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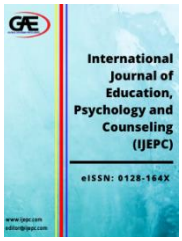

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VALIDATION OF THE E-LEARNING PRACTICES INSTRUMENT

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Abstract:

The success of the Malaysian Education Blueprint 2015-2025 could be achieved by the effective practices of e-learning. E-learning is not just an option today but has become a necessity when the pandemic covid-19 strikes the world. Therefore, this study aims to validate an instrument of an e-learning practice among student teachers in a public university. 139 respondents are randomly selected from undergraduate students from one of the public universities in Malaysia. In order to measure the suitability of each item and validate the instrument, exploratory factor analysis (EFA) is used. The findings of the study show that all load factor values exceed 0.5 so all items are accepted for real study. This instrument has a high degree of validity and reliability to determine the e-learning practices among university students.

Keywords:

E-Learning, Exploratory Factor Analysis, Pandemic Covid-19, Quantitative Study

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Introduction

The E-Learning system in any university is a system which is applied to increase the proficiency in the teaching and learning process as well as the management and administration. For example, when using the e-learning system, a student can communicate with other students by having online conversations, or they could upload notes and could also make notifications. Other than that, students are also able to download lecture notes from the lecturers, give evidence to their lecturers, interact with the lecturers and peers and other benefits. This e-learning system is required by universities and schools all over the country.

Literature Review

Electronic learning or e-learning is defined as the use of computer network technology in delivering information and instructions to individuals using internet (Ong & Lai, 2006). However, the definition should not be limited to the scope of the teaching and learning only. A broader definition for e-learning could be the delivery of education through various electronic media such as internet, satellite, video tape, audio tape or CD ROM (Koohang & Harman, 2005). E-learning could also be defined as the use of information and communications technology such as internet, computer, telephone, radio and video in supporting teaching and learning activities of all level of people (Masrom, 2007). For this study, the definition by Masrom is used. However, the definition of E-Learning often changes in line with technological advances today. It is also often misinterpreted in educational promotion advertisements. E-Learning could also be defined as any teaching and learning that uses electronic circuits (LAN, WAN or internet) for content delivery, interaction or explanation. Internet, Intranet, audio or video tapes, interactive TV and CD-ROMs are only some of the electronic media referred to in this category.

There are two forms of e-learning used in this university. They are synchronous learning and asynchronous learning. Synchronous learning can be conducted using audio conferencing (eg. Skype), video conferencing, web conferencing, chat, instant messaging, white boarding or application sharing (google document). The tools used allow a form of learning or 'live lectures' whereby there is no physical contact of participants, but the learning is done at a set time and interaction can be done by all participants from different locations (Kalpana, 2010). The challenge of this type of learning is that everybody is there at the same time in order to participate, and any failure of the technological framework might worsen the process. Normally, in synchronous learning immediate feedback is assured. Next is asynchronous learning. It is a learning process whereby participants are linked to the referenced material and it is not a 'live lectures' (Kalpana, 2010). It is a self-pace learning. It could be conducted through databases, document libraries, e-books, forums, messaging (emails), streaming audio, streaming video, blogs, website links or etc. In conclusion, the difference between these two modes of learning is that for the first mode, the students need to be available at the same time although they are at different places. However, for the second mode, the student can study in one's own time and one's desired pace (Hrastinski, 2008). After all, both modes of learning need information and communications technology without the presence of all the participants at the same place.

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In this study, both forms of learning are used as suggested by UPSI during COVID-19 pandemic time. In UPSI, synchronous learning involves teaching and learning process which follows current time-table. Topics should be based on Pro-Forma. Asynchronous learning is a learning process where all teaching and learning activities are planned by weekly basis and all online activities can be performed at any time. In addition, the platform which can be used for e-learning are MyGuru, Google classroom, social media such as WhatsApp, telegram, Facebook, Instagram, MS365 or MSTeams.

