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The Creation of Technological Interactive Cerdik BM Series 1 as an Innovation of Pedagogical Tool to Support Malay Language Skills

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Abstract: ***Education is a process of growth and development as a result of individual interaction with the social and physical spheres. Basic skills such as reading and writing skills are important to children in the world including Malaysia. Therefore, the Literacy and Numeracy Screening (LINUS) program was introduced to help children achieve these two skills. LINUS children can be as successful as the mainstream students but they need some kind of pedagogical innovations to help, motivate and engage them in learning. As such, interactive pedagogical tool innovation helps in the dissemination of information by teachers to students. In this study, qualitative research method was used to gain LINUS teachers' and students' insights into the innovative application of Cerdik BM Series 1. Interviews with semi-structured protocols were conducted on ten LINUS teachers and six Linus students in Northern Malaysia. The results showed that LINUS teachers and students responded positively to the Cerdik BM Series 1. The application of virtual game-based learning approach can create an entertainment learning environment to stimulate LINUS students which helps to improve their literacy skills. Per se, an innovative pedagogical tool that integrates technology can increase the interest of students, especially primary school students.***

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Keywords: Literacy and Numeracy Screening, Reading and writing skills, Malay Language, Game based learning, Innovation of pedagogical tool.

I. INTRODUCTION

Children are an invaluable asset in the formation and development of a nation. This is also supported by (UNICEF, 2015) who believe that productive life begins in the early childhood. This generation, who is still helpless from various angles, needs to be protected so that in the future they can offer the best contribution to the nation.

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Thus, the Universal Declaration of Human Rights 1948 (UN General Assembly, 1948) and the CRC (UN General Assembly, 1989) are among the declarations and conventions that were formulated to achieve this purpose. Human intelligence built from early childhood development will have a lasting impact on the child's intellectual capacity, personality and social behavior (UNICEF, 2015).
Children are believed to undergo the early stages of development through four aspects: numerical-literacy, physical, social-emotional and learning (UNICEF, 2014).

In line with UNICEF's (2014) agenda, Malaysia ratified the CRC on February 17, 1995. Article 28 touches on the country's responsibility to ensure that primary education is compulsory and free of charge to all children, whereas Article 29 of the CRC explains that education should have the goal of developing the highest level of personality, talent and mental and physical abilities of children. However, the reality is that children's mental abilities are not uniform as there are differences in the level of language acquisition and mastery among them. In line with Rice and Hoffman's (2015) study, children with language problems are less able to master vocabulary compared to children who are not affected by the language. However, these children showed improved performance when the picture vocabulary test was given (Rice & Hoffman, 2015).

When students, even at their most basic level, could not fully achieve the literacy ability, they will face a great challenge in mastering basic life skills and functioning effectively in society. It is with these skills and ability that they will be able to develop values for themselves, society, and the nation. Therefore, to ensure that all students reach a sufficient level of literacy, Literacy and Numeracy Screening (LINUS) was introduced in 2010 to replace the Reading and Writing Early Intervention Class (KIA2M) program that requires every student to undergo screening from Year One (7 years old) to Year Three (9 years old) (Abdul Said & Hariana, 2017). This paper therefore provides a brief background on the implementation of the LINUS program and literacy problems among students.

A. Research Background

The rights of child development through early education have been accepted by the international community (UNICEF, 2014).

The Ministry of Education Malaysia introduced Literacy and Numerical Screening or better known as LINUS 1.0 in 2010 to address the problem of reading, writing and counting among primary school students (Ministry of Education Malaysia, 2013).

The Malaysian Education Development Plan 2013-2025 also reported that early on, the LINUS Program saw remarkable success when 98% of 87% showed improvement in Malay language literacy and 99% of 76% in numeracy (Ministry of Education Malaysia, 2013).

This percentage further strengthened the Ministry of Education's (2013) effort to expand the LINUS 1.0 program to LINUS 2.0 by expanding its scope to overcome literacy in Malay and English languages; and numeracy. It aims to help students improve their reading and writing potential before they are reintroduced into the mainstream curricula (Abdul Rasid, 2011; Ministry of Education Malaysia, 2013).

