (ns)
	Control	54	20.59	2.85				
S2	Experimental	52	17.12	4.24	.93	22.54	1.485	.226 (ns)
	Control	53	16.19	3.53				

School	Group	N	M	SD	MD	MS	F	p
S3	Experimental	54	20.06	2.38	.98	25.69	4.813	.030*
	Control	53	19.08	2.24				
S4	Experimental	50	17.16	4.17	-.20	1.00	.059	.808 (ns)
	Control	50	17.36	4.04				

Note. S1 = No. (2) Basic Education High School, Yankin; S2 = No. (5) Basic Education High School, Kamayut; S3 = No. (2) Basic Education High School, Kyauktan; S4 = Basic Education High School, Hlegu.

* $p < .05$. ns = not significant.

Table 3 shows the analysis of covariance results for posttest scores in the four selected schools.

Table 3 Analysis of Covariance Results for Posttest Scores in Four Schools

School	Group	N	M	SD	MD	MS	F	p
S1	Experimental	53	35.04	1.79	9.71	2438.39	246.550	.000***
	Control	54	25.33	4.04				
S2	Experimental	52	23.87	3.54	5.42	729.19	40.171	.000***
	Control	53	18.45	4.87				
S3	Experimental	54	29.74	3.88	6.82	1103.22	72.52	.000***
	Control	53	22.92	3.97				
S4	Experimental	50	31.68	4.65	14.76	5432.28	225.226	.000***
	Control	50	16.92	5.13				

Note. S1 = No. (2) Basic Education High School, Yankin; S2 = No. (5) Basic Education High School, Kamayut; S3 = No. (2) Basic Education High School, Kyauktan; S4 = Basic Education High School, Hlegu.

*** $p < .001$.

The results of posttest scores in the four schools showed that the mean scores of the experimental groups were significantly higher than those of the control groups (see Table 3). Therefore, it can be interpreted that the application of IBL had a significant effect on the biology achievement of students. According to the ANCOVA results of posttest scores in the four schools, Figure 2 is illustrated.

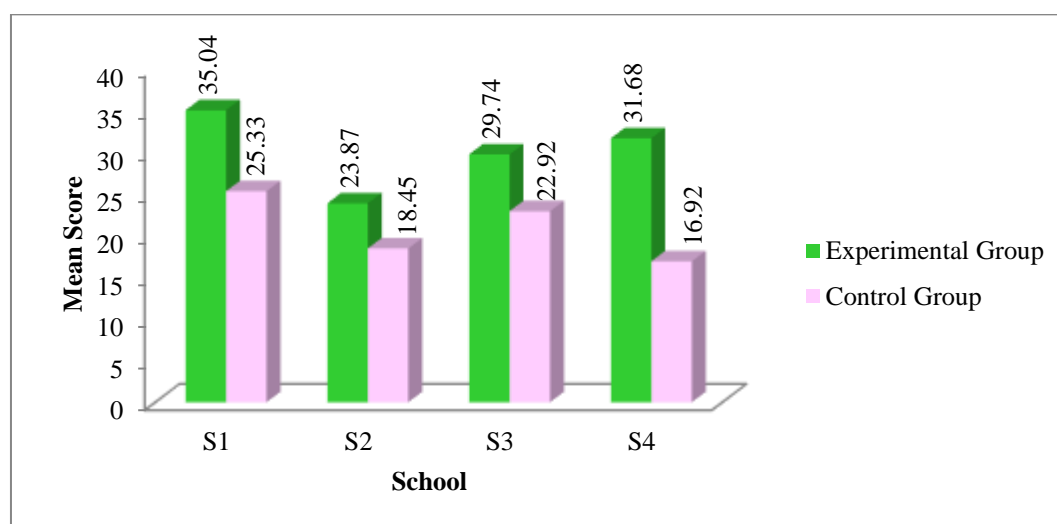


Figure 2 Comparison of Posttest Mean Scores in Four Schools

Relationship between Biology Achievement and Attitudes towards Inquiry Process Skills

The second research question is “Are there any significant relationships between students’ biology achievement and their attitudes towards inquiry process skills?” To answer this research question, Pearson product-moment correlation was used.

According to Mertler and Vannatta (2002), the Pearson product-moment correlation (r) measures the association between two quantitative variables without distinction between the independent and dependent variables.

Table 4 Correlation between Biology Achievement and Attitudes towards Inquiry Process Skills

	Biology Achievement	Questioning	Observing	Measuring	Classifying	Hypothesizing	Experimenting	Interpreting	Communicating
Biology Achievement	1	.760**	.769**	.280**	.715**	.750**	.649**	.291**	.758**
Questioning		1	.819**	.369**	.669**	.692**	.550**	.534**	.774**
Observing			1	.346**	.677**	.616**	.526**	.474**	.731**
Measuring				1	.365**	.349**	.251**	.600**	.429**
Classifying					1	.646**	.499**	.184**	.696**
Hypothesizing						1	.728**	.298**	.743**
Experimenting							1	.238**	.599**
Interpreting								1	.434**
Communicating									1

Note. **Correlation is significant at the 0.01 level (2 – tailed).

According to the result of Table 4, it showed that biology achievement was significantly correlated with all inquiry process skills.

According to Cohen’s guideline (1988, cited in Pallant, 2013), the strength of correlation from $r = .10$ to $.29$ is small, the strength of correlation from $r = .30$ to $.49$ is medium and the strength of correlation from $r = .50$ to 1.0 is large. From the Pearson correlation analysis, there was a large correlation between biology achievement and questioning, observing, classifying, hypothesizing, experimenting and communicating ($r = .50$ to 1.0), suggesting quite a strong relationship between biology achievement and questioning, observing, classifying, hypothesizing, experimenting and communicating. However, there was a weak correlation between biology achievement and measuring and interpreting ($r = .10$ to $.29$), suggesting quite a weak relationship between biology achievement and measuring and interpreting. From this result, it could be generally interpreted that students with inquiry process skills could contribute to the high biology achievement of the students.

Regression Analysis of Predictions of Inquiry Process Skills for Biology Achievement

The third research question is “Do inquiry process skills predict biology achievement?” To answer this research question, multiple regression analysis was used.

As pointed out by Creswell (2002, p.372), “multiple regression is a statistical procedure for examining the combined relationship of multiple independent variables with a single dependent variable.” Table 5 shows the regression analysis summary for the variables predicting biology achievement.

Table 5 Regression Analysis Summary for the Variables Predicting Biology Achievement

Variables	B	β	t	R	R ²	Adj R ²	F
Biology Achievement	9.484		7.817***	.872	.761	.752	79.661***
Predictor Variables							
Questioning	.425	.156	2.104*				
Observing	.808	.301	4.585***				
Measuring	-.154	-.048	-.998				
Classifying	.536	.139	2.375*				
Hypothesizing	.796	.201	3.148**				
Experimenting	.605	.131	2.563*				
Interpreting	-.230	-.089	-1.637				
Communicating	.490	.151	2.292*				

Note. Constant = Dependent variable : Biology Achievement.

* $p < .05$. ** $p < .01$. *** $p < .001$.

The result of multiple regression analysis pointed out that inquiry process skills such as questioning, observing, classifying, hypothesizing, experimenting, and communicating made a significant predictive contribution to high students' biology achievement ($t = 7.817$, $p < .001$). The results in Table 5 stated $R^2 = .761$, $F = (8, 200) = 79.661$ and $p < .001$. The adjusted R square value is .752. This indicated that approximately 75.2% of the variance in biology achievement can be predicted from attitudes towards inquiry process skills: questioning, observing, classifying, hypothesizing, experimenting, and communicating.

