

Factors Influencing Psychology and Skills of the Secondary School Teachers' E-Learning Readiness: A Case Study in Malacca, Malaysia

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Adoption of e-learning into educational institutions has been the latest trend and it has been proven very much effective in the process of teaching and learning. The government of Malaysia had initiated self-styled "Smart School" project in 1997 with the view that traditional chalk and talk teaching and learning styles could be improved by implementing such a new strategy. Previous empirical studies have revealed that the e-learning readiness for all the countries in this world is vital as it positively and significantly influences teaching and learning outcomes in the educational institutions, particularly the secondary schools. This study is an effort to identify the factors that are influencing psychology and skills of the secondary school teachers as they have been dealing with the e-learning tools and techniques. The study has collected primary data from several secondary schools located in Malacca, Malaysia. The data have then been analysed using some suitable statistical techniques such as internal consistency test and factor analysis to come up with the findings of the present study. The study closes with some policy implications and concluding remarks.

Keywords: psychology; skills; e-learning; secondary school teachers; and Malaysia

1. Introduction

"If we didn't have computers life would be very difficult because they help a lot with all difficult subjects and make you understand the 'problem' better" [1]. Such a concept boosts the adoption trend of e-learning from schools, higher learning institutions to local and international organizations. In order to attain the new trend and to influence the people in the knowledge driven economy, government of Malaysia had initiated 'Smart School' project, which promotes e-learning since year 1997 in schools. 'Smart schools intend to create highly skilled, innovative and creative workers to deal with the rise up of information and communication technology' [2]. Since government wishes to make the education system rely more on e-learning, the e-readiness will be the main success factor [3]. For schools, teachers' readiness in using the technology will determine the success of e-learning implementation [4].

Secondary schools are the turning point that advances the students to universities or precedes them into the work field. Secondary school teachers as the guider have heavy responsibilities in matching the students with and preparing them to the labour market requirements. The present study has therefore narrowed its focus on secondary schools teachers. A previous study revealed that there are 7 main factors, which are influencing the teachers' e-learning readiness. The factors identified by the study are psychological, technological facilities, technical skills, management, course contents, environmental and financial [5]. The present study will determine and analyse the factors that are influencing the psychology and technical skills readiness of the secondary school teachers.

2. Brief Literature Review

2.1 Psychological Readiness

According to a study conducted by the Ministry of Education, Singapore, psychological readiness is considered as one of the most important factors and has the highest possibility of sabotaging the

implementation process for e-learning. It influences the e-learning initiative [6]. Teachers' negative attitude towards the importance of gaining technical skills might highly prohibit them to participate in e-learning. Based on a research report by Becta, schoolteachers lacked of confidence in using e-learning. They had computer anxiety, some teachers perceived non benefit gain from it, some did not use e-learning because it is not relevant to public examination and teachers even had negative attitude toward the e-learning such as persistence to change, and the report found that teachers were lacking of training on integrating teaching with e-learning and so on [7]. A study conducted by Anuwar Ali revealed that there is still a lack of awareness amongst the Malaysians on e-learning as a large segment of them are computer illiterate [8]. Besides, it is still a challenge for the Malaysian Ministry of Education to convince teachers to embrace change to incorporate ICT into their instruction [9]. Therefore it is important to change the mindset of everyone involved in the teaching and learning process. Hence, psychological readiness bears an importance to determine and assess their mindset and attitude.

2.2 Technical Skill Readiness

Another factor that might seriously prohibit the readiness of the secondary school teachers is the technical skill. Becta provided the evidence that the lacking of computer competence is one of the barriers for teachers in adopting e-learning [7]. A study by Tian Belawati revealed that the constraint for the growth of ICT is related to the shortage of teachers with ICT skills [9]. Fabry and Higgs argue that educators must experience the power of technology to implement it in the teaching and learning process [10]. In fact, implementation of ICT by the government in the teaching and learning process helps the teachers in gaining their skills, which will be extremely functional. Teachers are then expected to have a broad range of skills and use a wide range of software and adapt these skills to a diverse set of classroom situations. However, many teachers do not want to talk about Internet with students because students are more skilful than them and there are teachers who are facing difficulties to set up ICT tools when needed during presentation in class [11]. This reflects that the technical skill readiness is an important factor that influences the success implementation of e-learning.

