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MOBILE APPLICATION AS TEACHING AND LEARNING TOOL TO MUTE AND DEAF STUDENTS

a chapter by

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Introduction

Education is the foundation for the development of intellectual human capital that can provide a more perfect life and can contribute to the development of society and produce competent national leaders. Formal education is given to the children for which they must get formal education in school. According to Hamdi Ishak, Ab Halim Tamuri, Rosadah Abdul Majid, and Safani Bari (2012) children born into this world are entitled to education in preparation for their lives in the future. Education should be given to students based on the abilities, talents, and capabilities of students so that it is in line with the wants, technology and needs of the students.

The implementation of technology in teaching and learning can help students increase the level of student ability in mastering a subject studied (Siti Hajar Halili, Shukri Sulaiman, & Mohd Razha Abd. Rashid, 2011). In fact, it can also help teachers in teaching and learning. As with the implementation of Mobile Applications in teaching and learning, it acts as a practical teaching aid and suits the needs of students (Jeng, Wu, Huang, Tan, & Yang, 2010). In addition, it also facilitates teachers and students in practicing the knowledge learned. In fact, it can also provide reinforcement for a topic studied, which technology can help provide an overview of a topic through text, audio, video, animation, and graphics. This is explained in a study of the use of multimedia technology in the teaching and learning of English according to a global perspective by Min Pun (2013). Technology based teaching and learning has proven effective and conventional methods need to be integrated with multimedia learning methods to give a more significant impact to students.

Teaching and Learning Components

Technology based teaching and learning significantly has an impact on teaching and learning as noted by Singh and Hurley (2017). But the diversity of educational technologies has different effects on each other. The teaching and learning of Malay in the context of sign language using the Malaysian Sign Language Application (ABIM) has a significant impact on student achievement by combining five learning components such as pedagogical strategies, mobile devices, learning modules, communication methods, and design.

Impact of Pedagogical Strategy

Learning activities using mobile applications with the concept of real learning activities that apply several learning activities such as imitating movements or signals provided based on a learning to be learned. This learning concept gives students the freedom to choose the topic they want to study according to their needs. This method is adapted to the available content. The learning method using the Malaysian Sign Language Application (ABIM) encourages students to explore a variety of new knowledge through a simpler process and to be able to interact in a more interactive learning environment. This method uses two approaches, namely student-centred learning, and material cantered learning. This shows that the two approaches show that the learning environment does not depend on teachers alone, however teachers remain the main reference.

Based on the findings of a study by Samsudin (2019) Malaysian Sign Language Application (ABIM) makes it easier for students to understand what is learned because the module design incorporates animated elements and there are examples of the use of sentences in easy to understand language. In addition, through this method, students can identify their own weaknesses and based on the existing weaknesses, students need to emphasize on those. Learning modules that apply multimedia elements such as animation make it easy for students to imitate hand gestures, such a learning method as through real experience.

Figure 1: Interface Application for Malaysian Sign Language (ABIM)

Impact of Mobile Devices

Based on the current teaching and learning culture, mobile devices are highly significantly effective as tools for students 'social interaction in daily life. Studies show that mobile devices are significant as teaching and learning method because the culture of online learning is in line with today's education style and the latest technological developments. It clearly shows how mobile devices motivate students to learn because mobile devices like smartphones meet the needs in teaching and learning.

Figure 2: Mobile device

A study by Samsudin (2019) shows that mobile devices also affect student achievement. As the policy presented by the Ministry of Education Malaysia (MOE) which states that information and communication technology (ICT) is a requirement that needs to be integrated in teaching and learning. Such requirements include mobile devices such as computers, laptops, smartphones and so on. However, some of these devices are still in the research stage for formal use. This clearly shows that mobile devices are necessary in teaching and learning because their functions and uses are significant as a tool that gives access to information more quickly.