The good thing about e-learning is that it is flexible and convenience as the students are free to use their own time and place (Smart & Cappel, 2006). In addition, students can apply concepts realistically by using few multimedia tools. Animations are also made possible in demonstrating concepts by e-learning, which has a very good pedagogical advantage. However, it does have some limitations. By using asynchronous e-learning, students do not have practical exposures on what they have learnt especially something related to technical training programmes (Laine, 2003). In addition, students do not have a direct support system with peers and lecturers that makes study is a bit difficult (Hara & Kling, 2000). Students might also get bored, stressed and demotivated if they do not understand the subject. Some students might be computer illiterate so they would not be able to interact with their lecturers and peers effectively (Muir, 2001).

According to Eastin & LaRose (2000), someone who has a low self-sufficiency stage of e-learning will be less sure of his own ability to access e-learning and is not proficient in using these skills in his life. Barriers are defined as obstacles faced by students that will bring a negative impression on them in using e-learning. Learning barriers were found to lead to impressions of an individual in the learning and satisfaction stages (Schilke, 2001). Less supportive than advisors or supervisors to the use of e-learning is perceived as a hindrance by the institution itself (Schilke, 2001). These include a lack of quality for teaching materials (Oblinger, Barone & Hawkins, 2001; Schilke, 2001). Computers that are unable to access the internet are considered a technological problem (Gorard & Selwyn, 2000). In addition, there are problems in terms of consistency of computers to access the internet, computer fees and internet access costs (Pollard & Hillage, 2001), technical problems (Bischolf, 2000), access to technology (Williams, 2001) and technological trustworthiness. Other problems include the quality of technology, lack of technical assistance, lack of technical proficiency, the convenience of technology use, technological change and the problem of 'logging-in' (Schilke, 2001).

There are ten principles of e-learning as stated by Nichols (2003). The first is e-learning is a form of learning which could be applied with various educational models such as face to face or distance education. Choices in e-Learning technology may provide better follow-up in pedagogy. Hence, how technology is used is more important than which technology is used. E-learning has its main advantages with the triumph of implementing pedagogical innovation. It could be used in two ways, namely the delivery of learning content and the ease of the learning process. It is also developed as best as possible to operate with an optimal course selection design model. E-learning techniques and tools should only be used if consideration has been made of the online or offline system. Effective e-learning exercises provide opportunities for end users to take the learning opportunities that are provided to them. The overall educational goal developed by the teacher in the context of the learning curriculum or learning objectives will not change if e-learning is implemented. All this while, there is not much problem arise

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from the usage of myGuru application in this university. However, the biggest problem or challenges is that the internet connection might appear slow. Obstacles also raised by Mohd Sukri Saud et al (2007) in their study. The obstacles mentioned by the researchers are the internet in most hostels are not satisfying enough and the attitudes of the students themselves are not convincing as the students are more likely to open other pages which are not related to their studies. There is a need of this study to determine the effectiveness of the practise of e-learning especially in this era of pandemic. This study aims to validate the six main constructs in e-learning practices instrument to determine the practices of e-learning among student teachers in a public university.

Methods

Research methodology is a systematic procedure to combine data analysis and research approach (Raman, 2009). This action is conducted to ensure that the research could be well-achieved. One has to be careful in choosing research method as good data collection methods have to be carried out following the research questions and research objectives (Goudar, 2012). In addition, research methodology does have an influence on the quality of research (Creswell, 2009). The study is a survey research method using quantitative data. A total of 139 students were randomly selected from semester eight students from the education degree courses. These number of students are sufficient enough as Hair et. al. (2010) suggest that at least 100 respondents are needed for EFA. The questionnaire is adapted from the questionnaire developed by OLES (Renee, 2011). It consists of six constructs with 29 items altogether. Likert scale is used in assessing, starting from 1 (never) to 5 (very often). EFA is used to check for the construct validity of the items before it goes through confirmatory factor analysis using structural equation modelling by SEM AMOS in real study.