Moreover, the study conducted by Becta revealed that there were some complex interrelationships among all the barriers to e-learning readiness. This included the psychological and skill related readiness. For example, negative perception of the schoolteachers on technology might prohibit them to gain necessary skills. The study also showed that the use of e-learning can significantly motivate the students to learn. Since the main concern for schoolteachers is to teach their students and help them to learn, they should be necessarily ready with teaching and learning related technical skills. The same study revealed that the practice of e-learning in the secondary schools did not reach at satisfactory level. This study, therefore, aims to identify and analyse the factors that influence the psychological and technical readiness of the secondary school teachers to enable them to be ready for practicing e-learning in the schools.

3. Methodology

Stratified quota random sampling technique has been used to collect the data from the secondary schools located in both rural and urban areas of Malacca, Malaysia. 85% secondary schools have been selected from different secondary schools with a teaching staff size of between 25 to 30. In fact, the average teaching staff size in all the secondary schools in Malacca varies from 25 to 30. A total of 1837 questionnaires were distributed to the secondary school teachers of Malacca. Although a total of 68% completed questionnaires were then returned by the secondary school teachers, only about 33.5% of these questionnaires were found to be valid. Thus the final sample size was 412 and information provided by the secondary school teachers in these questionnaires were finally considered in data analysis. 5-point Likert Scales have been used in the questionnaire. At the first step of the analytical technique, internal consistency test used to determine and analyse the factors that are significantly influencing the psychological and technical skills readiness of the secondary school teachers towards their e-learning readiness. It is worthwhile to mention here that the psychological readiness in the present

study consists of 3 different views of the secondary school teachers. These include the views of the respondent about himself/herself, respondents' views about the colleagues and their views about the students. While technical skill readiness consists of 7 different categories. These include basic computer operation, file management, word processing, spreadsheet use, Internet use, telecommunication use and others skill. At the second step of the analytical technique, principal component test, and principal axis test with Oblimin, Varimax Rotation and Bivariate Correlation tests have been used to analyse the data in a meaningful way.

4. Findings and discussions

4.1 Psychological Readiness

There have been 16 negative items recoded to ignore the negative effects on cronbach alpha. Alpha value for these negative items was 0.847. Inconsistent items were excluded and then alpha value became 0.897. Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.880 and Bartlett's test of sphericity was significant at $P \leq 0.01$ level. For the extract factors with eigenvalues of more than 1, both Principal Component Analysis (PCA) and Principal Axis Factoring (PAF) extracted 8 factors. These factors explained 61.5% of total variance under PCA while explained 47.9% under PAF. Researchers have to exclude the items from analysis that loaded less than a value 0.5 on common factor. 12 items were then excluded, which caused KMO measure of sampling adequacy to increase to 0.898. Bartlett's test was proven significant at $P \leq 0.01$ level. Both PCA and PAF extracted 3 factors with eigenvalues of more than 1. The factors explained 52.4% total variation under PCA while 43.6% under PAF. Under PCA, all items loaded a value of more than 0.5 for common factors. While for PAF, one item loaded 0.47 and the result was acceptable. Researchers in the present study had to discard item ps4, which loaded more than one factor with a loading value of more than 0.4. This caused KMO measure of sampling adequacy to increase to 0.9. Then both PCA and PAF extracted 3 factors and these factors explained variations of 52.9% under PCA and 43.6% under PAF. 17 items were then loaded with a value of more than 0.5 for the common factor under PCA. For PAF, there are only 2 items loaded with a value of 0.47 and such finding was acceptable. Table 1 shows the factors loaded with both Varimax and Oblimin rotations for both PCA and PAF. The common factors renamed as Own Attitude (OwAtt, 17 items, alpha = 0.871). 3 factors were under rotation and they were renamed as Computer Anxiety (ComA, alpha = 0.828), Advantages of E-learning (AdvEL, alpha = 0.748) and Attitude Respond (AttRnd, alpha = 0.739).

Factor analysis was also used for the excluded items as well. Alpha coefficient for those items was 0.636 and KMO was 0.768. After excluded items with loading less than 0.3 for common factors, KMO became 0.776. However, both PCA and PAF extracted 5 factors and through a strict examination only 3 independent factors were then considered and analysed. Table 2 shows the factors loaded with both Varimax and Oblimin rotations for both PCA and PAF. Next, 3 factors were renamed as Views on Students (VStu, alpha = 0.734), Views on Colleagues (VCol, alpha = 0.665) and Awareness (Aware, alpha = 0.725). The researchers did not have to discard VCol as the alpha value of the item was found to be more than 0.6.

Table 1 Summary of result analysis of the factors influencing psychological readiness of the secondary school teachers towards e-learning.

