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# DIGITAL TRANSFORMATION IN EDUCATION: TEACHERS COMPETENCY IN INTEGRATING INTERACTIVE WHITE BOARD (IWB)

*Simin Ghavifekr[1] & Wong Seng Yue[2]

[1]Faculty of Education, University of Malaya , Malaysia.

[2]Centre for the Initiation of Talent and Industrial Training (CiTRA), University of Malaya , Malaysia.

*Corresponding Author:

drsimin@um.edu.my

## 1. Abstract

The main purpose of this study was to disclose the effectiveness of Interactive White Board (IWB) in school settings. More specifically this research intended to investigate on teachers' perceptions about IWB integration in their daily teachings. For this quantitative study, data were collected by distributing a set of survey questionnaire to total of 313 teachers from primary schools in Kuala Lumpur, The collected data were analysed using SPSS (23.V) through descriptive statistical analysis . Findings indicates that teachers possess a positive attitude towards IWB with small to moderate significant value and had indicated themselves as apprentice users or initial users with basic to moderate competent level in using the IWB. The study found that , the best way to strengthen teachers' IWB competence is cultivate teachers with relevant and quality professional development and training.

Keywords: Interactive White Board (IWB), Teacher competencies, Primary Education, Malaysia.

## 2. INTRODUCTION

The concept of "Digital Transformation in Education" is the rapid global technological advancement and development of Information Communication and Technology (ICT) had placed the teaching and learning process into a more challenging profession. Accordingly, teachers are required to integrate ICT tools and equipment in their daily teaching and learning instead of using the traditional teaching methods (Hamidi et al., 2011).

To equip young generation with 21st century competencies, schools plays a crucial role to ensure the application of ICT being adapted into the curriculum and daily teaching and learning process. The purpose of integrating ICT into primary education, as the fundamental stage for learning processes, is to achieve learning aims and enhance the learning outcome instead of just teaching the students these technical methods on how to use the technology devices to operate a computer (Peeraer & Van Petegem, 2012).

Peeraer and Van Petegem (2012) claim that to ensure the successful ICT integration ICT in primary schools, scholars have emphasized that it is about how teachers integrate ICT into teaching and learning process as the implementation process to foster students thinking skills and lastly promote better learning outcomes. Integrating ICT into primary school teaching and learning will not just enhance student learning achievement, it also benefits students such as i) motivating them when they get instant feedback during using ICT devices or programs ii) provide conducive environment for interaction and cooperation among group members; iii) allow students to explore to the problem-centered approach to make decision by themselves, iv) enable students to be active participants with minimum limitation and, v) improve their technological and communication skills (Chaamwe, 2010).

The intention of Malaysia's government to raise the education achievement by upgrading the quality of ICT in whole nation has been supported widely by school administrations. The integration of interactive whiteboard (IWB) in teaching and learning in Malaysian primary school was started since year 2008. The number of primary schools that integrated IWB into teaching and learning process was substantially increased from

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average two (2) IWB per school in year 2008 increased to average fifteen (15) IWB per school in year 2014 The insight of integrated IWB into teaching and learning process was to improve the achievement of students learning outcome as emphasized in Malaysia Education Blueprint (2013-2025).

However, despite of supportive development planning and innovation to implant ICT element into national education by Malaysia's government, the successful of ICT to plays its roles to improve quality teaching and learning outcome are still much depending on teachers' competencies level who act as the main medium to interact with pupils in their learning process (Rowe, 2003; MSC,2008).

Schools trying to provide teachers the best component to help in enhance the students' achievement. Yet, the teacher competencies will become one of the most important key to accomplish the goals of IWB integration into teaching and learning (Kulshrestha & Pandey, 2013). Teachers are the main "medium" that delivers the messages or resources based on students' need via IWB. This process required new competencies that needed by teachers. Teachers need to acquire in order to be able to use the interactive whiteboard (IWB) to develop their practice (Schmid, 2010). Therefore, teachers' competencies level of using IWB inside the classroom for instructional purpose deserves much more attention (Celik, 2012). This is because, teachers' competencies level on using ICT tools such as IWB will definitely affecting how effective teachers use the IWB (Lai, 2010) such as the frequency of teachers use IWB for teaching and learning, type of resources or presentation method that teachers choose to best meet the students' needs.

