Pedagogical And Social Issues Of Technology In Teaching And Learning; A Review

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Abstract. This article aims to look at pedagogical issues and social issues arising in connection with the use of technology in teaching and learning today. Suggested learning environments that include learning strategies, learning theories, learning activities, learning designs and delivery platforms have been proposed by researchers to meet the 21st century learning that emphasizes active involvement of students, active learning, fun learning and collaborating with peers, sharing information with other partners, creative thinking and critical thinking as well as self-directed learning among students are also discussed. Implementation of ICT in the teaching and learning process of pupils will not only provide students with the stimulus to learning, but will also increase their academic interest and achievement.

Keywords: Pedagogy, Issues, Obstacles, Learning Environment, ICT

1. Introduction

The development of the Information and Communication Technology (ICT) world has given many positive impacts to various fields including education [1][2]. The Ministry of Education's action which makes use of various teaching aids such as laptops, compact discs, the use of various educational software and other teaching aids demands that every educator use various teaching aids either in the form of tools or software to help stimulate and raising students’ interest and inclination towards learning topics [3–6]. Teaching and learning are the primary focus of national education management at both primary and secondary levels. Therefore, education management at both the state level and at the national level is always looking for the best teaching methods and methods in order to improve the ability of a teaching and learning process [7–9]. Application training and integration of information and communication technologies or otherwise known as ICT is among the efforts introduced in most primary and secondary schools by the government to improve ICT skills among Malaysian teachers [10–13]. All schools in Malaysia are encouraged to integrate ICT to enhance the effectiveness of teaching and learning processes as well as providing the students and teachers to face the challenges of information and communication technology [14,15,16]

2. Pedagogy and Social Issues in the use of technology in teaching

More than a decade ago, empirical studies have shown that the obstacles to computer and ICT usage among teachers in the classroom are related to time factors, training factors, attitude factors and more[2,4,8,16,17–21]. [6]The findings show that the level of teachers’ skills in computer and ICT use are still at a moderate level. Teachers are also more likely to use computers and ICTs are limited to personal use only and not for teaching and learning purposes. Among the identified barriers are time
factors, attitude factors, training factors and convenience factors. In this sophisticated technology era, researchers found that there are still a handful of rural teachers who are not interested in using this sophisticated technology. It is hoped that all teachers regardless of whether those who work in urban or rural areas can change their perceptions of using computer and ICT can further facilitate their teaching and learning process (refer to figure 1).

While information and communications technology in Malaysia is sought from the very beginning, there is no doubt that there are some problems and challenges often faced by the government to apply TMK in teaching and learning in Malaysia. There are some issues raised by certain quarters to identify the challenges faced in the education system especially the TMK application in the new education curriculum namely KSSR.

The main challenge identified is the lack of competence and skills among educators to use TMK tools. One of the constraints in using TMK effectively is due to the teacher's skill factor. [22,24,25] say that teachers are still faced with problems in terms of lack of skills in using information technology in teaching and learning in their classes. In addition, in terms of equipment deficiencies [5,6,8,26] through their study showed that lack of equipment and technology was one of the problems in using TMK in teaching and learning. As for computer maintenance aspects according to [1,27,28] stated that computer maintenance at school was inefficient and difficult to obtain technical assistance to repair computers. Teachers also face constraints in terms of time in spending the teaching syllabus set by the Ministry of Education.

![Figure 1. Current issues in the use of ICT](image)

Computer skills and skills in learning are an ability to be associated with intelligence, conglomerate development, creativity and innovation, inventions, designs, visuals, virtual learning and so on. In fact, not many of these educators benefit from the use of the internet as an alternative that provides access to a variety of information that can help reinforce the teaching and learning materials. Researchers found that generations born before the 1970s showed that their efficiency in handling information and communication technology tools was very low, especially the elderly teachers [5]. This is very different from the generation after the 1990s who are competent and knowledgeable in ICT usage. There are still teachers who do not know how to use the computer to enter data or are still struggling to type in official letters using Microsoft Word. The weakness of some of these teachers has led the government to apply TMK in teaching and learning stunted [3].

