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Research paper

Deploying Mobile Trend in Higher Education Institutions in Malaysia

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Abstract

The revolution of mobile technology has been spreading gradually around the world. Mobile technologies are a bridge between online social connections and real-world social interaction. This paper will discuss the results from an exploratory study on measuring the challenges of adopting mobile technology in Malaysian Higher Education Institutions (HEIs). For this purpose, an online 15-item questionnaire was distributed among academicians from public and private universities in Malaysia from which 42 respondents were recruited as sample. Preliminary results suggest that people, policies and technologies are a good construct for measuring the challenges of adopting mobile technology for a "mobile trend" in Malaysian HEIs. The present study confirms previous findings and contributes additional evidence on issues and challenges in implementing mobile learning and proposes that further studies taking these variables into account be undertaken.

Keywords: *Mobile revolution; Mobile learning; Higher education institutions.*

1. Introduction

A revolution of mobile technology has swept around the world across continents. Today there are over six billion mobile phone subscriptions worldwide. For every person who has access to the Internet from a computer, another does so from a mobile device [1]. Significantly, mobile applications are radically transforming how we access and share information and has changed the landscape of technology-supported learning [2]. Put another way, mobile technology is able to bring innovative ways of learning in a more virtual environment. Students around the globe are becoming absorbed in exciting new forms of mobile learning, yet traditional higher education institutions are still struggling to leverage the many opportunities in this area.

Mobile technologies are a bridge between online social connections and real-world social interaction. In discussing the impact of this mobile technology in higher education institutions, [3] there have been claims that mobile learning has a huge potential to transform education within social and cultural contexts. This transformation provides opportunities for institutions to engage with their students in significantly new ways [4-6], and to exploit mobile technologies to enhance both engagement and experience. Mobile 'products' are often the focus of attention for institutions, and mobile learning can be used to support traditional learning [7] [8-9] as well as distance learning [10-11]. In addition, [12-13] there exist further claims that the technology use enhances the teaching-learning in higher education, and that technologies always have a positive impact and can revolutionize the process of teaching and learning [14-15].

Research findings over the past decades have provided some evidence as to how rapid changes in technology have positively affected education [16]. Several studies that investigate the effects of implementation of mobile technology on adoption of mobile learning, mobile learning in Technical and Vocational Education (TVE), satisfaction of distance learners regarding mobile learning, demographic interest in Mobile Learning Readiness (MLR), Mobile Learning Services Acceptance Model and design and implementation of mobile learning have been carried out from a Malaysian perspective [17-24]. As a matter of fact, a major study has found that the reception of mobile learning in higher education institutions (HEIs) in Malaysia is encouraging [25]. There is an indication of an increasing momentum for applying mobile technology in Malaysian HEIs. Indeed, Malaysia is categorized as 'Category 1', which is characterized as exhibiting a high penetration of mobile phones and strong ICT infrastructure to enable m-learning under the broader context of national-level of ICT policies, along with other countries like Singapore and Korea [26]. With such promising empirical evidence, HEIs in Malaysia are already on the right track in implementing mobile learning.

Nevertheless, the questions that need to be asked to our higher education institutions: "Are we capable of fully implementing mobile learning and when will mobile learning become the mainstream mode of learning in higher education?" This paper will discuss the results of a pilot study on measuring the challenge of adopting mobile technology in response to mobile revolution in Malaysian HEIs. For the purpose of this study, this paper will evaluate 3 main components, namely people, policy and technology, as drivers for implementing mobile learning in higher education.

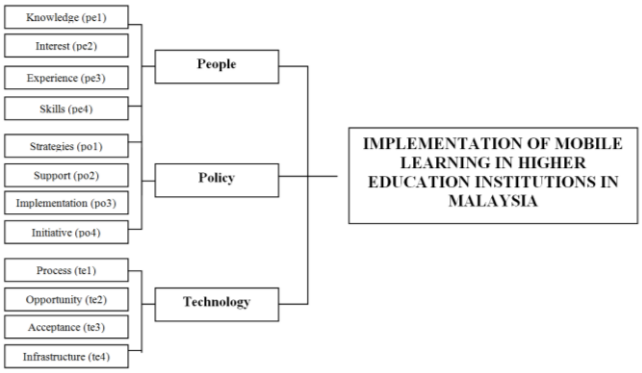

Fig. 1: Research framework

2. Methodology

In order to investigate the three components aforementioned, a 15-item questionnaire was developed based on the research framework illustrated in Figure 1 and online survey method was used to obtain the data for the pilot study. Respondents were provided a link to the online survey to enable them answer the questionnaire.

