THE IMPACT OF MULTISENSORY LEARNING ON MYANMAR LITERACY ENGAGEMENT OF GRADE 1 STUDENTS*

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Abstract

The main purpose of this study was to investigate the impact of multisensory learning on Myanmar literacy engagement of Grade 1 students. Both quantitative and qualitative research study were used to observe the impact of multisensory learning on Myanmar literacy engagement. Cluster sampling method was used in this study. The participants in this study consisted of 38 Grade 1 students (20 male and 18 female). Firstly, multisensory intervention framework was created to use in the intervention program. Then, Myanmar literacy test was constructed to use as pre-test and post-test. Before the intervention program, pre-test was administered. The intervention period was totally eight weeks. Post-test was administered after the intervention program. The paired samples *t*-test was used to study the differences between pre-test and post-test results. Quantitative data revealed that students' post-test of literacy engagement was significantly higher than those of pre-test. Then, qualitative study was conducted. Through the process of triangulation method, using interviews, field notes and observation checklists, it was discovered that multisensory learning encouraged and promoted Myanmar literacy engagement of Grade 1 students. Multisensory intervention program would make great contributions. The contribution of the study is that it will provide educational personnels with valuable information that to improve the students' literacy engagement.

Keywords: Multisensory Learning, Literacy, Engagement.

Introduction

Literacy is critical in helping us to make sense of our world. Literacy is not only a fundamental human right but also a foundation for lifelong learning and continued human capital development for inclusive and sustainable development (Wilso, 2016).

According to the recent World Development Report, millions of students that have completed primary school in low-income countries lack even the most basic literacy skills (World Bank, 2017). This illiteracy caused millions of students lack to take advantage of extensive benefits of education. It was paramount that children learnt to read around the age of five or six so as to achieve high literacy rates. Findings from neuroscience research showed that the ideal time to develop the basic reading skills that lead to reading fluency was in early childhood (Abadzi, 2017). Ultimately, if a child did not begin learning to read around first grade, the negative effects cascaded and prevented the person from achieving high levels of fluency, learning more advanced cognitive skills, and progressing to higher levels of education (Graham & Kelly, 2018).

In new curriculum of basic primary education in Myanmar, Grade 1 is very important for laying a solid foundation for children's later academic achievement. First graders are taught the fundamentals of literacy, including reading and writing alphabets, words, sentences, etc.

*Third Prize(2024)

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Therefore, students need to get basic literacy skills at Grade 1. Students need to be taught and engaged in literacy activities enthusiastically in classroom. What matter most during this literacy foundation period was that all children in the classroom need to be engaged in literacy activities. Unfortunately, one of the most important challenges for teacher is how to teach early literacy skills effectively. Nowadays, promoting engagement was one of the challenges for the teachers, especially for the teachers who teach primary students. Primary students tend to have a shorter attention span compared to older learners (Harmer, 2015).

Willis (2007) said that all students learn differently and do not process information the same way. Each student has a special way of acquiring and keeping information that is particularly best for him or her. On account of the fact that different individual has different learning styles, they possess various sensory needs and require dynamic activities that are appealing for them. Whilst many explanations have validated to be more effective in teaching-learning circumstances, some receive deeply by way of the auditory, some by way of the visual and some achieve with the kinesthetic. Accordingly, students' sensory needs have a great effect on their academic attainment. As soon as students' sensory needs are not fulfilled, it make students disrupt their ability to learn and participate in academic activities. Multisensory approach is an approach that can solve problems dealing with diverse sensory needs and enhance student involvement. As the name implies, multisensory learning is the process of learning through the use of two or more senses. This includes combining visual, auditory, tactile-kinesthetic, and/or even olfactory and taste (Scott, 1993). Multisensory approach meets the students' sensory needs.

By teaching through multiple senses, teachers are ensuring that students who learn through visual stimulation, auditory stimulation and movement are all being addressed and reached (Christie, 2000). To summarize, multisensory learning is also a more engaging approach so that it assures for all students by considering their learning preferences are provided with multiple ways to learn and comprehend. This research may help teachers and curriculum developers to review their instructional methods and curriculum in order to foster future education.