## 3. METHOD

In this study, a quantitative descriptive research method was used to investigate teachers' perceptions of their competencies towards IWB integration in classroom practices. According to the Best (Ololube & Kpolovie, 2012; Türel & Johnson, 2012) descriptive research always analyses the status or relationships that exist between variables; the practices that prevail; beliefs, perceptions, or attitudes that are held; processes that are going on; efforts that are fallen; or trends that are developing.

An examined survey questionnaire by Ishtaiwa and Shana (2011) was adopted to collect data for this study. Total of 350 questionnaires were distributed to the teachers from 21 primary schools' in Kuala Lumpur randomly, and total of 313 were returned. Since the focus of this study is to investigate the teachers' competency level of IWB integration in classroom practice, it was essential to select respondents among the ones who have taught in school which provided with IWB facilities and who have had teaching experiences integrated with the IWB in teaching and learning process. The statistical reliability of the instrument was assessed using Cronbach's alpha coefficient of internal consistency for the questionnaire with the data collected. The Cronbach Alpha value for the questionnaire has been calculated as.92.

## 4. FINDINGS

### 4.1 Teachers' Perceptions on Their Confidence Level in Using IWB

The confidence level of respondents is probed by the confidence on operating specific function of IWB that listed in Table 1 shows below and their self-reported familiarity degree in using the IWB for teaching and learning purposes.

Table 1: IWB's Use Frequencies and Percentages by Confidences Level

| IWB Function | Confidences Level [a] | | | | Use Frequencies [b] | |
|---|---|---|---|---|---|---|
| "I am very confident in using Delete function" | SD (%) | D (%) | A (%) | SA (%) | Seldom (%) | Frequently (%) |
| 1. Highlight | 1.0 | 15.7 | 48.2 | 35.1 | 131 (41.9) | 182 (58.1) |
| 2. Zoom in/ Zoom out | .6 | 2.6 | 46.6 | 50.2 | 71 (22.7) | 242 (77.3) |

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| | | | | | | |
|---|---|---|---|---|---|---|
| 3. Colour objects | 1.0 | 16.6 | 47.0 | 35.5 | 135 (43.1) | 178 (56.9) |
| 4. Gallery | 1.6 | 19.8 | 48.9 | 29.7 | 174 (55.6) | 139 (44.4) |
| 5. Draw | 1.0 | 23.6 | 50.8 | 24.6 | 195 (62.3) | 118 (37.7) |
| 6. Snapshot | 1.6 | 29.4 | 46.6 | 22.4 | 210 (67.1) | 103 (32.9) |
| 7. Remark / Comment | 1.6 | 29.4 | 51.8 | 17.3 | 227 (72.5) | 86 (27.5) |
| 8. Lesson record | 3.2 | 29.7 | 54.0 | 13.1 | 224 (71.6) | 89 (28.4) |
| 9. Virtual keyboard | 1.3 | 23.3 | 56.9 | 18.5 | 186 (59.4) | 127 (40.6) |
| 10. Import image/audio/video | 1.9 | 19.8 | 51.1 | 27.2 | 153 (48.9) | 160 (51.1) |
| 11. Handwriting recognition | 1.6 | 26.2 | 54.6 | 17.6 | 195 (62.3) | 118 (37.7) |
| 12. Screen shading/ screening | 2.2 | 26.8 | 54.6 | 16.3 | 214 (68.4) | 99 (31.6) |
| 13. Internet | 1.3 | 7.0 | 56.9 | 34.8 | 121 (38.7) | 192 (61.3) |
| 14. Hyperlinks | 1.9 | 27.8 | 49.8 | 20.4 | 213 (68.1) | 100 (31.9) |
| 15. Create shape/chart/table | 1.3 | 18.8 | 54.0 | 25.9 | 167 (53.4) | 146 (46.6) |
| 16. Document Camera/Visualizer | 1.0 | 14.1 | 51.8 | 33.2 | 127 (40.6) | 186 (59.4) |
| 17. Mirror (for Visualizer) | 1.0 | 20.5 | 53.5 | 25.0 | 161 (51.4) | 152 (48.6) |
| 18. Split (for Visualizer) | 1.3 | 24.4 | 52.9 | 21.5 | 179 (57.2) | 134 (42.8) |