The equation for predicting the biology achievement from the students' attitudes towards inquiry process skills can be defined as follows.

$$BA = 9.484 + .425X_1 + .808X_2 + .536X_3 + .796X_4 + .605X_5 + .490X_6$$

BA = Biology Achievement

X₁ = Questioning

X₂ = Observing

X₃ = Classifying

X₄ = Hypothesizing

X₅ = Experimenting

X₆ = Communicating

Based on the result of multiple regression analysis, among inquiry process skills, observing was the best predictor of the inquiry process skills ($\beta = .301$ ***, $p < .001$). The second predictor was hypothesizing ($\beta = .201$ **, $p < .01$), the third predictor was questioning ($\beta = .156$ *, $p < .05$), the fourth predictor was communicating ($\beta = .151$ *, $p < .05$), the fifth predictor was classifying ($\beta = .139$ *, $p < .05$) and the last predictor was experimenting ($\beta = .131$ *, $p < .05$). Based on the multiple regression analysis presented above, the multiple regression model of inquiry process skills for biology achievement is shown in Figure 3.

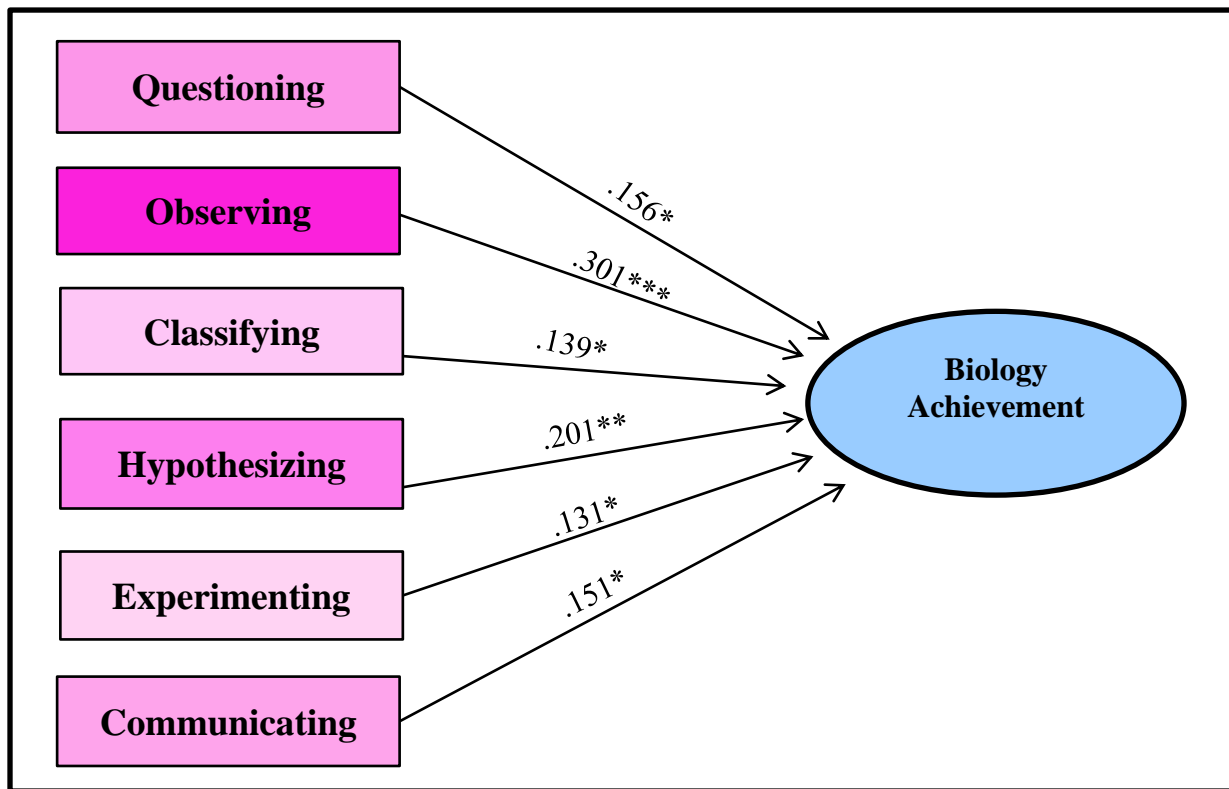


Figure 3 Multiple Regression Model of Inquiry Process Skills for Biology Achievement

According to Pallant (2013), multicollinearity exists when the independent variables are highly correlated ($r = .9$ and above). In this research, the independent variables are not highly correlated (below $r = .9$) to avoid multicollinearity (see Table 4). In the Normal P-P Plot, points lied in a reasonably straight diagonal line from bottom left to top right. This would suggest no major deviations from normality in this research. Since there is no multicollinearity and normality, it is reasonable to conclude that the multiple regression model to explain biology achievement is stable, good and quite respectable.

Qualitative Research Findings

Research Findings from Questionnaire. The qualitative data analysis showed that all teachers and most of the students developed positive attitudes towards inquiry process skills.

Research Findings from Teachers' Observation Checklist. The evidence from the observation checklists stated that teachers performed better in inquiry process skills when they have more teaching experiences.

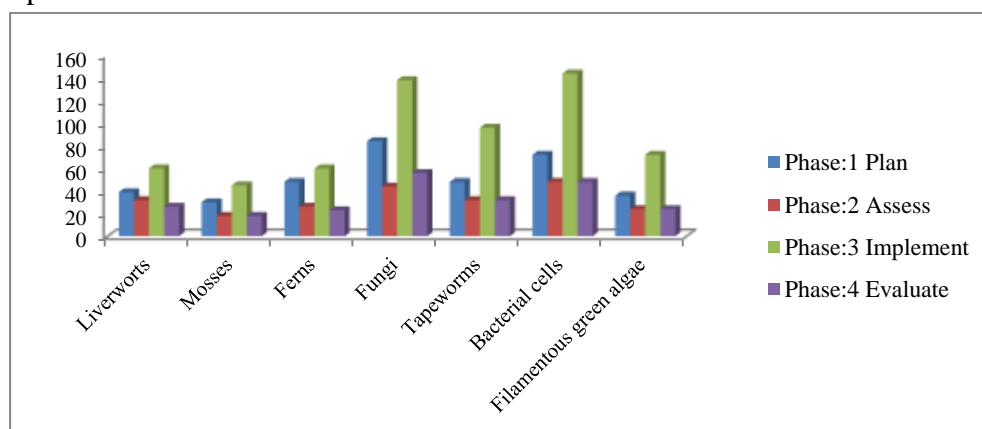


Figure 4 Graphic Illustration of Teachers' Observation Checklist on Biology Lessons

Research Findings from Students' Observation Checklist. The checklist expressed that students displayed better inquiry process skills when they have more learning experiences.

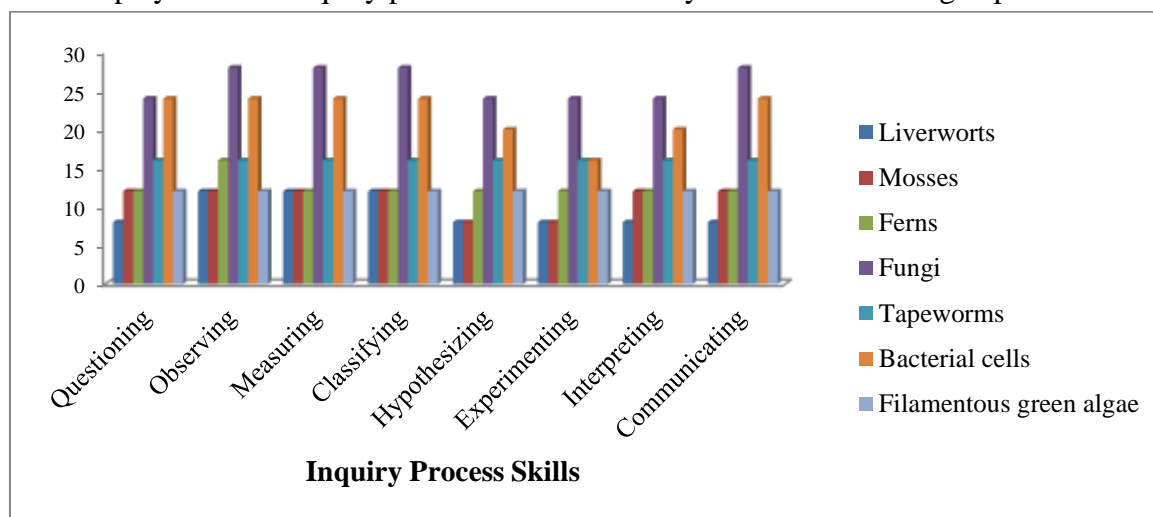


Figure 5 Graphic Illustration of Results of Students' Observation Checklist on Biology Lessons

