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Preliminary Study: The Challenges of Integrating Interactive Whiteboards in Teaching and Learning among KEMAS Kindergarten Teachers

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Abstract: The purpose of this study is to determine the challenges encountered by KEMAS kindergarten teachers when they integrate interactive whiteboards (IWB) in their classroom. Besides that, this study also intends to investigate on how teachers overcome the challenges that arise on a day-to-day basis. This is a qualitative study where data were collected through semi structured interviews, non-participatory classroom observations, and documents analysis. Two kindergarten teachers participated in this study, identified through the purposive sampling technique From the analysis, five main themes emerged in relation with the challenges faced by the kindergarten teachers when they integrate interactive whiteboard in their classroom. They are (i) lack of technical support, ii) maintenance cost, iii) classroom management, iv) technical failure, and v) lack of technological knowledge. Despite of the challenges aroused, the teachers had taken several initiatives to resolve the challenges including launching fund collections from student's parents or guardian, getting support from their own family and the community, setting rules enforcement in the classroom, and increasing their technological skills and knowledge through self-learning.

Keywords: Interactive whiteboards, IWB, challenges, difficulties, solutions, kindergarten teachers, KEMAS kindergarten teachers, Malaysian kindergarten, teaching and learning

1. Introduction

There is no doubt that technology has been increasingly and widely used in our education system today. Technology such as computers, televisions, tablets, and other instructional media have been used at the school to meet the demands of 21st Century education. Previous studies had proven that the use of technology in the teaching and learning process can enhance teaching and learning environment (Linder, 2010). Among others, technology can be used as a way to create hands-on and meaningful lesson (Herron, 2010). Another study also shown technology can be used to restructure the classroom to promote the development of higher order thinking skills (Kurt, 2010). Undeniably, technology is one of the essential tools that can be used for effective and permanent learning (Costley, 2014).

Aspiring to become a world leading country which promotes an education system that actively pursue technologies and innovations that fulfil 21st Century learners' needs, the Malaysian government has taken steps to improve the education system starting from its preschool. This is because children are the most valuable assets for a nation; as "today's children are leader for tomorrow" (Dahari & Ya, 2011). Advanced education system will inspire creativity and provides children with the necessary skills to be able to compete in the modern world (Ministry of Education Malaysia, 2012). This is in line with the preamble stated in the Malaysian Education Act (1996), "the purpose of education in Malaysia is to enable Malaysian to have knowledge, skills and values to survive in highly competitive and globalized future" (p. 11).

Because of that, it is important to ensure high quality education is provided to all Malaysian beginning from its preschool programme. The Malaysian government has taken one more step further through its programme by supplying interactive whiteboards to the preschool institutions. As such, in 2010, there are 126 interactive whiteboards supplied to 126 KEMAS kindergarten schools in Malaysia (KEMAS Annual Report, 2010). To ensure this programme can be successfully implemented, the KEMAS Information and Communication Technology (ICT) Unit has been entrusted to provide expertise and responsibilities to monitor the ICT infrastructures at every kindergarten. This step is taken to ensure that all infrastructures can be fully utilized and used optimally by the teachers and the students.

Generally, there are three ministries involved in the Malaysian preschools which are the Ministry of Education (MOE), the Ministry of Rural and Regional Development, and the Department of National Unity and Integration (Mustafa & Azman, 2013). Preschool, which include nurseries and kindergartens, is an institution that provides early exposure to children before they enroll in the formal education system. Usually, children will start going to kindergarten at the early age of four years old until six years old before they enter year one of primary school. In this study, the chosen kindergartens which are supplied with the interactive whiteboards are known as KEMAS. KEMAS is an abbreviation for *Kemajuan Masyarakat* or Community Development. They are under the responsibility of the Ministry of Rural and Regional Development.

