THE DEVELOPMENTS AND CHALLENGES OF THE INTEGRATION OF INTERACTIVE WHITEBOARD TECHNOLOGY IN TEACHING AND LEARNING READING SKILLS FOR PRESCHOOL CHILDREN

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ABSTRACT

Technological advances in education have expanded to preschool, primary, secondary and tertiary education. It is fundamental for the effectiveness of teaching and learning a subject in the classroom. The writing of this article covers the development of IWB in education and the advantages of IWB that are relevant to teaching and learning and to what extent they assist the development of preschool children, the challenges for teachers and children in using interactive whiteboard and ICT in teaching and learning and understanding the readiness of teachers and preschool children in the application of ICT especially IWB in teaching and learning reading skills. The review of the literature covers the development of the use of IWB in education, the advantages of IWB that help improve the knowledge and skills, the challenges and readiness of teachers and children in the integration of IWB in learning reading skills. The use of ICT especially IWB in learning can improve children's knowledge and skills. The features of IWB create a fun learning environment especially when teachers are teaching literacy skills. The challenges faced by teachers in integrating IWB in teaching and learning are time constraints to plan lessons, lack of training, teacher attitudes and the lack of technical support. The use of technologies in teaching is an added value in improving the quality of existing teaching to make it more effective. The teachers who use IWB in the classroom depend on their pedagogical skills and how they convey the lesson using this technology. The use of IWB is one of the initiatives of the preschool teachers to increase children's literacy skills especially reading skills.

Keywords: interactive whiteboard technology, reading skill, preschool

INTRODUCTION

Interactive Whiteboard (IWB) technology has brought changes in educational technology as it facilitates the teaching and learning process in the classroom. This technology has been used at all levels of the education sector, namely primary, secondary and tertiary institutions. This technology has been implemented nearly a decade ago but it has become known only in recent years. IWB is a device that has a large physical display panel where it can function as a regular white display, projector screen, and electronic copy board or as a computer projector screen. Images from a computer can be controlled by touching or writing on a whiteboard without using a mouse or keyboard.

The features of this IWB create a fun learning environment especially when teaching literacy skills. It improves the quality of teaching and learning as all information can be stored, reproduced, printed and shared either via media or hard copy. Learning can be integrated into small groups of students with print from a computer. This technology facilitates vocabulary learning especially through the Microsoft Power Point presentation where students can clearly see how the combination of letters becomes syllables and words. Pupils can also manipulate this interactive whiteboard by simply touching it to change other letters faster and more attractively. In addition, the use of IWB technology also enables teachers to provide lesson planning such as vocabulary activities, reading words and sentences, phonetic and short story activities as well as playing language games using a variety of interesting graphic animations.

The use of this interactive whiteboard encourages students to learn. Visuals in the form of diagrams, web and pictures, and the use of colours and shapes to highlight text can encourage student engagement in learning activities. Literacy learning such as word recognition, reading texts and stories will be facilitated using this IWB by displaying text and illustrations that interest students. In addition, the use of IWB also promotes student engagement in learning especially reading skills. Students will continue to focus and engage in literacy learning using this technology as they will be more likely to interact with the words used in this IWB. The use of IWB in early childhood literacy can help them improve their skills in writing, reading and listening skills. This is because their involvement in interacting directly with the IWB enhances their literacy skills as well as learning in fun and interesting situations and adopting student-centred learning strategies.

The Development of using Interactive Whiteboard in Teaching and Learning

The use of information and communication technology in education will enhance students' knowledge and skills (United States Agency International Development-USAID). If the school system is to be career-relevant and important to the community, it must be equipped with extensive knowledge with a range of skills including literacy, numeracy, information literacy and independent learning that contribute to student achievement. Information and communication technology (ICT) should be used to develop these skills to enhance student learning achievement. For example, USAID Enhancement Education Program in Afghanistan uses tablets and solar panels to prepare student exams for admission to public universities. In the context of education, ICT refers to the methods used to solve teaching and learning problems in the classroom, management and school administration by combining teaching theory with information technology tools such as email, forums, portals and websites. One of the growing branches of ICT technology in the education world today is the IWB.

