

The Perception of Teachers towards Smart Board Technology in a Malaysian Primary School

Kien Tsong Chau, Danial Aizat Bin Zainuddin, Siaw Kiong Ling, Li Min Ng, and Jiaqi Yang

Abstract—The paper investigates the perception of teachers towards smart board. Malaysian government started to deploy smart boards in various schools in the year of 2000. However, the deployment encountered numerous obstacles, such that teachers followed with reluctance, and less intrigued to teach using smart boards. After twenty years, are the teachers still perceive the same? Research into this phenomenon could shed light on some sensible perspectives on the deployment of the ICT tools in education that worth further research. There are relative dearth of research works that offer representative evidences for such phenomenon in Malaysian context. Therefore, the researchers took initiative to conduct relevant research by recruiting 18 teachers from a local primary school. The questionnaire were analysed based on descriptive statistics and the findings indicate that smart board was well received by the teachers. Attributed to positive perception towards smart board, majority of the teachers were prepared to use it for teaching and learning in a variety of creative ways. Research findings potentially support the use of smart board in classroom, and contribute towards the development of various learning activities and strategies using smart board.

Index Terms—Acceptance, board, interactive white board, communication, perception, smart board, technology.

I. INTRODUCTION

The use of smart board in education in Malaysia can be traced back to past smart school program in the year of 2000, where Malaysian Minister of Education endeavored to install smart board in all selected smart schools. However, the school program encountered various obstacles which led to the postponement of the deployment [1]. During the period of time, teachers followed with reluctance, and less intrigued to teach using smart board. They raised their concern that smart board was not only costly, but also would increase their workload [2]. After twenty years, are teachers nowadays still perceive the same? Are they holding the belief that smart board facilitates teaching and learning effectively? Smart board is an interactive board resembling to conventional white board but connectable electronically to laptops, personal computers, tablets, printer, touch screen panel, and relevant electronic devices. By deploying computer integrated programs, smart board allows ‘interactivity’

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features for teachers to write, edit, erase, move, and modify digital contents using fingers as well as projecting visuals inclusive of animations and videos on touch screen panel. In view of the indispensability of traditional blackboards in classroom, lecture hall, and training sessions [3], research into the smart board that incorporates the ability of computer technology could shed light on some sensible perspectives on the deployment of the ICT tools in education that worth further research. There are relative dearth of research works that offer representative evidence for such phenomenon. Therefore, relevant research was hereby conducted on the perception of primary school teachers towards smart board. Research findings potentially support the use of smart board in classroom, and contribute towards the development of various learning activities and strategies using smart board.

II. OBJECTIVES

The research focuses on the smart board, and its purpose is to investigate the perception of Malaysian teachers on the technology in general. The objectives of this paper are threefold. Firstly, it aims to assess the usage level of smart board by teachers in classroom. Secondly, it identifies the benefits and limitations of using smart board from the perspectives of teachers. Thirdly, it ascertains the expectation of teachers on smart board technology. There are numerous research works directed on the effects of smart boards on students [4], [5], but relatively limited on the perception of Malaysian teachers towards smart board. After twenty years, it is interesting to discern how teachers nowadays perceive smart board. In their mind, has the usefulness of smart board already fully replaced the conventional white board? Or otherwise. The result of the research will provide a glimpse of idea of whether schools of today should continue to install smart board in teaching and learning.

III. LITERATURE REVIEW

Taking a closer look at relevant functions, smart board provides a variety of uncomplicated functions potentially play massive part to support teachers in teaching and learning. Amongst others, it provides pen tools, video and audio players, touch screen, recorder, and on-screen keyboard functionalities. The alternative functions compatible with technology already utilised in today’s classrooms include Math functionality that permits movement and modification of mathematical notes, ink editing and 3D Tools for the choice of styles and colour of digital brushes as well as 3D effects respectively. With the advent of different features in smart board, many quarters view it as a catalyst in motivating

students [6]-[8]. Indeed, substantial empirical research works confirmed students to have found constructing knowledge, skills, and mastering advanced thinking skills. For instance, a research work on the effects of using interactive white board in teaching English on 146 primary school students in Turkey demonstrated that interactive whiteboard enhanced the students' English academic success compared to the blackboard [4]. Research works on integration of particular learning approaches into smart board were observed as well. In research conducted by [9] on 30 students implicated that active learning using smart board program was effective in enhancing primary school students' learning performance in Data Handling. Other areas of research works engaging smart board include [5] on tertiary students and [10] on social studies.