Findings and Discussion

This study is using SPSS to analyse the data. The construct validity is measured using exploratory factor analysis. Then, it followed by the analysis of Cronbach's Alpha which measures internal consistency or reliability of the items.

Table 1: Exploratory Factor Analysis for 'The Use of Computer' Construct

ITEM	FACTOR
A. Computer Usage: I use the computer to …	0.875
A1. deliver assignments via e-mail to lecturer	0.744
A2. ask questions to lecturer	0.729
A3. seek information regarding the course	0.788
A4. read the notes provided by the lecturer	0.836
A5. get information regarding how my course is assessed	0.712
A6. discuss online with other colleagues	0.884
Eigenvalue	4.234
Variance percentage explained	62.422

The value of Kaiser-Meyer-Olkin Sampling Adequacy is 0.782 (more than 0.7) which indicates that the data is suitable for Principal Component Analysis. The Bartlett's Test of Sphericity is significant ($p<0.001$) which shows that the relationship between items is sufficient for EFA. The percentage variance explained for this construct is 62.422%. All items have a load value more than 0.50 so none of the items are discarded. The EFA results for the first construct named 'The use of computer' is shown in Table 1.

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Table 2: Exploratory Factor Analysis for 'Lecturer Support' Construct

ITEM	FACTOR
B. Lecturer Support: If I have a question, my lecturer …	0.872
B1. provide time to reply	0.711
B2. help me identify problems in learning	0.729
B3. respond quickly to my questions	0.788
B4. provide valuable feedback regarding my assignment	0.836
B5. answer my question exactly	0.701
B6. promote my inclusion in learning	0.829
B7. nice to be contacted	0.776
B8. provide useful information regarding my assignment	0.829
Eigenvalue	4.588
Variance percentage explained	60.495

The value of Kaiser-Meyer-Olkin Sampling Adequacy is 0.881 (more than 0.7) which indicates that the data is suitable for Principal Component Analysis. The Bartlett's Test of Sphericity is significant ($p<0.001$) which shows that the relationship between items is sufficient for EFA. The percentage variance explained for this construct is 60.495%. All items have a load value more than 0.50 so none of the items are discarded. The EFA results for the first construct named 'Lecturer Support' is shown in Table 2.

Table 3: Exploratory Factor Analysis for 'Students' Interaction' Construct

ITEM	FACTOR
C. Students' interaction	0.871
C1. I can work with other colleagues	0.723
C2. I may associate partner assignments with mine	0.711
C3. I share the announcement with other colleagues	0.809
C4. I can collaborate with other colleagues	0.822
Eigenvalue	4.200
Variance percentage explained	61.421

The value of Kaiser-Meyer-Olkin Sampling Adequacy is 0.821 (more than 0.7) which indicates that the data is suitable for Principal Component Analysis. The Bartlett's Test of Sphericity is significant ($p<0.001$) which shows that the relationship between items is sufficient for EFA. The percentage variance explained for this construct is 62.795%. All items have a load value more than 0.50 so none of the items are discarded. The EFA results for the first construct named 'Students' Interaction' is shown in Table 3.

Table 4: Exploratory Factor Analysis for 'Personal Factor' Construct

ITEM	FACTOR
D. Personal Factor: With e-learning, I may …	0.771
D1. relate what is learned in class to life outside	0.798
D2. develop more topics that I am interested in	0.810
D3. relate assignments in class to life outside	0.809
Eigenvalue	4.290
Variance percentage explained	60.591

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The value of Kaiser-Meyer-Olkin Sampling Adequacy is 0.789 (more than 0.7) which indicates that the data is suitable for Principal Component Analysis. The Bartlett's Test of Sphericity is significant (p<0.001) which shows that the relationship between items is sufficient for EFA. The percentage variance explained for this construct is 61.225%. All items have a load value more than 0.50 so none of the items are discarded. The EFA results for the first construct named 'Personal Factor' is shown in Table 4.