Inadequate funding sources of school cause some issues arise among teachers. Each school will get a budget to fund some of the costs at school. One of the costs that the school will have to pay if they have problems with TMK tools. This is because the school does not have sufficient financial resources
to finance the various costs of using this information technology in accordance with the findings of the study by [29, 26,10] that the attitude of teachers in the use of school computer labs is at moderate level, also has the most basic computer software skills of Microsoft Words and the main problem of using computer labs is a slowly repaired computer.

In the event of failure of TMK tools such as projectors, laptops and so on it will be abandoned and the superior or teachers will not care about it because the cost of financing is expensive [5,8,11,26]. Sometimes some teachers take their own initiative to fix it but the cost is to be borne by itself. Therefore, most teachers will not care about it and eventually they will be left behind in the school store without any use. The disadvantage of school leaders who are less committed to using ICT can also cause schools to lag behind the mainstream of change that is in line with the findings of [23] states that the constraints arising in the study are support aspects of the school's own management.

Schools also failed to play a positive role in developing students to computer literacy, especially in rural areas. Not only that, funds provided by the government are not enough to provide all facilities in schools such as computer facilities [27]. Some schools in Malaysia still have a problem with the lack of computers even with spacious room facilities. The number of students in the school will have this problem and it will cause teachers who teach not to show interest in using it [10]. Sometimes some schools have too many computers, so some can not be used because the numbers they provide and the space available at school is limited. So here comes some issues and the goal of the government's goals can not be reached. It should be noted that all schools get equal rights to avoid wastage.

Another challenge that can be identified is the negative attitude of teachers who do not give importance to TMK in teaching and learning [3,10]. The rapid development of technology has a profound impact on the teaching practices of teachers in the classroom. [30–33] has identified three categories of computer-based learning environment based on computer programming, computer-assisted learning and ultimately computer as a tool in teaching and learning. This study aims to see computer technology as a tool in the learning environment to implement teaching strategies for information and communication technology components. Based on these developments, the teachers should take the initiative by showing a positive attitude or interest in the teaching and learning of TMK elements [34,26]. On the other hand, some teachers who do not show their interest and positive attitudes make the government and school's aspirations unreachable [3].

[35] finds that some teachers have been familiar with the traditional methods and it is difficult to make adjustments with instructional technology while [36] propose in the era of globalization based on the development of information and communication technology (ICT) among students. Changes should take place in teaching and learning systems in the classroom where constructivism is encouraged as it can foster interest and encourage students to be more responsible for learning while applying lifelong learning practices. In the context of TMK in teaching, technology is used as a presentation tool and demonstration tool and it is the best way to be used in teaching and learning [3].

The use of technology media among educators and students in teaching and learning is essential for the current educational needs of the country. This paradigm shift is seen to have a major impact on education, especially in IPTAs that make this technology a key requirement for educators and students themselves [9]. In fact, the best approach is that when the use of TMK is in line with the needs of the students, it can produce the expected results within a reasonable time frame. Even negative attitude of teachers causes the use of this TMK can not be applied to improve the quality of student learning. They prefer to use traditional methods to save their time and also pursue to spend the syllabus. In fact, the use of TMK helps teachers to save time and deliver their teaching creatively and innovatively [1].

In addition, the challenges identified by the influence of information and communication technology development are the digital divide between rural students and students in urban areas. Access issues and the use of ICTs called the digital divide. Although it has shown quite encouraging growth, in Malaysia the problem of this digital divide can be considered still significant and serious [1]. Students in urban areas have complete facilities and access to information and communication technology materials is very easy as they get extensive exposure. Compared to students in rural areas, they do not receive or suffer from lack of internet facilities at school. This led to the exposure of rural
students not equivalent to pupils in the city [32,35,36]. Education policy in Malaysia is providing equal education regardless of race, economic status, student background and so on [13]. On the contrary, this issue is often raised as a serious issue and can not be solved for some reason. The digital divide between urban and rural students is an injustice in education. The digital divide illustrates the unfairness of students in rural areas.