In the early stages of schooling, a very important skill for primary school students in Malaysia to master is the Malay language literacy (Zahanim, 2016). Malay language literacy is the ability to acquire the skills to read, write and understand Malay words (Mahzan, 2012). The mastery of these skills enables students to apply knowledge in daily learning and communication (Ministry of Education Malaysia, 2013).The National Key Result Areas (NKRA) and the Ministry of Education Malaysia (KPM) aim to ensure that all students master the Malay language literacy (Chew, 2015). Recent studies indicate that there are still students who are lagging behind in this aspect (Copland, Garton & Burns, 2014). According to Nazariyah (2014), the Government Transformation Program shows that in 2008, 54, 000 1st year students did not master the literacy skills. Thus, to enhance the literacy ability of students in learning the Malay language, KPM has made significant changes by implementing a literacy and numeracy program called the Literacy and Numeracy Screening (LINUS) program in 2010 (Abdul Said & Hariana, 2017).

According to Mohd Razak, Shaharuddin and Normah (2014), the purpose of the LINUS program is to ensure that pupils master literacy within the first three years of schooling. The LINUS program has received the support of researchers (Arbiah, Mohd Khairuddin, Musirin & Hairi, 2018; Chew, 2015; Roslan, 2014) in previous studies, who felt that the program should continue with strong support from parents and the community. Following the implementation of this program, the Examination Syndicate, Ministry of Education Malaysia (2013) has provided a module for teachers and students to adhere to the concept of an integrated literacy approach. However, no inventions have been made on interactive pedagogical tools that use computers to serve children living in this age of sophisticated technology.

The creation of interactive application innovations is needed to enable students to actively learn and think dynamically. Active learning is indeed relevant in education such as literacy because it involves cognitive, cooperative and communicative activities. The activities such as listening, reviewing, asking, discussing and applying knowledge are gained during group work (Roehl, Reddy & Shannon, 2013). Computer-based learning is another attempt to create active learning. LINUS students tend to get bored when learning takes place in a one-way teacher-centered environment (Aliza & Zamri, 2015). Thus, teachers play a role in enhancing students' responsibility, learning skills, social interaction, interest and confidence (Umi Kalthom & Ahmad Esa, 2014). Consequently, computer-based learning using interactive applications too can create an active learning environment among students (Ali, 2009). Interactive elements create two-way communication and drive interest, motivation, readiness, responsibility for learning in LINUS students. This situation supports their potential to increase the level of language and literacy skills to a more perfect level (Ali, 2009).

B. Problem Statement

The Government Transformation Program Report, 2010 shows the statistics in 2008, of which 54, 000 Year One students lacked literacy skills. As such, the KPM implemented the LINUS Program to address the rate of students' failure in literacy. According to a study by Roslan (2014), there were 11% or 50, 235 Year One students in Malaysia who did not meet the literacy standard. Although there was a reduction in 2007 of 10% or 51, 486, in 2008 the rate of Year One students who did not reach literacy increased to 13%, or 54, 000 failing students. This shows that the implementation of literacy modules for teachers and students (Ministry of Education Malaysia, 2013) needs to be supported, that is through the creation of multimedia interactive application innovations.

II. RESEARCH QUESTIONS

1. What are LINUS teachers' views of innovation in learning tools such as the Cerdik BM Series 1?
2. What are LINUS students' views on the creation of the Cerdik BM Series 1?

III. LITERATURE REVIEW

A. The Use of ICT to Enhance Learning

Digital age education requires the use of Information Communication Technology (ICT) as a medium of teaching and learning in the classroom. According to Noor Mazlan and Noraziah (2010), the use of ICT can solve many problems, especially learning problems. This is in line with Dlamini and Coleman's (2017) opinion that ICT provides an opportunity for teachers to innovate to improve students' achievement and learning experience. This is evidenced by Genlott and Gronlund's (2016) study of students with reading and writing problems. The findings of the students' study of reading problems were divided into two groups, namely, those undergoing traditional processes (chalk & talk) and those using ICT. The results showed that students who underwent the process and experience of learning through ICT performed better than students in the conventional learning group.

With ICT integration, teachers can also create interactive pedagogical tools that enhance students' learning (Amin, 2013). Further, according to Cai, Chiang, Sun, Lin and Lee (2016), interactive pedagogical tools help students to master learning and enhance students' memory. This is in line with Cordero et al. (2015) that interactive pedagogical tools are important to balance the learning experiences and achieve pedagogical goals in children's learning processes.