Relatively scarce empirical research works from the teachers' perspective in Malaysian context were witnessed. Among the research works in Malaysian context identified are [3], [11]-[13]. Reference [3] research on Turkey teachers of different fields including mathematics, science, technology, English, social sciences, and design field. Attributed to variety of background, the research is representable to be generalised that smart board is beneficial in other fields as well. Reference [3] found teachers embraced positive attitude towards the technology. A broader scale of research was observed in [14] where 74 mathematics teachers from private schools in Jordan were researched. They concluded that mathematics teachers believed smart board could enhance students' level of clarity and higher order thinking skills. A research gap observed from the research are the lack of relevant research in Malaysian context.

IV. RESEARCH METHODOLOGY

The researchers scoped the research on the views of the teachers in the school. Data were collected by means of structured questions in line with a short interview formed of open-ended question technique. The questionnaire composed of different sections and multiple choice questions. The first section was two questions on soliciting demographic data. The second section contained six questions on asking the respondents to indicate the acceptance level of using smart board in primary school. The third section offered fourteen questions on the benefits and limitation of using smart board in classroom. 5-point Likert scale rated on a one-to-five Agree-Disagree response scale were intentionally deployed because of time constraint faced by the teachers. The simplicity of questions allows the teachers to merely consume 15 minutes to answer items in questions. Information for this research was gathered through online Google Form. The form was available for responses for four days. For this research, a primary school in Baling, Kedah, Malaysia was chosen as target investigated venue. The school was under observation as smart school by the Malaysian government. Eighteen primary school teachers participated in the research. Among these respondents, 15 were females and 3 males. Their identities were not requested, thereby confidentiality and privacy were guaranteed. There were 12 respondents worked more than 5 years as a teacher

while the rest works less than five years (Table I).

TABLE I: EXPERIENCE AS A TEACHER

Respondents	< 1 year	1-2 years	3-5 years	> 5 years
18	2	2	2	12

The teachers answered questionnaire through online Google Form. Two top management personnel were interviewed to gain further insights into teachers' responses.

V. FINDINGS

A. The Acceptance Level of Using Smart Board by Teachers in Primary School

Table II reveals that the knowledge of teachers and availability of smart board in primary school was high. All respondents knew about smart board. A total of 16 respondents indicated smart board was installed in their classroom. Only two respondents indicated that smart board was not available in the classrooms they attended to, and this reflect the extent of awareness and popularity of smart board technology in Malaysia.

TABLE II: WILLINGNESS TO USE SMART BOARD

*SB: smart board	Yes	No
Do you know about SB?	18 (100%)	0 (0%)
Do your classroom have SB?	16 (89.9%)	2 (11.1%)

Out of 16 respondents who had accessibility to the smart board facility, 5 (31.3%) respondents used smart board in their classroom very frequently while 8 (50%) used it frequently (Table III). Only three teachers who had the opportunity to use the technology stated that they occasionally and seldom use the technology.

TABLE III: FREQUENCY OF USING SMART BOARD IN CLASSROOM (N=16)

Very frequently	Frequently	Occasionally	Seldom	Never
5 (31.3%)	8 (50%)	2 (13.5%)	1(6.3%)	0

The expression of high degree of usage reflected that smart board was valued highly in instruction by a large majority of teachers. 75% of classrooms in England adopted the technology [9] has likely set a benchmark for the accessibility of the technology if quality education is aimed to be achieved. The researched school had the smart board available in its classes, and the teachers utilised them to a sufficient degree.

Despite high accessibility level of smart board in the school, the teachers generally were of opinion that the Malaysian schools generally faced difficulty to secure smart board. Table IV described budgeting constraint as main factor, where 83% agreed.

TABLE IV: REASON OF THE SCHOOL DO NOT PURCHASE SMART BOARD

Respondents	Budget	School refusal to display
18	15 (83%)	3 (17%)

The schools need the smart board but restricted on a tight budget. The cost of smart board itself, relevant accessories and maintenance had impeded government to fully procure the smart boards for all school in Malaysia. It is thus expected

that full accessibility to smart board would only be realised when the price fell to an affordable level in the view of the school management. This also means that the failure of smart board in the past was not fully caused by teachers in school.

All respondents were willing to learn more about smart board. Table V illustrates that 10 (55.6%) out of 18 respondents wanted to learn because it was a new technology whereas 22.2% of them learned smart board because of interest. Four respondents provided other reasons. One stated that it was required by the school, two stated they believed it could improve learning and the last one had no any reason.

TABLE V: REASONS TO LEARN SMART BOARD

Respondents	New Technology	Interesting	Others
18	10 (55.6%)	4 (22.2%)	4 (22.2%)

It is not surprising to observe the “new technology” as major reason to learn smart board, particularly during this period of information age where digital technology is something indispensable for accessing information.