Discussion

The first objective of this research is to investigate the applicability of inquiry-based learning that can improve students' inquiry process skills in teaching and learning high school biology. Based on the research findings, the experimental groups who received IBL performed significantly higher than the control groups who did not receive it in all schools. This result shows that the experimental groups could get more biology achievement than the control groups. Therefore, it can be interpreted that the application of IBL had a significant effect on the biology achievement of all schools.

The second objective is to explore the attitudes and opinions of teachers and students who participate in this study. To examine the relationship between students' biology achievement and their attitudes towards inquiry process skills, Pearson product-moment correlation was used. According to this result, there were significant relationships between biology achievement and all inquiry process skills: questioning, observing, measuring, classifying, hypothesizing, experimenting, interpreting and communicating. Among them, questioning, observing, classifying, hypothesizing, experimenting, and communicating were strongly correlated with biology achievement. However, measuring and interpreting were weakly correlated with biology achievement. Therefore, it can be interpreted that the stronger the inquiry process skills were developed, the higher the biology achievement.

According to Gibson and Chase (2002), inquiry based activities were influenced in students' having positive attitudes towards science learning. In a similar vein, Chen, Wang, Dede and Grotzer (2007) also concluded that the students' attitudes towards inquiry learning were quite positive. This was also evident from their interview data. In addition, during the free discussion between the researcher and the participants after the experiment, most students revealed that the inquiry learning approach was very interesting, stimulating their passions in exploring the problem and made them become active in learning. The above research findings were consistent with the results of this study.

To explore the predicting factor of attitudes towards inquiry process skills, multiple regression was used. From the regression analysis, inquiry process skills such as questioning, observing, classifying, hypothesizing, experimenting, and communicating were significant predictors for biology achievement. Among inquiry process skills, observing was the best predictor of the inquiry process skills. The second predictor was hypothesizing, the third

predictor was questioning, the fourth predictor was communicating, the fifth predictor was classifying and the last predictor was experimenting. These findings showed that the students who had high questioning, observing, classifying, hypothesizing, experimenting, and communicating skills had high biology achievement. From this result, experimenting got the last ranking skill. So, it can be interpreted that students should do many experiments to know cause and effect relationships among biological concepts.

The third objective of this research is to analyze the improvement of inquiry process skills by applying inquiry-based learning. Concerning inquiry process skills, the experimental groups were significantly higher than the control groups in all schools. Therefore, it can be interpreted that the application of IBL can develop inquiry process skills. Based on the discussion obtained, it can be concluded that the application of IBL had a positive impact on biology students' inquiry process skills.

Suggestions

The first portion is suggestion for teachers. It was found that most of the biology teachers agreed that they asked the students to observe their instruction by using teaching aids. As a result, students will be able to answer all the questions that are posed to them (observing). Therefore, it is suggested that biology teachers should be provided with teaching aids, real plants and animals, preserved specimens and inquiry-oriented materials, especially electron microscopes.

According to Liu, Lee and Linn (2010), teachers who use inquiry learning can produce students who have a high level of knowledge. According to the research findings, it was found that teachers and students developed positive attitudes towards inquiry process skills. Therefore, it is suggested that teachers should use inquiry process skills to develop biological concepts among students.

The second portion is suggestions for students. Concerning students' attitudes towards inquiry process skills, it was found that students developed positive attitudes towards inquiry process skills, especially observing. This is due to the fact that most of the biology students agreed that they liked learning biology taught by means of IBL because it enhanced their longer retention of the content areas of the lessons as a result of being given an opportunity to make inquiry and learn by using all the five senses including sight, hearing, smell, taste and touch (observing). Therefore, it is suggested that biology students should be provided with teaching aids, real plants and animals, preserved specimens and inquiry-oriented materials, especially electron microscopes.

According to the research results of the predictors of inquiry process skills in biology achievement, the best predictor was the observing skill and the last predictor was the experimenting skill. These findings pointed out that students had less experience in experimentation. Therefore, it is suggested that students should do many experiments as possible to develop experimenting, thinking and reasoning skills.

In Myanmar, biology is taught at the high school level. However, biological concepts such as living things are taught as a science subject with Myanmar language from primary to middle school levels. As a result, biology teachers from primary to high school levels should prepare lesson plans based on IBL to improve inquiry process skills.

According to research findings of observation checklist, students could not achieve well in all inquiry process skills at the initial biology lessons because they were not familiar with inquiry process skills. However, students could achieve gradually all inquiry process skills at the final lessons according to their learning experiences. Thus, it is suggested that biology teachers should emphasize on the development of inquiry process skills right from the primary school level to improve inquiry process skills. To have been familiar with inquiry process skills,

students should be taught with inquiry-based learning not only in biology but also in science from primary to high school levels.

Recommendations

The results of this research contributed to the improvement of teaching and learning biology at the high school level in Myanmar. But, it is not perfect for all situations. Therefore, it is necessary to conduct further research. Since all data in this research were collected from Yangon Region, it may have limitations to the generalizability of findings. So, further research should be carried out in the other states and regions. In this study, the participants were only Grade Ten students. In fact, biology is taught in both Grade Ten and Grade Eleven. Therefore, further research on biology teaching and learning should be carried out in Grade Eleven. Then, the research results will become generalizable to a wider population. According to time frame, this research was conducted for only seven topics. Further research should attempt to cover more topics from biology textbook. This study focused more on inquiry process skills and less on other inquiry approach such as field-based approach. Further research should focus on the latter.

Conclusion

The objective of this research is to investigate the applicability of IBL that can enhance students' inquiry process skills in teaching and learning high school biology. According to the research results, the experimental groups who received IBL improved inquiry process skills more than the control groups who did not in all schools. Therefore, it can be interpreted that IBL had a significant effect on students' biology achievement. Therefore, teachers should use IBL to develop the students' inquiry process skills.

Inquiry-based learning is not just teaching biology, but using biology to teach thinking. The implementing phase included inquiry process skills: questioning, observing, measuring, classifying, hypothesizing, experimenting, interpreting and communicating. Moreover, pretest and posttest were constructed on the basis of these inquiry process skills and the third domain of students' questionnaire was based on these inquiry process skills. According to the research findings, students with inquiry process skills could contribute to raise the biology achievement of the students. Therefore, it is suggested that inquiry-based learning should be applied to develop students' thinking skills in biology.