Purposes of the Study

1. To study the difference between pre-test and post-test in Myanmar literacy engagement of Grade 1 students.
2. To study how multisensory learning impacts on Myanmar literacy engagement of Grade 1 students.

Definitions of Key Terms

Multisensory Learning. Multisensory learning is continual use of the two or more senses to teach abstract concepts, making them concrete and accessible for memory, usage, and transference, and using several modalities at one time to strengthen neural pathways (Sprenger, 2008).

Literacy. Literacy is operationally defined as the ability to read, write, communicate, and compute using printed and written materials associated with varying contexts (Wilso, 2016).

Engagement. Engagement is defined as the students' willingness to actively participate in the learning process, as well as a demonstrating of sustained involvement and positive emotional tone toward learning experiences (Miller et al., 2011).

Related Literature Review

Multisensory Approach

Multisensory was one of the methods which had been adopted in the application of teaching and learning strategies. Multisensory teaching was developed by several pioneers in the field of education such as Montessori (1912), Fernald (1943), and Gillingham & Stillman (1997), where they have had to teach toddlers and students with learning disabilities such as dyslexics, late learners and those with inability to focus in learning (Inocian, 2018; Nakra, 2019). This approach was first introduced by Grace Fernald in 1943 and popularized by Maria Montessori (Inocian, 2018; Nakra, 2019). A few principles were applied as part of the technique to integrate all sensory such as application by the professionally trained, testing using appropriate tests, enhanced sensory activities involving audio and visual, safe intervention areas, engaging activities, activities requiring interaction involving the whole body especially through game-playing, the creation of internal motivation, and activities enjoyed by the students (Inocian, 2018).

Literacy

There is no best way to define literacy which changes according to the needs and practices of groups of people. Thames and York (2004) stated that literacy was complex; it is a constantly mediated force that can take on a life of its own in different contexts, cultures, and social and political areas (Kennedy et al., 2012). Because literacy evolves with changes in cultural communicative practices and technological developments, so too do definitions of literacy (Wilso, 2016). A wide range of theoretical perspectives which have evolved and developed over time strengthen research on literacy. These perspectives have a great impact on research, policy and pedagogy (Kennedy et al., 2012). As the years passed, there were numerous theories with respect to literacy. They are maturational theories, cognitive theories, constructivist theories, socio-cultural theories, psycholinguistic theories, emergent literacy, digital literacy, multimodality (Kenned et al., 2012).

Students' Engagement

Student engagement was crucial in the learning process since it was about the students' active participation that helped achieving the learning objectives (Miller et al., 2011). Classification of engagement into three key elements is cognitive, emotional and behavioral. This classification covered the complexity of students' engagement (Fredricks, Reschly, & Christenson, 2019). Involvement of student in class-associated activities is determined as behavioral engagement. Emotional engagement referred to students' affective responses to

learning; and cognitive engagement refers to mental effort to process information in execute classroom tasks (Ng, Bartlett, & Elliott, 2018). Behavioral and emotional engagement are preconditions of cognitive engagement (Ishak & Amjah, 2015).

Method

Sample of the Study

A total of 38 Grade 1 students, 20 male students and 18 female students, from B.E.M.S (19) Paukkaung were chosen by using cluster sampling method.

Research Method

The one group pre-test post-test experimental design was used. Quantitative and qualitative methods were used. Triangulation method, using students' interview, field notes and observation checklist, was used for qualitative study.

Instrumentation

To measure the Grade 1students' Myanmar literacy engagement, Myanmar literacy test was constructed. DIBELS (Dynamic Indicator for Basic Early Skills) (Good & Kaminski, 2011) was referenced and modified for Myanmar literacy test. The DIBELS measures are indicators of beginning literacy skill development used to assess kindergarten through 6th grade beginning literacy skills (Good and Kaminski, 2011). The essential literacy skills measured and assessed by DIBELS include phonemic awareness, alphabetic principle, fluency, and reading comprehension. Myanmar literacy test was based on basic early literacy skills of DIBELS. In this study, there were nine subtests for Myanmar literacy test: Letter Sound Identification, Letter Name Identification, Rhyme Recognition, Rhyme Production, Nonsense Word Reading, Initial Sound Identification, Words Reading, Oral Reading and Listening Comprehension. The time allowed for Myanmar Literacy Test was 40 minutes.

