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Exploring the Relationship between Attitude towards Laptop Usage and Laptop Utilisation: A Preliminary Study among Malaysian Science and Mathematics Teachers

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ABSTRACT

Realising the importance of ICT in the education system, the Malaysian Ministry of Education introduced the laptop initiative to integrate ICT into the students' learning environment. The laptop provides a unique feature which allows the integration of ICT into the education at anytime and anywhere. Based on the review of literature, teachers' attitude is seen as one of the significant indicators in influencing teacher's laptop utilisation. The objectives of this study were to explore the teachers' levels of laptop utilisation in terms of teaching and learning processes (TLP), lesson preparation and planning (LPP); teachers' level of attitude towards laptop usage; and also to examine the relationship between teachers' attitude towards laptop usage and laptop utilisation. Survey questionnaires were administered to 38 secondary school Mathematics and Science teachers. The results reported that the teachers' laptop utilisation was at the moderate level (TLP: M = 3.13, S.D. = 5.56 and LPP: M = 3.09, S.D. = 4.68) and these teachers showed positive attitude towards the laptop (M = 3.84, S.D. = 13.04). Furthermore, the findings also revealed that there was a significant positive correlation between teachers' attitude towards laptop usage and laptop utilisation (TLP: r = .69 and LPP: r = .44).

Keywords: Attitude, in-service teachers, laptop utilisation

INTRODUCTION

The Information and Communication Technology (ICT) is regarded as a major revolution and it has had a profound impact on education (Yee, Luan, Ayub & Mahmud, 2009). In order to compete with the rapid

growth of ICT, the Malaysian Ministry of Education (MoE) initiated a gateway to integrate ICT into the students' learning environment. Extensive innovations incorporating ICT have been diffused by MoE to enhance the instructional process. In line with this, the diffusion of innovations by Rogers (1962) was employed as the theoretical foundation of this particular study. The four fundamental elements in the diffusion of innovative ideas are innovation, communication channels, social system and time (Rogers, 1962; Rogers & Shoemaker, 1971; Rogers, 1986). Hence, the innovation is communicated via certain channels from an individual to another individual between the members in a social system over time (Rogers, 1962). The first element of the diffusion process refers to an idea, practice or object that is perceived as novel to the individual. Communication is a process of transmitting ideas from a source to a receiver via mass media or interpersonal channels. The third element of diffusion describes the social system as a population of individuals who are interrelated in joint problem solving to achieve a common goal. The fourth element in the analysis of the diffusion of innovations is time. The time element is involved in innovation-decision process, innovativeness, and rate of adoption (Rogers, 1986). Since the innovation-decision process is closely related to this research, it will be further discussed in the purpose of the study.

In this Information Age, accommodating an ICT based classroom environment requires the teachers to progressively familiarize themselves from being a knowledgeable presenter to a knowledgeable facilitator (Wong & Hanafi, 2007). In other words, the teachers' role ceases from being the main player to being the facilitator in the classrooms (Wong, Jalil, Ayub & Tang, 2003; Luan, Bakar, Mee & Ayub, 2010). Hence, teachers are expected to utilise the ICT gadgets, such as desktop computers, laptops, interactive whiteboards, smart boards, digital camera, data projector, printer and scanner to enhance students' learning. This present study particularly focused on the use of laptops among the teachers due to its own special features as compared to other ICT devices.

A unique characteristic that a laptop provides is it allows the integration of ICT into the education at anytime and anywhere. It was reported that teachers were able to try various teaching strategies that are different from their conventional methods with the help of the laptops as the instructional device (Walker & Rockman, 1997). Therefore, laptops can provide greater mobility and ease of changeover for the teachers in this advanced learning era for teaching and learning processes as well as for lesson preparation and planning purposes.

Laptops are known as "powerful instructional tools" (Falba, Grove, Anderson & Putney, 2001) which enable the teachers to integrate ICT into the classrooms. Moses, Khambari and Luan (2008a) conducted a comprehensive literature review to explore how teachers utilised the laptop and found that "educators use the laptop for more than

one purpose" (p. 109). Laptop utilisation was categorised by them into four different categories, namely teaching and learning processes, lesson preparation and planning, administration and management tasks, and lastly for communication purposes. A learning technology evaluation research was conducted by the Maine Education Policy Research Institute to examine how laptops were being used by the teachers (Silvernail & Harris, 2003). It was reported that the laptops were used by the teachers for different purposes, in which mostly were used for conducting research for lessons, developing instructional materials and to communicate with colleagues. Moreover, teachers could access up-to-date information easily and in a fast mode via the utilisation of laptop. Simultaneously, these teachers found that their lessons were up-to-date, extensive and provided ways for them to search for knowledge in depth. It was summarized in the evaluation report that a majority of the teachers utilised the laptops for lesson development and classroom instruction (Silvernail & Harris, 2003). This finding was corroborated by Khambari, Luan and Ayub (2010) who reported that the majority of teachers believed the usage of laptops were beneficial to their classroom instruction.