Impact of Learning Modules

A study by Samsudin (2019) shows the modules have been developed can help students to suit the needs of deaf and dumb students. A previous study by Saripah Salbiah Syed Abdul Azziz et al. (2013) also explained that good modules can help improve students 'understanding in teaching and learning. Based on the test results conducted on the use of Malaysian Sign Language Application (ABIM) clearly shows that it is effective, and respondents also think that the module developed meets the needs of students because it is based on the syllabus of the Ministry of Education Malaysia (MOE).
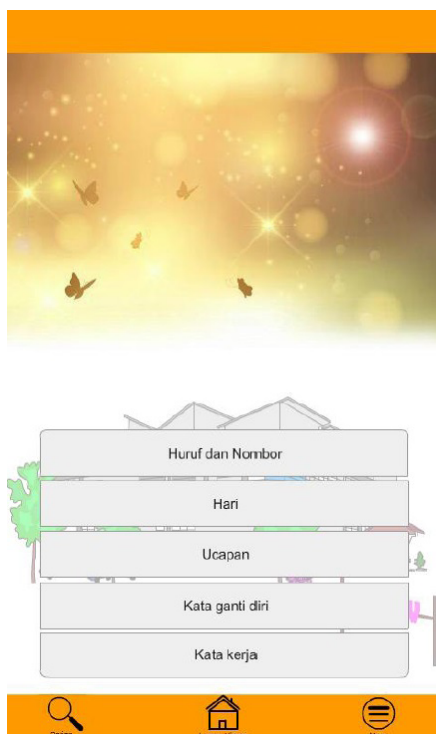
Figure 3: Module

In addition, the findings of the study also show that the modules developed are more systematic where the development of modules has gone through the process of testing consumer satisfaction. Systematic module management is important to ensure that students can learn based on the level of student mastery of a learning topic. It aims to meet the wants and needs of students on the modules developed. Using a constructivist approach in teaching and learning, it's in line with the concept of learning. Mobile applications is a new pedagogical approach, and it's a democratization of learning to students (Hairiah Munip, 2012).

Among other things, the modules developed incorporate several multimedia elements that make it more interesting. Saripah Salbiah Syed Abdul Azziz et al. (2013) also explained in his study that, the use of multimedia elements is important to attract students and it should be adapted to the needs of users so that it does not distract students. The suitability of the module also focusses on the designer to ensure it is suitable for all, whether unskilled or less skilled. Based on the findings of a study conducted by Samsudin, Guan, Yusof, and Mustapha (2018) the results of the study show that mobile applications are suitable for all deaf and dumb students.

Impact of Communication Methods

Communication effectiveness is also associated with success (Bishop, 2006), for which effective communication will contribute to student success. In daily life as a mute deaf person, the normal method of communication is to use hand signals and it is effective for daily communication, but if it involves non-verbal communication such as writing letters, reports and so on there are language errors. Therefore, the implementation of the Malaysian Sign Language Application (ABIM) in education shows a suitable method as a tool to improve the level of student communication. This approach is easy to use, and it builds better writing skills.

In addition, students' difficulty in translating the use of long texts is also their weakness and it has a direct impact on their level of achievement and communication. Therefore, various approaches used in the Malaysian Sign Language Application (ABIM) that combine multimedia elements to ensure more effective teaching and learning. Interactive application features such as two-way communication methods create a more effective learning environment.

Design Impact

The results of a study conducted by Samsudin et al. (2018) showed that design is significant on learning using mobile applications in Malaysian sign language learning. Organized and systematic planning of presentations in mobile applications using a self-learning approach is well implemented. This finding is supported by Hairiah Munip (2012) that good design influences students because the learning process is not boring, and students are more likely to be more motivated.

The perception of human thinking to understand a concept and interpret a piece of information depends on a good visual design balance it is explained by Norasikin Fabil, Zawawi Ismail, Shanhrul Azman Mohd Noah, and Zarina Shukur (2011). This means that design elements play an important role in education to help students to

understand a concept in teaching and learning. Good visual design can also provide clear, comprehensive descriptions and help students make decisions.

Impact of Mobile App Components on Achievement

A study conducted by Samsudin, Guan, Yusof, and Mustapha (2018) showed that mobile applications have a good impact on students with hearing impairment compared to conventional learning methods. Looking in terms of achievement, students who used the mobile app clearly showed that there was an increase in student achievement after the experiments were performed for the treatment group. This is clearly stated by Aminuddin Hassan, Fadzilah Abd Rahman, and Yew (2015) that student achievement is influenced by logical thinking, for which thinking is more relevant to related issues. Learning using mobile apps also improves quality in terms of thinking. This shows that students can make decisions and solve problems more maturely.

The results of the study also found that students have more fun learning and show a positive attitude towards learning using mobile applications. In addition, students are more focused during the ongoing learning session. Based on the tests performed showed that there is an increase in understanding of a topic discussed. The concept of learning that actively applies learning activities that is the direct involvement of students shows that students can answer the questions posed. A previous study that tested the usability model by Harrison, Flood, and Duce (2013), learning using mobile applications supports the findings of this study that provide satisfaction to students, effective as a learning aid and students more efficiently perform a task.