[a] Agreement Level (SD=Strongly Disagree, D=Disagree, A=Agree, SA=Strongly Agree)

As shows in the table above, the greater respondents felt confident in using a feature, the greater the confidence degree for them to use IWB. From Table 1, under the column of confidence level, about 70% of the respondents indicated (for agreed and strongly agreed) that they are confident in operating common functions such as highlight (83.3%), color an object (82.5%), gallery (78.6%), draw (75.4%), virtual keyboard (75.4%), import image/audio/video (78.3%), handwriting recognition (72.2%), or create shape/chart/table (79.9%), mirror function in for visualizer (75%), Split function for visualizer (74.4%).

While, teachers also indicated that functions such as zoom in/ zoom out (96.8%), Internet (90.7%), and document camera also known as visualizer (85%) are the functions they felt most confident in operating.

However, respondents do not feel confident in using functions like lesson record (33%), snapshot (31%), remark/ comment (31%), hyperlink (29.7%), and screen shading/ screening (29%). It might because of these functions are seldom required when using an IWB for teaching and learning process. The confidence level of using an IWB also can determine according to the usage frequencies in IWB's functions.

By obtaining teachers' use of the tools above, it exhibits the confidence level of teachers are not averagely distributed. And this might because of the lack of training or knowledge to operate it.

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Based on Table 1, a comparison bar chart of the IWB's functions uses frequencies was created as shows in Figure 1 below. The highest degree of usage frequencies of IWB feature is "zoom in/ zoom out" with 77.3 % of respondents frequently used for teaching and learning. Teachers used to show several types of document via the document camera which also known as visualizer (59.4%). To ensure the teaching content display in IWB visible for whole class, whether using linked desktop or visualizer, it always requires the teacher to use "zoom in or zoom out" function much frequently.
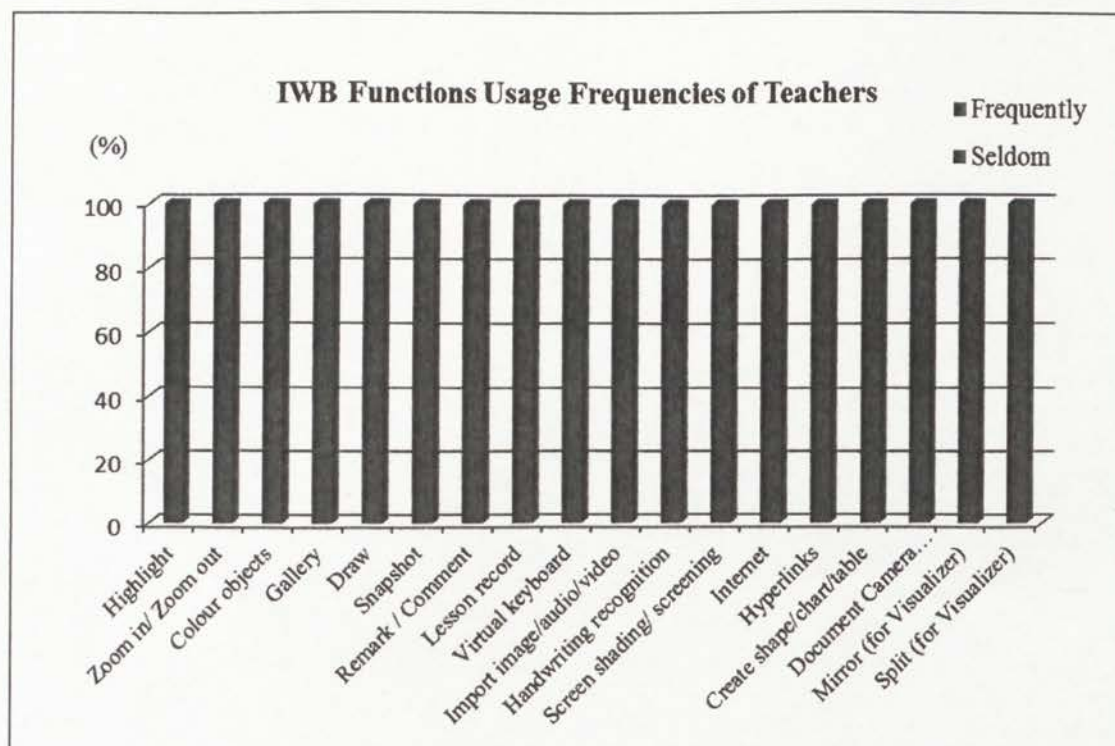


Figure 1: IWB functions usage frequencies of Teachers.