For the qualitative study, interview questions were created. There were four items of interview questions in this study. Interview questions were stressed on students' reflection and opinions on multisensory lessons. Observation checklist was used with the focus on students' behaviors during multisensory activities. Observation checklist was constructed by following the principles and guidelines of Gay et al. (2012). There were ten items in the observation checklists. Field notes were used to get all relevant information of the students' situation during the intervention program. Field notes were based on the protocol of field notes guided by Gay et al. (2012). Field notes contained two basic types of information: (1) descriptive information about what the observer has directly seen or heard on-site through the course of the study and (2) reflective information that captures the researcher's personal reactions to observations, the researcher's experiences, and the researcher's thoughts during the observation sessions.

Procedure

Firstly, multisensory intervention framework was constructed. Then, multisensory lesson plans for Myanmar subject was created in order to develop multisensory intervention program. The multisensory lesson plans were constructed based on the Grade 1 Myanmar textbook. Then, Myanmar literacy test was constructed for the pre-test and post-test. Next, Grade 1 students from B.E.M.S (19) Paukkaung were selected as the sample by the cluster sampling method. The pre-test was administered to the students before the intervention program. After the pre-test had administered, the intervention program was implemented. The intervention program duration was totally eight weeks. There was one hour of teaching period for a day. During the intervention program, observation checklist was used to observe students' behaviors in multisensory activities. In order to collect data needed and to get the reliability of data, researcher assistant was involved as an observer. Moreover, field notes were written after every a lesson had finished in order to get the data about students' behaviors and activities during the intervention program. After completing the intervention program, post-test was assessed and data were calculated to know about the differences between pre-test and post-test. After administering the post-test, interview was conducted to get the students' feeling and reflection about the multisensory intervention program.

Data Analysis and Research Findings

Quantitative Data Analysis and Research Findings

Comparison of Pre-test and Post-test Results for Myanmar Literacy Test

To evaluate the difference between pretest and posttest in Myanmar literacy engagement of Grade 1 students, paired samples *t* test was calculated. To examine students' Myanmar literacy engagement, Myanmar literacy test was used. The mean scores and standard deviations of Myanmar literacy test of pre-test and post-test were described in Table 1. The results of paired samples *t* test stated that there were significant differences of pre-test and post-test results in letter sound identification (t = -4.080, $p <$ 0.001), letter name identification (t = -6.726, $p <$ 0.001), listening comprehension (t = -15.558, $p < 0.001$), nonsense word reading (t = -27.313, $p < 0.001$), rhyme production (t = -15.308, $p < 0.001$), words reading (t = -17.402, $p < 0.001$), initial sound identification (t = -3.582, $p < 0.001$), oral reading (t = -20.004, $p < 0.001$), rhyme recognition(t = -4.839, $p < 0.001$), and total Myanmar literacy test (t = -39.6, $p <$ 0.00l). It may be interpreted that multisensory learning effectively improved student's engagement in Myanmar Subject. Students performed better in post-test of letter sound identification, letter name identification, rhyme recognition, nonsense word reading, rhyme production, word reading, initial sound identification, oral reading, listening comprehension than those of pre-test. It was expected that, because of the multisensory intervention, students were versed in literacy skills such as alphabetic principles, the letter sound and letter names accurately and effectively. Also, it would be supposed that students were conversant in similar sounds and rhyming words through the multisensory approach. As well as, students would attain the ability to recognize and produce

the initial sound accompanying multisensory intervention. Moreover, there was an accelerated progress in nonsense words reading, words reading and oral reading, and it would be assumed that students mastered phonemic awareness, letter-sound correspondence and ability to blend letters into words together with multisensory approaches. Finally, it can be said that students developed listening comprehension skills by engaging in multisensory activities. Mean comparison of visual presentation was shown in Table 1.