Mouza (2006) examined the ways in which elementary school teachers integrate laptops in their classrooms for instructional tasks. Through interviews and observations, Mouza (2006) found that the teachers integrated laptops for an extensive range of instructional practices consistently after gradually overcoming the difficulties in using the laptops. In the study, Mouza (2006) also summarised that the teachers utilised the laptops for teaching practices and lesson development. In other words, laptop utilisation in this study was categorised into two dimensions, namely the teaching and learning processes (TLP), and lesson preparation and planning (LPP) as these usage were generally reported by other researchers (Moses *et al*., 2008a; Mouza, 2006; Silvernail & Harris, 2003).

Meanwhile, Idris, Loh, Mohd. Nor, Abdul Razak, and Md. Saad (2007) stated that at the end of the day, the teachers would be the ones that make a difference despite how well the curriculum, infrastructure or teaching aids were prepared. This was further affirmed when Liaw (2002) noted that "no matter how sophisticated and how capable the technology, its effective implementation depended upon the user having positive attitude towards it" (p. 18). The study revealed that when the users possessed more positive attitudes toward computers, they also possessed more positive attitudes toward Web atmospheres subsequently (Liaw, 2002). Attitude was defined by Ajzen and Fisherbein (2000) as an individual's degree to respond in a favourable or unfavourable approach with respect to a psychological object. Brown, Manogue and Rohlin (2002) expressed attitude as a combination of beliefs, thoughts and feelings that influence an individual to react in a positive or negative way. Thus, teachers need to possess a positive attitude towards laptop to successfully implement laptops in the TLP and LPP.

In addition, the attitude towards technology use acts as one of the key antecedents that influences the teachers to integrate technologies (Baylor & Ritchie, 2002; Kersaint, Horton, Stohl, & Garofalo, 2003; Teo, Lee, & Chai, 2008, Teo, Lee, Chai & Wong, 2009; Luan & Teo, 2009) into the classrooms. According to Hebert and Benbasat (1994), about 77% of the variance of intention to use the technology was explained by the users' attitude. A survey was conducted by Al-Khaldi and Al-Jabri (1998) to study the relationship between computer utilisation and attitudes. Based on the results, attitudes were found to affect the usage of computer and the strongest factor determined was computer liking, followed by confidence. Albirini (2006) conducted a study among the teachers in Syria and found that they have positive attitude towards the integration of ICT in the education system. This truly supports the findings by Abdullah, Zainol Abidin, Wong, Majid, and Hanafi (2006) who reported that most teachers have positive attitude towards computer use in their instructional delivery. Apart from that, Shapka and Ferrari (2003) carried out a study to investigate the computer-related attitudes of pre-service teachers. In their study, they examined the relationship between self-reported beliefs and the results of a challenging computer task. The findings revealed that attitudes were correlated with computer task and the relationship between the variables was strong.

A study on the usage of laptops was conducted by Khambari (2009) among Mathematics and Science teachers to investigate the relationship between laptop use and professional development. This quantitative study revealed that there was a moderate correlation between laptop use and professional development. In general, past studies pertaining to ICT application in education are used to support this present study as it shares some series of knowledge and features of laptop utilisation in the teaching environments. It shapes similar ideas since computers and laptops could be categorised as a subset or a component of ICT. Therefore, as pervious studies (Al-Khaldi & Al-Jabri, 1998; Shapka & Ferrari, 2003) have found that there is a relationship between computer use and attitudes, teachers' laptop utilisation may also have a relationship with their attitude towards laptop use.

PURPOSE OF THE STUDY

Primarily, Mathematics and Science teachers in Malaysia were given laptops by the government beginning from 2003 to be utilised as a device to assist their daily teaching task. This was to emphasize the use of technology in the learning interaction among the teachers and the students in both the subjects. As a consequence of the transformation to integrate technology using the laptop in the Mathematics and Science curricula, the teachers were expected to be proficient in handling the teaching tool. With the current impetus of technology in the teaching and learning environment, it is imperative to explore the teachers' attitude towards technology use as it has been identified as one of the significant

indicators in influencing teacher's utilisation of technology. According to Rogers (1986), the innovation-decision process comprising five steps is termed as "the mental process through which an individual or other decision-making unit passes from first knowledge of innovation, to forming an attitude toward the innovation, to a decision to adopt or reject, to implementation of the new idea, and to confirmation of this decision" (p. 118). The second decision-making step which involves the formation of an attitude refers to persuasion. Rogers and Shoemaker (1971) asserted that persuasion occurs within an individual when he or she forms a favourable or unfavourable attitude toward a new idea. Besides, they also stated that one of the major divisions of the innovation-decision process model is the antecedents which comprise the individual's personal characteristics, social characteristics and the strength of the perceived need of the idea. The uttered paradigm of personal characteristic is the attitude of an individual toward alteration.