Potential respondents were approached to participate in the pilot study based on list of academic staff at Malaysian HEIs obtained from staff directory of web pages of respective public and private HEIs and provided with a link to the questionnaire through various modes such as email, Facebook, SMS, Yahoo Messenger, WhatsApp, LINE and We Chat. The questionnaire consisted of 3 sections: 1) demography; 2) people, technology and policy in implementing mobile learning; and, 3) future direction of mobile learning. There are five (5) types of Likert-rating used in this questionnaire.

The questionnaire took an average of 10 minutes to be completed for each respondent. The online questionnaire survey system was open to respondents from 15th April 2018 until 29th April 2018. During these 14 days, 42 respondents managed to complete the survey and data from this survey were analysed. A summary of the distribution of questionnaires, response rate including non-response were tabulated for interpretation. Data from this survey were sorted and coded using Microsoft Excel 2010 and then analysed using Winsteps version 3.6.3, a software for performing Rasch analysis.

3. Results and discussions

A summary of statistics of the result are given in Table 1. In this pilot study, 'persons' represent 42 respondents (academics), and 'items' represent the 15 items or questions asked. The summary statistics contain information regarding mean, standard deviation, and maximum and minimum values of both persons and items, where the maximum and minimum of person and item spread are reflected in the standard deviation (SD) in the Person Item Distribution Map (PIDM) in Figure 2. This is called the distribution of the respondents, and the questions are based on the logit ruler. The questions were analyzed using an Item Measure table to check for validity of the items. The questions were compared to three rules using the Point Measure Correlation, Outfit MNSQ and Outfit ZSTD.

Table 1 shows that item reliability (Cronbach Alpha) was 0.79, indicating sufficient item range with .40 errors, consider the instrument had an excellent item targeting (Fisher, 2007). It shows a good spread of 4.56 logit, where MaxPerson = 3.22 and MinPerson = -1.34 with Person Reliability = 0.77. These are considered good indexes for both item and person. The major finding in Table 1 is the Person Mean, μPerson = -26 logit which is higher than the threshold value, μItem= 0. These values show that the respondents were found to be higher than expected performance with two groups of respondents separation (G = 2.44). This also gives a good summary of item separation, G = 3.44 and a very high reliability = 0.92. There is a good item spread of 3.18 logit with SDi =1.57. With these good values of indicators, it is expected that the data could produce statistically stable measures.

Table 1: Summary of measured person

SUMMARY OF 42 MEASURED Person

	TOTAL SCORE	COUNT	MEASURE	MODEL ERROR	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD
MEAN	38.4	15.0	.26	.40	1.06	.0	1.06	.0
S.D.	5.8	.0	.93	.03	.55	1.5	.56	1.5
MAX.	54.0	15.0	3.22	.59	2.80	3.6	2.67	3.5
MIN.	28.0	15.0	-1.34	.39	.13	-4.0	.14	-3.7
REAL RMSE	.45	TRUE SD	.81	SEPARATION	1.83	Person RELIABILITY		.77
MODEL RMSE	.40	TRUE SD	.84	SEPARATION	2.10	Person RELIABILITY		.82
S.E. OF Person MEAN = .15								

Person RAW SCORE-TO-MEASURE CORRELATION = 1.00
CRONBACH ALPHA (KR-20) Person RAW SCORE "TEST" RELIABILITY = .79

SUMMARY OF 15 MEASURED Item

	TOTAL SCORE	COUNT	MEASURE	MODEL ERROR	INFIT MNSQ	INFIT ZSTD	OUTFIT MNSQ	OUTFIT ZSTD
MEAN	107.5	42.0	.00	.24	1.01	-.1	1.06	.0
S.D.	21.2	.0	.92	.02	.50	2.0	.69	2.3
MAX.	138.0	42.0	1.57	.28	2.53	5.4	3.39	6.9
MIN.	70.0	42.0	-1.61	.20	.54	-2.3	.53	-2.4
REAL RMSE	.26	TRUE SD	.88	SEPARATION	3.44	Item RELIABILITY		.92
MODEL RMSE	.24	TRUE SD	.89	SEPARATION	3.70	Item RELIABILITY		.93
S.E. OF Item MEAN = .25								

UMEAN=.0000 USCALE=1.0000
Item RAW SCORE-TO-MEASURE CORRELATION = -.92
630 DATA POINTS. LOG-LIKELIHOOD CHI-SQUARE: 1177.56 with 563 d.f. p=.0000
Global Root-Mean-Square Residual (excluding extreme scores): .6692