Specifically, the KEMAS programme started in the 1970 and it is one of the government funded pre-schools in Malaysia. There are about 11,131 of KEMAS kindergarten was built in Malaysia on 2014 (KEMAS, 2014). Interestingly, these numbers keep growing year-by-year in order to provide accessible early education to all Malaysian children. This is from the facts that only 9,533 kindergartens were built on 2011 and 10,816 kindergartens were built on 2012. The idea of this establishment is to give education to children who come from rural and remote areas with low income family (Mustafa & Azman, 2013). National Preschool Curriculum was also enforced to unify the early education system in Malaysia. For that, every preschool institution must have specific and standardized syllabus that need to be followed.

2. Background of the Study

Interactive whiteboard is one of the technologies that have been widely used in today's classroom. The use of it has created a variety of interactive and engaging activity in teaching and learning process (Haldane, 2007). Research done by Smith, Higgins, Wall, and Miller (2005) also suggested that interactive whiteboards can have positive effects on both teaching and learning. Apart from that, learning environment has shifted more towards student-centered and has transform the teacher's role as an educator. The interactive whiteboard technology has also replaced the traditional chalkboards which enable students to draw, write, move and manipulate the objects on the screen by using their hands (Schmid, 2006). With the use of the Internet on the interactive whiteboard, teachers are able to bring the outside world into their classrooms.

Currently, there are 126 of interactive whiteboards supplied to KEMAS kindergartens by the Malaysian government. The programme has come into its sixth year implementation since its establishment in 2010. Billions of money has been spent by the government to ensure its successful implementation. However, the uses of these interactive whiteboards are still not remarkably noticed by the society. Most of the teachers found that integrating the interactive whiteboard in the teaching and learning process has helped them deliver the instruction in a more meaningful way. The use of ICT in the classroom also provides teachers with huge opportunities to enhance their delivery instruction and enable greater learner participation in the classroom activities (Hennessy, Deaney, Ruthven, & Winterbottom, 2007).

However, there are teachers who had encountered challenges or difficulties in using the interactive whiteboard. The complexity to deal with the tools and unfamiliar technology are among reasons that were found in the previous studies conducted by Karasavvidis (2009). Similarly, previous research studies had confirmed that many teachers tend to encounter problems when they are incompetent in the technology knowledge (Mohamed & Khamis, 2014). For that, the teachers prefer to use a traditional approach in teaching such as chalk-and-talk or pencil-paper assessment in their

classroom rather than using the interactive whiteboard. This situation would lead to an issue when the teachers prefers to deliver the instruction in lecture-style teaching thus reduced the student-centered learning approaches in the classroom (Md. Khambari, Hassett, Thomas, & Wong, 2014).

Mastering the use of the interactive whiteboard in the classroom has become a new challenge for the teachers. Korkmaz and Cakil (2013) claimed that utilization of technologies might depend on various factors including cost, teaching and training, technology physical condition and the superior management. For these reasons, this study was carried out to determine the kinds of challenges faced by teachers when they integrate the interactive whiteboard in their classroom. Besides that, this study also intends to investigate how teachers overcome those challenges.

3. Research Questions

This study focuses on exploring the challenges faced by teachers when they integrate interactive whiteboard in their classroom and how they overcome those challenges. Specifically, this study aims to answer these questions, "What are the challenges faced by KEMAS kindergarten teachers when they interactive whiteboard in their classroom?" and "How do KEMAS kindergarten teachers overcome the challenges that arise when they integrate interactive whiteboard in their classroom?"

4. Methodology

4.1 Participants and Research Context

To ensure that all research participants have prior knowledge in using the interactive whiteboard, the purposive sampling technique was used in this study. This technique was employed because it is regarded as one of the effective ways when the researchers need to study about certain cultural domain (Tongco, 2007). A total of two teachers from Tabika KEMAS Anjung Bistari, which is located in Shah Alam, are chosen as research participants. Tabika KEMAS Anjung Bistari is a pseudonym given by the researchers in order to prevent research participants from being individually recognizable. This is in line with the study carried out by Kaiser (2009), which stated giving pseudonym is considered as one of the ways to protect participants in a qualitative research. Their consent has been obtained through phone calls after the researchers explained about the purpose of the study. The research participants are also regarded as frequent users of the interactive whiteboard in their classroom for the teaching and learning sessions.

