Teacher Trainees’ Computer Self-Efficacy: Its Relationships towards Implementation of Blended Learning

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Abstract: This study aimed to assessing the readiness level of Teacher Trainees (TT) or Guru Pelatih in applying the blended learning model in teaching and learning (T&L) at schools as well as identifying its relationship with teachers’ computer self-efficacy. This survey research was conducted on 201 teacher trainees who were completing their teaching practice in selected Malaysian schools. The study findings indicated that the teachers’ computer self-efficacy level (CSE) was moderate or they lacked confidence in using the learning platform Frog Virtual Learning Environment (Frog VLE) in their teaching activities. The teachers also were less involved in the implementation of blended learning which combined face-to-face learning with online teaching outside the classroom. There was a high positive relationship between teachers’ computer self-efficacy with the usage of blended learning. To ensure that teachers are competent in technology usage or any systems implemented by (KPM) at schools, the teacher trainees should be exposed directly to the current usage while at the university before they start their teaching practice at selected schools.

Keywords: Blended learning, Teacher Trainees, learning platform, Computer self-efficacy

1. Background of the Study

Innovation in the education system is vital for producing a positive impact on student achievement as well as preparing them to face the 21st century challenges of globalisation. The Malaysian education system is indeed growing rapidly in line with the 21st century learning styles which have encouraged student-centred teaching and learning. The current learning styles put more emphasis on active learning among students and are not only focused on school learning activities. The expected positive impact would depend on solid cooperation from all parties. According to Wang et al., (2015), interaction from all parties should be balanced and fair in the effort to form an effective workforce for starting a new system or transformation. The growth of technology has become more dynamic and futuristic Kong et al., (2014) and this should provide the impetus for change in the Malaysia education system. With the available technology which includes the teaching resources and tools in schools, Kementerian Pendidikan Malaysia (KPM) expects that teachers should be prepared to optimise the integration of ICT in learning as well as being able to cultivate a flexible teaching environment in line with the 21st century learning needs. A variety of teaching approaches could be utilised by teachers to ensure that their teaching methods are more creative and innovative as well as being aligned with the current educational needs. One of the approaches mentioned is the Blended Learning. This particular approach is not a new one nor is it difficult to be implemented in schools. For example, in a teaching and learning session in the classroom, teachers who combine two or more pedagogical approaches, or utilise various instructional technology tools during the face-to-face interaction in the classroom could be considered as using the Blended Learning approach.

KPM is optimistic that the Learning Management System which is already utilised in Malaysian schools, such as Google Classroom or Frog VLE, can enable teachers to use the learning platforms to implement a blended teaching approach in schools. Teachers can prepare various learning resources, guides, project guidelines, worksheets or online quizzes to be uploaded onto the LMS to achieve the learning objectives. Additionally, the teachers could communicate with the students via e-mail and the notice board. The benefits of blended learning could be enjoyed by students if the teachers have been prepared to integrate the approach in learning either in the classroom or at home.

According to Mohamad Amin et al (2014), there are 4 criteria related to blended learning: firstly, the combination of instructional technology with students’ assignment, secondly, the combination of two or more learning approaches, thirdly, the combination of multiple web-based technologies in the learning process and lastly, the combination of instructional technology with face-to-face learning. Zaharah et al (2015) stated that Blended Learning is a combination of conventional learning with online learning. There are 4 types of models which could be used to implement Blended Learning in schools which are the Rotation model, the Flex model, the Self-Blend model and the Enriched Virtual model (Horn & Staker 2011). As such, via the cloud-based learning platforms such as Frog VLE, various widgets could be utilised for implementing Blended Learning in teaching and learning. The International Association for K-12 Online Learning (iNACOL) in its report titled Blended Learning: The Evolution of Online and Face-to-Face Education from 2008-2015 (Gorman, 2015)
informed that hybrid learning which could be described as a teaching model and a hybrid facilitation combining the best features from conventional schooling with the benefits of online teaching could be utilised by teachers to convey a different and unique way of teaching according to the students’ different needs. Blended learning is not only a learning technique, but it is also a paradigm from a more personal choice depending on the teachers’ needs specifically to a technique which could fulfil students’ requirements.