		ComA, 5 items					AdvEL, 3 items			AttRnd, 3 items		
		ps11	ps12	ps14	ps15	ps16	ps6	ps8	ps10	ps27	ps28	ps29
PCA	Varimax	0.68	0.71	0.77	0.80	0.75	0.76	0.79	0.69	0.75	0.72	0.76
	Oblimin	-0.67	-0.73	-0.79	-0.82	-0.78	0.79	0.83	0.71	0.79	0.72	0.78
PAF	Varimax	0.62	0.63	0.73	0.76	0.68	0.71	0.73	0.57	0.60	0.63	0.66
	Oblimin	-0.62	-0.65	-0.76	-0.80	-0.72	0.75	0.79	0.59	0.65	0.66	0.71

Table 2 Summary of result analysis of the excluded items influencing psychological readiness of the secondary school teachers towards e-learning.

		VStu, 3 items			VCol, 3 items			Aware, 2 items	
		stu1	stu3	stu4	col1	col2	col4	ps1	ps2
PCA	Varimax	0.68	0.81	0.80	0.73	0.75	0.70	0.84	0.81
	Oblimin	0.68	0.84	0.82	0.72	0.74	0.69	0.84	0.80
PAF	Varimax	0.51	0.66	0.75	0.63	0.68	0.54	0.83	0.63
	Oblimin	0.50	0.70	0.81	0.63	0.69	0.54	0.84	0.62

4.2 Technical Skill Readiness

At the first stage of analysis, the initial alpha value for the technical skills of the secondary school teachers was 0.936. After inconsistent items were excluded from the analysis, the alpha value became 0.968. The KMO measure of adequacy was found to be 0.96 and Bartlett's test of sphericity was significant at $P \leq 0.01$ level. By extracting the factors with eigenvalues of more than 1, the PCA and PAF then extracted 5 factors. Under PCA, the factors explained 71.2% of the total variation while for PAF the variation was 65.8%. The loading for common factors ranged from 0.52 to 0.82. Items loaded a value of more than 0.4 on two factors were excluded from analysis. Then, KMO measure of adequacy became 0.953 and Bartlett's test of sphericity was significant at $P \leq 0.01$ level. Both PCA and PAF extracted 4 factors. Under PCA, the factors explained 70.5% of the total variation while for PAF the variation was 64.8%. Loading for common factors was more than 0.5. Table 3 shows the factors loading for both Varimax and Oblimin rotations. All these items loaded a minimum value of 0.55 or above except for spre4, which was having a value of 0.52 under Oblimin rotation. But the value is still accepted. Next, the researchers have been preceded with the excluded items. For the excluded items, the Alpha value was found to be 0.836 while KMO was 0.866. By discarding the items with a loaded value of less than 0.3 on common factors and items loaded with a value of more than 0.4 on two factors, both PCA and PAF extracted two factors. KMO measure of adequacy then became 0.884. Under PCA, factors explained 50.4% of total variation while for PAF, factors explained 44.2% of total variation. Table 4 shows the values of the excluded items influencing the technical skills of the secondary school teachers towards their e-learning readiness. The common factors renamed as Basic Skill (BscS, 21 items, alpha = 0.953). All the valid factors were then renamed as Basic Document Handling (BDocH, alpha = 0.882), Spreadsheet Use (SprU, alpha = 0.917), Internet Use [WWW] (IntU, alpha = 0.955), Basic Operation (BscOp, alpha = 0.773), Advanced Operation (AdvOp, alpha = 0.897) and Telecommunication Used (TelCU, alpha = 0.782).

Table 3 Summary of result analysis of the factors influencing technical skills readiness of the secondary school teachers towards e-learning.

		BdocH, 6 items					SprU, 4 items				IntU, 6 items						BscOp, 3 items			
		fal1	fal6	wrd1	wrd2	wrd3	spre1	spre2	spre3	spre4	spre5	int1	int2	int3	int4	int5	int6	bas2	bas3	bas4
PCA	Varimax	0.76	0.62	0.83	0.73	0.67	0.71	0.76	0.73	0.65	0.83	0.79	0.83	0.80	0.76	0.79	0.81	0.69	0.66	0.79
	Oblimin	0.79	0.55	0.88	0.76	0.66	0.68	0.81	0.76	0.64	0.91	0.89	0.94	0.90	0.82	0.85	0.89	0.68	0.67	0.86
PAF	Varimax	0.72	0.61	0.82	0.64	0.60	0.68	0.70	0.65	0.55	0.83	0.74	0.82	0.76	0.73	0.76	0.78	0.64	0.57	0.64
	Oblimin	0.76	0.54	0.88	0.66	0.57	0.66	0.74	0.68	0.52	0.94	0.85	0.94	0.86	0.78	0.84	0.88	0.66	0.58	0.71

Table 4 Summary of result analysis of the excluded items influencing technical skills readiness of the secondary school teachers towards e-learning.