Table 1. The Paired Samples *t* test Results for Myanmar Literacy Test

Subtest	Groups	*N*	*M*	*SD*	*t*	*df*	*p*
LLetter Sound Identification	Pre-test	38	6.79	.905	-4.080***	37	.000
	Post-test	38	7.45	.504			
Letter Name Identification	Pre-test	38	6.45	.645	-6.726***	37	.000
	Post-test	38	7.39	.638			
Listening Comprehension	Pre-test	38	3.37	.489	-15.558***	37	.000
	Post-test	38	3.84	.370			
Nonsense Word Reading	Pre-test	38	2.21	.664	-27.313***	37	.000
	Post-test	38	7.03	.788			
Rhyme Production	Pre-test	38	2.27	.623	-15.308***	37	.000
	Post-test	38	4.37	.675			
Word Reading	Pre-test	38	1.92	.673	-17.402***	37	.000
	Post-test	38	6.13	1.319			
Initial Sound Identification	Pre-test	38	3.39	.547	-3.582***	37	.000
	Post-test	38	3.79	.413			
Oral Reading	Pre-test	38	2.50	.797	-20.004***	37	.000
	Post-test	38	7.61	1.424			
Rhyme Recognition	Pre-test	38	2.24	0.490	-4.839***	37	.000
	Post-test	38	4.42	0.642			
Total Myanmar Literacy Test	Pre-test	38	30.76	1.992	-39.600***	37	.000
	Post-test	38	52.03	2.410			

Note.***p<.001

Qualitative Data Analysis and Research Findings

Triangulation method was used. Three types of data were collected in this study; students' interviews, observation, and field notes.

Results of Interviews

The first question included in interviews is "Did you enjoy learning with multisensory activities?" "Why/Why not?" All students answered they enjoyed learning with multisensory activities, however their reasons of responses varied. Exactly, students enjoyed because of playing games (75% of participants), proficiency in reading and writing (eg. I can read and write much better than before, 64% of participants), unusual and new activities (eg. I have never

learned with games like this before, 58% of participants), motivation (eg. Sometimes, I used to be lazy and sleepy to learn but I was happy to learn now, 43% of participants), other reasons (25% of participants). Visual presentation was shown in Figure 1.