The school is located in the developing area and is surrounded by residential area. It has two classes which comprises of five-year-old students and six-year-old students. Although it has two classes, the interactive whiteboard is only installed in the class for the five-year-old students. But the technology is shared among the teachers and students of both classes. Whenever they use the interactive whiteboard, the teachers will either combine their classes or exchange classrooms when only one of them needs to use the interactive whiteboard.

4.2 Procedure

This is a qualitative research design where data were collected through semi structured interviews, non-participatory classroom observations, and documents analysis. Data were gathered to investigate on the challenges faced by teachers when they integrate interactive whiteboard in their classroom and how they overcome those challenges. The researchers first meet the research participants on 5th April 2016. The researchers later visited the school to conduct interviews following the non-participatory observation. The observation, which was videotaped, lasted for approximately four hours starting from approximately 8 am until noon. Each interviews session took approximately around one hour and was audio recorded. During the classroom visit, related documents such as teacher's lesson plans and student's worksheet were also collected for the purpose of further analysis.

The meetings with the participants have given opportunities to the researchers to explore on how they used interactive whiteboard in the classroom, the kind of activities conducted by the teachers, and how they utilize the interactive whiteboard to prepare their lesson plan. The researchers used open-ended questioning technique in order to get an in-depth exploration of a particular topic that is useful to the researchers (Charmaz, 2006). Besides that, the researchers also had the opportunity to grasp a better understanding of the teacher's situation and their experiences on how they integrate the interactive whiteboard in the classroom activities. The data collection was carried out on the 3rd, 9th, 10th May and 12th July. Taking heed of Charmaz's (2006) suggestion whereby researchers tend to lost access to conduct data collection if they do not establish rapport with the research participants, the researchers had visited the preschool and had casual conversations with the teachers before the research started. This had allowed the participants to feel comfortable to share their stories and experiences, and allowed the researchers to learn about their views and understand them from their perspectives.

5. Data Analysis

The systematic grounded theory analysis was adopted to analyze the data gathered in this study. This technique requires the researchers to study all the early data collected, and then sort and synthesize them through qualitative coding (Charmaz, 2006). Firstly, the audio-recorded interviews were transcribed by using verbatim technique. Each of the interview session between the researchers and the teachers lasted for about 30 to 60 minutes. Next, the researchers read and re-read all of the transcripts for at least two times as a mean to familiarize themselves with the data (Ary, Jacobs, Razavieh, & Sorensen, 2006).

The data were analyzed by using the open coding method (Strauss & Corbin, 1998). Then, the data were categorized by giving them a short name and the researchers sorting them in the related category. The purpose of adopting this data analysis technique is to look for patterns and trends in the data (Northcote, Mildenhall, Marshall, & Swan, 2010). Several themes were revealed during the coding process and they are used to answer the outlined research questions in the forthcoming section. In order to protect the identity of research participants, the researchers have given pseudonyms to both participants as Sophia and Suzanna.

6. Findings

6.1 Challenges Integrating Interactive Whiteboard in the Classroom

This section will discuss the findings related to the first research question, "What are the challenges faced by KEMAS kindergarten teachers when they integrate interactive whiteboard in their classroom?" Five main themes have emerged from the data analysis, namely (i) lack of technical support, (ii) cost maintenance, (iii) classroom management, (iv) technical failure, and (v) lack of technological knowledge.

Theme 1: Lack of Technical Support

From the data analysis, the researchers have found out that the teachers experienced lack of technical support from the technical expertise. When the researchers asked if there is any technical expertise came to fix the interactive whiteboard, the research participants commented:

> No technician has ever came. We fixed it ourselves. We informed them that the interactive whiteboard was broken, but no such action was taken. We have to build our own financial support and fix it ourselves. [Sophia]
> The people (technician) came just to monitor. Then he said we have to wait. But, there is no action taken to fix the interactive whiteboard until today. [Suzanna]

These interviews excerpts are evidences that technical support is lacking and the teachers have to find their own initiatives to overcome this challenge. Both teachers reported that there is no official technical expertise available to solve the issues. Thus, adequate technical support should come along when new technologies are introduced in the classroom.