In line with the development of ICT in global education, Malaysia is also committed to ensuring that the education system in the country leverages ICT in the implementation of teaching and learning at various levels of school including the preschool level. In chapter 6 of the Malaysian Education Development Plan (2015-2025), the Ministry of Education has outlined a wave of achievements in integrating ICT in inter-disciplinary education where all teachers need to have skills and competencies in ICT by 2015 (Chee et al., 2018). According to Chear and Yunus (2019), the changes in the construction and planning of education curricula in Malaysia are the result of developments related to issues of globalization, internationalization and Industrial Revolution 4.0 that have changed the lifestyle of the people. This wave of change has made teaching and learning strategies

complex processes in the 21st century (Scott, 2015). Thus, building a current curriculum focuses on preparing students from the areas of skills and knowledge to meet the challenges of education in the 21st century. 21st Century learning covers all aspects of skills that students need to master: environmental sensitivity, social skills, thinking skills, cross-cultural skills, computer-like thinking, new media literacy, multidisciplinary, open-minded, knowledge management and virtual collaboration.

Not only in the aspect of curriculum preparation that is more focused on 21st century education patterns, but the program of instruction provided to teachers also needs to apply 21st century learning skills as teachers are the key intermediaries in delivering the content of the curriculum (American Association of College for Teacher Education, 2010). Implementing a curriculum that incorporates 21st century learning skills is a major challenge for teachers to design appropriate teaching and learning and meet the curriculum objectives. As a result of focusing on the objectives of developing learning and innovation skills among students, information technology and media courses related to the future of student careers are seen to assist teachers in planning and implementing appropriate learning activities for students to meet the educational wave of the 21st century (Wrahatnolo & Munolo, 2018). In addition, Davidson and Major (2014) in Chear and Yunus (2019) suggest that cooperative, collaborative learning and problem solving are important for facing 21st century challenges. According to Lee et. al (2016) in Chear and Yunus (2019), online learning using smartphones extends the reach of collaborative information and skills through opportunities for creative and critical collaboration. Thus, it can be concluded that teachers need to be prepared from the aspects of skills and knowledge in the ability to integrate a variety of disciplines, thinking and problem-solving skills in planned teaching and learning. This includes the application of information technology as an intermediary medium that facilitates the implementation of learning objectives 21st century.

The Advantages of IWB that are Relevant to Teaching and Learning

IWB has been introduced in various sectors of education as an innovation in education technology today. This technology is increasingly accepted at primary and preschool levels (Dwyer, 2007; Hvit, 2010; Klerfelt, 2010; Mercer et al., 2007; Twiner et al., 2010) in Bourbour and Bjorklund (2014). The IWB is a sensitive white board with a touch of a finger or a special pen and is used in conjunction with computers and digital projectors. According to Mousa Malkawi (2017), the use of IWB in teaching and learning is very effective in helping students learn. It is very suitable for use by various age groups. It has been proven successful in teaching and evaluation in schools.

The development of the use of IWB technology which is one of the ICT equipment in Malaysia is very limited due to the relatively high cost of equipment as well as the exposure to this technology to the less educated teachers. Teachers are also less skilled in the use of this technology because of the lack of training provided regarding the use of this technology in teaching and learning. This statement was supported by Mohamed et al. (2015) who stated that teachers have good ICT foundations but they lack knowledge and skills in handling ICT equipment in teaching and learning prevents them from using it as a teaching method.

The integration of ICT in early childhood education or more specifically in preschools is still low. According to Mohamed et al. (2015), preschool teachers who are less skilled in

using ICT include integrating IWB technology and android applications in their teaching and learning to expose children to ICT. However, it was found that teachers have the skills and knowledge to handle this ICT equipment only for personal purposes, classroom management and parent relationships. An ICT-based teaching and learning approach can stimulate pre-schoolers' interest in learning and thus enhance their understanding and encourage them to do their homework well (Puteh & Abd Salam, 2011). However, today's scenario shows that the implementation of ICT-based teaching and learning is still underdeveloped at the pre-school level related to the mastery and knowledge of preschool teachers in ICT (Puteh & Abd Salam, 2011; Mohamed et al., 2015). The lack of implementation of ICT-based teaching and learning at the preschool level is based on factors such as teachers' attitude towards using ICT tools in teaching and negative outlook towards ICT technology, time constraints to provide teaching and learning using ICT under the burden of other tasks and lack of skills and knowledge (Rahman et al., 2013; Puteh & Abd Salam, 2011; Mohamed et al., 2015).