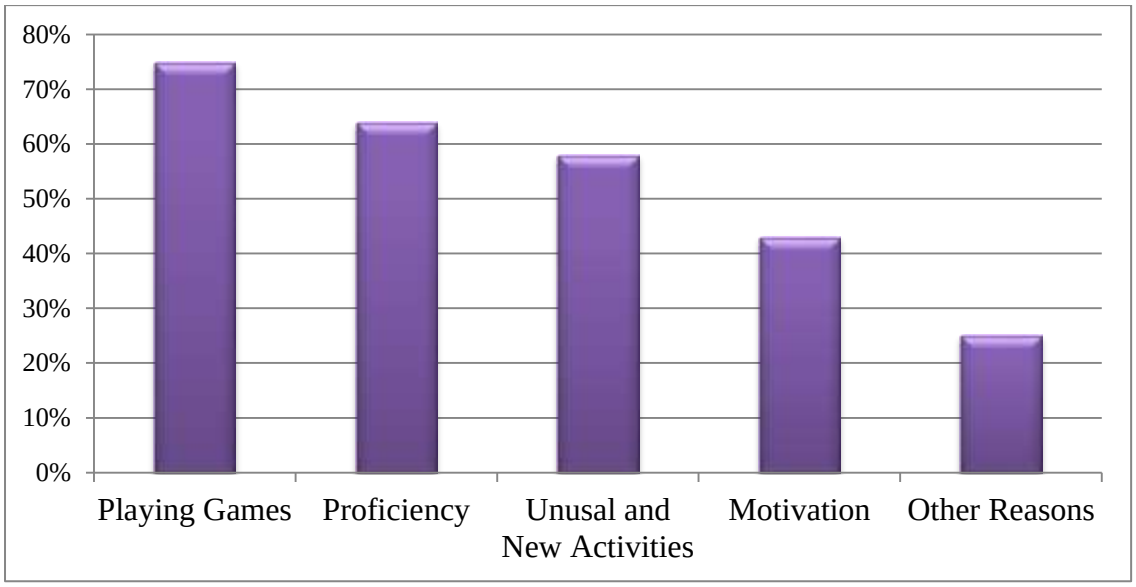

Figure 1 Percentage of Students' Responses Regarding the Reasons for Why They Enjoy Learning with Multisensory Activities

The second question was "Which sensory (kinesthetic, auditory, visual, tactile, gustatory) activities used in the lessons did you like most?" Students answered their favorite activities used in the lessons. Specifically, responses were kinesthetic (98% of participants), tactile (88% of participants), gustatory (67% of participants), visual (62% of participants), auditory (56% of participants). Visual presentation was as shown in Figure 2.

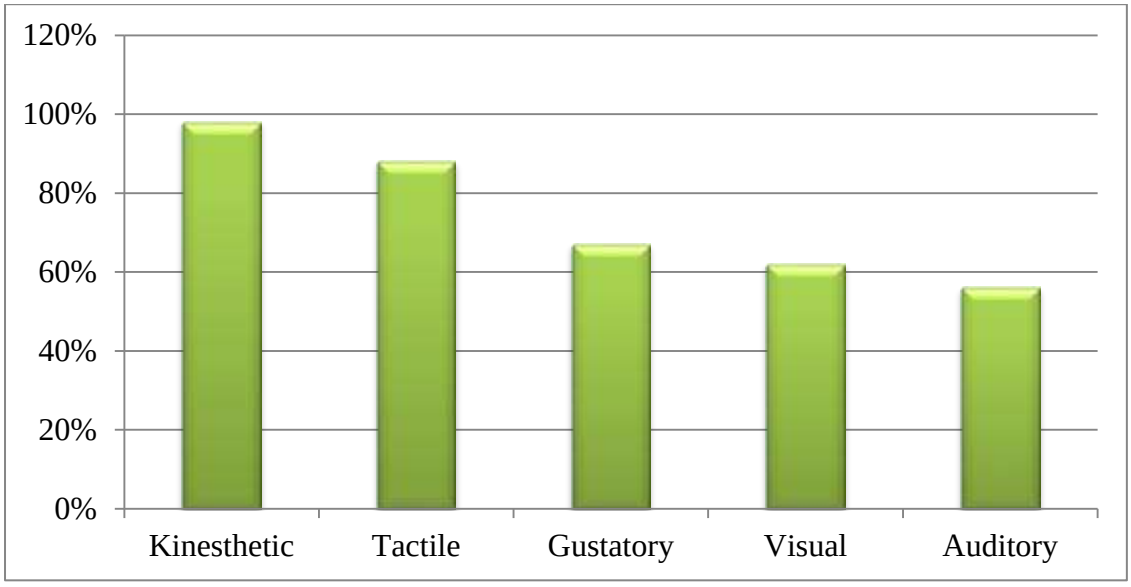

Figure 2 Percentage of Students' Responses Regarding Their Most Favorite Sensory Activities

The third question was "Which sensory (kinesthetic, auditory, visual, tactile) activities used in the lesson did you like least?" Regarding their least preferred sensory activities, most students expressed nothingness that there was no sensory activity that they didn't like (eg. I like

every activities, they all are fun; I like all and I wanted to learn more and more; 85% of participants did not express anything they didn't like). Other responses included tactile (10% of participants, eg. I don't like writing letters on the toothpaste because I didn't like its smell; I don't like writing letters on the sand because it was dirty), Kinesthetic (5% of participants, eg. I don't like shooting phonics sounds cards with hockey sticks and read it activity because I can't shoot the cards rightly; I don't like bouncing the ball to the letters from the wall because my hands were tired to bounce the ball). Visual presentation was viewed in Figure 3.