Theme 2: Cost Maintenance

The analysis also revealed that teachers are having problems with the high cost of fixing the interactive whiteboard when it is not functioning. According to Sophia, there is no specific allocation provided by the administration for the interactive whiteboard's cost maintenance. She added, they have to find their own money and resources to fix the interactive whiteboard.

> The interactive whiteboard can't be used for today. The RAM was broken and we need around RM200 to repair it … and people in charge of this IWB also said that the cost to change the bulb itself may cost from RM700 to RM800. [Sophia]

> A broken interactive whiteboard demands a high cost to get it fixed. Last time, the projector was broken and now the printer also can't be used. This happened for the second time in this year … and I think it is better for me to find a new one. It's not worth to fix it. [Sophia]

This finding is similar with the previous study conducted by Jones and Vincent (2006) who suggests that the integration of the interactive whiteboard in the classroom is closely related with the significant financial input required to purchase, install and maintain the use of it. From the above excerpts, the teachers required a substantial amount of budget to fix the interactive whiteboard. This situation continues to deteriorate because there is no specific fund allocation provided to help them overcome this issue.

Theme 3: Classroom Management

The teachers also experienced challenges with classroom management in two areas, namely dealing with student's behavior and time constraint to integrate the interactive whiteboard in the classroom. According to Suzanna, there are students who are playing around with the interactive whiteboard's screen which is touch-sensitive and it may disrupt the learning session.

> Since the students know that the screen can be touched, they will keep touching the screen even when their friend is doing the exercise on the interactive whiteboard. [Suzanna]

Besides that, the teachers also claimed they have other workloads to complete and do not have enough time to prepare learning materials by using the interactive whiteboard. They added, a packed schedule has been one of the challenges for them to teach everything listed in the curriculum especially when technical problems happen.

> The time is limited because there will not be enough time to let every student to try the activities on the interactive whiteboard. Sometimes, the lesson got interrupted when the computer is suddenly jammed. [Sophia]

Theme 4: Technical Failure

Another theme that revealed from the analysis is technical failure, be it hardware or software. Both research participants reported that there is no official technician who would come to assist them whenever they are having problem with the interactive whiteboard. Suzanna added that she sometimes felt discouraged to use the interactive whiteboard when this situation happened. This is in congruent with Erduran and Tataroglu (2009) who concluded that technical problems occur in technology integration will discourage teachers from using it. Other studies conducted by Hall and Higgins (2005) also highlighted the same findings.

Kocak and Gulcu (2013) reported that technical failure including software, material and resource deficiency are seen as unpleasant things happening in the classroom. Technical and installation difficulties are also among the major findings related with the interactive whiteboard integration (Manny-ikan, Dagan, Tikochinski, & Zorman, 2011).

> The screen sensor is not functioning well. Plus we can't calibrate the interactive whiteboard because the program in not available in the computer ... because of that, when we write something on the interactive whiteboard it will appear slowly or at the other area and not exactly on the surface that we write or touch. [Sophia]

> It is so frustrating because the students can't touch the screen to manipulate the objects. So, I had to alternatively use the mouse to move the objects on the screen. [Suzanna]

> I have to find the learning materials on my own at my house because we do not have Internet connection here. We do not subscribe to the Internet because we want to reduce the cost. [Suzanna]

The teachers' frustrations and concerns are is in line with the study conducted by Warwick, Mercer, Kershner, and Staarman (2010) that emphasized major influencing factor relates on how teachers use the interactive whiteboard is highly dependent on the interactive whiteboard's ability used as a learning tool to assist instructional process. Thus, it is important to make sure that the interactive whiteboard is always in a good condition so that instructional delivery process can be conducted swiftly.

Theme 5: Lack of Technological Knowledge

The last theme that emerged shows that the teachers are lacking technological knowledge especially in using the interactive whiteboard. Insufficient ICT training has made this situation even worse. Both research participants claimed that they only attended one training course and no other professional trainings or refresher courses are conducted since then. Advanced trainings are needed because teachers' efficiency in using interactive whiteboard is one of the contributing factors on its effective integration (Higgins, Beuchamp, & Miller, 2007). Apart from that, the teachers also require a significant amount of experience to become technical and pedagogical experts in using the interactive whiteboards.