Although the government took the initiative to overcome this problem by providing TMK facilities in rural schools but there are also some problems such as internet networking problems, lack of skills to use ICT equipment and do not care about the school cause a digital divide. Because of this digital divide, students in rural areas are far behind in contrast to students in rural areas. This should be given a serious emphasis when we see the impact [13].

3. Problems in Using Technology in Teaching

The use of ICT has become an important agenda in the current education system. The use of ICT in teaching and learning has now been recognized as one of the R & D approaches in pre-school classes as well as other pre-school R & D approaches. Deputy Prime Minister Tan Sri Muhyiddin Yassin, who is also the Education Minister, said the new curriculum incorporated elements of creativity, innovation and life skills in the teaching and learning process, involving all subjects, were part of the government's agenda to provide quality education for all. Tan Sri Muhyiddin said efforts to combine more aspects of creativity and innovation in the national education system would not be perfect without the role of ICT. He said ICT usage in the teaching and learning process enabled interactive learning, more effective and stimulating minds [37].

However, in Malaysia the ICT approach has not yet received encouraging attention as in western countries. The findings from the 2001-2010 Education Plan find that between 1996-2000, out of 30% of teachers attending ICT courses are only a few who use ICT in teaching and learning. In western countries, ICT usage is quite well known. For example in western countries, ICTs such as video, television, multimedia software are used to involve pre-school children actively in the teaching and learning process. The Internet is also used to assist teaching and learning. For example, the Public Broadcasting Service (PBS) website PBS Kids site provides good literacy learning for children aged 3 to 8 years. Here they can read and also have a variety of activities. In addition, the National Geographic Kids website provides information on geography, exploration, crafts, science and technology for children [38,39].

The study of [40,41] on the use of ICT across the curriculum in the preschool curriculum of the Ministry of Education Malaysia finds that the entire pre-school teacher has computer skills, abilities and computer skills. They also realized that the use of ICT in teaching and learning could attract students to learn and develop their intellectual [42]. However, lower ICTs are less encouraging and motivating pre-school teachers to use ICT in teaching and learning. This finding is supported by [14] which shows that teachers are prepared to implement teaching using ICT approaches and there is a strong relationship between work and behavior towards respondents. The use of ICT is also influenced by the duration of teacher service. Longer-serving teachers are less likely to use ICT in R & D because they are less exposed to ICT when they are in teaching training than with new teachers. Preschool teachers actually have no reason not to use ICT in R & D. Ministry of Education Malaysia through the Teacher's Activity Center has always organized short-term courses on computer skills so that preschool teachers receive the latest ICT knowledge and skills (refer to table 1).

Table 1. Problems in the Use of ICT

| No | Problem                        | Reviewer                        | Year       |
|----|--------------------------------|--------------------------------|------------|
| 1  | Lack of ICT facilities         | Sandra, Abu Bakar, Norlidah     | 2013,2011  |
| 2  | Lack of training               | Bahadur, Othman, Saidon         | 2018       |
| 3  | Frequency of use               | Johari, Fazliana                | 2011       |
| 4  | Integration in ICT             | Md. Nor & Rashita               | 2011       |
[4] examine the factors that influence the integration of teaching technology based on the TPACK model among mathematics teachers. Overall, the results of the study show that the factors that influence the integration of teaching technology based on the TPACK model are at a moderate level. Researchers suggested that mathematics teachers in the Kubang Pasu district were given training on the use of technology so that technological skills could be enhanced and could further facilitate the process of integrating teaching technology based on the TPACK model so that the teaching and learning process of mathematics became more meaningful and able to attract interest and motivate the students improving performance while encouraging mathematical teachers to widen ICT usage in schools.