The Impact of Mobile Application Components on Student Communication

The communication process of students with deaf and dumb disabilities occurs based on observations in terms of behaviour, actions and so on, which indirectly affects the communication style of students. The findings of a study by Samsudin (2019) show that behaviour will have a

psychological impact. Based on the observations, they will interpret and subsequently translate based on their understanding. This clearly shows that pedagogical strategies have a significant effect that self-learning methods encourage students to think more creatively.

The use of language also plays an important role in improving the level of communication of students. The findings of a study conducted by Samsudin et al. (2018) also showed no significant relationship that communication methods using mobile applications can affect the level of student communication. A study conducted by Dewitt, Norlidah Alias, and Saedah Siraj (2013) social interaction exists in forums or discussions between students and teachers, the findings of the study showed 7.7 percent communication between students, while 2.9 percent between teachers. This means that interaction relationships between students are more frequent. Based on the percentage shows lower communication between students and teachers. Therefore, there is a need for the use of accurate hand signals so that there is no confusion and differences in the use of students' daily language. Easy to understand language facilitates student social interaction in the classroom between teachers and peers.

As mobile devices become tools that serve as the social transformation of students (Laouris & Eteokleous, 2005). Interpersonal interaction is an important thing for communication between students with devices where interpersonal skills need to exist to facilitate students to communicate with mobile devices that are flatform to mobile applications. Interpersonal skills refer to students 'skills of using mobile devices to interact with each other. Students need to know what types and uses of each component are provided. However, the findings of the study also showed no significant relationship on the level of communication of students, but mobile devices facilitate the communication process.

In the context of learning, content design in mobile applications also contributes significantly to improving student communication. Good content can convey accurate information on related topics, this is also explained by Dewitt et al. (2013) where students can explore a variety of

knowledge to equip themselves with something new. This indicates a cognitive learning process in which learning takes place based on new knowledge and existing knowledge. New knowledge can be reinforced with existing knowledge. However, the findings of the study show that it is not significant to determine the relationship to the increase in the level of communication of students because, there is no specific signal to determine the use of rewards, on a word. Its use depends on the situation, place, time and so on. Such understanding needs to be mastered independently through teaching and learning sessions by teachers. However, through the mobile application, students can make an example of the use of adjectives on a word.

The Effect of Mobile Application Components on Student Motivation

Learning using mobile applications has a significant impact on students, especially the internal motivation that is interest in learning. The results of a study conducted by Samsudin et al. (2018) showed that students are very interested in mobile applications used as learning aids. This clearly shows that digital learning is well received among students with disabilities. In addition, students also show motivation in terms of attitudes in which students are more focused on their learning. Also influencing students 'internal motivation are pedagogical strategies and mobile devices. The findings of the study also show that pedagogical strategies and mobile devices are significant on student motivation. Seen from the aspect of devices, it affects the motivation of students because mobile phones are a technology that has become a current culture in life and a necessity for every individual. So that, the existence of mobile applications has facilitated their learning.

Meanwhile, from the aspect of learning modules, the integration from the Ministry of Education module makes students more focused on mobile applications because they have similar content, and they can be accessed online. This is acknowledged by Rossyahida Abd Rahman and Mohamad Hisyam Mohd Hashim (2011) that online modules are easily accessible to all students and facilitate their learning. However,

the findings of the study showed no significant relationship of effect on student motivation due to the tendency of students to use mobile devices for entertainment alone. But if viewed from the context of learning in more detail it significantly affects students from the aspect of their achievement. Thus, there is an intrinsic motivation of students to use their mobile devices for things unrelated to learning. To implement learning using mobile applications there is a need for monitoring by parents and teachers so that it can be practiced more effectively.

From the aspect of pedagogical strategy, learning using mobile applications has the concept of self-learning, where students can manage their learning time at the appropriate time, and this is an innovation in the field of Education which if the first class takes place face to face and at a set time (Rossyahida Abd Rahman & Mohamad Hisyam Mohd Hashim, 2011). The concept of self-learning is a flexible learning approach that includes techniques such as actively exchanging learning experiences, solving problems that require critical and creative thinking. This is explained by (Abdullah Ibrahim, 2004) that the aspect of communication in simple applications is more to the use of text and graphics because it suits the needs of students. If associated with motivation in the design aspect, it has a very significant effect on interest in learning because students are more interested in learning with a combination of multimedia elements such as animation, graphics, text and so on. However, it had no significant relationship affecting student motivation. This means that there is interest, but it does not necessarily influence student motivation.