There have been several studies reported on the teachers' attitude towards laptop use as the antecedent of laptop utilisation (Inan & Lowther, 2010; Moses *et al.*, 2008a; Moses *et al.*, 2008b). Thus far, there has been no study conducted to investigate the relationship between these two variables in the Malaysian context. For this reason, there is a need to comprehend whether a relationship exists between the teachers' attitude towards laptop use and the laptop utilisation among the Malaysian in-service Mathematics and Science teachers. The

objectives of the current study were: (a) to explore the Mathematics and Science teachers' levels of laptop utilisation in terms of TLP and LPP, (b) to explore the Mathematics and Science teachers' level of attitude towards laptop usage, and (c) to examine the relationship between teachers' attitude towards laptop usage and laptop utilisation (TLP and LPP).

METHODOLOGY

The method employed in this study was a quantitative descriptive research design. The data were gathered using questionnaires. The survey instruments were administered to 38 in-service Mathematics and Science teachers. This sample size was deemed adequate for this preliminary study as it surpassed the minimum sample size (N= 30) required for a correlational study (Gay, Mills, & Airasian, 2009). Ary, Jacobs, Razavieh, and Sorensen (2006) also asserted that correlational studies do not require a very large sample size. The selection of the teachers was done via simple random sampling. Four secondary schools located in the state of Selangor were randomly selected to participate in this study. The first author went to the respective schools personally to collect the data. Before distributing the questionnaires, the researcher elucidated the purpose of the study to each of the teachers. This was followed by giving explanation, while the questionnaires were administered and time was allocated according to the teachers' conveniences. Subsequently, the instruments were collected after the teachers had responded to the items. However, due

to time constraint, several teachers in two of the schools were not able to complete the questionnaires on that particular day. Hence, the researcher had to go to the respective schools on another day to collect the data. The majority of the teachers involved in this survey research were females (32 teachers) and the rest were males (6 teachers). Almost all of them (34 teachers, 89.5%) were provided with laptops by the school. However, the remaining four of them (10.5%) personally owned a laptop which enabled them to use it for instructional purposes.

The instrument had two separate sections with 5-point Likert scale items requiring the teachers to respond. The first section required the teachers to answer on the utilisation of laptop in TLP and LPP, whereas the second section needed the teachers to respond on their attitude towards laptop usage. The validity of the instrument was carefully evaluated and established via a validation process by four experts in the field of ICT.

The TLP and LPP scales were developed by the researchers based on the review of relevant literature. These scales were quantified on five different laptop utilisations ranging from "Never", "Rarely", "Sometimes", "Often", and "Always". All the 11 items (6 items for TLP and 5 items for LPP) were scored such as "Never" – 1 point, "Rarely" – 2 points, "Sometimes" – 3 points, "Often" – 4 points, and "Always" – 5 points. Higher scores indicate a higher level of laptop utilisation among the secondary school teachers and

vice versa. The maximum score for the TLP scale was 30 and the minimum score was 6. As for the LPP scale, the maximum score was 25 and the minimum possible score was 5. The indication of the levels for the TLP and LPP were generated by the researchers themselves (see Tables 1 and 2). According to Pallant (2006), the general alpha level of a scale should be above .70. In this study, the reliability coefficient value obtained was .90 for the TLP scale and .79 for the LPP scale. As such, these scales have an acceptable level of reliability as the values are higher than .70.

TABLE 1
Indication of Levels by Categorization of Summated Scores for TLP

Category of Scores	Level
Below 14.00	Low
Between 14.00 and 22.00	Moderate
Above 22.00	High

TABLE 2
Indication of Levels by Categorization of Summated Scores for LPP

Category of Scores	Level
Below 11.67	Low
Between 11.67 and 18.33	Moderate
Above 18.33	High

The attitude scale used in the survey instrument was entailed to measure teachers' attitude towards the laptop and it was developed by Albirini (2006). Permission to use, modify and translate the instrument was obtained from Albirini by the researchers. Double-barrelled items were amended to make them clearer and understandable whereas one of the items was omitted from

the scale due to its irrelevancy. Apart from modifications, six additional items were constructed by the researchers to meet the purpose of the study. In total, therefore, the attitude scale consisted of 26 items. The scale was quantified on five different rating of attitude towards the laptop ranging from "Strongly Disagree", "Disagree", "Neutral", "Agree", and "Strongly Agree". Each of the items in the scale was scored as "Strongly Disagree" - 1 point, "Disagree" - 2 points, "Neutral" - 3 points, "Agree" - 4 points, and "Strongly Agree" - 5 points. Reliability testing by Albirini (2006) yielded a Cronbach's alpha value of .90 for the attitude scale. However, the reliability coefficient value obtained for this study was slightly higher, i.e. .93. The total summated scores for teachers' attitude towards laptop usage ranged from 26 to 130. The researchers also generated the indication of levels by categorising the summated scores for teachers' attitude towards laptop usage (see Table 3). The scores approaching the minimum score denote a negative attitude of the teachers whereas the scores approaching the maximum score indicate a positive attitude of the teachers towards laptop usage. All the negative items in this scale were reverse scored before the computation of the data analysis.