The Blended Learning approach is based on technology usage (Huang et al., 2008; Isman et al., 2012; Mohamed Amin, Norazah, & Ebrahim, 2014; Nuanmeesri, 2014; Wong et al 2019). As such, researchers would refer to the concrete technology acceptance models by previous researchers to identify and assess teachers’ acceptance towards the Blended Learning approach in schools. As such, in the context of the learning management system usage in teaching and learning, teachers’ knowledge and skills related to a particular technology is important. Additionally, teachers should have a high confidence level to integrate the technology to obtain maximum impact for the students as well as the teachers. According to Bandura (2000), self-efficacy could be considered as one’s belief in his/her own ability to mobilise the cognitive resources, motivation and acceptable methods for a required task. Banas & York (2014), and Kulviwat, Bruner, & Neelankavil (2014) proved that self-efficacy had a positive relationship with the behavioural intention construct of a particular technology usage. Some researchers discovered that the computer self-efficacy is a multidimensional concept which can exist at many levels (Downey & McMurtrey 2007; Marakas et al. 1998). According to Marakas et al. (2007), computer self-efficacy could appear in two levels which were computer self-efficacy at a general level and also at a specific level. As such, to utilise the learning platform suggested at schools in order to provide a blended learning environment, teachers need specific computer self-efficacy for their skills to solve more specific tasks such as ICT usage in teaching and learning (Tschannen-Moran & Hoy 2001). Teachers with high computer self-efficacy would be confident to transform his/her students to become more successful (Noraini 2012; Mashitah et al. 2013). Previous research showed that low computer self-efficacy could be a barrier for individuals to accept new technology (Youngman 1999; Sami & Pangannaiah 2006) and this could also hinder that individual to change for the better (Ellen et al. 1991; Dabholkar & Bagozzi 2002; Liu & Grandon 2002). This meant that teacher trainees’ computer self-efficacy level was important to assess the readiness of the trainees to accept and utilise the learning platform at schools for the purpose of blended learning

In the effort to transform an education system, teachers play the main role in accepting innovation for making it a success and reality (Foong Mae, 2002; Hoque, Ahmad Zabidi, & Fatema Zohora, 2012; Stratton, 2014.). The implementation of an innovation in teaching and learning would not be a success without active participation and cooperation from all parties including the teacher trainees. In order to deal with the demands of 21st century education, teacher trainees in higher education institutions are also provided with multiple skills and knowledge to produce future teachers who are ready to implement teaching and learning in the current environment. The teacher trainees have been exposed to various educational courses related to pedagogy, technology and assessment in the university, as well as other major courses. These courses provide exposure specifically in instructional strategy with current development, integration of ICT in teaching and learning and continuous assessment. These trainees have to undergo 16 weeks of teaching practice at schools, and they are especially ready to adapt to theories, knowledge, existing skills with available technological innovation at schools such as the Frog VLE platform and other digital resources like EduWebTV into teachers’ teaching and learning activities. The questions that need to be answered are whether the teachers have high computer efficacy while using the Frog VLE and if they were willing to utilise the blended learning approach during the teaching practice at schools?

2. Statement of Problem

A few studies have been conducted on the usage of the learning management system in schools as a platform for teaching and learning like Google Classroom and Frog VLE (Frog Virtual Learning Environment), and some studies found that the usage was still low (Noraini et al. 2019, Mohd Azli et al. 2016). One of the barriers faced by teachers in accepting and using the technological innovation was the teachers’ attitude. Teachers’ attitude in accepting technology was influenced by their own belief of the technology benefits and whether it could be better than present technology, compatibility with normal practices, usefulness and usability (Noraini et al. 2010). Teachers’ attitude towards the acceptance of technological innovation could also be influenced directly by their computer self-confidence or self-efficacy in doing a specific test (Mohd Arif et al. 2011). Based on the findings from Noraini et al. (2018), the level of acceptance for blended learning innovation using the Frog VLE platform from the aspect of computer self-efficacy among primary school teachers in Pahang was moderate. The teachers were not confident in using the Frog VLE and ICT teaching platforms for preparing students’ learning resources whether at home or at school if they did not have enough experience in using the internet in integrating ICT in teaching and learning. The primary school teachers also lacked confidence in using blended learning via the Frog

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VLE platform if they did not receive intensive training. They were also reluctant to take the risk to use Frog VLE in their teaching and learning until they were truly skilled in using it. The question which remains is whether the teacher trainees were ready to utilise blended learning by using the available learning platform at school? What is the trainees’ computer self-efficacy level towards the blended learning approach?