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AN INVESTIGATION INTO THE EFFECTIVENESS OF PROCESS ORIENTED GUIDED INQUIRY LEARNING MODEL ON STUDENTS' LEARNING CHEMISTRY CONCEPTS

Hswe Mar Oo¹ and Daw Kyi Swe²

Abstract

The main purpose of this study is to investigate the effectiveness of proposed process oriented guided inquiry learning model for chemistry teaching at the high school level in Myanmar. The research design was one of the quasi-experimental designs, the nonequivalent control group design. The participants were selected from Grade Ten students in BEHS Yekyi, BEHS Kwin Thone Zint, BEHS (5) Hinthada, BEHS Neikban, BEHS (2) Danuphyu and BEHS Alamyio in Ayeyawady Region by using simple random sampling method. There were totally (483) participants to conduct the experiment for this research study. From each school, two intact classes were randomly selected as experimental group who received proposed process oriented guided inquiry learning model and control group who received formal instruction. The instruments were pretest, posttest, and questionnaire. The data were analyzed by using one-way analysis of covariance (One-Way ANCOVA). According to ANCOVA results, there were significant differences in the achievement on concept skills between the experimental groups and control groups in all schools. The results of students' responses from questionnaire expressed that all students who participated in experimental groups had positive attitudes towards proposed process oriented guided inquiry learning. Research findings proved that proposed process oriented guided inquiry learning model had positive contribution for chemistry teaching at the high school level in Myanmar.

Keywords: Guided Inquiry Learning, Process Oriented Guide Inquiry Learning, Teaching Model, Chemistry, Concept

Introduction

Developing students' teamwork spirits, critical thinking, problem solving and communication skills are educational goals of every discipline in 21st century. To develop these skills among the students, teachers should try to cultivate the habits of inquiry. Inquiry is a seeking for truth, and information through questioning. Inquiry encourages students to discover facts and to develop concepts. It not only provides ways of finding out and thinking, but can also increase students' interest in science (Kuhlthau, Maniotes & Caspari, 2007). In order to survive and flourish as a teacher in today's school; teachers have to learn ways of using effectively associated with teaching methods for students. To fulfill the requirements of basic education sector, it is important that process oriented guided inquiry learning can be implemented in basic education high school level.

Objectives of the Research

- (1) To develop a process oriented guided inquiry learning model for chemistry teaching at the high school level.
- (2) To investigate the effectiveness of proposed process oriented guided inquiry learning model on students' chemistry achievement.
- (3) To explore the attitudes of students who participated in this research on the proposed process oriented guided inquiry learning model, and
- (4) To give suggestions and recommendations for the improvement of chemistry teaching

Research Questions

- (1) Are there any significant differences in the achievement on concept skills of students who received proposed process oriented guided inquiry learning model in teaching chemistry and those who do not receive it?

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- (2) Do students who were taught with proposed process oriented guided inquiry learning model in teaching chemistry have positive attitudes towards the proposed process oriented guided inquiry learning model?

Scope of the Research

- (1) This study is geographically restricted to Ayeyawady Region.
- (2) Participants in this research study are Grade Ten chemistry students from the selected schools in the academic year (2019-2020).
- (3) The content area is limited to six chapters from Grade Ten chemistry textbook prescribed by the Basic Education Curriculum, Syllabus and Textbook Committee of Ministry of Education, 2018.

Definitions of Key Terms

For this research study, definitions of key terms are presented as follows.

Guided Inquiry Learning: Guided inquiry is defined as interacting with concrete materials to gain knowledge about some scientific concepts by the guidance of the teacher in order to be able to solve a problem (Hassard, 2005).

Process Oriented Guided Inquiry Learning: Process oriented guided inquiry learning (POGIL) is a research-based, student-centered philosophy and science pedagogy in which students work in small groups to engage in guided inquiry using carefully designed materials that direct and guide students to build and rebuild their chemistry knowledge (Moog, Creegan, Hanson, Spencer & Straumanis, 2006).

Teaching Model: A teaching model is a plan or pattern that can be used to shape curriculum, to design instructional materials, and to guide instruction in the classroom and other settings (Joyce & Weil, 1980).

Chemistry: Chemistry is the study of the composition of matter and the changes that matter undergoes. Chemistry affects all aspects of life and most natural events because all living and nonliving things are made of matter (Wilbraham, Staley, Matta & Waterman, 2012).

Concept: A concept is a set of specific objects, symbols, or events which are grouped together on the basis of shared characteristics and which can be referenced by a particular name or symbol (Merill & Tennyson, 1977).

Statement of the Problem

Chemistry, the central science, is a systematic inquiry about natural phenomena. Although chemistry is central in the drive of global sustainable economic development, students have many misconceptions about chemistry. Chemistry curricula commonly incorporate many abstract concepts which are central to further learning in both chemistry and other science. Chemistry learning involves conceptual relationships among macroscopic, microscopic, and symbolic representations (Dori & Hamairi, 2003, cited in Bilgin, 2006).

In Myanmar, chemistry is taught at the high school level in English language. However, students taught the science subjects in Myanmar language from primary to middle school level. Besides, Myanmar is undergoing critical lack of resources and skills and little practical application in the classroom. It emphasizes upon rote learning and memorization of factual information. Therefore, students can have misconceptions in chemistry lessons due to language barriers, lack of resources and skills and little practical application.

Process oriented guided inquiry learning can solve many struggles faced by teachers and students in teaching of chemistry. It is hoped that it can be useful, to some extent, for the improvement of chemistry teaching at the high school level in Myanmar. Therefore, this study is to explore both students' chemistry concept skills and the attitudes of chemistry students towards proposed process oriented guided inquiry learning model.

Review of Related Literature

Philosophical Foundations of Process Oriented Guided Inquiry Learning

Progressivism, pragmatism, cognitivism and constructivism are deeply taken into philosophical foundations for developing proposed process oriented guided inquiry learning model.

Progressives place more emphasis on the process of learning than on the end product. In process oriented guided inquiry learning, the emphasis is on the process rather than on the product. Process oriented guided inquiry learning derives students to be good problem solvers and good thinkers.

Pragmatism puts emphasis on free flow of ideas, spirit of inquiry of investigation and discussion. Students investigate learning activities, solve chemistry problems and then explore experiments to get necessary concept. In process oriented guided inquiry learning model, the implementing phase focuses on learning activities to think about and solve the investigated problem.

Cognitivism involves how people think and gain knowledge (Brandi, 2011). In process oriented guided inquiry learning model, students explore, determine and apply concepts. Constructivism emphasizes hands-on activity, activity-based teaching and learning (Ozmon & Craver, 1986). Students construct their own understanding and knowledge through experiences. In process oriented guided inquiry learning model, the implementing phase emphasizes students to construct knowledge by connecting with their previous ideas and experiences.

Psychological Foundations of Process Oriented Guided Inquiry Learning

Piaget's cognitive learning theory, Vygotsky's sociocultural theory and Gagne's information processing theory are deeply taken into psychological foundations for developing proposed process oriented guided inquiry learning model. In Piaget's cognitive learning theory, cognitive development is achieved through observation and experimentation. In Vygotsky's sociocultural theory, interactions with persons in the environment stimulate developmental processes and foster cognitive growth (Schunk, 2012). Gagne's information processing model describes how people input information into their central processor (brain), and how they process that information within various memory systems until appropriate output or responses can be generated (Fetsco & McClure, 2005).

Background Teaching Models of Process Oriented Guided Inquiry Learning

Gerlach and Ely model, Talyzina's cognitivo-cybernetic model, Bybee's 5E instructional model and Professor Dr. Khin Zaw's multimodal model are background teaching models that support the proposed process oriented guided inquiry learning model.

Gerlach and Ely model consists of ten elements: identification of content, specification of objectives, assessment of entering behaviors, determination of strategy, organization of groups, allocation of time, allocation of space, selection of resources, evaluation of performance, and analysis of feedback. The orientation phase of proposed process oriented guided inquiry learning model is based on the first and second phase of Gerlach and Ely model, organizing small groups step in the organization phase of proposed process oriented guided inquiry learning model is based on the fifth phase of Gerlach and Ely model, the summative evaluation phase of proposed process oriented guided inquiry learning model is based on the ninth phase of Gerlach and Ely model, and the feedback phase of proposed process oriented guided inquiry learning model is based on the last phase of Gerlach and Ely model.