B. Edutainment Approach

Computer-assisted teaching and information technology is one of the processes that can help make student-centered learning and materials a success (Norasiah, Nor Risah, Rosnah, 2011;

Aliyah & Mohd Mokhtar, 2017). Children are a very vulnerable generation of technological changes and advances. The younger generation is seen as having natural ability in exploring technology (Laili & Maizatul, 2014). Game-Based Learning is a visual game that utilizes a play and learning approach that is favored by students (Amin & Ahmed Tanni, 2014). Play is an exciting part of early childhood education because playing enables children to experience their own learning experiences (Ad Norazli & Jamil, 2014). The excitement of learning while playing causes students to unconsciously go through effective learning processes (Hamari, Shernoff, Rowe, Coller, Asbell-Clarke, & Edwards, 2016). This can stimulate students' learning and motivation as they focus on the next lesson to make learning more meaningful and effective. (Eseryel, Law, Ifenthaler, Ge, Miller, 2014). Games are a method of teaching that develops creativity and engages students' interest in the subject being taught (Ramsi, 2015). Research shows that learning through playing can reduce students' boredom and frustration while learning in the classroom (Hanus & Fox, 2015). In order to identify the real potential of children, in the development of a multimedia product such as digital games in education, their views should be taken into account (Laili & Maizatul, 2014). Learning activities involving digital games help students become more confident and creative, and value the game as a learning process (Laili & Maizatul, 2014).

C. Screen Shot of Cerdk BM Series 1

Cerdik BM series 1 contains 3 constructs: construct 1 (vowel and consonant letter), construct 2 (practicing the syllables), construct 3 (practicing a combination of two syllables, reading and writing open syllables). Teaching sessions begin with the use of vocal and consonant songs to create a fun learning environment. The learning activity is based on fun learning through game-based learning approach. Scores and time periods for learning activities are displayed automatically to motivate students to continue learning.

IV. RESEARCH METHODOLOGY

A. Research Design and Instrument

The study was carried out fully using qualitative research method. The form of Qualitative Study aims to provide a deeper understanding of the subject matter of the study (Braun & Clark, 2013; Hesse-Biber, 2017). Data from semi-structured interviews were thematically analyzed to gain LINUS teachers' and students' views on the construction of Cerdik BM Series 1. This investigation approach aims to find and understand the phenomenon or process, along with the perspective and worldview of the people involved (Hesse-Biber, 2017). There are three types of interview techniques outlined by Braun and Clark (2013) namely structured interviews, semi-structured interviews and unstructured interviews. Two semi-structured interview protocols were developed by researchers to gain the views of LINUS teachers and students. The rationale for using semi-structured interviews is that it is flexible and allows respondents to articulate what they think to gain the perspective of LINUS teachers and students in the Cerdik BM Series 1 application. Both instruments have undergone a process of validity and reliability to ensure that they serve as a valid benchmark for this study.

Five experts in the field of qualitative research were selected to review the interview protocols so that it fits the purpose of the study and the language used by the respondents was clear and easy to understand.

B. Research Participants

The study consisted of 10 LINUS teachers from two schools in the state of Kedah, one in a city and one in the rural area. The selected LINUS teachers have the experience of teaching LINUS Malay language and Malay language for the mainstream between eight and

20 years in primary school. The six students selected for the interview consisted of LINUS students between the ages of seven and nine. The selection of study participants is in line with the recommendations of Braun and Clarke (2013) that the selection of participants for qualitative research based on their relevance to the subject being studied.

C. Data Collection Procedure

The process of data collection requires careful planning to ensure that the data collection process can be carried out efficiently. In qualitative research, the relationship between the researcher and the respondent is crucial to reducing bias and enabling the researcher to build the trust of the respondent (Creswell, 2009). Rapport facilitates the researcher to obtain sufficient information for his or her research (Creswell, 2009) and the built-in rapport enables the respondents to provide a wide range of honest information in the usual circumstances and feel safe without being influenced by the presence of the researcher. This study requires researchers to work with selected LINUS teachers and students as samples. The relationship between the researcher and the teacher and the student is one of the important factors in determining the success of this qualitative study. Through face-to-face interviews, the sessions were recorded with tape recordings and notes. Interview sessions began with asking basic, general questions and then focusing on the research needs. This session was conducted to obtain LINUS teachers' and students' perceptions and explanations regarding interactive applications of Cerdik BM Series 1.

