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The Teachers' Perception of The Effectiveness of Using Technology in Classroom Teaching in Secondary Schools

Abstract

The application of technology in the classroom has been persistently integrated since the third industrial revolution emerged whereby technology gradually becomes a prominent role in modern education. This study is designed to understand the teachers' perception of the effectiveness of using technology in classroom teaching in secondary schools. Qualitative research is used as the mode of inquiry for this research study. The main mode of data collection is the questionnaire that elicits information on the respondents' views of the use of technology in the classroom. Participants for this study were 25 local secondary school teachers in Malaysia. Our findings indicate that teachers' perceptions towards incorporating technology for teaching and assessing the students are positive and the implication of our findings can affect the teachers' personal teaching philosophy and approach in the classroom.

Background of the study

One of the 11 shifts outlined in MEB 2013-2025 is leveraging ICT to scale up quality learning across Malaysia. Therefore, we perceive the teachers' perception plays a prominent role in effectively implementing and utilizing the technology in the classroom for teaching. According to Cope and Ward (2002), experiences teachers who had little or no professional development in the use of technology in the classroom were likely to use it in the classroom and were less likely to see the benefit of technology usage in the classroom. Royer (2002) found that the more teachers were involved in actually setting up classroom technology the more likely they were to use technology for instruction (Royer, 2002). This is why it is important for teachers to receive technology skill training.

This is not to say that the advancement of technology use in the classroom changes the role of the teacher. Wang (2002) found that teachers saw their roles as being more teacher centered and less student centered in classrooms that did not have computers. However, teachers did not think that they would teach differently or that their roles would be different in a classroom with computers. Savery(200) noticed that faculty felt comfortable using technology

such as email, overhead projectors, and videos. We do this research to find and know what the best effective technology for teaching and assessment for each teacher is for our participants.

Methodology

In this study, the quantitative research method was adopted to attain greater knowledge and understanding of the teachers' perception of the effectiveness of using technology in classroom teaching in secondary schools. The target participants for this study were secondary school teachers and there were 25 of them in total who had answered the online questionnaire. These teachers are teaching in different schools across the country and have different years of teaching experience. Years of teaching experience ranged from under 4 years to 13 years or more.

Data collection and analysis

An online questionnaire was created by Google Survey tool to gather and store data. Google form is an application in the form of a template or worksheet or questionnaire that can be used independently or together for the purpose of getting user information very efficiently. The researcher only needs to inform the short link of the intended respondent and the respondent can easily download it by clicking on the short link from their respective mobile phone (Endah & Rissa, 2019). The questionnaire was closed-ended questions (dichotomous; yes and no, multiple-choice, likert-scale, and checklist) and consisted of 12 items that were divided into 4 main parts: informed consent form, teacher's years of teaching experience, utilization of technology in the classroom, and technology tools for teaching and assessment. The snowball sampling technique was used to recruit participants through the social networking application, WhatsApp. Detailed descriptions and the link of the survey were directly distributed to the researchers' old school teachers on WhatsApp and also were asked to share the survey's link and information to their colleagues and other potential participants, too. Data collection was concluded after 2 weeks.

Results

The results of the study are divided into five parts: analysis of teachers' background information, analysis of the teachers' frequency of use of technological tools for teaching and assessment,

analysis of reasons teachers use of technology tools for teaching and assessment, analysis of the most effective technology tools teacher use for teaching and assessment purposes & analysis of teacher beliefs regarding their uses of technology

1. Analysis of teachers' background information

Categories		Total Participants	Percentage
Years of teaching experience	4 years or fewer	9	32%
	5 - 8 years	6	24%
	9 - 12 years	4	16%
	13 years or more	6	28%
Classroom is connected to the internet/Wi-Fi	Yes	10	40%
	No	15	60%

Table 1 *Analysis of teachers' background information*

Table 1 illustrates a brief background information regarding the teachers' years of teaching experience and their classroom settings. Concerning the teachers' experiences, a majority of the participants have at least 4 years of teaching experience. In terms of Wi-Fi/internet connection, 15 participants reported that their classroom does not connect to any Wi-Fi/internet connection,while there were only 10 teachers who have internet connection in their classroom.