The mean infit and outfit for person and item mean squares were expected to be 1.00, and for this data, they are all close to 1.00. The mean standardized infit and outfit for items were expected to be 0.0. The table shows that the z-scores for infit and outfit are 0 for persons and varies (-. 1 for infit and .0 for the outfit) for items, respectively. This indicates that the items are overfit. It also implies that

the data fit the model somewhat better than would be expected which may be due to some redundant items. The data show an overall acceptable fit as the value for standardized infit standard deviation for persons is 0.55 while for the item is 0.50.
The separation index for persons is 1.83, a moderately good spread of items and person along a continuum. For an item separation index, it shows a large index of 3.41 which indicates that a broader continuum for items than in person, and broader range of item difficulties.

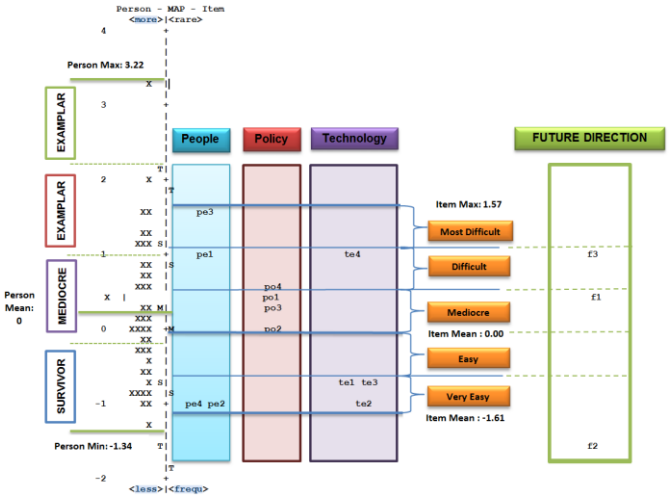

Fig. 2: Person Item Distribution Map (PIDM)

As shown in Figure 2, 59% (n=25) of the respondents measure were found to be above the µItem whilst 41% (n=17) respondents were below the µItem. Overall, one item (pe3) is the most difficult question to answer and three questions (pe4, pe2 and te2) are the easiest items. As we can see in Figure 2, the items are categorized into five categories; namely most difficult, difficult, mediocre, easy and very easy. One item (pe3 – experience) is under the 'most difficult' item category. This is followed by items (pe1 – knowledge and infrastructure) under 'difficult' and 3 items (po1-strategies, po3 – implementation and po2 – support) under 'mediocre.' There are no items under 'easy.' Lastly, 5 items are under 'very easy' (pe4- skill, pe2-interest, te1-process, te3-acceptance and te2-opportunity).
In the last section, respondents were asked to rank their opinion on the three statements , 'I have confidence that we are ready to fully implement m-learning in higher education institutions as a method in the advancement of teaching and learning' (f1), 'and 'When do you believe m-learning will become the mainstream of our higher education ? (f3). Figure 3 shows the item measure order for these statements. It is apparent from the item measure order that in response to the first statement (f1), 36% of the respondents (n=15) answered Strongly Agree. The findings lead to a revelation that the respondents were confident that Malaysian higher education institutions would be ready to fully implement m-learning. This corroborates the findings of past studies in this field regarding implementation of mobile learning in higher education in Malaysia [28-29].
Further analysis on the second statement (f2) indicates that 52% (n=22) of the respondents gave their opinion that mobile learning will become mainstream in our higher education within 1-3 years. In assessing the status of the mobile revolution in Malaysian higher education institutions, results show that Malaysian academics were confident of the capability of Malayian HEIs in implementing mobile learning within a short time. This indicates that mobile learning is not a transient phenomenon and will play an important role in democratizing education and contributing towards the generation of knowledge workers. Our study reveals that Malaysia is certainly heading in the right direction for a successful mobile revolution.

4. Conclusion

It is evident that the results from this pilot study suggest that people, policy and technology are the standing construct in measuring the challenge of adopting mobile technology for the mobile revolution in Higher Education Institutions in Malaysia. The three factors have reasonably shown that people, policy and technology are important in identifying what needs to be taken into account for developing a good model for measuring the challenges of implementing of mobile learning in Malaysian higher education. The present study confirms previous findings and contributes additional evidence on issues and challenges in implementing mobile learning. For the reform process to be successful, Higher Education Institutions in Malaysia will ultimately blend together people, policy and technology as an effective strategy. However, more research on this topic needs to be undertaken to further explore the relationship between challenges and implementation of mobile learning before such relationship can be more clearly understood.

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