TABLE 3
Indication of Levels by Categorisation of Summated Scores for Teachers' Attitude towards Laptop Usage

Category of Scores	Level
Below 60.67	Negative
Between 60.67 and 95.33	Neutral
Above 95.33	Positive

Data collected in this study were analysed through two different approaches, namely, descriptive statistics and inferential statistics using SPSS Version 17.0. Descriptive statistics such as mean scores and standard deviations were calculated for the dependent variables (laptop utilisation in TLP and LPP) and independent variable (attitude towards laptop usage). A correlational analysis was performed to determine the relationship between teachers' attitude towards laptop usage and laptop utilisation (TLP and LPP).

RESULTS

Laptop Utilisation among In-service Mathematics and Science Teachers

Laptop utilisation among the secondary school Mathematics and Science teachers was measured via two dimensions, namely the usage of laptop in the TLP and LPP. The TLP dimension measures the use of laptop in the teaching and learning processes among the Mathematics and Science teachers (Table 4).

Less than one third of the teachers (26.3%, M = 3.66, S.D. = 1.17) used the laptop sometimes for the teaching and learning processes. Meanwhile, nearly half of the teachers (47.4%, M = 3.11, S.D. = 1.01) reported that they sometimes utilised the laptop to facilitate the various pedagogical approaches in the teaching and learning process, such as collaborative learning and problem-based learning. About one third of the teachers (34.2%, M = 3.61, S.D. = 1.10) used the laptop often to provide detailed explanation to the students during the teaching and learning processes. Most

TABLE 4
Descriptive Statistics for TLP Scale

Item	Never	Rarely	Sometimes	Often	Always	M	S. D.
	f	f	f	f	f		
	(%)	(%)	(%)	(%)	(%)		
I use the laptop in the teaching-learning process.	1 (2.6)	6 (15.8)	10 (26.3)	9 (23.7)	12 (13.6)	3.66	1.17
I use the laptop to facilitate various pedagogical approaches (e.g., collaborative learning, problem-based learning, etc.).	3 (7.9)	5 (13.2)	18 (47.4)	12 (23.7)	3 (7.9)	3.11	1.01
I use the laptop to provide detailed explanations (e.g., visual aids, etc.) during the teaching-learning process.	1 (2.6)	6 (15.8)	9 (23.7)	13 (34.2)	9 (23.7)	3.61	1.10
I use the laptop to show examples (e.g., pictures, animation, audio, video, etc.) to enhance students' learning.	2 (5.3)	3 (7.9)	16 (42.1)	7 (18.4)	10 (26.3)	3.53	1.13
I use the laptop to facilitate the use of relevant Internet resources during the teaching-learning process.	10 (26.3)	10 (26.3)	9 (23.7)	5 (13.2)	4 (10.5)	2.55	1.31
I create a conducive learning environment (e.g., educational flash, jokes, music, etc.) using the laptop to motivate the students to learn.	11 (28.9)	8 (21.1)	16 (42.1)	1 (2.6)	2 (5.3)	2.34	1.10

of the teachers (42.1%, M = 3.53, S.D. = 1.13) utilised the laptop sometimes to show examples such as pictures, animation, audio and video to enhance the students' learning. Equal percentages of the teachers (26.3%, M = 2.55, S.D. = 1.31) reported that they never and rarely used the laptop to facilitate the use of relevant Internet resources during the teaching and learning practices. Majority of the teachers (42.1%, M = 2.34, S.D. = 1.10) reported that they created a conducive learning environment using the laptop sometimes to motivate their students to learn.

Based on the results for laptop

utilisation in TLP, the item "I use the laptop in the teaching-learning process" scored the highest mean (3.66, S.D. = 1.17). On the contrary, the item with the lowest mean score was "I create a conducive learning environment (e.g., educational flash, jokes, music, etc.) using the laptop to motivate the students to learn" with the value of 2.34 (S.D. = 1.10). Thus, the mean score for item 1 showed that the teachers mainly used the laptop in the teaching and learning processes as a whole compared to the other items in TLP.