B. The Benefits of Using Smart Board in Classroom

Table VI shows that teachers treasured smart board as highly beneficial technological tool. According to teachers, the most prominent benefit was time saving. All teachers (100%) agreed (61.1%) and strongly agreed (38.9%) that smart board assisted them to prioritise tasks after saving time in preparing teaching materials.

TABLE VI: BENEFITS OF USING SMART BOARD IN CLASSROOM

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
*SB: smart board					
SB is environmentally friendly	0	0	5 27.8%	11 61.1%	2 11.1%
Provide great learning experience to students	0	0	2 11.1%	11 61.1%	5 27.8%
Enhance teacher's teaching experience	0	0	2 11.1%	11 61.1%	5 27.8%
Save time in preparing teaching materials	0	0	0	11 61.1%	7 38.9%
Enjoyable and fun	0	0	1 5.6%	9 50%	8 44.4%
Enable teachers & students to revisit lessons learned the day	0	0	2 11.1%	13 72.2%	3 16.7%

Others noticeable benefits were great learning experience to students (61.1% agreed and 27.8% strongly agreed, giving 88.9% solid agreement), enhanced teacher’s teaching experience (88.9%), smart board made the topics easy, enjoyable and interesting (94.4%), and enabled teachers and students to revisit the lessons learned in the day (88.9%). The least favourable benefit felt by the teachers was the issue pertaining to environmental friendliness, with only 72.2 % teachers agreed and strongly agreed. The teachers who agreed elaborated that smart board eliminated the need for photocopying and printing of papers. Overall students embraced positive perception and agreed the adoption of smart board during the course of class learning was effective.

Dominating positive perception observed in Table IV explicates that teachers were in fact well aware that students

learned best when perceptual learning styles which are sensory based were involved and smart board nicely providing relevant features and functionalities [9]. With smart board, the teachers believed that the students no longer required to be passively watching classroom presentations. Cone of Learning [15] underlines the premise that if teachers engaged the students directly in a meaningful way through the availability of hands-on-experience using smart board, in addition that interactivity features and visuals helped clarifying abstract concepts that was hard to explain, the students would likely be nurtured into active learners and thereby understood the lessons better and resulted in up to 90% of retention rate.

C. The Limitations of Using Smart Board in Classroom

Table VII illustrates that the limitations of using smart board were not stemmed from the smart board itself, but rather because of technical problems that hindered the deployment.

TABLE VII: LIMITATIONS OF USING SMART BOARD

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
*SB: smart board					
Technical problems (no WiFi/electricity) hinder flow of the course	0	0	3 16.7%	12 66.7%	3 16.7%
Lack of knowledge on how to use SB	1 5.6%	1 5.6%	8 44.4%	7 38.9%	1 5.6%
Lack of proper training from expert or trainer on using SB	0	0	8 44.4%	9 50%	1 5.6%
SB and its accessories are costly	0	0	6 33.3%	9 50%	3 16.7%
SB is hard to use	1 5.6%	10 55.6%	6 33.3%	1 5.6%	0
SB is hard to maintain	1 5.6%	4 22.2%	7 38.9%	6 33.3%	0
SB is hard to manipulate	1 5.6%	6 33.3%	9 50%	2 11.1%	0
I need to spend a lot of time to learn to use SB	1 5.6%	6 33.3%	7 38.9%	4 22.2%	0

A total of 83.4% of the teachers strongly agreed (16.7%) and agreed (66.7%) that technical problem such as absence of Wi-Fi and electricity was the major problem they encountered in daily lesson. Because the smart board was not functioned well in daily lesson, they always needed to waste time to prepare back-up lesson plan. Only 5.6% of the teachers strongly disagreed that smart board was hard to use, manipulate, and maintain. The teachers explained that they did not received adequate and proper training from experts.

D. The Expectation of Teacher Using Smart Board

Items which states “smart board is effective?” and items related to “enjoyable”, “improvement” recorded the highest percentage of 94.5% (combination of agree and strongly agree) in Table VII. This result indicated that teachers expected well the effectiveness of smart board usage in class.