Talyzina's cognitivo-cybernetic model is composed of eight elements: instructional objectives, input level or entering behavior, selection and/or structuring of knowledge, technological devices or multimedia presentation of materials, acquisitional steps or step-by-step psychological theory, teaching algorithms, feedback phase, and regulation or corrective action

stage. Defining instructional objective in the orientation phase of proposed process oriented guided inquiry learning model is based on the first phase of Talyzina's cognitivo-cybernetic model, connecting to prior conception step in the implementation phase of proposed process oriented guided inquiry learning model is based on the second phase of Talyzina's cognitivo-cybernetic model, and feedback phase of proposed process oriented guided inquiry learning model is based on the seven phase of Talyzina's cognitivo-cybernetic model.

Bybee's 5E instructional model comprises of five components: engagement, exploration, explanation, elaboration and evaluation. The heart of proposed process oriented guided inquiry learning model is implementation phase. Every step in implementation phase of proposed process oriented guided inquiry learning model is based on Bybee's 5E instructional model.

Khin Zaw's multimodal model consists of five main components: channel capacity, brain resilience, redundancy, unitizing/symbolizing modes, and diffusing/re-synthesizing modes. It is important in teaching and learning process because it gives pedagogues, teachers and students the ways how the human brain works, transmits and transforms information and data. Identifying a need to learn and connecting to prior conception in implementation phase of proposed process oriented guided inquiry learning model is based on channel capacity of multimodal model. Moreover, the brain must think and devise ways and means of coping with the overwhelming multitude of stimulus information to be taught that have to be encountered every day of its physical life.

Proposed Process Oriented Guided Inquiry Learning Model

Proposed process oriented guided inquiry learning model for effective instructional process is developed for Myanmar high school chemistry teaching. Proposed process oriented guided inquiry learning model is organized into four main phases.

- (1) Orientation;
- (2) Organization;
- (3) Implementation; and
- (4) Summative Evaluation.

These four phases are sequential and interrelated. The teacher first orientates, organizes, then implements those plans and finally evaluates the achievement of students' chemistry activities and knowledge.

(1) Orientation

The orientation phase prepares for students' learning. This stage is composed of two tasks including preparation of content, and defining instructional objectives.

(2) Organization

The organization phase is essential as the beginning of the learning process. This stage is also consisted of two tasks including organizing small groups, and assigning and defining roles.

(3) Implementation

The implementation phase is a key to succeed the whole teaching and learning process for teachers. This stage is composed of nine tasks including identifying a need to learn, connecting to prior conception, providing instructional materials, exploring experiment for concept, determining concept, applying concept in context, reporting findings, generalizing solution of problem and formative evaluation.

(4) Summative Evaluation

After implementation phase, summative evaluation is performed. To evaluate how well the students have achieved the instructional objectives, summative evaluation is made. If they can perform well in an inquiry process, they can proceed to the next content. If they cannot, they have to go back again to the step of feedback according to the proposed process oriented guided inquiry learning model.

Figure 1.

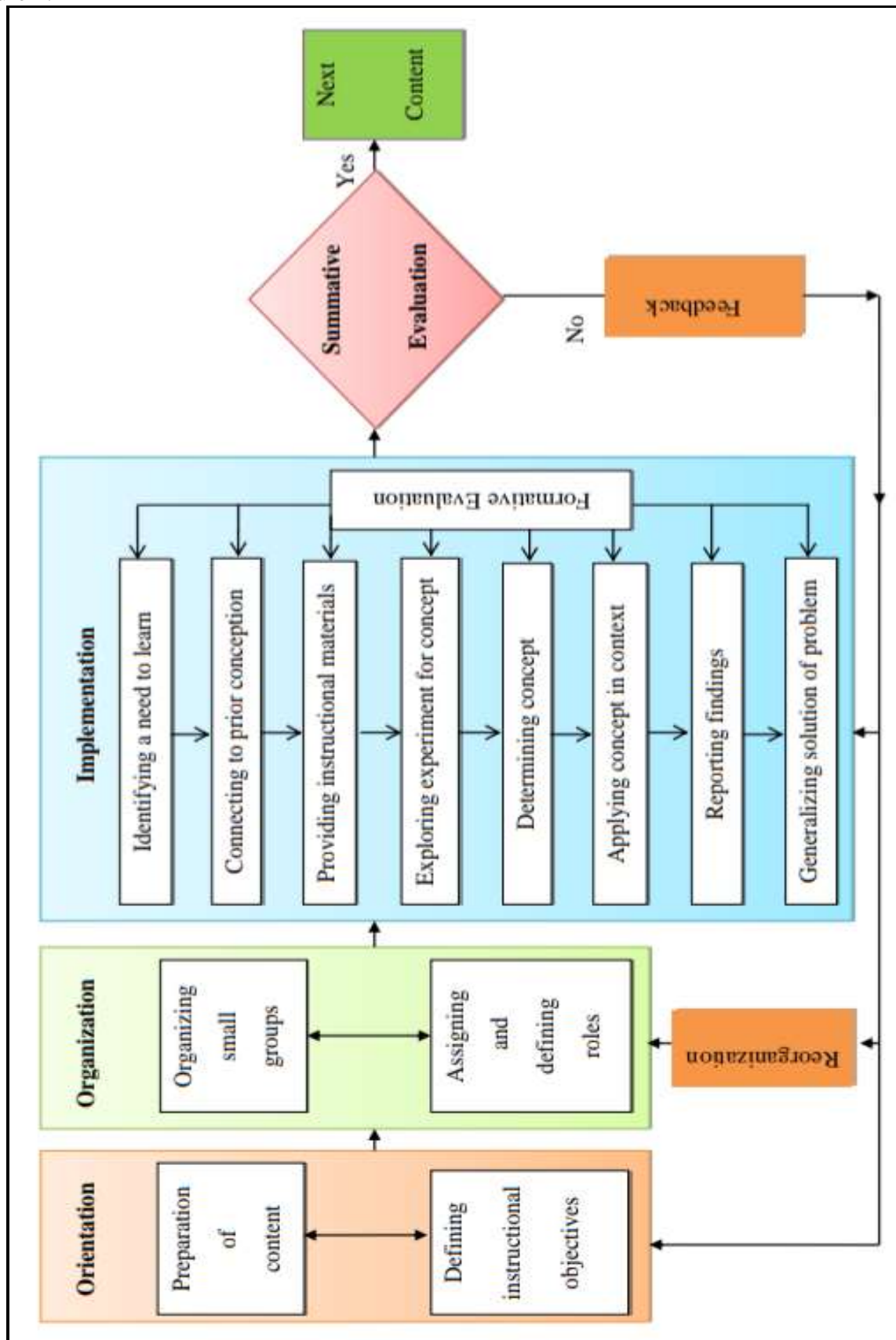


Figure 1: Proposed Process Oriented Guided Inquiry Learning Model

Method

Population and Sample: Table 1 shows population and sample size of this research study.

Table 1 Population and Sample Size

Selected District	Selected Township	Selected School	No. of Population	No. of Subject		
				Experimental	Control	Total
Pathein	Yekyi	BEHS Yekyi	125	45	34	79
		BEHS Kwin Thone Zint	64	32	32	64
Hinthada	Hinthada	BEHS (5) Hinthada	123	46	40	86
		BEHS Neikban	101	49	52	101
Maubin	Danuphyu	BEHS (2) Danuphyu	85	46	39	85
		BEHS Alamyio	68	34	34	68
Total			566	252	231	483

Research Design: The research design was nonequivalent control group design.

Research Instruments: Pretest, posttest and questionnaire were used as instruments.

Data Analysis: The Statistical Package for the Social Sciences (SPSS) version (22) was used to analyze the data. The data were analyzed by using one-way analysis of covariance.

Findings

Findings for Posttest

The first research question of this study is: "Are there any significant differences in the achievement on concept skills of students who received proposed process oriented guided inquiry learning model in teaching chemistry and those who do not receive it?" To answer this research question, one-way ANCOVA was used to analyze the data from posttest.