Using of IWB Help Improve Children's Development

Children and play are inseparable. This is because play is a part of children's development (Siraj-Blatchford, 2009). According to Emfinger, 2009; Fantuzzo, Sekino & Cohen, 2004 in Tasripin and Abu Bakar (2018), early childhood education curriculum incorporates elements of play into achieving learning and skills objectives and has been exposed to learning and play. Among the benefits of engaging with play (Susan et al., 2015, in Tasripin and Abu Bakr, 2018) is that they can stimulate children's development in terms of cognitive, social and interpersonal development. This fact was also supported by Peng and Fikri Ismail (2020) which stated that the willingness of teachers to implement play-based teaching was high and believed that the play approach could help children master the Malay language. The education world today emphasizes the integration of ICT technology in classroom learning activities.

For preschool children, they need to be exposed to one method of integrating ICT technology using one way of playing at a time. As such, the use of mobile applications such as android based games are exciting to help create a fun learning environment and improve children's achievement (Iliyas & Jumaat, 2020). This mobile-based application is also known as a multimedia interactive game and it features pictures, stories, music, voice, text, art, animation and video according to Mochamad et al. (2011) and Mayer (2009) in Tasripin and Abu Bakar (2018). Multimedia games or better known as android applications for most mobile users provide a wide range of literacy and numeracy learning games applications for pre-school children such as reading, writing, number recognition and simple number operations. The game is well known and familiar and easy to download for kids, parents and teachers. According to Tasripin and Abu Bakar (2018), the use of multimedia games can have a positive effect on children's knowledge of ICT technology, familiarize children with instruction, provide training and problem-solving skills, increase fine motor skills and abilities adult relationships and create a fun learning environment. This statement was supported by Peng and Fikri Ismail (2020) by stating that teachers recognized that the method of play using multimedia could create a fun learning environment especially in literacy learning of Malay language.

Today, we need to look at the use of technology as an effective tool in creating an effective and enjoyable learning environment for children (Kamaruddin et al., 2017). The use of IWB technology can assist children in improving the development of learning domains,

especially as a starting point in their formal introduction to the learning world. This technology is able to interest children especially in mastering difficult subjects by interacting directly with the equipment so they will be more mindful of what they are learning in a fun environment. According to Kamaruddin et al. (2017), IWB can assist children in learning as it allows them to interact with this equipment and meet the needs of children who want to learn constructively. In addition, the involvement of the sensory response can also function in learning such as sight, hearing, touch and mind which will be actively engaged in the activity. The use of IWB will enhance children's learning readiness, especially for those who are shy and fearless. The children will naturally respond actively to voluntarily try IWB and this promotes active participation in the classroom. This is supported by Kamaruddin et al. (2017) who stated that the use of IWB will attract student attention, build long-term memory, faster learning and enhance student motivation, as well as increase student engagement in teaching and learning.

Understanding the Readiness to Teachers and Children in Using ICT Especially IWB in Teaching and Learning Reading Skills

Applying technology in teaching and learning requires high skill and knowledge to handle the equipment among teachers. This is because teachers will use this technology in teaching and help children to use it as well. According to Kamaruddin et al. (2017), Early Childhood Education (ECE) teachers are found to be knowledgeable and skilled in just a few applications such as tv, radio and computers, smartphones and the internet, but this knowledge is for personal use only. In addition, it was found that ECE teachers only used ICT to provide lesson plans and reports, use the internet to find teaching materials and communicate with parents. Teachers need to be aware of the importance of having the skills and knowledge to implement ICT in their teaching and learning as it will add value to the quality of their teaching. ECE teachers also need to be aware of the importance of using ICT like the internet in assessing and controlling children's achievement. However, according to Kamaruddin et al. (2017), ECE teachers face several constraints in the implementation of ICT in teaching and learning including the lack of technical support, time constraints in the use of ICT and lack of knowledge and skills among teachers. According to Yi-fang and Shu (2016), there are many factors that impede the implementation of ICT especially IWB in the classroom such as equipment which does not function properly, operating problems, incompatibility with lesson plans, students' cognitive developmental level and their learning style. Therefore, the failure of the IWB in the classroom does not depend solely on the readiness of the teacher as there are other factors that influence it. However, teachers need to have high technical skills including teaching design so that they can use IWB effectively. (Yi-fang & Shu, 2016).