Table 5: Exploratory Factor Analysis for 'Authentic Learning' Construct

ITEM	FACTOR
E. Authentic Learning	0.872
E1. I learn real cases related to learning	0.898
E2. I use real facts during class activities	0.811
E3. I carry out assignments related to real notices	0.709
E4. I work with real examples	0.813
Eigenvalue	4.280
Variance percentage explained	61.791

The value of Kaiser-Meyer-Olkin Sampling Adequacy is 0.729 (more than 0.7) which indicates that the data is suitable for Principal Component Analysis. The Bartlett's Test of Sphericity is significant (p<0.001) which shows that the relationship between items is sufficient for EFA. The percentage variance explained for this construct is 60.790%. All items have a load value more than 0.50 so none of the items are discarded. The EFA results for the first construct named 'Authentic Learning' is shown in Table 5.

Table 6: Exploratory Factor Analysis for 'Students' Autonomy' Construct

ITEM	FACTOR
F. Students' autonomy	0.712
F1. I am free to make decisions regarding my learning	0.899
F2. I work according to the convenience of my time	0.711
F3. I take full responsibility in my learning	0.722
F4. I have an important role in my learning	0.819
Eigenvalue	4.320
Variance percentage explained	60.881

The value of Kaiser-Meyer-Olkin Sampling Adequacy is 0.722 (more than 0.7) which indicates that the data is suitable for Principal Component Analysis. The Bartlett's Test of Sphericity is significant (p<0.001) which shows that the relationship between items is sufficient for EFA. The percentage variance explained for this construct is 60.545%. All items have a load value more than 0.50 so none of the items are discarded. The EFA results for the first construct named 'Students' Autonomy' is shown in Table 6.

Cronbach's Alpha Coefficient Value Analysis

After all the items are checked for their construct validity, they then go through reliability checking by determining the Cronbach Alpha coefficient value. The minimum value for the Cronbach alpha value for item to be reliable is 0.7 (Hair et. al, 2010). Table 7 shows the value of Cronbach alpha for each construct.

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Table 7: Cronbach Alpha Coefficient Value

Construct	Number of items (original)	Items dropped	Number of items (after EFA)	Cronbach's alpha coefficient
Computer usage	6	0	6	0.882
Lecturer Support	8	0	8	0.911
Students' Interaction	4	0	4	0.884
Personal Factor	3	0	3	0.798
Authentic learning	4	0	4	0.824
Students' autonomy	4	0	4	0.913
Total items after EFA			29	

The findings have shown that all the items are maintained, hence all six main constructs which contributes to the e-learning practices are maintained. This study which produces a valid and reliable instrument also contributes to the instrument development and validity through the EFA analysis (Ghazali et. al., 2020). So, these findings give an opportunity for other researchers to use this instrument in their research later. It could also be used as an instrument to look for an in-depth research concerning e-learning practises. The implication of the study is that this study enables the Ministry of Higher Education (MOHE) to make a guideline in dealing with e-learning practices. Appropriate measures could be taken to combat the weakness especially on the usage of internet. This study also implies that the officers from the ministry should make regular inspections so that the system is always upgraded. The policy should be looked into, so that it is in line with the National Education Policy and the Education Development Plan which have been structured earlier. This study is also hoped to contribute to the knowledge of the possible mechanism for achieving the best practices in e-learning at the university level.

Implications For Future Studies

A number of limitations for this study. The samples of this study are undergraduate students and not considering views from teachers or parents. This study is also conducted one-shot, so it limits the findings. For future research, the researcher might use interviews or observations for data collection method to gain an in-depth finding. This study shows that the instrument is valid and reliable although the instrument comes from the west. It shows that it is valid and reliable and could be used in our education system.

Conclusion

This instrument could be used by any researcher in future study. It is valid and reliable when checked using exploratory factor analysis value for construct validity of items and value of Cronbach Alpha coefficient for reliability of items.

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