> For me, the only training that we had attended was not enough to make us competent in using the interactive whiteboard … it (the training) lasted for only three days. On the first day, we introduced ourselves and then we were divided into several groups. We were given tasks to create the learning materials in groups, not individually. That's it. [Sophia]

> Truthfully, I'm still in the learning process to use the interactive whiteboard. There are a lot of things that I need to learn. But for now, I still can teach the students but with simple use of the interactive whiteboard such as playing video and others. [Sophia]

These interviews excerpts shown the teachers received inadequate training to incorporate the interactive whiteboard in their lesson. From their perspectives, the training is like an introductory courses and it is not emphasize on the interactive whiteboard interactivity. In fact, they suggested that KEMAS should conduct subsequent training in the future so that the teachers can fully utilize the interactive whiteboard in their classroom.

6.2 Ways of Overcoming the Challenges

This section will discuss the findings related to the second research question: "How do KEMAS kindergarten teachers overcome the challenges that arise when they integrate interactive whiteboard in their classroom?" Among the effort taken by the teachers are (i) launching fund collections from student's parents or guardian, (ii) getting support from the community and their own family, (iii) setting rules enforcement in the classroom, and (iv) increasing their technological skills and knowledge through self-taught.

Launching Fund Collection

Several approaches have been taken by the teachers to overcome the problems arise when they integrate interactive whiteboard in the teaching and learning process. The first solution that has been identified is teachers will gather fund collection from the student's guardian. For example, Suzanna reported that they have collected money from the student's guardian to help them pay for the cost of fixing the projector. The teachers reported:

> Like I have said before, I will inform the student's parents or guardians first in the Whatsapp group that we are going to make a fund collection. Or sometimes, I will just ask them nicely when I met them at the kindergarten. [Sophia]

> Usually, we will ask the student's parents or guardians to give some donation if we do not have enough money to pay the maintenance cost. We will put one big container outside the classroom so that they can put the money inside it. [Suzanna]

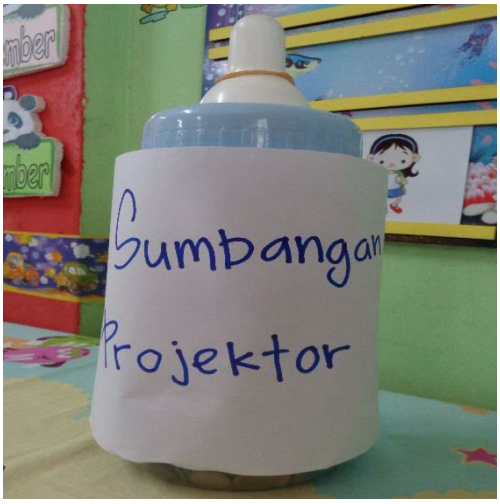

Figure 1. The container used to collect money from student's parents or guardians which reads "Sumbangan Projektor" or "Donation for Projector" in the Malaysia native language.

The action taken by the teachers shown they have received community support which will be discussed further in the next section. Undoubtedly, this initiative somewhat helped them get extra money to help them fix the interactive whiteboard.

Getting Support from Own Family and Community

Technically, it is a common situation when teachers are having problem in the classroom that integrates technology. For that, technical support is considered as an influencing factor for successful technology integration for teaching and learning process (Mohamed & Khamis, 2014). Both research participants agreed that support from colleagues would be helpful when they encountered problem using the interactive whiteboard. Suzanna added, she even gets help from her husband whenever the technical problems happen. For example, her husband helped to reset the interactive whiteboard's calibration program and changed the computer's RAM when it breaks down.