The level of preparedness of pre-school teachers in implementing teaching and learning based on ICT tools especially IWB technology and android applications is crucial as teachers need to be prepared in terms of skills, knowledge and attitude. According to Mohamed et al. (2015), preschool teachers use ICT in teaching and learning because they are less skilled in its use. This statement was also supported by Puteh and Abd Salam (2011) who found that pre-school teachers' readiness for ICT use in teaching and learning was at a moderate level of only 65.5%. This statement was supported by Masnan et al. (2019) who stated that preschool teachers were ready to use technology such as internet in their teaching approach. However, they needed to improve skills and knowledge related to appropriate teaching approach for children. This indicated that preschool teachers were prepared for the

use of ICT in teaching and learning but did not have the appropriate training and courses to improve their skills. Although most preschool teachers used some of the ICT tools such as mobile phones, laptops, internet and printers, these were utilised for personal purposes only in relation to children's parents and school-related matters. However, preschool teachers strongly supported the use of ICT in classroom teaching and learning in terms of improving children's mastery, creativity and ability to think high and problem solve (Mohamed et al., 2015).

Technological developments are in line with the changing times. There are many changes in the world of education today especially concerning the use of ICT in classroom teaching. There is no shortcoming in teaching the old and relevant methods used today but the existence of ICT is beneficial in helping teachers make the teaching sessions more interesting and effective. Today's generation of teachers are more receptive towards the development of ICT than that of the previous generation who had used the chalk and board method in teaching. According to Giannikas (2016), today's young teachers were more exposed to technology and software and were more excited about using IWB technology than pupils. As a result, these teachers inadvertently implemented teacher-centred teaching methods where they were more likely to use this technology than to provide opportunities for children to use it. As for older teachers, they preferred to let the students explore this technology on their own without supervision due to their own inability to handle this equipment.

In learning language, IWB use is seen as beneficial to children where teachers are ready to use it in their teaching. This is a very good attitude among teachers, so administrators need to be more attentive to the training and knowledge requirements of using IWB to teachers (Giannikas, 2016). Creating a positive and engaging learning environment depends on pedagogical techniques in the teaching that the teacher brings. The use of technology in teaching is an added value in improving the quality of existing teaching to make it more effective. The effectiveness of such learning depends on the wisdom of the teacher in creating an attractive learning environment. Therefore, teachers' pedagogical skills are more important in enhancing the effectiveness of teaching and learning in the classroom. This statement is supported by Bourbour and Masoumi (2016) who stated that by applying the IWB technology in the classroom it would not be able to create an effective learning environment and not change teacher pedagogy. This is because the teachers who used IWB in the classroom depended on their pedagogical skills and how they conveyed the lessons using this technology. Differences in pedagogical skills and teaching techniques can be seen from the way IWB is used. The use of the IWB cannot create a dynamic learning environment in the preschool unless the teacher has the knowledge and skills of pedagogy and effective teaching techniques in managing the IWB itself. The use of IWB in the classroom does not make the teacher excellent. In other words, IWB has no impact on the quality of learning without being operated by a skilled and knowledgeable teacher (Bourbour & Masoumi, 2016). Therefore, to enhance the quality of teaching and learning and to create a more dynamic learning environment, teachers need to be provided with knowledge, skills and knowledge in pedagogical skills especially in relation to the use of IWB. Through the use of IWB, teachers are able to diversify teaching materials more interestingly and effectively as well as enhance children's motivation to learn based on their interests. Teachers are also encouraged to build their own teaching materials in addition to using existing materials in IWB technology itself.

The teaching methods of reading that benefit children should be delivered through a safe and comprehensive learning environment and fun, creative and meaningful activities (Kementerian Pendidikan Malaysia, 2017). According to Yahya (2004) in Chee et al. (2018), teachers need to diversify teaching techniques to engage children in learning to read. However, Chee et al. (2018) found that teachers still adopted conventional teaching methods that failed to attract children to learn to read. Therefore, unpleasant learning has been a contributing factor to early childhood literacy problems (Resnick, 2007; Marxen et al., 2008; Hoffman, 2010 & Arshad, 2013).