TABLE VII: THE EXPECTATION OF TEACHER USING SMART BOARD

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
*SB: smart board					
I satisfy with the lesson using SB	0	0	6 33.3%	10 55.6%	2 11.1%
The SB is effective in your classroom?	0	0	1 5.6%	14 77.8%	3 16.7%
Do you think your students enjoy during your lesson with the aid of smart board?	0	0	1 5.6%	13 72.2%	4 22.2%
Do you see any improvement in your students when you use SB?	0	0	1 5.6%	14 77.8%	3 16.7%
Do your students interact/cooperate with you while you are using the SB in your lesson?	0	0	2 11.1%	15 83.3%	1 5.6%
Do you think Ministry of Education should continue using SB in every class?	0	0	1 5.6%	12 66.7%	5 27.8%
If given the opportunity to learn, will you willing to learn SB?	0	0	1 5.6%	14 77.8%	3 16.7%

Items which state “Ministry of Education should continue using smart board in every class” and “If given opportunity to learn, willing to learn smart board” recorded high percentage as well (both 94.5% agreed and strongly agreed). These items implicates that teachers were generally gratified with the classroom lessons using smart board. Their high level of expectation led them to look forward the government’s involvement in the future. The least expectation was “I satisfy with the lesson using smart board” where 66.7% of respondents strongly agreed and agreed with it. Smart board was not deemed difficult to be used by the teachers. They indicated problems arisen was due to the result of inadequacy and lack of training.

E. The Usage Level of Smart Board

In attempts to gain further insight into the use of smart board technology, two top management (principal and deputy principal) of the researched school were briefly interviewed. The management of school elaborated that the usage level of smart board was high, where it reached 80% of the teaching activities conducted. Along with being asked to elaborate whether the teachers could operate the technology, the management unanimously described that the problem did not exist. All teachers in the school were well trained by the smart board vendor. Further to questions on the effectiveness of the smart board technology as well as what they liked best and least about the technology, they mentioned that teachers were highly engaged with the students by using the smart board as it was convenient and interactive. According to them, there was vast changes on the teaching approach since the technology deployment. The teaching method was changed gradually from teacher-centred approach to student-centred approach. With the aid of smart board, the teachers now serve as facilitator and designer of the lesson. In their opinions, the students were highly enjoyable using the smart board. The smart board no longer an accessories to the classroom, but a learning conducive tool truly assisted the teachers in daily lessons. Observation during the interview sessions found that the students’ concentration and attention were enhanced with the aid of the smart board. As shown in Fig. 1, teachers were

observed to have used the smart board in a variety of creative ways, such as projecting and manipulating various visuals and animations on screen to draw students’ attentions.



Fig. 1. Fieldwork in school.

Top management of the school expressed their hope that additional smart boards would be available and accessible conveniently in all on their classrooms in near future.

VI. DISCUSSION

Positive responses described by the teachers indicated that teachers would be potentially more enthusiastic and motivated when lessons were offered using the smart board rather than using alternative teaching methods. The level of satisfaction discovered in the finding is consistent with majority of research works conducted globally, such as [3] that concluded that teachers find smart boards beneficial.

One contradictory point was observed in opinions from teachers and management. In interview, the school management described that all lecturers were well trained, but teachers stated in the opposite position. There were eight respondents (44.4%) neutral. Besides, over 50% of teachers responded neutral, agreed, and strongly agreed that they “lacked of adequate and proper training from trainers on using smart board”, “lacked of knowledge on how to operate it”, smart board is “hard to use”, and “hard to manipulate”. They even undecided on the question on “I need to spend a lot of time to learn to use smart board”. Such gap and misunderstanding on training, and the lack thereof warrant further investigation. The expressions that teachers’ lack of technological knowledge could be real and thus should not be taken lightly. Reference [3] indicated similar problems which were the result of inadequate amount of training sessions. Likewise, reference [16] confirmed this phenomenon and called on the teachers to improve their knowledge in order to enhance teaching quality in classroom.

In light of the research results, future research shall look into actual experiments on pedagogical smart board that take a longer period of time on Malaysian teachers of different qualification, gender, and years of teaching experience. The researched population and relevant demographic, which is a limitation in the present research, should be augmented in order to produce healthier analysis in research.

VII. CONCLUSION

The overall responses of the research illuminate a clear

discernment of the perception of the teachers towards smart board. Based on the findings, it was perceived as a conducive tool for learning. Smart board is therefore confirmed very essential and should be encouraged. Recommendations are hereby forwarded to relevant authorities regarding the effective deployment of the smart board technology for instructional delivery. Furthermore, integration of smart board technology is consistent with the vision of Malaysian Education Development Plan of 2013 to 2025 to build up the quality of education in Malaysia [17].

CONFLICT OF INTEREST

We certify that there is no actual or potential conflict of interest in relation to this article

AUTHOR CONTRIBUTIONS

All authors have contributed equally to this manuscript. All authors have agreed to the final version.

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