The second dimension measured the

TABLE 5
Descriptive Statistics for LPP Scale

Item	Never	Rarely	Sometimes	Often	Always	M	S. D.
	f	f	f	f	f		
	(%)	(%)	(%)	(%)	(%)		
I use the laptop to prepare my lesson plan.	13 (34.2)	7 (18.4)	6 (15.8)	7 (18.4)	5 (13.2)	2.58	1.46
I use the laptop to design instructional materials that can attract my students' interest.	2 (5.3)	11 (28.9)	14 (36.8)	6 (15.8)	5 (13.2)	3.03	1.10
I develop teaching materials (e.g., presentation slides, videos, etc.) to be used in the class using the laptop.	4 (10.5)	12 (31.6)	11 (28.9)	7 (18.4)	4 (10.5)	2.87	1.17
I use the laptop to prepare handouts (e.g., quiz, notes, homework, etc.) for the students.	2 (5.3)	4 (10.5)	13 (34.2)	8 (21.1)	11 (28.9)	3.58	1.18
I use the laptop to search for teaching resources from the Internet.	4 (10.5)	9 (23.7)	4 (10.5)	11 (28.9)	10 (26.3)	3.37	1.38

utilisation of laptops in the LPP among the teachers (see Table 5).

The percentage of the teachers (34.2%) who reported that they never used the laptop to prepare lesson plan (M = 2.58, S.D. = 1.46) is equivalent to the teachers who used the laptop sometimes to prepare handouts such as quizzes, notes and homework for the students (M = 3.58, S.D. = 1.18). More than one third of them (36.8%, M = 3.03, S.D. = 1.10) use the laptop sometimes to design instructional materials that can attract the students' interest. About one third of the teachers (31.6%, M = 2.87, S.D. = 1.17) stated that they rarely use the laptop to develop teaching materials such as presentation slides and videos to be used in the class. Meanwhile, less than one third of the teachers (28.9%, M = 3.37, S.D. = 1.38)

often use the laptop to search for teaching resources from the Internet.

The statement with the highest mean score for this dimension was "I use the laptop to prepare handouts (e.g., quiz, notes, homework etc.) for the students" (M = 3.58, S.D. = 1.18) and the item "I use the laptop to prepare my lesson plan" scored the lowest mean score among the other items (M = 2.58, S. D. = 1.46). As a result, these teachers utilise the laptop more frequently to prepare handouts for the students compared to the other tasks described under the LPP dimension.

Descriptive statistics were carried out to explore the in-service secondary school Mathematics and Science teachers' levels of laptop utilisation in terms of TLP and LPP as shown in Table 6. The laptop utilisation

TABLE 6
Descriptive Statistics for Laptop Utilisation

		Mean	Standard Deviation	Summated Score	Level
Laptop Utilisation	TLP	3.13	5.56	18.79	Moderate
	LPP	3.09	4.68	15.42	Moderate

mean scores obtained for TLP (M = 3.13, S.D. = 5.56) is higher than the mean scores for LPP (M = 3.09, S.D. = 4.68).

There were three out of the six items in TLP that scored above the mean of means for TLP. As for the second dimension, there were two items that scored above the mean of means for LPP. Hence, the Mathematics and Science teachers generally utilise the laptops more regularly for the teaching and learning practices compared to lesson preparation. However, according to the summated scores calculated, the teachers' use of laptop for both the dimensions (TLP = 18.79, TPP = 15.42) was found to be at the moderate level.

In-service Mathematics and Science Teachers' Attitude towards Laptop Usage

The findings concerning the teachers' attitude towards laptop usage are given in Table 7. Generally, most of the teachers disagreed or agreed with the items in the attitude scale.

The teachers agree that they are glad there are more teachers using the laptops these days (reported as the highest percentage - 78.9%; M = 3.84, S.D. = 0.59), followed by other items such as "I like to use the laptop because it is portable" (76.3%, M = 4.08, S.D. = 0.49), "Using the laptop in lessons can motivate the students

to learn" (71.1%, M = 4.03, S.D. = 0.55), "I would like to use the laptop for teaching-learning process more frequently" (71.1%, M = 3.97, S.D. = 0.68), "Using the laptop does not scare me at all" (68.4%, M = 4.18, S.D. = 0.61), "The laptop is an efficient tool to access information from anywhere" (68.4%, M = 4.18, S.D. = 0.61) and "Using the laptop is enjoyable" (60.5%, M = 4.03, S.D. = 0.64). About one third of the teachers (39.5%) agree that they are anxious about laptop security (M = 2.39, S.D. = 0.97). However, a fraction of them (36.8%) support the need of laptops in every subject (M = 3.29, S.D. = 0.93).