D. Data Analysis

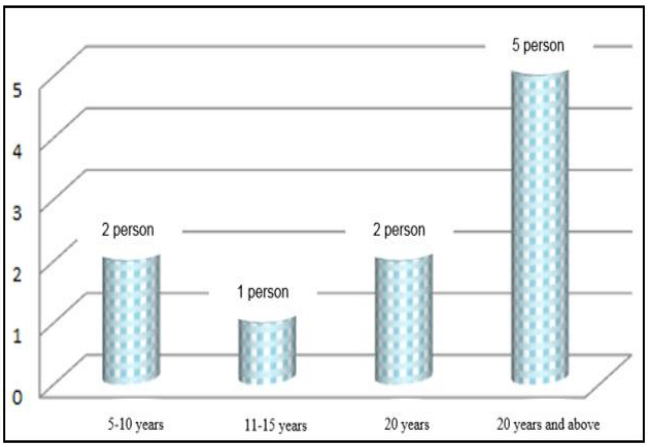
Thematic analysis approach was used in this study as suggested by Braun and Clark (2013) to analyze the interview data. According to Braun and Clark (2013) thematic analysis is the method of analysis used in qualitative studies by identifying themes, concepts and meanings. It requires a coding system related to the purpose of a research. According to Braun and Clark (2013), coding categories should be developed as soon as the first data collection is performed. Coding makes it easy for a researcher to understand the information obtained and to guide in determining the focus of the next information search. Creswell (2009) states that encoding is not a data that is ready to be analyzed. It is published continuously throughout the process of data collection. All the information obtained through the interview will be reviewed by the researcher through the tape recordings and compared to the notes taken. The analysis of the interview data was done manually according to the questions asked. Interview data analysis was done in two stages, namely (i) interview transcription stage (ii) theme search and coding.

V. RESEARCH FINDINGS

A. Profile of Research Participants

The study participants consisted of 10 teachers who taught LINUS Malay language and the mainstreams and six LINUS students, of seven to nine years old, are students who do not pass the literacy and numeracy tests. All study participants from rural schools were given codes G1, G2, G3, G4, G5. While codes G6, G7, G8, G9 and G10 refer to teachers from urban schools. Meanwhile, the codes for students involved as study participants were M1, M2, M3 from rural schools and M4, M5 and M6 from urban schools.

B. Teachers' Teaching Experience Profile

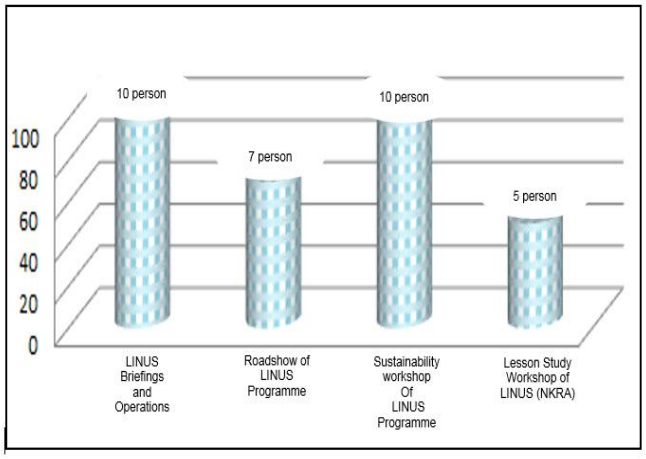


Rajah 1: Teachers' Teaching Experience Profile

The findings showed that 50% of the teachers (n=5) interviewed had the experience of teaching LINUS Malay language and the mainstream students over 20 years, followed by 20% of teachers (n=2) each having 5 to 10 years and 11 to 15 respectively years. Meanwhile, 10% of teachers (n=1) have been teaching for 11-15 years.

C. Profile of Teacher Professionalism Development Course

The findings of the professional development course profile indicate that the study participants generally have knowledge and skills related to LINUS. Among the courses, briefings and workshops attended by the teachers were LINUS Role and Operations Briefing, LINUS Program Science Course, Literacy and Numeracy Screening Program (LINUS) Workshop and LINUS NKRA 'Lesson Study' Workshop.