From each school, the two intact groups were selected as the experimental group who received proposed process oriented guided inquiry learning model and the control group who received formal instruction. As pointed out by Pallant (2013), ANCOVA is used when the study has been unable to randomly assign the participants to the different groups, but instead has had to use existing groups.

Table 2 shows the results of pretest scores in the six selected schools.

Table 2 Results of Pretest Scores in Six Selected Schools

School	Group	N	M	SD	MD	F	p
S1	Experimental	45	39.27	4.19	0.53	.31	.582 (ns)
	Control	34	38.74	4.27			
S2	Experimental	32	31.25	3.34	1.88	2.31	.134 (ns)
	Control	32	29.37	6.13			
S3	Experimental	46	32.22	4.26	- 0.50	.32	.571 (ns)
	Control	40	32.72	3.97			
S4	Experimental	49	34.47	3.52	1.16	1.97	.163 (ns)
	Control	52	33.31	4.68			

School	Group	N	M	SD	MD	F	p
S5	Experimental	46	35.04	5.79	0.04	.00	.966 (ns)
	Control	39	35.00	2.75			
S6	Experimental	34	39.35	5.44	0.38	.10	.753 (ns)
	Control	34	38.97	4.50			

Note. S1 = BEHS Yekyi; S2 = BEHS Kwin Thone Zint; S3 = BEHS (5) Hinthada; S4 = BEHS Neikban; S5 = BEHS (2) Danuphyu; S6 = BEHS Alamy, ns = not significant

Findings of Concept Skills on Posttest in S1

Table 3 shows the analysis of covariance results for concept skills of posttest in S1.

Table 3 Analysis of Covariance Results for Concept Skills of Posttest in S1

Level	Group	N	M	SD	MD	F	p
Knowledge	Experimental	45	7.91	1.54	0.17	.31	.577 (ns)
	Control	34	7.74	.97			
Comprehension	Experimental	45	8.58	1.50	3.20	67.24	.000***
	Control	34	5.38	1.59			
Application	Experimental	45	5.69	1.29	3.54	172.79	.000***
	Control	34	2.15	1.08			
Analysis	Experimental	45	7.31	1.16	1.52	12.11	.001**
	Control	34	5.79	2.09			
Synthesis	Experimental	45	6.87	2.13	3.34	35.15	.000***
	Control	34	3.53	2.85			
Evaluation	Experimental	45	7.84	.367	4.02	48.47	.000***
	Control	34	3.82	3.69			
Overall	Experimental	45	44.20	3.51	15.85	178.31	.000***
	Control	34	28.35	7.36			

Note. *** $p < .001$, ** $p < .01$, ns = not significant

Concerning knowledge level questions, there was no significant difference in the posttest mean scores between the experimental group and the control group. Therefore, it can be interpreted that the formal instruction had a significant effect on remembering facts and terms like proposed process oriented guided inquiry learning model in S1. For comprehension, application, analysis, synthesis and evaluation level questions, there were significant differences between the experimental group and the control group for the posttest mean scores. Therefore, it can be interpreted that proposed process oriented guided inquiry learning model had the ability to understand, apply, analyze, synthesize and evaluate concept skills of students in S1.

Findings of Concept Skills on Posttest in S2

Table 4 shows the analysis of covariance results for concept skills of posttest in S2.

Table 4 Analysis of Covariance Results for Concept Skills of Posttest in S2

Level	Group	N	M	SD	MD	F	p
Knowledge	Experimental	32	7.41	1.52	0.41	1.21	.276 (ns)
	Control	32	7.00	1.34			
Comprehension	Experimental	32	8.03	1.53	1.34	8.06	.006**
	Control	32	6.69	2.18			

Level	Group	N	M	SD	MD	F	p
Application	Experimental	32	5.84	1.11	3.50	78.06	.000***
	Control	32	2.34	1.85			
Analysis	Experimental	32	6.47	1.83	1.47	7.19	.009**
	Control	32	5.00	2.50			
Synthesis	Experimental	32	6.91	1.25	3.35	51.45	.000***
	Control	32	3.56	2.42			
Evaluation	Experimental	32	6.88	1.36	3.50	32.26	.000***
	Control	32	3.38	3.05			
Overall	Experimental	32	41.44	3.00	13.38	89.71	.000***
	Control	32	28.06	7.55			

Note. *** $p < .001$, ** $p < .01$, ns = not significant

Concerning knowledge level questions, there was no significant difference in the posttest mean scores between the experimental group and the control group. Therefore, it can be interpreted that the formal instruction had a significant effect on remembering facts and terms like proposed process oriented guided inquiry learning model in S2. For comprehension, application, analysis, synthesis and evaluation level questions, there were significant differences between the experimental group and the control group for the posttest mean scores. Therefore, it can be interpreted that proposed process oriented guided inquiry learning model had the ability to understand, apply, analyze, synthesize and evaluate concept skills of students in S2.

Findings of Concept Skills on Posttest in S3

Table 5 shows the analysis of covariance results for concept skills of posttest in S3.

Table 5 Analysis of Covariance Results for Concept Skills of Posttest in S3

Level	Group	N	M	SD	MD	F	p
Knowledge	Experimental	46	8.20	.78	0.20	1.45	.232 (ns)
	Control	40	8.00	.72			
Comprehension	Experimental	46	9.46	1.05	1.16	15.24	.000***
	Control	40	8.30	1.47			
Application	Experimental	46	6.24	.79	1.76	54.30	.000***
	Control	40	4.48	1.47			
Analysis	Experimental	46	6.65	1.25	1.70	34.21	.000***
	Control	40	4.95	1.43			
Synthesis	Experimental	46	7.35	1.46	5.40	97.64	.000***
	Control	40	1.95	3.15			
Evaluation	Experimental	46	5.76	3.02	4.48	43.25	.000***
	Control	40	1.28	2.57			
Overall	Experimental	46	43.74	4.47	14.79	267.39	.000***
	Control	40	28.95	3.84			

Note. *** $p < .001$, ns = not significant

Concerning knowledge level questions, there was no significant difference in the posttest mean scores between the experimental group and the control group. Therefore, it can be interpreted that the formal instruction had a significant effect on remembering facts and terms

like proposed process oriented guided inquiry learning model in S3. For comprehension, application, analysis, synthesis and evaluation level questions, there were significant differences between the experimental group and the control group for the posttest mean scores. Therefore, it can be interpreted that proposed process oriented guided inquiry learning model had the ability to understand, apply, analyze, synthesize and evaluate concept skills of students in S3.

Findings of Concept Skills on Posttest in S4

Table 6 shows the analysis of covariance results for concept skills of posttest in S4.

Table 6 Analysis of Covariance Results for Concept Skills of Posttest in S4

Level	Group	N	M	SD	MD	F	p
Knowledge	Experimental	49	7.80	1.22	- 0.01	.68	.410 (ns)
	Control	52	7.81	1.07			
Comprehension	Experimental	49	9.43	.76	2.58	66.56	.000***
	Control	52	6.85	1.64			
Application	Experimental	49	4.53	1.02	2.95	123.87	.000***
	Control	52	1.58	1.54			
Analysis	Experimental	49	7.18	.81	3.03	76.62	.000***
	Control	52	4.15	2.25			
Synthesis	Experimental	49	6.98	.99	4.94	262.14	.000***
	Control	52	2.04	1.80			
Evaluation	Experimental	49	7.57	.71	3.20	43.21	.000***
	Control	52	4.37	3.16			
Overall	Experimental	49	43.55	2.22	16.70	240.12	.000***
	Control	52	26.85	6.64			

Note. *** $p < .001$, ns = not significant

Concerning knowledge level questions, there was no significant difference in the posttest mean scores between the experimental group and the control group. Therefore, it can be interpreted that the formal instruction had a significant effect on remembering facts and terms like proposed process oriented guided inquiry learning model in S4. For comprehension, application, analysis, synthesis and evaluation level questions, there were significant differences between the experimental group and the control group for the posttest mean scores. Therefore, it can be interpreted that proposed process oriented guided inquiry learning model had the ability to understand, apply, analyze, synthesize and evaluate concept skills of students in S4.