2. Analysis of the teachers' frequency of use of technological tools for teaching and assessment

Categories	Degrees	Total Participants	Percentage
Utilize technology for teaching	Always	6	24%
	Only when necessary	19	76%
	Not at all	0	0%

Utilize technology for assessing student's performance	Always	5	20%
	Only when necessary	16	64%
	Not at all	4	16%

Table 2 *Analysis of teachers' utilizing technology tools for teaching and assessment*

Table 2 illustrates the teachers' use of technology tools in the classroom for teaching and assessment. It shows the information regarding the degrees of the teachers using technology purposes, 19 teachers expressed that they only use technology tools when necessary while other 6 teachers use them daily in their classroom. As for the assessment, 16 out of 25 teachers during the teaching and assessment process. As shown in Table 2, there were two aspects of when they use the technology tools: (1) for teaching and (2) for assessment. First, for teaching expressed that they utilize technology tools to evaluate their students only when it is necessary, 5 of them use the technology tools frequently, while there were only 4 teachers who did not use the tools at all.

3. Analysis of reasons teachers use of technology tools for teaching and assessment

Categories		**Total Participants**	**Percentage**
For teaching	To increase students' engagement	20	80%
	To support teaching (as a teaching tool)	19	76%
	To improve lesson plans	17	68%
	To facilitate personalized learning	15	60%
For assessment	Can store digital records of student development	21	84%
	Can enhance question types	19	76%

	Can increase flexibility (online assessment)	18	72%
	Can track student progress over time	17	68%

Table 3 *Factors affecting teachers use of technology tools for teaching and assessment purposes*

Table 3 lists the factors that have been influencing the teachers to incorporate the technology in the classroom particularly for teaching and assessment purposes. According to the online questionnaire, the participants were asked to tick the items that they perceived as the reasons using the technology tools in their classroom. There were 4 items in each category; (1) for teaching and (2) for assessment. The data were gathered by analysing the rankings from the respondents for each item and arranging the data in condescending order.

Regarding the reasons teachers use technology tools for teaching purposes—*increasing students' engagement (80%), supporting teaching (76%) and improving lesson plans (68%)*, and assessment purposes—*storing digital records of student development (84%), enhancing question types (76%) and increasing flexibility (72%)*, were the top-reported aspects, while the least-reported aspects were to facilitate personalized learning (60%) (teaching purpose) and to track student progress overtime (68%) (assessment purpose).

From the data in Table 3, we can conclude that increasing students' engagement and supporting teaching (as a teaching tool) are the factors that influence the teachers most to use technological tools during the teaching process. As for assessment, the teachers are more likely to integrate the technological tools in evaluating the students because the tools help to store digital records of student development and improve the question types.

4. Analysis of the most effective technology tools teacher use for teaching and assessment purposes

Categories		Degrees of Effectiveness	Total Participants	Mean
For teaching	Multimedia Projector, Screen, & Laptop	1	0	4.36
		2	0	
		3	0	
		4	12	
		5	13	
	Chromebook (school's property)	1	0	3.64
		2	0	
		3	13	
		4	8	
		5	4	
	Visualizer	1	2	3.56
		2	2	
		3	8	
		4	6	
		5	7	
	Ipad / Tablet / Smartphone	1	3	2.68
		2	5	
		3	14	
		4	3	
		5	0	
For assessment	Google classroom (turn in assignments/exercise)	1	3	
		2	1	

		3	9	3.40
		4	7	
		5	5	
	Google Form (formative & summative test/quiz/feedbacks)	1	0	3.88
		2	0	
		3	10	
		4	8	
		5	7	
	Kahoot! (quiz)	1	0	4.12
		2	1	
		3	5	
		4	9	
		5	10	
	Quizizz (quiz)	1	0	3.48
		2	3	
		3	12	
		4	5	
		5	5	

Table 4 *Analysis of the most effective technology tools teacher use for teaching and assessment purposes*

1: Poorly Effective | 2: Less Effective | 3: Moderately Effective | 4: Effective
5: Highly Effective

Table 4 is a list of technological tools that have been used by the teachers inside their classroom for teaching and assessment purposes. Each item in the list was given a numerical score so that the data can be analyzed quantitatively and sorted out which tool is the most effective for each aspect. As the data have been shown in Table 4, the highest mean score for teaching tools is projector, screen and laptop which had gathered a total of 4.36, followed by

chromebook (3.64), visualizer (3.56) and ipad tablet/smartphone (2.68). As for the technology tool in assessing the students' performance, Kahoot was voted as the most effective tool in the category and received 4.12 total mean score followed by Google Form (3.88), Quizizz (3.48 and Google Classroom (3.40).