Rajah 2: Profile of Teacher Professionalism Courses

D. The Positive View of Teachers towards Cerdik BM Series 1

i) Cerdik BM Series 1 Increases LINUS Students' Interest to Learn

The LINUS teachers interviewed expressed their views on the Cerdik BM Series 1. They believe that the Cerdik BM Series 1 can attract LINUS students to learn. One of the reasons LINUS students are interested in the Cerdik BM Series 1 is that the use of computers has made them more attentive and focused on learning. While the concept of drilling in learning and assessment activities is also one that is able to attract LINUS students to focus on learning. The following are some excerpts from the feedback provided by the interviewees (G).

"This application is very effective for LINUS students to use because usually LINUS students are not interested in learning, so using a computer will make them more inclined to continue learning." (G1)

"LINUS students cannot focus on a long period of time while in the classroom. However, when using applications that involve computers they are usually more attentive and focused on learning. Therefore, the application is very good and effective in capturing their focus on the lessons and it also allows them to accept the lessons well." (G3)

"The use of this application gives LINUS students the opportunity to apply what the teachers have taught in the classroom through Cerdik BM Series 1. They will be more aware of what teachers have previously demonstrated in the classroom. This software will indirectly attract students because of the concept of drilling being implemented in learning and self-assessment activities." (G4)

ii) Cerdik BM Series 1 application is fun with interactive animation learning activities

From the interviews, teachers commented that the Cerdik BM Series 1 interactive application contains interactive animated elements that create a fun learning environment. A fun learning environment can help LINUS students to learn and understand the content more easily. In fact, the concept of edutainment using the computer and providing interactive learning activities is a factor in creating a fun learning environment. Teachers stated that graphic animation element is an attractive attraction in the Cerdik BM Series 1. Teachers found pupils to be excited and thrilled to use this app with the ever-moving graphics animations that make a difference in the learning environment of LINUS students.

"LINUS students enjoyed using this app because they love the interactive and animated elements that come with this app. If they are interested in continuing to use this application they will be able to learn and understand more easily." (G2)

"This Cerdik BM Series 1 application allows LINUS students to be interested in continuing to learn using the computer. Their direct interaction with the computer makes teaching and learning sessions more enjoyable. Therefore, the Cerdik BM Series 1 is great for LINUS students through learning while play concept." (G5)

"The use of this app in the classroom can attract students to learn in the classroom. Even students find it fun to learn and play with interactive learning activities."(G6)

"The use of pictures, moving graphics has successfully drawn LINUS students to explore the content in Cerdik BM Siri 1." (G5)

"In addition, the use of interesting graphics can also interest students. LINUS students were very impressed with the choices of pictures. In fact, they seemed happy with the picture animations and it was an experience that weak students often lack."(G7)

"Maximum use of animated graphics is the main attraction of LINUS students to Cerdik BM Series 1. Graphic animations create a difference in LINUS student learning environment."(G9)

iii) Cerdik BM Series 1 saves teachers' time without having to build teaching aids and gives teachers space to monitor students' performance.

Creating a Cerdik BM Series 1 interactive application can save teachers' time to build LINUS students' teaching aids. Thus, more time can be allocated for teachers to monitor students' performance over time.

"Teachers' time can be saved when using this application which means they can save / minimize the time to build their own teaching aids. It also gives teachers the opportunity to see or monitor student performance when they use the app."(G8)

iv) Cerdik BM Siri 1 inspires teachers to dominate the use of ICT in teaching

Interviews with teachers found that Cerdik BM Series 1 has given them aspirations to use technology in teaching and learning. Teachers also argue that teachers should dominate the use of ICT to guide the country's development and modernization.

"The use of this application made me realize that the use of ICT in learning can capture students' attention. Cerdik BM Series 1 inspires LINUS teachers to dominate the use of ICT in learning." (G3).

"Effective teaching through the dominance of ICT in learning in Cerdik BM Series 1 has given me the inspiration to diversify my teaching with the use of ICT." (G4)

"The Cerdik BM Series 1 app gives LINUS teachers a new aspiration to be ready to change for the better and not to be afraid of change. This is the modernization we need to recognize and the use of this application is a turning point for teachers to be more open in dominating the use of ICT in learning."(G9)

*"I am excited by the interactive application of Cerdik BM Series 1 as it inspires me to try more comprehensive use of ICT in teaching and learning LINUS." (*G10)

v) Cerdik BM Series 1 application is equipped with LINUS student-friendly language games.