Followed by the next frequently used function is surfing resource for Internet (61.3%). As advocated by the Ministry of Education, teachers are encouraged to integrate more current issues or updated resource to support their teaching contents. It is also allows teachers to access their works saved online in advance before the lesson.

On the other hand, remark or comment function is seldom used by teachers, as well as the lesson record or hyperlink functions. Notwithstanding this, the confidence level of respondents cannot be generalized by only analyzing the usage frequencies on IWB, because it is possible for trained teachers to grasp and manage the skills to operate IWB functions, but they are designed and preparing their lesson activities according the needs of students, not on the skill to operate IWB they have.

### 4.2  IWB Familiarity in Teaching and Learning

Teachers' confidence level in using an IWB also can be explored through the aspect of teachers' familiarity of using an IWB in teaching and learning process. The greater the familiarity of IWB used the greatest level of confidence in using teachers.

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According Table 2, it appears that 248 (79.2%) of the respondents are familiar to use IWB for teaching and learning purpose in the classroom. On the other hand, there are 65 (20.8%) of respondents evince that they are unfamiliar to use IWB during teaching and learning process.

Table 2: IWB Familiarity in Teaching and Learning

| Familiar to IWB | No of Respondents | Percentage (%) |
|---|---|---|
| Yes | 248 | 79.2 |
| No | 65 | 20.8 |

Basically, the majority of teachers are familiar with using an IWB in teaching and learning activities, but the usage might only be limited to certain function or subject, instead of applying to all subjects.

### 4.3 Source of IWB Skills Learned

Figure 2, shows that party that could provide sources of help to 313 respondents in using an IWB in school. Respondents are allowed to select more than one answer from the options provided. The findings are based on the number sources learned instead of the other way round.

According to the responses, 49% of respondents learned knowledge about IWB from the training courses arranged by schools. Some 28% of teachers claimed that they learned IWB information from their colleagues. At the same time, 17% of teachers learned IWB skills from the vendor of IWB which used to provide training courses once in a while depending on the requests from schools. Lastly, 6% of teachers learn how to navigate or use IWB on their own.
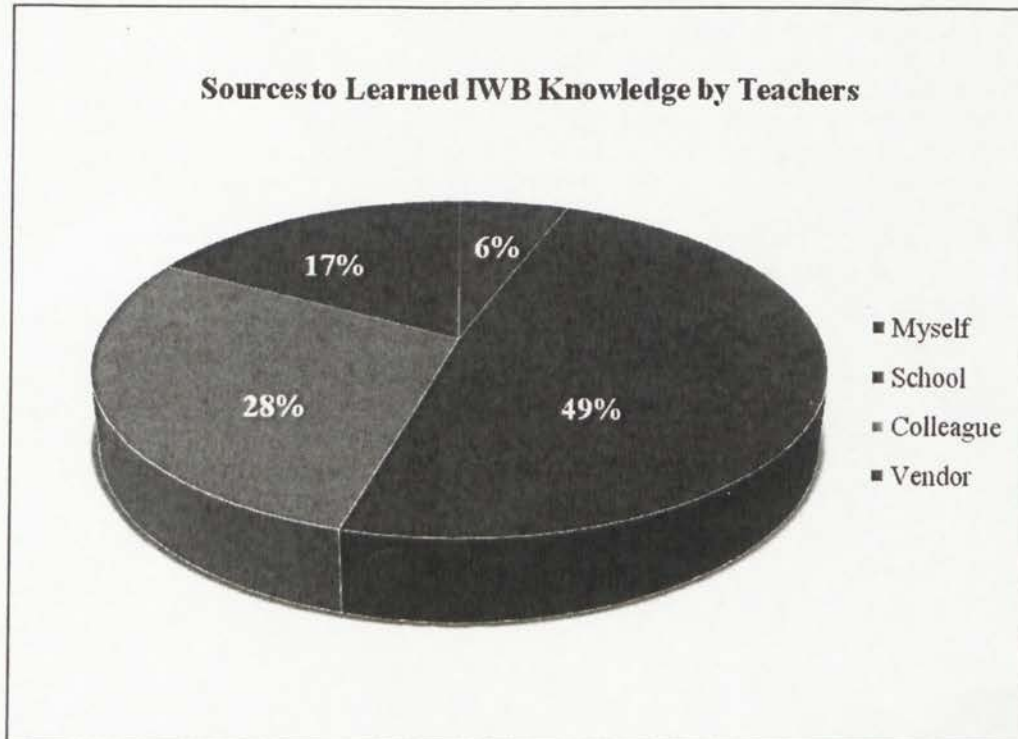