On the contrary, several items that scored the highest percentages of disagreement among the teachers include "I do not like talking to others about laptop" (68.4%, M = 3.71, S.D. = 0.69), "I do not like to use the laptop because of virus attack" (60.5%, M = 3.53, S.D. = 0.95) and "I have no intention to use the laptop in the future" (60.5%, M = 4.11, S.D. = 0.69). Less than half of them disagreed with the statements, such as "I dislike using the laptop in teaching" (44.7%, M = 3.74, S.D. = 1.06), "I do not think I would need the laptop in my classroom" (44.7%, M = 3.68, S.D. = 1.02) and "I would do things manually rather than using the laptop" (42.1%, M = 3.82, S.D. = 0.90).

Based on the results, the highest mean

TABLE 7
Descriptive Statistics for Teachers' Attitude towards Laptop Usage Scale

Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	M	S. D.
	f	f	f	f	f		
	(%)	(%)	(%)	(%)	(%)		
Using the laptop does not scare me at all.	0 (0.0)	1 (2.6)	1 (2.6)	26 (68.4)	10 (26.3)	4.18	0.61
Using the laptop makes me feel uncomfortable.*	8 (21.1)	19 (50.0)	6 (15.8)	5 (13.2)	0 (0.0)	3.79	0.94
I am glad there are more teachers using the laptops these days.	0 (0.0)	2 (5.3)	4 (10.5)	30 (78.9)	2 (5.3)	3.84	0.59
I do not like talking to others about laptop.*	2 (5.3)	26 (68.4)	7 (18.4)	3 (7.9)	0 (0.0)	3.71	0.69
I do not like to use the laptop because of virus attack.*	3 (7.9)	23 (60.5)	3 (7.9)	9 (23.7)	0 (0.0)	3.53	0.95
I like to use the laptop because it is portable.	0 (0.0)	0 (0.0)	3 (7.9)	29 (76.3)	6 (15.8)	4.08	0.49
Using the laptop is enjoyable.	0 (0.0)	0 (0.0)	7 (18.4)	23 (60.5)	8 (21.1)	4.03	0.64
I am anxious about laptop security.*	0 (0.0)	6 (15.8)	10 (26.3)	15 (39.5)	7 (18.4)	2.39	0.97
I dislike using the laptop in teaching.*	9 (23.7)	17 (44.7)	6 (15.8)	5 (13.2)	1 (2.6)	3.74	1.06
Using the laptop saves time.	0 (0.0)	6 (15.8)	4 (10.5)	19 (50.0)	9 (23.7)	3.82	0.98
Using the laptop saves my effort.	0 (0.0)	7 (18.4)	4 (10.5)	19 (50.0)	8 (21.1)	3.74	1.01
Schools would be a better place without the usage of laptops.*	9 (23.7)	19 (50.0)	5 (13.2)	4 (10.5)	1 (2.6)	3.82	1.01
Teachers need to use the laptops in all subjects.	0 (0.0)	9 (23.7)	12 (31.6)	14 (36.8)	3 (7.9)	3.29	0.93
Learning how to use the laptop is a waste of time.*	11 (28.9)	22 (57.9)	3 (7.9)	2 (5.3)	0 (0.0)	4.11	0.76
Using the laptop in lessons can motivate the students to learn.	0 (0.0)	0 (0.0)	5 (13.2)	27 (71.1)	6 (15.8)	4.03	0.55
The laptop is an efficient tool to access information from anywhere.	0 (0.0)	1 (2.6)	1 (2.6)	26 (68.4)	10 (26.3)	4.18	.61
I do not think I would need the laptop in my classroom.*	8 (21.1)	17 (44.7)	6 (15.8)	7 (18.4)	0 (0.0)	3.68	1.02

Table 7 (*continued*)

The laptop enhances the students' learning.	0 (0.0)	1 (2.6)	8 (21.1)	22 (57.9)	7 (18.4)	3.92	0.71
The laptop brings more disadvantages than advantages in my teaching.*	9 (23.7)	19 (50.0)	6 (15.8)	3 (7.9)	1 (2.6)	3.84	0.97
I would do things manually rather than using the laptop.*	9 (23.7)	16 (42.1)	10 (26.3)	3 (7.9)	0 (0.0)	3.82	0.90
I would avoid using the laptop as much as possible.*	9 (23.7)	20 (52.6)	7 (18.4)	2 (5.3)	0 (0.0)	3.95	0.80
I would like to learn more on how to use the laptop.	0 (0.0)	2 (5.3)	0 (0.0)	22 (57.9)	14 (36.8)	4.26	0.72
I have no intention to use the laptop in the future.*	10 (26.3)	23 (60.5)	4 (10.5)	1 (2.6)	0 (0.0)	4.11	0.69
I would like to use the laptop for teaching-learning process more frequently.	0 (0.0)	2 (5.3)	3 (7.9)	27 (71.1)	6 (15.8)	3.97	0.68
I do not like to explore the laptop by myself.*	7 (18.4)	19 (50.0)	7 (18.4)	5 (13.2)	0 (0.0)	3.74	0.92
I am willing to attend more training to learn about the usage of the laptop.	0 (0.0)	1 (2.6)	4 (10.5)	21 (55.3)	12 (31.6)	4.16	0.72