The provision of language games through learning and assessment activities greatly facilitated control of LINUS students. The concept of learning while playing is very close to the students' environment.

"*Cerdik BM Series 1 application that uses theme park concepts is filled with game animations close to the LINUS students' environment. The concept of learning while playing through language games as a learning and assessment activity facilitates control of LINUS students."* (G6)

"Cerdik BM Series application involves language games through the concept of learning while playing. Student-friendly activities which can be managed by the LINUS students" (G8)

"The app comes with a language game that is very easy to understand and very close to the students' environment. It is also very easy for the students to handle on their own when it is explained by the teacher."(G10)

E. Challenges in the Implementation of Cerdik BM Series 1

i) Lack of computer skills among rural LINUS students

In an interview with LINUS teachers, they expressed some of the challenges they faced in implementing the Cerdik BM Series 1. Among them is the rural LINUS students' preparation and readiness in using the computer. The rural area students do not have good computer skills. Therefore, they need guidance and tutorials from teachers when using this application. One of the common feedbacks from the interview with these teachers is as follows (G).

"Students here are usually unfamiliar with the use of computers because the use of computers is not widespread as schools in the rural area."(G2)

ii) Teachers' Attitude

The attitude of teachers who are not ready to change towards the use of ICT in the teaching of LINUS is also a challenge.

"*lack of interest in using computers. So they are a bit skeptical of using software that uses computers."*(G1)

"Students appeared very rigid when using this application and even needed the guidance of a teacher when using the computer. This situation can be seen for students whose parents only work in the village. It is also a challenge" (G2)

"There are some teachers who do not use the facilities provided with students as some feel it is a waste of time to move from classroom to computer lab. In addition, teachers may be less skilled at using computers and more comfortable with traditional teaching methods." (G6)

"Teachers are not ready to change. There are some teachers who do not want to use ICT because they find it difficult to use." (G7)

"Some teachers are reluctant to accept the concept of entertainment in their teaching. They are only concerned with trying to finish the syllabus."(G9)

iii) Limited number of computers and lack maintenance

The limited number of computers in the school is a challenge for teachers in their quest to implement Cerdik BM Series 1. This has forced students to wait for their turn.

"Computers provided in schools are insufficient for the teachers and students. Therefore, a rotation system has to be implemented so that students can use it." (G5)

"Insufficient number of computers and so teachers had to take turns using the ICT lab. The school gave priority to the core subjects to use the lab and teachers had to spend extra time at the end of school."(G8)

F. Teachers' Perspective on Computer-Based Learning

Most of the teachers interviewed said that computer-based learning (CBL) should be widely used by all teachers in urban and rural schools. The use of computers in teaching and learning is in line with 21st Century Learning. Pupils were so excited when using this Cerdik BM Series 1 app. Some of the teacher respondents gave their statements as follows.

"CBL should be widely used as the interaction between students can enhance students' interest in learning in the classroom."(G1)

"Also, the use of the Cerdik BM Series 1 application can indicate or demonstrate whether or not the student understands what he or she is learning. It can guide the teacher to determine the level of mastery of the student being taught."(G2)

"Using CBL allows students to be more competitive with each other. Using CBL-based application challenges students' ability to learn using the computer.

G. Students' Perspective on Cerdik BM Series 1

i) LINUS students enjoyed themselves when using Cerdik BM Series 1

Six LINUS students expressed their excitement when using the Cerdik BM Series 1 app. According to them, this feeling was due to the abundance of moving pictures, interesting colors, music, songs, and especially the theme park environment where they have never visited.