		AdvOp, 5 items					TelCU, 4 items			
		fal2	fal3	fal4	wr4	wr5	eml1	eml3	eml5	eml6
PCA	Varimax	0.78	0.83	0.84	0.77	0.74	0.61	0.75	0.83	0.79
	Oblimin	0.80	0.84	0.85	0.77	0.74	0.58	0.79	0.84	0.79
PAF	Varimax	0.74	0.82	0.85	0.73	0.69	0.52	0.63	0.82	0.74
	Oblimin	0.78	0.85	0.87	0.74	0.7	0.49	0.68	0.85	0.76

4.3 Discussions

Table 5 presents the factors influencing psychological readiness of the secondary school teachers towards e-learning and majority of the factors had an acceptable correlation values. For technical skills readiness, all the factors had a strong and positive correlation ranged from 0.51 to 0.9. It was not surprising that the sub factors such as ComA, AdvEL, AttRnd were highly correlated to the common factor of OwAtt. For technical skills, sub factors such as BDocH, SprU, IntU and BscOp were highly correlated to BscS as well. The correlation matrix was consistent with Becta's finding as all these psychological and technical skill factors had meaningful interrelationship. The matrix revealed that computer anxiety and all the technical skills were strongly and negatively correlated with each other except for Internet and Telecommunication uses. This result was also consistent with what Cikgu Wan had revealed earlier by saying that teachers might tend to avoid using e-learning during teaching because they lack of technical skills [11]. The connection between Internet and Telecommunication uses and views about colleagues were found to be insignificant. Both technical skills were weakly correlated to majority of the factors for psychological readiness as well as they do not usually use these technical items to teach the students in the classrooms. However, respondents' attitude towards e-learning seems to be influenced by both psychological and technical skills in the long run, if appropriate motivations are provided to them. In the present study, there were found some interrelationships between the views of the teachers on students and advantages of e-learning. This reveals that teachers are well concerned whether students benefit from the use of e-learning. Moreover, fellow colleagues' knowledge on e-learning and their willingness to share the technological skills seem to have positive influence on teachers' e-learning readiness.

Table 5 Correlation matrix for psychological and technical skills readiness of the secondary school teachers toward e-learning.

	OwAtt	ComA	AdvEL	AttRnd	Vstu	Vcol	Aware	BscS	BDocH	SprU	IntU	BscOp	AdvOp	TelCU
OwAtt	1.00													
ComA	-0.83	1.00												
AdvEL	0.65	-0.32	1.00											
AttRnd	0.69	-0.39	0.41	1.00										
Vstu	0.38	-0.16	0.42	0.28	1.00									
Vcol	0.25	-0.10	0.28	0.25	0.30	1.00								
Aware	0.41	-0.28	0.33	0.29	0.20	0.26	1.00							
BscS	0.67	-0.61	0.32	0.47	0.22	0.16	0.35	1.00						
BDocH	0.58	-0.46	0.33	0.46	0.16	0.13	0.31	0.81	1.00					
SprU	0.56	-0.53	0.25	0.40	0.17	0.17	0.27	0.86	0.69	1.00				
IntU	0.56	-0.51	0.24	0.37	0.21	0.06	0.31	0.90	0.63	0.66	1.00			
BscOp	0.58	-0.55	0.32	0.38	0.22	0.16	0.32	0.76	0.51	0.60	0.61	1.00		
AdvOp	0.61	-0.55	0.32	0.45	0.18	0.14	0.36	0.86	0.81	0.78	0.69	0.67	1.00	
TelCU	0.35	-0.33	0.13	0.17	0.16	0.09	0.20	0.59	0.35	0.49	0.60	0.44	0.40	1.00

5. Conclusion

It can be concluded here that e-learning readiness of the secondary school teachers is significantly influenced by their psychological and technical skills as evidenced in this study. Since e-learning readiness of the secondary school teachers is not only influenced by the above two factors, a more detailed study is therefore needed in order to explore the interrelationship of the demographic and socio-economic factors with the secondary school teachers' e-learning readiness. Finally, motivations and necessary supports from the local and central governments are also essential to provide appropriate environments to the secondary school teachers for their e-learning readiness.

Acknowledgements: The authors are grateful to Multimedia University, Malacca Campus, Malaysia for providing necessary funds for conducting this study.

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