* *Negative items*

TABLE 8
Descriptive Statistics for Teachers' Attitude towards Laptop Usage

	Mean	Standard Deviation	Summated Score	Level
Attitude towards Laptop Usage	3.84	13.04	99.71	Positive

score is 4.26 (S.D. = 0.72), which is for the item "I would like to learn more on how to use the laptop". Teachers reported that they have very favourable thoughts of learning to use the laptop compared to other attitude statements. On the other hand, the item with the lowest mean score was "I am anxious about laptop security" (M = 2.39, S. D. = 0.97).

As illustrated in Table 8, the descriptive analysis was performed to explore the in-service secondary school Mathematics and Science teachers' attitude towards laptop usage. The mean computed from the data for the teachers' attitude towards laptop usage was 3.84 (S.D. = 13.04).

In total, 12 items scored above the mean of means and two items scored equally same, with the mean of means for this scale. It can be concluded that the teachers have a positive attitude towards the laptop as the summated score reported is relatively high (99.71).

The Relationship between Teachers' Attitude towards Laptop Usage and Laptop Utilisation (TLP and LPP)

Assumptions testing for normality, linearity, and homoscedasticity were performed on the collected data. Normality testing was individually done on each of the variables and it was found that the variables were normally distributed. The relationships between the variables were assumed to be linear and the variability in scores for the variables was found to be similar. Hence, the preliminary analyses conducted revealed that there were no violations of assumptions. Scatterplots were used to check for the assumptions and distribution of the variables involved.

This scatterplot (Fig.1) indicates a positive relationship between the variables, suggesting that the high scores on the teachers' attitude towards laptop usage are associated with the secondary school Mathematics and Science teachers' high scores on the laptop utilisation in the teaching and learning processes.

The relationship between the teachers' attitude towards laptop usage and dimensions of laptop utilisation was determined using the Pearson product-moment correlation coefficient. The findings are presented in Table 9. Based on the results, there was a large (Cohen, 1988), positive correlation between teachers' attitude towards laptop usage and laptop utilisation in TLP ($r = .69$, n = 38, p < .0005). A correlation coefficient of 0.69 indicates that there is a large linear relationship between both the variables. It means, as the scores for attitude towards laptop usage increases, so will the scores for the utilisation of laptop for TLP.

TABLE 9
The Pearson Product-Moment Correlation between the Teachers' Attitude towards Laptop Usage and TLP

	Laptop Utilisation
	TLP
Attitude towards Laptop Usage	.69*

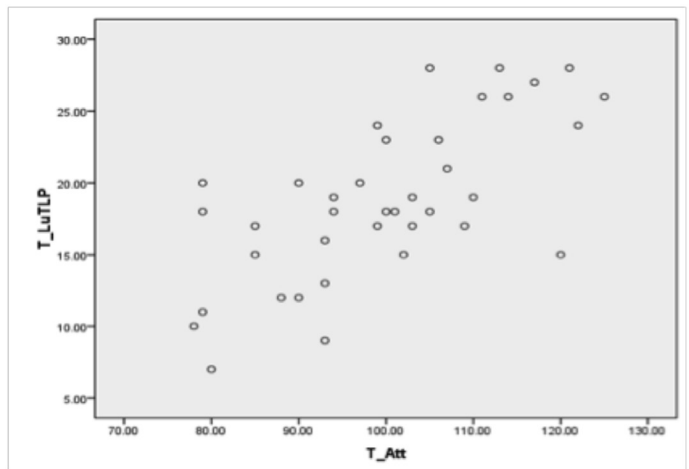* Correlation is significant at .01 level (2-tailed)

Fig.1: Distribution of the Teachers' Attitude towards Laptop Usage and Laptop Utilisation in TLP

The scatterplot depicted in Figure 2 denotes a positive relationship between both the variables. This explains that the high scores on the teachers' attitude towards laptop usage are associated with the high scores on the laptop utilisation of the secondary school Mathematics and Science teachers in the lesson preparation and planning.

As for the second dimension (Table 10), it was reported that there was a medium (Cohen, 1988), positive correlation between teachers' attitude towards laptop usage and laptop utilisation in LPP ($r = .44$, n = 38, p < .0005). This shows that on average basis, teachers who have a more positive attitude towards laptop usage use the laptop more for LPP.