Intrinsic motivation of students is related to with extrinsic motivation such as support of teachers and peers. The study found that the treatment group in the study conducted by Samsudin et al. (2018) was so active in learning involving teachers and students, and it has proved that post test results for treatment group are improved compared to pre-test in the same group. The learning environment is also better where the focus of the students is focused on their respective devices. Student motivation is therefore an important aspect for their educational success.

Based on a previous study by Reed, Antia, and Kreimeyer (2008) stated, teachers or facilitators need to provide support to students to achieve success. The test showed 60% of the students agreed that teachers play an important role in their education, therefore facilities such as the use of these mobile applications need support from teachers to help students.

Theory and Practice

The findings of the study show that mobile applications are significant as a learning aid in education among students with disabilities and it has contributed theoretically, and practically to students. In terms of theory, the findings of the study have contributed to the main concepts and theories that exist in teaching and learning, namely constructivist learning theory and student-centred learning theory. Several components involved in the theory contribute to the improvement of student achievement. As can be seen from the test results, the increase of more than 100% is very significant and this proves that the use of Malaysian Sign Language Application (ABIM) is very helpful to students in teaching and learning.

The results of the study have also contributed to the existence of a significant new method in learning sign language not only for students with disabilities, but it can be benefited by all groups. This is because there are many Malaysians who have family members who have hearing and speech impairments. However, the focus in this study is students and it is hoped that the results of the study can be an injection in education to implement teaching and learning using mobile application methods in education.

Summary

Basically, the use of technology has been accepted in life as well as education and it has been proven by previous studies its impact on education. However, there are some gaps that need to be seen in the impact of technology on special education students with mute and deaf disabilities. The results of the study have outlined a framework to determine appropriate methods in the teaching and learning of mute and deaf students using mobile applications based on constructivist learning theory and student-centred learning. This learning method approach contributes to the level of communication and motivation of students and thus affects the better student achievement. Thus, the findings of the study have contributed to the teaching and learning methods theoretically and practically.

A study conducted by Samsudin (2020) outlined several key components in the implementation of learning methods using mobile applications. Based on constructivist theory, five components are outlined namely pedagogical strategies, mobile devices, learning modules, communication methods and design. These five components are the main subjects for practicing mobile applications in teaching and learning. Based on the test results performed it clearly shows that mobile applications have a significant impact on the level of communication and motivation of students and thus it contributes to the improvement of student achievement.

Through the experiments conducted, the implementation of learning methods using Malaysian Sign Language Application (ABIM) showed clear results that is more than 150% increase in post-test achievement from pre-test. The results of this study have proposed a framework that has gone through a validation process and proved it to be significant for the teaching and learning of deaf and dumb students. Overall, students gave a positive response to the Malaysian Sign Language Application (ABIM) as a learning aid. With the existence of the Malaysian Sign Language Application (ABIM), it's hoped that it can benefit students in their learning, and it can be used as a learning aid more quickly and effectively. In fact, its existence is also expected to be utilized by all communities who want to learn sign language more easily.

The implementation of mobile application methods in teaching and learning needs to consider external factors that affect students' cognitive. Among external factors such as advertisements, it affects student concentration. Therefore, what are the security features in the application that can prevent interference and maximize the engagement of focused learning. In addition, the findings of the study involved lower

secondary school students. Therefore, further research needs to be done on upper secondary students so that it can also benefit all students. In fact, it should also be done for parents and families who have family members of people with disabilities to see their acceptance of this mobile application towards their children as it is important to increase the effectiveness of student communication level at home as well as school.

The success of the learning method using mobile applications is undeniable, however it cannot be generalized to all levels where the study needs to be done in different schools such as rural and suburban schools. Because the results of this study are not inclusive for both groups of schools. This is because schools in urban as well as rural areas may have various facilities especially in terms of infrastructure and family income that can be attributed to the ability of mobile device ownership. While the selected topics are limited, therefore a thorough study needs to be done for other relevant and appropriate topics using mobile applications. It is important to look at the level of need for such applications in various learning topics.

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Sekian, terima kasih.

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