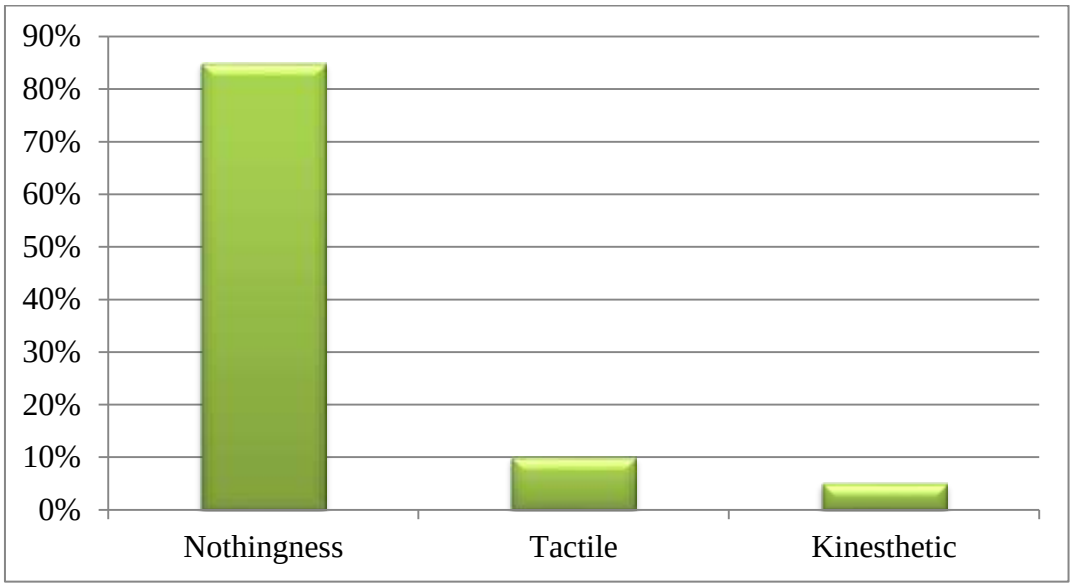

Figure 3 Percentage of Students' Responses Regarding Their Least Favorite Sensory Activities

The fourth question was "Which sensory activities (visual, auditory, kinesthetic, tactile, gustatory) do you think you are powerful or you can do the best? Students answered their powerful sensory activities used in the lessons. Precisely, responses are tactile (84% of participants), kinesthetic (80% of participants), visual (78% of participants), auditory (65% of participants), gustatory (60% of participants). Visual presentation is as shown in Figure 4.