TABLE 10
Pearson Product-Moment Correlation between Teachers' Attitude towards Laptop Usage and LPP

	Laptop Utilisation
	LPP
Attitude towards Laptop Usage	.44*

* Correlation is significant at .01 level (2-tailed)

DISCUSSION

This study investigated a sample of 38 in-service secondary school Mathematics and Science teachers. The teachers' level of laptop utilisation was measured in two dimensions, namely TLP and LPP. Based on the computed data, it was reported that the teachers' laptop utilisation in both TLP and LPP was at the moderate level. Laptop utilisation in terms of TLP and LPP was categorised under the same level because the teachers basically use the laptop for the teaching and learning processes if they utilise it to prepare for their lessons and materials. Therefore, the teachers who utilise the laptop for LPP would also utilise the laptop for TLP and vice versa. However, the level of use was reported as moderate as some of the teachers might have the thinking that conventional method of teaching is more appropriate for certain topics in teaching Mathematics and Science. This finding is supported by Khambari (2009), who said that teachers noted that other approaches rather than laptop were also preferable in carrying out certain tasks.

On the other hand, the teachers' attitude towards laptop usage was found to be at a high level, since the majority of the teachers have positive attitude towards the laptop. This is also suggested by Liaw (2002) who stated that a successful implementation of technology is dependent upon the users' positive attitude. In more specific, teachers with positive attitude have a sense of contentment, enjoyment and feel at ease to use the laptop for instructional purposes and lesson preparation of Mathematics and Science subjects. These teachers have positive mind-set towards the utilisation of laptop. Conversely, teachers with a negative attitude towards it will avoid, dislike and have no intention to incorporate the laptop into their teaching practices.

The final analysis using the Pearson product-moment correlation coefficient between the teachers' attitude and the dimensions of laptop utilisation produced expected results as supported by previous

Fig.2: Distribution of the Teachers' Attitude towards Laptop Usage and Laptop Utilisation in LPP

studies. The present findings are consistent with those of the previous studies by Al-Khaldi and Al-Jabri (1998) as well as Shapka and Ferrari (2003) who support the notion that there is a relationship between attitude and computer utilisation. The result showed that the relationship between the teachers' attitude towards laptop usage and the laptop utilisation in TLP had a large and significant positive correlation. Meanwhile, the relationship between the teachers' attitude towards laptop usage and the laptop utilisation in LPP had a medium and significant positive correlation. A stronger linear relationship was found between teachers' attitude and their use of the laptop for TLP as compared to LPP, as there was a difference between the strength of the relationship in TLP (0.69) and LPP (0.44).

Generally, the relationship between teachers' attitude towards laptop usage and laptop utilisation had a significantly positive linear correlation. Additionally, the results suggested that the teachers' attitude provided a criterion for the concurrent validity of the laptop utilisation in the TLP and LPP. Correspondingly, laptop utilisation implied a criterion for the concurrent validity of the teachers' attitude towards laptop usage. It depicts that the teachers will utilise the laptop in the TLP and LPP when they have a positive attitude towards the laptop. Consequently, it has been verified through this study that the teachers' laptop utilisation is positively related to their attitude towards the use of laptop in TLP and LPP.

Furthermore, laptop initiative was perceived as new when it was initiated by the government amongst the teachers in the schools. The idea or message was transmitted from the authority to the teachers through mass media and interpersonal channels over time. The current study supported the innovation-decision process model by Rogers (1986) which suggests that attitude occurs in the persuasion function as the teachers mentally form a favourable or unfavourable attitude towards laptop usage for instructional delivery.

CONCLUSION

This study offers a set of important results regarding the level of laptop utilisation in terms of TLP and LPP, the level of teachers' attitude towards laptop usage and finally the relationship between teachers' attitude towards laptop usage and laptop utilisation. The findings revealed that the teachers' attitude towards laptop usage was positively correlated with utilisation of laptops. Therefore, the teachers' attitude towards laptop usage and laptop utilisation among the secondary school Mathematics and Science teachers could provide concurrent validity or strength to each other. Teachers with a positive attitude will incorporate laptops in their teaching practices as compared to those with negative attitude and less preference to utilise laptops. For this reason, more research should be carried out in the future to ensure the effectiveness of laptop utilisation by the Mathematics and Science teachers in Malaysia.

LIMITATIONS AND RECOMMENDATIONS

The samples selected for this preliminary study were considered to be small. Therefore, the findings of this study could and should not be generalised beyond the samples who had participated in this survey. Further studies need to be conducted with a larger sample size to study the relationship between attitude and other predicted variables, such as self-belief, time deficiency, technical support, leadership and so forth which may have an effect on the teachers' use of laptops. Besides, this research was conducted in a quantitative manner. As such, structured interviews can be carried out among the teachers to make the study more robust as richer and more meaningful data can be collected. Based on these recommendations, the limitations of this study may be examined more extensively in future research so as to yield more interesting findings.

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