3. Research Questions

1. Is there a positive relationship between teachers’ computer self-efficacy with the usage of the blended learning approach?

Ho 1 There is no significant relationship between teachers’ computer self-efficacy with the usage of the blended learning approach in their teaching and learning.

4. Study Methodology

This study was conducted using the survey method. The study was conducted on 200 teacher trainees from a public university and the sample was chosen randomly from various programmes. The trainees were completing their bachelor’s degrees in education and they were undergoing their teaching practicum at Malaysian secondary schools at selected schools. The students were in their seventh semester. They would return to the university for the final semester after they finished their practicum after 16 weeks at school. During their practicum, they were required to teach subjects stipulated by the schools with a minimum of 12 periods a week. The data in this study was collected using the survey instrument for the purpose of measuring the levels of blended learning usage and the teachers’ computer self-efficacy. Additionally, interviews were also conducted on 10 teacher trainees to further strengthen the existing quantitative data.

The instrument for blended learning contained two constructs which were face-to-face learning in the classroom and non-face-to-face learning using online learning. The survey instrument was adapted and adopted from another instrument for assessing blended learning which was conducted by Spyridon Varthis (2016). It utilised a 5-point scale which comprised 1 = Never, 2= Rarely, 3= Sometimes, 4= Frequently and 5= Very frequent. The instrument had a high reliability which was 0.818. As for the instrument for computer self-efficacy, this was used to measure teachers’ confidence in using Frog VLE and other ICT resources for students’ learning at school and at home. The instrument was modified from the instrument used by Hu et al. (2003) and Gong et al. (2004). This section contained 15 items and the respondents needed to choose the best response according to the 5-point scale: 1 = Very low, 2= Low, 3= Moderate, 4= High, 5= Very high. After the pilot study had been conducted, it was found that the instrument had a high reliability of 0.938.

5. Findings and Discussion

Demographics of trainee teachers

A sample of 201 teacher trainees who were completing their teaching practice in Malaysian secondary schools were chosen as the sample. The sample comprised 48 male trainees (24%) and 152 female trainees (76%) and they were chosen randomly. In terms of their education level, most of the trainees completed their Sijil Pelajaran Tinggi Malaysia (STPM) with a total of 117 trainees (58.5%), followed by diploma graduates with a total of 52 (26.0%). Additionally, there were 31 respondents (15.5%) from the matriculation and foundation level. It was also found that most of the trainees owned mobile phones. 198 trainees owned mobile phones (99.0%) and only 2 of them (1.0%) did not own mobile phones. Additionally, 196 trainees subscribed to mobile data for their phones and only 4 respondents (2.0%) who did not subscribe to any mobile data. Regarding broadband data, 69 trainees (34.5%) used broadband data while 131 trainees (65.5%) did not use broadband data.

Trainees Computer Self-Efficacy Level

The table below shows some of the items which were used in this study to measure the trainees’ confidence in using Frog VLE as a learning management system specifically to assist in implementing teaching and learning using the blended learning approach.

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
</table>

400
I am confident in using the learning platform even though
- There is no encouragement from colleagues 3.29 1.31 Moderate
- There is no directive from the mentor teachers 3.10 1.32 Moderate
- There is no encouragement from the administrator 3.05 1.26 Moderate
- There is no training on usage provided by the school 3.00 1.27 Moderate
- ada pengalaman menggunakan myguru2 di UPSI 3.31 1.26 Moderate
- I was not exposed to the Frog VLE platform while at the university 3.12 1.27 Moderate
- There is no directive from the teaching practicum office 3.05 1.28 Moderate
- I had to upload teaching materials in digital form 4.00 .96 High
- I had to upload teaching materials in digital form from the internet 3.92 1.00 High
- Even though it was quite hard to get internet access 3.59 1.10 Moderate
- Even though I had many students in my class 3.62 1.06 Moderate