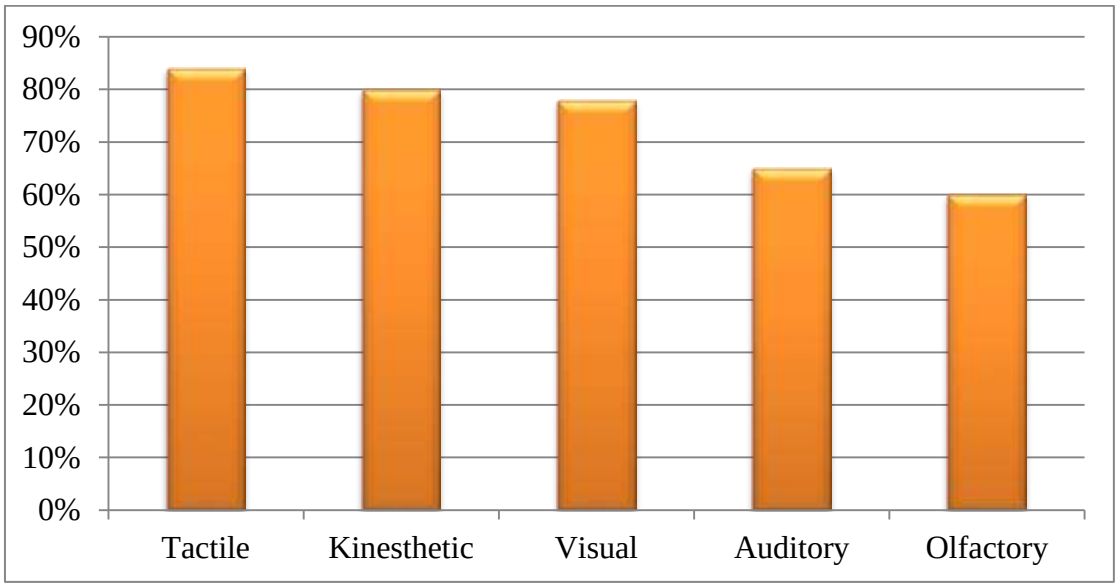

Figure 4 Percentage of Students' Responses Regarding Their Powerful Sensory Activities

To conclude, all students described multisensory lessons as fun and enjoyable. Students were interested in multisensory lessons and wanted to be involved in learning. This finding was consistent of Molenda & Bhavangri (2009), which stated that students become not only cognitively involved but also emotionally involved in multisensory activities in the classroom.

Results of Observation Checklists

The number of total observations was 40 for total 40 lesson plans. Percentages of observation were calculated based on total 40 observations. Students participated in various sensory activities actively and enthusiastically. However, students participated weakly in group work activities. The following table showed summary of results of observations checklists. The following Table 2 revealed the summary of results of observation checklists.

Table 2. Summary of Results of Observation Checklists

No	Students' Behavior	% of total observation
1.	Students looked at the pictures or visual aids .	85%
2.	Students listened to the teacher presentation.	87%
3.	Students wrote on the worksheets or in their notebooks.	95%
4.	Students participated in hands-on activities.	80%
5.	Students engaged in kinesthetic activities.	85%
6.	Students involved in group work activities.	60%
7.	Students involved individual work activities.	75%
8.	Students took part in tactile activities.	80%
9.	Students responded to teacher questions.	70%
10.	Students performed in reading or singing the poems, songs.	80%

Results of Field Notes

The results from the field notes indicated that students were motivated to learn in different ways. Students performed energetically and were passionate in daily multisensory activities through the whole of intervention duration. Overall to say that, from the data in the field notes, it was determined that students engaged in their own learning by using a variety of multisensory approaches.

Conclusion and Suggestion

To summarize, this research has discussed about the application of multisensory approach in Grade 1 Myanmar subject. Owing to the numerous benefits of multisensory learning from the

current study, it is highly recommended that teachers should use multisensory learning in their classrooms. Based on the quantitative and qualitative data results, multisensory approach not only produced high test scores but also encouraged educational fun which fostered motivation and engagement of students. When students have fun in their learning at schools, they become friendly with schools and develop a love of learning. Since the study results showed that students received literacy engagement, and students were emotionally and behaviorally engaged in multisensory activities, teachers and administrators should apply multisensory learning approach and activities as a media to become child friendly school as well as to promote literacy engagement. Based on the findings of this study, some recommendations for future research were made. Supplementary confirmation of the effects of multisensory approach will be provided to the researchers by expanding the utilization of multisensory approach across another subject. A comparative study amongst primary, middle and upper grades should be conducted in order to get more light on the effect of multisensory learning. Again, future research should be operated to study the impact of multisensory learning on special students and special education classroom.

Acknowledgements

We would like to offer respectful gratitude to Rector Dr. Kay Thwe Hlaing, Pro-rector Dr. May Myat Thu, Pro-rector Dr. Khin Khin Oo, and Pro-rector Dr. Nyo Nyo Lwin for their official permission to do this research. Especially, We are grateful to Dr. Khin Hnin Nwe (Professor and Head of Department of Educational Psychology, Yangon University of Education) for her encouragement and valuable comments. Moreover, We would like to express our heartfelt gratitude to teachers from the Department of Educational Psychology for their warm support and kindness. We owe a great debt to teachers and students of the selected school who helped us heart and soul in collecting data and allowed their students to participate in this study.

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