Researchers [43] on ICT Integration In Mathematics Teaching And Learning Among Mathematics Teachers In Kota Tinggi District to 30 Mathematics teachers and 15 teachers in computer lab at secondary schools around Kota Tinggi district. The findings show that the level of ICT integration among Mathematics teachers in teaching and learning is low. However, the reluctance of Mathematics teachers to integrate ICT into teaching and learning Mathematics is not due to their internal factors but it is due to external factors such as inadequate ICT facilities and lack of ICT training since the level of study to service level. The findings of this study were supported by [7] who found that there was a strong relationship between teacher ICT literacy and critical thinking. However, there are still less skilled teachers using ICT in the 21st century teaching. The findings also show that the mean and percentage of literacy teacher literacy relationships with critical thinking are at a moderate level. Overall, ICT literacy level of mathematics teachers needs to be improved.

The findings are partly similar to the findings conducted by [44] and [45]. The researcher found that the seven obstacles that existed during the integration of ICT in teaching were less confident teachers during integration (21.2% respondents), lack of access to resources (20.8%), lack of time to integrate (16.4%), lack of effective training (15.0%), encountered technical problems while the software was used (13.3%), lack of individual access during the provision of teaching materials (4.9%) and teacher's age (1.8%). ICT equipment in computer laboratories is often damaged due to poor quality equipment and the use of unscrupulous students. Students who use computer labs in their teaching and learning process often damage the ICT equipment found in the computer lab. Among the frequent damage they make is removing the mouse, switching buttons on the keyboard and changing the setting on the computer. Damage made by a handful of irresponsible students causes the computer to not be used by other students. Internet disruptions occur because of incomplete and easy-to-use hardware such as lightning-insulating devices. Damage occurs frequently to this hardware, causing a damaged modem to be struck by lightning. As a result Internet disturbances will take place and take a while to be taken action by the contractor involved.

4. Proposal to improve the use of TMK among teachers
To overcome the challenges presented above, the school and teachers need to take appropriate action so that pupils in school will not be left out of this TMK explosion [10]. First of all, the school assisted teachers who did not master the skills of using TMK to participate in several courses conducted by the ministry. Not only that, the school also provides lectures to motivate teachers to master the skills [46]. Additionally, the school helps teachers to expose them to new ideas and opportunities in their teaching profession such as attending short-term ICT courses. These courses help teachers to have enough training to enhance their knowledge in terms of teaching and learning that incorporate technology elements and can also improve the quality of their teaching [3].
The study by [47] on 20 indigenous students who have difficulty reading the Malay language found that the use of computers and songs can improve reading levels among Asli pupils in primary schools. Implications of this study are that Malay language teachers need to integrate the use of computers and songs in their teaching. The findings are in line with [48,49] finding that language teaching using computers is one of the methods of teaching that is considered appropriate to the needs of today's educational needs. The use of computers in language teaching can influence the effectiveness of teacher teaching and the mastery of student language skills [3].

![Diagram](image)

**Figure 2.** Suggestions for increasing the use of ICT among Teachers

Ahmad & Jinggan [26] also acknowledged that the competence of History teachers in the use of information technology (ICT) can improve students' academic achievement in History subjects with values of 0.417, p <0.05 (at 0.01-level 2-end tests). The previous study suggests that the use of digital digital resources really helps to increase student interest and make the process of teaching and learning History more interesting [50,51]. Focus on multimedia software such as sounds, graphics, diagrams, animations and colorful pictures can improve the cognitive achievement, psychomotor, interest and behavior of students, some of the curriculum software can be owned and re-broadcasted in order to strengthen understanding and improve student performance to a higher level [50]. [52] also acknowledged that teachers 'skills in applying technology such as YouTube videos as a teaching aid in Arabic teaching and learning process attracted and increased students' understanding and memory because the teaching content was delivered in a transparent manner.