5. Analysis of teacher beliefs regarding their uses of technology

Categories	Degrees	Total Participants	Percentage
Technology tools are really helpful in teaching	Yes	25	100%
	Maybe	0	0%
	No	0	0%
Technology tools are really helpful to in assessing students' progress	Yes	21	84%
	Maybe	4	16%
	No	0	0%

Table 5 *Analysis of teacher beliefs regarding their uses of technology*

It can be seen in Table 5 that all the teachers positively agreed that technology is helpful in the teaching process. Regarding the assessment tools, 21 out of 25 teachers perceived the tools were absolutely helpful in evaluating students' performance, while there were 4 teachers who expressed uncertainty of the need to integrate technology tools during students evaluation process. This small group of teachers may highly perceive that traditional assessment would be much more effective and better as they are familiar with it.

Discussion

The primary purpose of this study was to understand the teachers' perception of the effectiveness of using technology in classroom teaching in secondary schools. Earlier research suggested that teachers' intentions and attitudes influence their use of technology (Yan and Zhao, 2006, as cited in Nikian et al, 2013). The study's findings reveal that teachers are more pessimistic about adopting technology in the classroom due to a lack of training for technology implementation. Furthermore, maintaining the status quo and preventing disruption can also be

perceived as barriers blocking them from using technology in their classes (Yan and Zhao, 2006, as cited in Nikian et al, 2013).

Overall, the majority of teachers in this study revealed that they incorporate the technological tools during teaching and assessing their students when it is only necessary. This result may be because the teachers perceive the technological tools are solely tools to assist the teaching and learning process as well as make for a smooth-running for students' evaluation. This can be further elucidated with the results from Table 3 that were in agreement with the results from Table 2. The factors teachers use the technological tools in teaching were to increase their students' engagement and to support their teaching process (Table 3). According to prior research, integrating technology into the classroom environment is a student-centered approach in which students are actively involved in authentic learning experiences that foster critical and creative thinking while also broadening their knowledge base (Hartman et al, 2019). Similar to technological tools usage during the assessment process, teachers are highly driven to use the tool because it facilitates teachers to keep students' development record and improve or create many questions types online through computer-based application.

Regarding the analysis of the most effective technology tools teachers use for teaching, the teachers perceive multimedia projector, screen and laptop are the most effective tools in the classroom. We'd be of the opinion that multimedia projector enable teachers to create bulleted PowerPoint presentations or other highly organized notes for the class. With the use of projectors in the classroom, students can take better notes with the ability to discern what information the teacher displays is most useful to them. According to Groot (2002), multimedia projectors affected the teaching and learning experience, several areas of influence were identified, including visual aid, greater flexibility for alternative teaching methods, enhanced teacher demonstrations, heightened student awareness and customized curriculum applications.

As for assessment tools, it was found that teachers are also active in using online tools for evaluating the students, for instance, Kahoot, Quizizz, Google Classroom and Google Form. Surprisingly, Kahoot was the most often utilized tool in the teachers' classrooms in this survey. It is reasonable to suppose that Kahoot provided more appealing instructional elements to instructors than other applications (e.g., Google Forms and Quizizz). We believe that game-based learning plays an important role in teaching by making students collaborate, communicate, interact and work in teams. Strategic games improve the functioning of the brain. This idea was

also supported byCárdenas-Moncada et al (2020), which in their report said Kahoot encourages students to collaborate while also including game show elements such as background music, time limits in delivering answers, a point awarding system, and a scoreboard. Furthermore, Kahoot's qualities are similar to other gamification tools whereby it involves rules, goals and objectives, outcomes and feedback, challenge and interaction (Prensky, 2001).

Regarding the analysis of teacher beliefs towards their uses of technology, surprisingly majority of the teachers perceive that technological tools are very helpful for teaching in the classroom and assisting to assess the students' academic performance. We strongly believe that these positive responses correspond to the data in Table 4. Table 4 illustrates the effectiveness of each tool inside of the classroom. Moreover, it can also be interpreted that the teachers had positive experiences and perceptions of the technological tools along the way. We believe, when they rank the effectiveness of each tool for teaching and assessment process, they use their prior knowledge, past experiences and personal beliefs.

Conclusions

In summation, this study helps to broaden our knowledge of teachers' use of the in secondary education contexts. It has been proven that technology is important and has provided huge benefits for educators during the teaching and learning process. Furthermore, the technology tools have opened up a new universe of information for children of all ages in a relatively short time. Based on our findings, it clearly shows that most of the teachers agree that using technology is very effective in the classroom.

To its limitations, this study focuses on teachers' beliefs of utilizing the technology and the number of respondents is low to represent the whole teachers in the society. It is suggested that the future research should examine in detail the reasons behind teachers incorporating the technology inside of their classroom on a large scale. Also, future studies may investigate teachers' digital competence for academic needs and the problem they may face to deliver the contents through the new technology tools. Hopefully this research can help and enhance the education system, school, teachers and students in the future.

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