Based on the table above, the findings showed that the trainees computer self-efficacy was at a moderate level (m=3.18). This showed that the trainees lacked confidence to utilise the Frog VLE platform in blended learning. This was because they did not receive any training in usage from the school and they were not exposed to Frog VLE while at the university. Furthermore, the desire to utilise the Frog VLE platform in blended learning voluntarily was low as there was no encouragement from the administrator, mentor teacher, colleagues as well as from the teaching practical centre. Though the trainee teachers showed a lot of confidence in uploading teaching materials from the internet for teaching and learning purposes, their attitude indicated that they lacked the interest to utilise the platform voluntarily if there was no directive from the administrator or the university.

The level of blended learning usage among the trainees

The table below showed some of the items which were used in the study instrument to measure the blended learning activity in teaching and learning via face-to-face interaction and non-face-to-face interaction.

Table 2. The mean and standard deviation values and interpretation for the teaching and learning activities in the classroom

<table>
<thead>
<tr>
<th>Item</th>
<th>Mean</th>
<th>SD</th>
<th>Interpretation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Searching for information from the school resource centre during</td>
<td>3.35</td>
<td>1.23</td>
<td>Moderate</td>
</tr>
<tr>
<td>the teaching and learning in the classroom</td>
<td>3.21</td>
<td>1.27</td>
<td>Moderate</td>
</tr>
<tr>
<td>Implementing formative assessment using written quiz and online</td>
<td>3.96</td>
<td>.95</td>
<td>High</td>
</tr>
<tr>
<td>quiz (Kahoot) during the teaching and learning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combining a few teaching methods (games and show and tell) during</td>
<td>3.56</td>
<td>1.10</td>
<td>Moderate</td>
</tr>
<tr>
<td>the face-to-face interaction</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combining two or more learning activities as suggested in PAK21</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>during the teaching and learning</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Using materials from the internet apart from the text book during</td>
<td>3.50</td>
<td>1.24</td>
<td>Moderate</td>
</tr>
<tr>
<td>the teaching and learning</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 2 shows the mean and standard deviation scores for some of the items in the study in order to acquire the level of usage for the blended learning approach among the teacher trainees. Overall, the usage level was moderate (m=3.21). The mean range for the usage of blended learning was between 2.21 to 4.17. It was found that the trainees utilised the blended learning approach while having face-to-face interaction in the classroom. Some of them combined two or more activities suggested in the PAK21 which were the Jigsaw method, Think Pair Share, Gallery Walk and others in one classroom learning session. Apart from the combination of methods, the trainees also combined the assessment methods such as implementing the formative assessment using the written quiz and the online quiz (Kahoot) during the teaching and learning. However, there were also learning activities which combined face-to-face interaction in the classroom and non-face-to-face interaction which comprised self-learning at home. The reasons for these were the trainees did not spend a lot of time using blogs, Facebook or Frog VLE as a sharing platform for resources such as materials, information, directives and assignments.

Online communication activities between the teacher and the student like e-mail and private messages in Frog VLE were less frequent. Blended learning using the Flipped Classroom model also were not so popular as they did not really practise teaching using notes, assignments and directives before the actual teaching and learning in the classroom. However, this study found that the trainees really encouraged the students to discuss with their group members regarding the tasks after the teaching learning had been implemented in the classroom.

The relationship of teacher’s computer self-efficacy with the blended learning application in teaching and learning

<table>
<thead>
<tr>
<th>Variable</th>
<th>Blended learning application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearson (r) correlation</td>
<td>0.640**</td>
</tr>
<tr>
<td>Significance</td>
<td>0.000</td>
</tr>
<tr>
<td>N</td>
<td>201</td>
</tr>
</tbody>
</table>

** Significant at a 0.001. level

The findings of the correlational analysis showed a positive relationship which was strong and significant between teachers’ computer self-efficacy and the usage of blended learning ($r_{201} = 0.64$, $p = 0.00$ ($p<0.01$). As such, the null hypothesis Ho 1 was rejected. This meant that there was a positive and strong relationship between teachers’ self-efficacy with the usage of blended learning. The high computer self-efficacy level could assure the teachers to utilise technological innovation, while a low computer self-efficacy would create a barrier for the teacher to learn about Frog VLE as a learning management system which could be utilised in teaching and learning effectively. These findings are in line with Noraini’s study (2011) which stated that the computer self-efficacy aspect had a high correlation with variables such as previous work achievement and experience of mastery.
6. Discussion