The findings of this study are supported by [29,53] that training for teachers should focus on integrating technology into real teaching in the classroom with specific tasks not merely providing computer-based skills training. He said that as a dedicated teacher should apply the TMK efficiently in teaching and learning that can produce a dynamic and progressive generation because the knowledge and training it acquires is equipped with the latest knowledge and skills. Knowledge acquired by teachers can lead to the generation of students in effective use of the Internet [37,47,54,55]

Furthermore, the challenge in terms of digital gap is not the government alone to take the initiative to overcome it, but the school also extends its hand to the superior to reduce this gap [56]. Students in rural areas should not be left behind in the rapidly expanding information and communication technology. Even though the government runs various programs and spends some million to provide all the facilities, the school does not use this opportunity well so the problem can not be solved. As a school manager, the superintendent always checks the teachers who are in rural schools in the use of these facilities efficiently. In addition, managers are also always aware of the use of TMK in teaching.
and learning. In terms of teachers’ perceptions, they also need to take the initiative to use all the government's preparedness and provide rural students to enjoy the opportunity and convenience of TMK in this way [57]. In this way, the problem of digital divide can be reduced gradually. Additionally, teachers should also give students exposure on the usefulness and importance of this technology and information in the era of globalization and modernization [58].

The source of financial resources is a problem that cannot be solved at any time because the needs and wants of each school are different. Therefore, to alleviate this problem, the school also needs to be constantly with the financial difficulties it faces from time to time. As a result, cost implications are often the criteria for implementing computer-based learning in schools. School planning should also take into account the changes that occur especially the use of information and communication technology. In addition to providing ICT-based learning facilities, schools need to devise a growing education budget, particularly spending on the use of information technology facilities, equipment and hardware [59]. This can help reduce the burden of government and the government gets to implement systematically planned programs. Not only that, the teachers can always be prepared with any problems faced through the use of TMK and handle them efficiently [13].

Finally, teacher's attitude is a very important aspect of a teacher because it shows their appearance and their credibility and accountability in the teaching profession. So negative attitude of teachers should be marginalized and should be positive and should be open to changing us according to the changes that occur in the education system from time to time [59]. Teachers should abandon the traditional way of teaching and learning, chalk and talk, instead of thinking of dynamic learning in the context of information technology [1]. Positive thinking should exist among TMK's policy-makers at all levels of the education system in the country to enable technology to be adapted and expanded in learning culture in line with [60] recommendation. The mental preparation, knowledge and skills factor among members is important towards a change in an organization [61].

Changes in attitude and value to IT are needed by teachers in the face of new challenges in education [3,10,15,62]. [3] states that positive teacher attitude will further encourage and mobilize the use of TMK in teaching and learning in primary and secondary schools running smoothly, quickly and thoroughly. Teachers need to be the driving force and triggers of the transformation of information and communication technology society and the formation of digital society by the year 2020. Teachers should be prepared to carry out new tasks to develop ICT in teaching and learning[16].

5. Summary
In conclusion, there are four things that challenge the government influenced by the development of information and communications technology in this third wave era. Technology is something that is not fixed and it will change over time. As a teacher, we know that this development will increase without any constraints in the future and it will affect the education system. Therefore, education trends should also be based on the development of TMK in order to produce highly knowledgeable and dynamic generation. In addition, the effectiveness of teaching and learning based on information and communication technology refers to the ability of teachers to integrate aspects of pedagogy, psychology and technology in their teaching and the ability of students to access and learn from the materials provided. However, if TMK infrastructure is incomplete and not efficient, teachers and students can not undergo good teaching and learning and the implementation of TMK in teaching and learning will fail. So, the infrastructure and facilities at schools should be monitored to allow the use of computers widely among teachers. There is still plenty of free space that can be filled and used to improve teaching and learning by using computers especially in the era of globalization where knowledge can be found only at the tip of the finger.

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