Figure 2: Source of IWB Skill and Knowledge Obtained by Teachers

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The percentage of teachers who learned IWB skills from colleagues is unexpectedly high, and this might be because of the insufficient training courses provided by schools, especially for newly joined teachers or teachers who transferred from another school which do not have IWB.

## 5.  CONCLUSIONS

The confidence level is one of the key factors that could motivate or be an obstacle for teachers in using the IWB. The confidence level of teacher in using IWB was observed by investigating the daily usage frequencies of IWB features. According to Bidaki and  Mobasheri (2013). teachers or technology users with a higher degree of confidence in using ICT features will relatively apply their technical skills to integrate IWB into classroom practices. Sang et al. (2010) also made a statement that a regular ICT user is more likely to integrate IWB in teaching and learning process.

The finding exhibits that teachers are only confident in using certain tools or features in IWB. The teacher confidence level is not averagely distributed in features or tools asked in the questionnaire. This is supportive of The SmartVET project findings that IWB features to using IWB are reflexed the same situation in this study, where the level agreements toward the IWB features vary with feature such as a pen, eraser and highlight tools shows a greater percentage of confidence level. While others features such as Hyperlink, speech/bubble, and create a graph/ diagram tools appeared greater percentage of unconfident to in using it (Koenraad, 2012; Koenraad, Whyte & Schmid, 2013).

The confidence level also has been tested by IWB feature use frequencies by choosing from two options: seldom or frequently use (see Table 1). Based on the finding in this study, the most seldom use features were remarking/comment (72.5%), lesson record (71.6%), screen shading/ screening (68.4%) and hyperlink (68.1%). At the same time, the features frequently used by teachers zoomed in/zoom out (77.3%), Internet (61.3%), visualizer (59.4%) and highlight (58.1%). A same trend of finding on IWB features uses frequencies was found in relevant researches where hyperlink has fewer number of uses compared to other features (Celik, 2012; Koenraad, 2012; Türel & Johnson, 2012).

Besides, teachers' confidence level in using an IWB also can be explored through the aspect of teachers' familiarity of using an IWB in teaching and learning process. The familiarity with IWB features is the best way to use it and this is important to promote the quality of IWB integration in teaching and learning process (Celik, 2012; Emron & Dhindsa, 2010). In the other words, the greater the familiarity of IWB uses the greatest level of confidence in using teachers. This is also applicable to the relationship between advance ICT users and IWB use frequencies in instructional practice where teachers who are proficient in ICT skills has more confidence and are pleased to use the IWB as they are more familiar with technical aspects of these features (Bidaki & Mobasheri, 2013; Cox, Cox & Preston, 2000). However, to promote quality use of IWB, the level of confidence in teachers to integrate IWB in the classroom need to be strengthened through professional development and training programs to enhance their IWB competencies.

As previous researchers (Bidaki & Mobasheri, 2013; Hussain, Morgan, & Al-Jumeily, 2011; Holmes, 2009) have stated, providing relevant training for teachers is an essential factor in the effective use of Interactive Whiteboards in the teaching and learning process. So, to integrate IWB into primary education level, the focus should not limit on IWB facilities, but the School Director Board, Teachers and Parents Association  (TPA), school's management level should prepare teacher a complete professional Development and training program to confront the generation of IWB.

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