Findings of Concept Skills on Posttest in S5

Table 7 describes the analysis of covariance results for concept skills of posttest in S5.

Table 7 Analysis of Covariance Results for Concept Skills of Posttest in S5

Level	Group	N	M	SD	MD	F	p
Knowledge	Experimental	46	8.41	.69	0.59	8.19	.005**
	Control	39	7.82	1.19			
Comprehension	Experimental	46	9.72	.50	0.57	7.47	.008**
	Control	39	9.15	1.23			
Application	Experimental	46	5.87	.40	0.95	13.01	.001**
	Control	39	4.92	1.59			

Level	Group	N	M	SD	MD	F	p
Analysis	Experimental	46	5.72	1.15	1.85	40.08	.000***
	Control	39	3.87	1.45			
Synthesis	Experimental	46	4.37	1.06	1.99	47.38	.000***
	Control	39	2.38	1.57			
Evaluation	Experimental	46	7.48	.72	1.79	16.51	.000***
	Control	39	5.69	2.28			
Overall	Experimental	46	41.57	1.81	7.72	81.78	.000***
	Control	39	33.85	5.49			

Note. *** $p < .001$, ** $p < .01$

Concerning knowledge, comprehension, application, analysis, synthesis and evaluation level questions, there were significant differences between the experimental group and the control group for the posttest mean scores. Therefore, it can be interpreted that proposed process oriented guided inquiry learning model had the ability to remember, understand, apply, analyze, synthesize and evaluate concept skills of students in S5.

Findings of Concept Skills on Posttest in S6

Table 8 shows the analysis of covariance results for concept skills of posttest in S6.

Table 8 Analysis of Covariance Results for Concept Skills of Posttest in S6

Level	Group	N	M	SD	MD	F	p
Knowledge	Experimental	34	7.59	.74	0.24	.79	.375 (ns)
	Control	34	7.35	1.35			
Comprehension	Experimental	34	9.12	.84	1.47	17.20	.000***
	Control	34	7.65	1.76			
Application	Experimental	34	6.59	.86	3.33	51.97	.000***
	Control	34	3.26	2.50			
Analysis	Experimental	34	5.53	1.29	1.00	7.54	.008**
	Control	34	4.53	1.75			
Synthesis	Experimental	34	6.50	1.73	5.06	126.72	.000***
	Control	34	1.44	1.96			
Evaluation	Experimental	34	7.44	.50	3.91	53.87	.000***
	Control	34	3.53	3.06			
Overall	Experimental	34	42.76	2.92	14.94	224.87	.000***
	Control	34	27.82	5.14			

Note. *** $p < .001$, ** $p < .01$, ns = not significant

Concerning knowledge level questions, there was no significant difference in the posttest mean scores between the experimental group and the control group. Therefore, it can be interpreted that the formal instruction had a significant effect on remembering facts and terms like proposed process oriented guided inquiry learning model in S6. For comprehension, application, analysis, synthesis and evaluation level questions, there were significant differences between the experimental group and the control group for the posttest mean scores. Therefore, it can be interpreted that proposed process oriented guided inquiry learning model had the ability to understand, apply, analyze, synthesize and evaluate concept skills of students in S6.

Figure 2 shows graphic illustrations of the comparison of concept skills on overall posttest mean scores for the six selected schools.

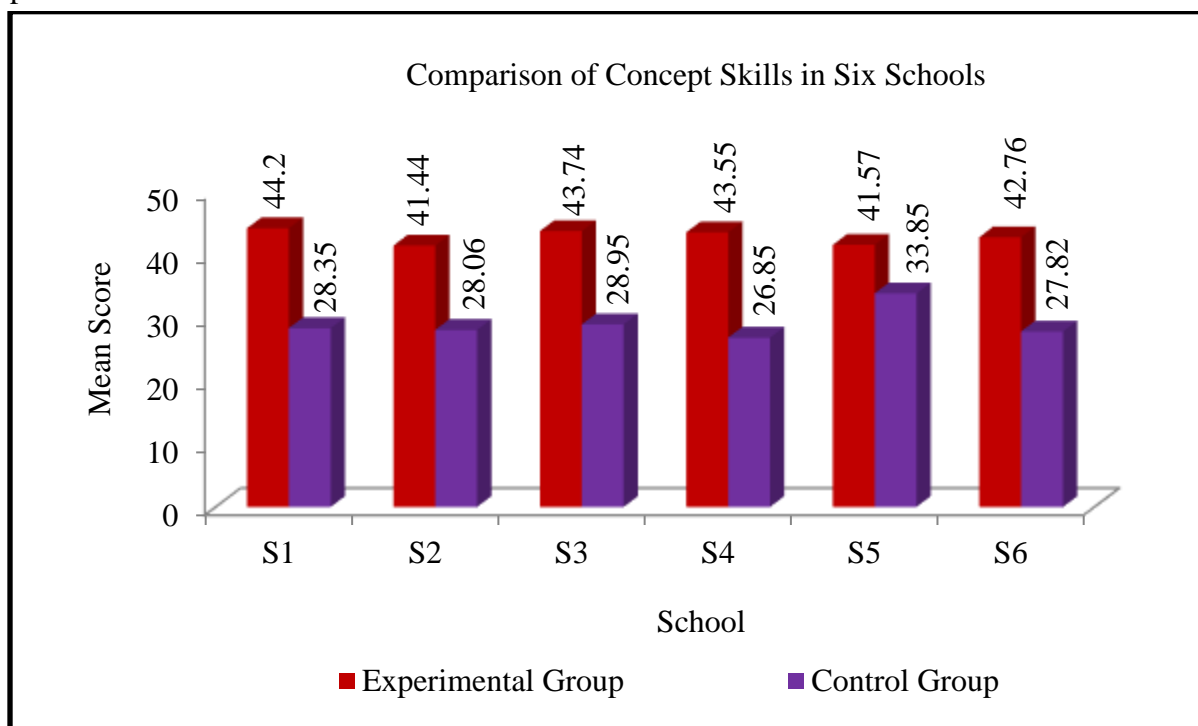


Figure 2 Graphic Illustration of the Comparison of Concept Skills on Overall Posttest Mean Scores for the Six Selected Schools

Findings for Students' Responses from Questionnaire

The second research question of this study is: "Do students who were taught with proposed process oriented guided inquiry learning model in teaching chemistry have positive attitudes towards the proposed process oriented guided inquiry learning model? To answer this research question, percentages of agreement and disagreement were calculated for all items in the questionnaire.

The attitudes of students who participated in experimental groups towards proposed process oriented guided inquiry learning are presented in terms of four areas such as developing good habits through small group discussions (item number 1, 2, 3 and 4), developing good habits through inquiring (item number 5, 6, 7 and 8), developing good habits through practical activities (item number 9, 10, 11 and 12), and developing POGIL process skills (item number 13, 14, 15, 16, 17, 18 and 19).

The students' attitude questionnaire consists of (19) statements linked to a five-point Likert scale, ranging from strongly disagree to strongly agree. The scores were given 1 = strongly disagree, 2 = disagree, 3 = undecided, 4 = agree, and 5 = strongly agree. All these questions are structured items that were answered by ticking the provided response options.

Table 9 shows the results of students' attitudes towards proposed process oriented guided inquiry learning model.