"It's fun. Because we can use the computer, look at the moving pictures, the colors. The images in it are all the best. The one near the balloon exploded. I want to play again later." (M1)

"Interesting. Because can use the computer. Can see pictures of all kinds. So many colors. Good pictures in this. The train in front of it. There's also music. I want to play everyday." (M2)

"Fun. Can play computer ... can see pictures ... Many pictures everywhere. There's a train, there's a balloon, there's an ABC song. That ABC song is at the beginning. Then there is a train. I've ridden a train before. With mom, dad, brother and sister. Later I want to take my mom on the train again teacher." (M3)

"Some good some not good. Can play, can sing ABC songs, can see pictures of all kinds. But have to read a lot. Read ba bi bu ... a lot. I want to play again later .. but want to play another activity." (M4)

"Good because can use computer. But can play only a short time. Friends like to disturb. I like the moving pictures. The pictures are beautiful. Tomorrow I want to play some more and longer." (M5)

"It's fun but it's hard for the arrows to stay still. When i click, it went somewhere else. But the game is interesting. Good because can play, to learn, many games. I like the picture arrangement and breaking the balloons. But the balloon moved very fast, I couldn't find it. Want to play again later." (M6)

ii) LINUS students prefer learning using Cerdik BM Series 1 instead of conventional learning.

Interviews with six LINUS students found that students liked learning using the Cerdik BM Series 1 over conventional methods.

"I choose to use the computer. Because can learn while using a computer. There is music to sing too. Then there are questions that can be answered while playing. Don't like regular learning because I have to read books, write in the book. Cannot play this kind of application." (M1)

"I love using computers. But if I can use longer, it is better. Computers can help me learn, can follow the words in the application. The app has so many things. There's ABC, there's a song, there's a game, the pictures have beautiful colors. Moving pictures." (M2)

"I prefer to study using computers. I can press the button myself and use the computer. There's voices and sounds, music, games. Can arrange pictures and words. It's fun because there's a song. But the music is very strong sometimes. I don't like learning the old ways because I can't use computers. Then i have to write in a book." (M3)

"Studying with computers is fun. If you learn the old ways of writing, you can't use a computer. I have to read a book. In a book, the pictures cannot move like in a computer. (M4)

"If I could choose, I would choose to learn using the computer. I love using computers. This application has music and pictures that can move. The pictures are also pretty and colorful. So many pictures. Can play, read, arrange pictures. Learning the old ways is also fun, but using a computer is more fun too. Sometimes teacher let us play games in the computer if we can finish our work quickly." (M5)

"I love learning using computers. At home there is no computer so when i can use the computer here, it is fun. Can also read in this application. Even the pictures are beautiful and moving. Learning using books, pictures don't move. Sometimes have to color myself." (M6)

iii) Understand better when using the Cerdik BM Series 1 interactive application compared to the conventional teaching method.

"I understand what i learnt more using the computer because i cannot understand, i can go back. When learning the old ways, if you do not understand, sometimes teachers do not repeat because other friends already understand. In this app you can learn, hear, and arrange to get the right answer. If I answer correctly or not, there is a voice telling me. In the usual class, when i answer wrong, teacher will mark wrong and i have to do corrections." (M1)

"I understand better with the usual way because if I do not understand, the teacher will show and repeat until I understand. But using this application, if I do not understand, I can just do it again, and ask the teacher for explanation as well. Sometimes, i cannot catch up when it is fast and if i do it again, it is still fast. The star going up is the part where it is fast." (M2)

"I can understand better using the computer with this app. Because, it is clearly explained. If I do not understand it can be repeated even if the teacher is looking at another friend. With this computer I can learn it myself. The part about the question is, it's fun because if i answer correct, he says it right but when i answer wrongly, he says i am wrong. It is fun to use a computer because i get the score for the right answer. The usual way of learning is okay too but it has to be read many times." (M3)

" Actually, I understand both ways of learning. But I like to learn to use the computer because it's fun to press on my own. There is a sound, the picture is moving and colorful." (M4)

"I understand using the computer and application. The words in the application are easy to spell. If I don't know I can listen to the sound and then follow the spelling. You can then review whether or not the spelling is the same as what is said in this application. In the usual way of teaching, I can understand some but not all. But teacher already teach other things." (M5)

"I love using this application. This app is easy to understand because it is easy to follow and has moving pictures. It's fun to watch and learn. The usual way sometimes I do not understand because teacher teaches very fast." (M6)