Besides that, the teachers also share information with their colleagues from other kindergartens to deal with the technical failure. This action is possible because according to Sophia, they have created Whatsapp group when they attended the training course last time. She commented:

I used to share problems related with the use of interactive whiteboard with my colleagues. For example, there is only one interactive whiteboard in the Shah Alam district and it is installed at this kindergarten. So if I have problems, I will just contact my colleagues to help me. [Sophia]

The warranty for this interactive whiteboard had expired mid of 2014. After that, I used to call my husband to fix it whenever it breaks. Like last time, my husband had changed the computer's RAM with a new one. [Suzanna]

That time we collect money from the student's parents and guardian because the cost to fix the projector is nearly RM500. So we had to get help from them to top up the cost with the existing fund from this kindergarten. [Suzanna]

Figure 2. Suzanna's husband seen giving a hand on the interactive whiteboard, is the unofficial technical support received by the teachers at KEMAS Anjung Bistari.

Setting Rules Enforcement

In order to increase the control over student's behavior, Suzanna has set several rules to manage the students in the classroom. She claimed that students will be in their best behavior if the rules were enforced when conducting activities using the interactive whiteboard. She commented:

For example, when I carried out an activity in the classroom, I will set the rules to ensure that the classroom is well-managed. For instance, I will only pick up students with good behavior which is when they sit at their place, not making noise and not playing around with their friends. In that way, students will automatically start to behave. [Suzanna]

From this interview excerpt, the use of interactive whiteboard in the classroom can bring positive impact toward student's behavior. This finding is similar with previous research conducted by Northcote et al. (2010) that stated interactive whiteboard integration can encourage positive influence on children's behavior. Md. Khambari, Hassett, and Wong (2015) also stated that rules enforcement can help the teachers to achieve the desired goals and objective. Developing good routines and following them is an initiative taken to handle the classroom. In conclusion, it is suffice to say that rules enforcement can control student's behavior and indirectly, enhance the learning environment by having a good classroom management.

Self-Taught

According to the teachers, both of them agreed that they received insufficient training after attending the interactive whiteboard's training course. They added, attending the training for only three days was not enough because they do not get opportunities to explore and familiarize themselves with the

interactive whiteboard's functions. They also said that they are still in the 'learning processes' to integrate interactive whiteboard in the teaching and learning process. For example, they commented:

> I explored a lot by myself. In fact, I had my laptop installed with the interactive whiteboard software when I'm attending the training; so that I can practice more on how to use them and integrate it with the interactive whiteboard in the classroom. [Suzanna]

> During the training, we are only introduced to the available functions embedded in the interactive whiteboard, buttons and program installed in it. For that, I have to refer to the user manual book provided to learn more or use it as reference in case I forgot what I had learnt. [Suzanna]

Hence, these excerpts show that self-taught is one of the initiatives taken by the teachers to increase their existing technological skills and knowledge. During the interviews, the teachers agreed that they can learn more about functions embedded in the interactive whiteboards when they explore it by themselves.

7. Conclusion and Recommendations

Based on the findings gathered, the KEMAS kindergarten teachers faced several challenges when they integrate interactive whiteboard in their classroom. Lack of technical support and maintenance cost are the two prominent challenges found in this study. Besides that, the difficulties to manage student's behavior in the classroom also become one of the challenges the teachers faced. Even though the use of the interactive whiteboard had sparked excitement among students, this has also become a challenge as their over-excitement makes them became more difficult to control. Packed schedules and other managerial workloads also prevented the teachers to utilize the interactive whiteboards to the fullest. Apart from that, the teachers also faced trouble to troubleshoot the problems with interactive whiteboard themselves because of their lack of technical knowledge and skills.

Nevertheless, despite all challenges that they encountered, the teachers do find their own way of solutions to overcome the problems. This situation proved that the teachers have the effort to ensure a quality classroom instruction powered by advanced technology. The teachers are aware that today's children are digital learners and the use of interactive whiteboards in the classroom can support them in their learning activities. Thus, this study recommends adequate training and technical support to assist teachers in using the interactive whiteboards. It can be seen clearly that ongoing technical support provided is insufficient as for now. The related parties or the top management should be aware that teachers may have different kind of computer literacy and technological skills. For that, they should conduct more tailored professional development courses and trainings, and supervise the teachers from time to time to ensure that the teaching and learning process are carried out efficiently.

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