Table 9 Students' Attitudes toward Proposed Process Oriented Guided Inquiry Learning Model

Item No.	Statement	N	Percentage (%)				
			Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
1.	Through this proposed process oriented guided inquiry learning model, I develop cognitive and social skills.	252	1	2	6	73	28
2.	Through this proposed process oriented guided inquiry learning model, I develop the skills of finding new information through familiar content, debating and working hard to get the correct solution.	252	2	2	4	55	37
3.	Through this proposed process oriented guided inquiry learning model, I can learn to work in groups and develop the habit of collaboration to solve problems.	252	1	1	1	35	62
4.	Through this proposed process oriented guided inquiry learning model, I develop the habit of responsibility in different roles (manager, spokesperson, recorder and strategy analyst).	252	0.3	2.7	9.5	45	42.5
5.	Through this proposed process oriented guided inquiry learning model, I develop the habit of inquiring various concerns about a problem.	252	0.3	1.2	6	43.3	49.2
6.	Through this proposed process oriented guided inquiry learning model, I develop the habit of inquiring the possible ways to solve a problem.	252	0.3	2.7	8	55	34
7.	Through this proposed process oriented guided inquiry learning model, I develop the habits of inquiring not only chemistry subject but also other subjects.	252	1	0	6	38	55
8.	Through this proposed process oriented guided inquiry learning model, I develop the habits of inquiring in order to gain new knowledge and experiences.	252	1	0.8	5	45.6	47.6
9.	Through this proposed process oriented guided inquiry learning model, I am satisfied myself as it is important for academic achievement.	252	0.3	2.7	7	40	50

Item No.	Statement	N	Percentage (%)				
			Strongly Disagree	Disagree	Undecided	Agree	Strongly Agree
10.	Through this proposed process oriented guided inquiry learning model, I want to ask questions and discuss with each other until I get the correct answers.	252	3	2	6	41	48
11.	Through this proposed process oriented guided inquiry learning model, I want to do hands-on activities myself.	252	2	2	11	47	38
12.	Through this proposed process oriented guided inquiry learning model, I want to implement this teaching model not only in chemistry but also in other subjects.	252	1	4	6	41	48
13.	This teaching model enables me to improve knowledge and information.	252	3	6	17	56	18
14.	This teaching model enables me to develop critical thinking skill.	252	1	3	7.5	58	30.5
15.	This teaching model enables me to develop problem solving skill.	252	1	12	18	46.8	22.2
16.	This teaching model enables me to develop the skill of management in their learning activities.	252	1	3	13.9	43.6	38.5
17.	This teaching model enables me to develop communication skill.	252	1	4	6	50	39
18.	This teaching model enables me to develop teamwork spirit.	252	1	1	3	46	49
19.	This teaching model enables me to develop self-assessment and assessment of other's responses.	252	2	2	11	43.3	41.7

Note. N = Number of students who participated in the experimental groups

Based on the results of Table (9), most of the students who participated in experimental groups had positive attitudes in four areas of proposed process oriented guided inquiry learning model: developing good habits through small group discussions, developing good habits through inquiring, developing good habits through practical activities, and developing POGIL process skills. Therefore, it can be interpreted that proposed process oriented guided inquiry learning model had a significant effect on students' learning to get chemistry concepts.

Discussion and Suggestions

Concerning knowledge level on posttest scores, there were no significant differences between experimental groups and control groups at knowledge level questions in S1, S2, S3, S4 and S6. Generally, formal instruction could improve the lowest level of cognitive domain.

Therefore, it can be interpreted that the formal instruction could improve and remember facts, terms and basic concepts on knowledge level questions like proposed process oriented guided inquiry learning model. However, there was a significant difference between experimental group and control group at knowledge level questions in S5. Therefore, it can be interpreted that proposed process oriented guided inquiry learning model had a significant effect on the development of concept skills of students in S5.

Concerning comprehension, application, analysis, synthesis and evaluation level questions on posttest scores, there were significant differences between experimental groups and control groups at comprehension, application, analysis, synthesis and evaluation level questions in all schools. This is due to the fact that students from the experimental groups understand chemistry facts, ideas and concepts by organizing, comparing, interpreting, giving descriptions and stating the main ideas more than those of control groups. This result is similar with the findings of Şen, Yilmaz and Geban (2016) from a public school in Turkey that process oriented guided inquiry learning resulted in a better acquisition of scientific conceptions and in changing misconceptions in electrochemistry concepts.

Concerning attitude questionnaire of students towards proposed process oriented guided inquiry learning model, it consists of four main areas such as developing the good habits through small group discussions, developing the good habits through inquiring, developing the good habits through practical activities, and developing POGIL process skills. According to the results, all students who participated in experimental groups had positive attitudes towards proposed process oriented guided inquiry learning model. Therefore, it can be concluded that proposed process oriented guided inquiry learning model has the positive effects on the development of concept skills of students at the high school level in Myanmar.

From the results of research findings, the following suggestions are described to improve teaching and learning of chemistry. Concerning suggestions for students' learning, the experimental groups who received proposed process oriented guided inquiry learning model were significantly higher than control groups who did not receive it for concept skills on posttest from the six selected schools. Relating the students' attitudes towards proposed process oriented guided inquiry learning model, it consists of four areas: developing the good habits through small group discussions, developing the good habits through inquiring, developing the good habits through practical activities and developing POGIL process skills. According to these results, it was found that all students who participated in experimental groups had positive attitudes towards proposed process oriented guided inquiry learning model. This is due to the fact that most of the students agree that they were very interested in proposed process oriented guided inquiry learning model because they worked in small group discussion, learned practical activities, and explored chemistry concepts through additional reference books and key questions. Therefore, it is suggested that chemistry students should be given the opportunities such as small group discussion, practical activities, exploring chemistry concepts through additional reference books and key questions.

Concerning suggestions for the improvement of chemistry subject, chemistry is based on both practice and interpretation. According to Basic Education Curriculum, Syllabus and Textbook Committee (2017-2018), there are (15) chapters in Grade Ten chemistry textbook. It is organized five main areas such as matter, laboratory preparation, laws and questions and problems, mathematical problems and practical activities. However, it is not possible to use proposed process oriented guided inquiry learning model for all activities and chemistry concepts in Grade Ten chemistry textbook. But, it should be used based on the time and circumstance of a lesson. Therefore, it is suggested that chemistry teachers should use this learning model in accordance with the nature of the content area.

The results of this research study contributed to the improvement of teaching and learning chemistry at the high school level. However, there is no perfection for all circumstances of a situation. Therefore, it is necessary to conduct for future research study. Since all data were collected from Ayeyawady Region, further research study should be carried out in the rest of the States and Regions to become generalization. Actually, this research study was carried out in chemistry subject of Grade Ten. So, further research should be carried out Grade Eleven and other subjects. In this study, the content areas were limited to six chapters: symbols, formulae and equations, formula writing and the naming system, the mole concept, oxygen and its compounds, oxides and hydroxides and hydrogen from Grade Ten chemistry textbook. Further research should be carried out more topics to become generalization.

According to these results, experimental groups improved concept skills more than those of control groups in all schools. The results also showed that proposed process oriented guided inquiry learning model made improvement not only in urban schools but also in rural schools. Therefore, it can be interpreted that proposed process oriented guided inquiry learning model had a significant effect on the development of concept skills of students in all schools.

Conclusion

The main objective of this study is to investigate the effectiveness of proposed process oriented guided inquiry learning model for chemistry teaching at the high school level. Process oriented guided inquiry learning is a very effective teaching method not only in rural schools but also in urban schools for the improvement of academic achievement of students. According to the results of research findings, it can be concluded that students who were taught by proposed process oriented guided inquiry learning model positively contributed to the improvement of students' academic achievement at the high school level. Therefore, it is hoped that the proposed process oriented guided inquiry learning model will make substantial contributions to the chemistry teaching optimum in Myanmar high schools.

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