The National Preschool Standard Curriculum (KSPK) has established the objective of reading skills is to equip children with the ability to communicate with the Malaysian language and become the medium of instruction in everyday life (Kementerian Pendidikan Malaysia, 2017). Therefore, reading teaching should have effective strategies in teaching and learning that include content delivery methods and use of language relevant to children's interests, abilities, experiences and knowledge (National Association for the Education of Young Children, 2008). The mastery of literacy skills (especially reading skills) is different for every child. This is due to several factors such as early exposure to children under the age of seven, whether at home or preschool. According to Azizan and Hussin (2017), appropriate early childhood teachers' assistance and guidance in teaching and learning can help children to master reading skills. The phenomenon of mastering literacy skills (especially reading) is still an issue in education in Malaysia as there are still students who cannot read well. Reading skills are a very difficult skill especially in preschool children. It requires a very effective teaching strategy to improve children's reading skills. Failure to read strategies has led to a decline in children's mastery of these skills. This was supported by Chee et al. (2018) who argued that failure to master children's reading skills was due to the conventional teacher-taught teaching strategies that utilized memorized and well-rehearsed methods that were no longer able to interest children to learn to read. Various initiatives have been implemented by the government to help improve this skill at the primary level, including the LINUS program which was implemented in 2010. However, according to Bungga (2018) in the Berita Harian newspaper dated November 30, 2018, the Director-General of Education announced that the program would be completed beginning 2019 as stated by sources from the Ministry of Education Malaysia (MOE). As such, each school must develop and implement its own literacy program with the support of the MOE. Therefore, effective teaching and learning strategies need to be designed and implemented so that all children can master these literacy skills. The use of IWB technology and android applications (learning to read) is one of the initiatives of the school or preschool to increase children's literacy skills, especially reading skills.

The Challenges Faced by Teachers in Integrating IWB in Teaching and Learning

Preschool teachers have the skills but lack confidence and competence in the use of ICT. Teachers' time constraints are also a factor in the lack of use of ICT in classroom teaching (Rahman et al., 2013). Teachers are faced with limited time constraints in setting up ICT-based learning schedules in terms of equipment preparation and access to specific websites. In addition, they do not have enough time to prepare for teaching, exploring and learning technology, dealing with technical problems and attending specific training. This statement is supported by Rahman et al. (2013) who stated that preschool teachers face time constraints in providing ICT and multimedia teaching and learning due to the burdens of other tasks. They also face the problem of lack of confidence in integrating ICT into their pedagogical

practices. In addition, they lack skills in the use of ICT especially for preschool teachers who have served for over 10 years using computers and only using ICT equipment that is not relevant today (Rahman et al., 2013). Therefore, teachers' proficiency in the use of ICT influences the implementation of ICT integration in classroom teaching and learning. The lack of time for professional discussions in the field of ICT was part of the factor leading to a lack of efficiency teachers in the use of ICT. In addition, the burden of teaching and management tasks also causes teachers to have less time to share knowledge and experiences related to ICT with their peers. However, according to Delcourt and Kinzie (1993) in Rahman et al. (2013), teachers' attitudes play an important role in ensuring that ICT is effectively used in teaching and learning. Teachers should therefore have their own initiative to increase their knowledge and skills in the use of ICT in teaching and learning so as not to miss the development of educational technology (Rahman et al., 2013).

There is no denying that teachers have good ICT skills such as using smartphones with android applications, Microsoft Office software and Power Point. However, the use of these skills and knowledge is limited to personal use only and this does not apply in their teaching and learning in the classroom. Based on the ICT foundations of these teachers, it is not difficult to apply the latest ICT skills in teaching and learning. What these teachers need is on-going and effective ICT skills training and introduction to more up-to-date devices that can be used in their teaching. This statement was supported by Mohamed et al. (2015) who stated that preschool teachers needed to be given courses and courses to enhance their ICT skills.

CONCLUSION

The advantages and effectiveness of IWB in education at preschool, primary, secondary and tertiary institutions have been proven to be widely used throughout the world over the past decade. It is a powerful device, very easy to use and very helpful in teaching and learning students in the classroom. The use of the IWB provides a breakthrough in the context of teaching and learning pedagogy from traditional methods. The use of IWB can also be extended across the curriculum in all subjects. Attractive IWB functions enhance students' mastery of a range of skills and learning. In addition, it enhances the motivation of students and teachers to learn and teach. In the context of early childhood education, the use of IWB is relatively new and less widespread. Teacher readiness is critical to implementing this technology in the classroom. However, some children have been exposed indirectly to such technology devices as the use of smartphones and laptops at home. Therefore, teachers need to be more skilled and prepared to use of IWB to learning activities in order to achieve the curriculum objectives. On the other hand, the school administration needs to provide specialized training to IWB-related teachers and try to overcome some of the constraints in its implementation in schools such as the lack of technical support.

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