The mastery of pedagogical skills in the 21st century among teacher trainees is an aspect which should not be taken lightly. This study found that teachers' readiness in applying blended learning during the teaching practice was still at a moderate level. The level of trainees' computer self-efficacy in implementing blended learning was moderate. Additionally, the findings showed that the computer self-efficacy had a high relationship with the usage of blended learning.

Trainees' moderate computer self-efficacy could provide some implications in the preparation and implementation of teaching using blended learning. This includes confidence in planning teaching strategy. ICT usage as a teaching resource and the assessment of students’ learning during the blended learning process. Trainee with moderate computer self-efficacy could face certain challenges when using the Frog VLE platform as it could be something strange to them and they would need a longer time to learn how to use the learning platform in teaching. The students would probably cite this difficulty to the reason that they were not given specific exposure on Frog VLE when they were learning educational courses at the university. While another learning platform, MyGuru, is utilised in every university course and the students utilise it from the start of semester 1; nonetheless, they students do not usually have the experience to become the admin or teacher to simulate the learning management using the learning platform. With no experience as the admin, the teacher trainees would face difficulties to develop the learning dashboard required in order to implement teaching and learning using blended learning. Computer anxiety as well as a lack of confidence to utilise the learning platforms at school would cause them to feel hesitant to implement blended learning. This would be related to the reasons below.

i. The teacher’s choice in designing blended learning
ii. Continuous effort to fulfil the objective of implementing maximum blended learning.
iii. The time range in which the teacher can endure in terms of current diligence and focus while facing the challenges and problems in implementing blended learning.
iv. Problem solving and creativity while facing challenges in implementing blended learning.
v. Pressure and depression faced by the teacher in providing a blended learning environment.

A high computer self-efficacy would assist and encourage the teacher to become ready to study the interface on a new learning platform and he/she would be able to adapt his/her learning of using the learning platform while at the university with the features on the new learning platform. A high computer self-efficacy would provide a positive impact on the trainee’s real abilities to implement blended learning and it could also the change the trainee’s perception that blended learning was easy to implement and effective in helping the students’ learning process. This is because they found it easy to understand why they needed to use blended learning and how to become successful in implementing blended learning. This is in line with Williams and Williams (2010) who stated that individuals with high self-efficacy would accept and implement a difficult task as a challenge to be mastered and not as a threat to be avoided.

7. Contribution of the Study

The study found that computer self-efficacy would be useful to measure the growth of acceptance and individual ability in integrating ICT in the effort to implement blended learning. This concept is important as it would help researchers understand better how teacher trainees accept the learning platform at school, and the extent of their abilities in using the learning platform in their teaching and learning via blended learning. It seemed that the trainees were not prepared in becoming role models for their friends in the school’s social system. They appeared to lack new ideas and had less abilities to share new ideas on PAK21 which was disseminated from the university in order to influence other people about ICT usage in PAK21 learning via word of mouth. The university must ensure that teacher trainees should be exposed to relevant pedagogy and technology. The type of assignments given to students in courses like pedagogy, technology and assessment should be reviewed as the suitable type of assignment would help students in developing their way of thinking, the ability to understand abstract ideas as well as cultivating a high curiosity. This indicated that assignments should not only focus on skills which involve questions such as know-what, know-why and know-how but also towards the adaptation of solving in the context of teaching and learning. It could be summarised that apart from the benefits of knowledge and skills, confidence in one’s ability to utilise the Frog VLE platform as well as the belief in the platform’s innovative attributes are all vital as requirements for trainees to become prepared for using the existing learning platforms in schools. Equally important are the willingness to take risks in implementing blended learning, to work harder when facing difficulties and to provide more motivation for the
students. Previous studies have looked at the importance of training in the integration of technology in teaching and learning (Cudanov, Savoiu, & Jasko, 2012; Davies & Sinclair, 2013).

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