VI. DISCUSSION

All of the interviewed teachers gave positive views on the development of the interactive application of Cerdik BM Series 1. Among them, this application is able to attract students to focus LINUS learning. This is in line with the opinion of Kabali et al. (2015) who stated that the use of interactive applications was favored by children as well as improved early childhood literacy skills (Radesky, Schumacher, Zuckerman, 2015). Based on the findings of the study, there were several challenges faced by teachers in implementing Cerdik BM Series 1. One of them is the teachers' skills in using technology as a teaching tool. Interviews show that teachers are comfortable with conventional methods such as chalk and talk. Even the age factor may be one of the reasons teachers prefer conventional methods of teaching. This is proven by studies conducted by Scherer, Siddiq and Teo (2015), where they found that age factor influences the use of ICT in teaching and learning. Older teachers have a low motivation for ICT integration because they have no systematic plan or lack of support to apply ICT (Uluyol & Sahin, 2014). This is in line with Hassan, Rosnaini, Ahmad Fauzi, Mohd Ayob and Su (2016), in their study that found that teachers were less exposed to implementing ICT in the teaching and learning process.

In addition, the other challenge is the skills of rural LINUS students in the use of computers were also mentioned by teachers. Compared to urban students, rural students are less exposed to the use of computers. Therefore, training on the use of computers must be provided before they are exposed to Cerdik BM Series 1 interactive application. According to Bai, Mo, Zhang, Boswell dan Rozelle (2016), effective use of ICT can be achieved if students have basic knowledge of ICT. In fact, a study by Olatokun (2007) found that children living in rural areas have low income backgrounds and are unable to have equipments such as computers. In contrast to the study of Erdogdu and Erdogdu (2015), children with computers at home are able to master basic ICT skills.

The findings show that teachers' attitudes towards adopting ICT are also a challenge that may be encountered when implementing Cerdik BM Series 1. This is in line with the findings of Valtonen, Kukkonen, Kontkanen, Sormunen, Dillon, and Sointu, (2015) who found that teachers' unreadiness in using ICT is a hindrance in applying ICT. This is also due to teachers' lack of ICT skills. Therefore, this study also suggests that training for all senior teachers is essential to give them knowledge and confidence in the use of ICT in teaching. This is because there are studies that show that young teachers have a positive attitude towards applying or integrating ICT in the teaching and learning process (Sadaf, Newby & Ertmer, 2012; Valtonen, Kukkonen, Kontkanen, Sormunen, Dillon & Sointu, 2015). The Malaysian government is fully supportive about the use of ICT in teaching and learning when a review of the preliminary report of the Education Development Plan in 2012 emphasized the development of computer technology infrastructure in schools (Ministry of Education Malaysia, 2012). Consequently, according to the Ministry of Education Malaysia (2012), the ministry promised to provide more computers to students. Adequate computer preparation helps teachers develop innovative ideas by producing fun computer-based learning materials (Abdul Rasid and Hasmah, 2013).

Further, the interviews with LINUS students showed a positive response to the use of animation in the Cerdik BM Series 1. Movements, visuals and colors were their main attraction. In fact, all LINUS students love the concept of learning and play that is used in this Cerdik BM Series 1 application. They love the game-based learning and assessment activities. This is in line with the study by Abdul Rasid, Norhashimah & Shamsudin, 2012; Lee dan Hao (2015) who found that teaching aids that incorporate animated elements and games can enhance learning effectiveness, motivate learning, move students' minds and create fun in students' learning. Interviews with LINUS students also found that they preferred learning methods using interactive applications such as Cerdik BM Series 1 rather than conventional methods.

Among the responses given is that the use of interactive applications is easier to understand and can be learned over and over again until they understand it. In fact, all LINUS students welcome the creation of Cerdik BM Series 1 as this application can create a fun learning environment. All students were excited to learn using computers. The learning environment became more meaningful with the theme park used as the background in Cerdik BM Series 1.

VII. CONCLUSION

In conclusion, the results of this study show that LINUS teachers and students have received good development of the Cerdik BM Series 1 interactive application as a pedagogical tool to help improve Malay language literacy skills. The Ministry of Education Malaysia is responsible for providing gradual training and exposure of ICT knowledge especially to teachers with over 20 years of teaching experience. This is because teachers who are familiar with conventional teaching require motivation and exposure to computer-based learning in order to apply and practice LINUS teaching. Besides computer-based learning, teachers should be ready with the use of smartphones to build educational applications using the android system. The provision of "YES" smartphones to teachers in Malaysia should be able to help with the education of Malay language LINUS so that there is no dropout in children's learning from one to three years of schooling.

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