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A Study on Student's Attitude towards Mobile Apps Use for E-Learning at Undergraduate Level

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Abstract

The study examines student's attitude and experience in using e-learning as a holistic learning tool. A qualitative methodology used in this study is based on content analysis of online forums and survey among 134 students at undergraduate level, who have responded to online forums posted through Mobile Apps. Using Roger's (1995) diffusion of innovations model, this study attempts to understand the factors that influence the adoption of Mobile Apps e-learning system based on user's own experience. Although in this case the students have no choices and are required to use Mobile Apps, the study finds that there are elements of relative advantages, compatibility and complexity for students to adopt Mobile Apps. Furthermore, the positive experience among students using Mobile Apps motivates them to continuously use Mobile Apps. Overall, the results provide insights and recommendations to the learning institutions, faculties and instructors to accelerate the adoption of e-learning.

Key Words:E-learning, Internet, Behavioural Science, Mobile Apps

I. Introduction

E-learning (or Internet-based learning) has emerged as one of the fastest moving trends in 21st century education (Palmer et al., 2001) that provides an exceptional opportunity to increase student access to education. In the US, common terms used for e-learning are Course Management System (CMS) and Learning Management System (LMS); while in the UK, Virtual Learning Environment (VLE) and Managed Learning Environment (MLE) are more common (Martin-Blas & Serrano-Fernandez, 2009).

On undergraduate level, computer usage in Higher Education Institutions (HEIs) has positive impact on development that turns into learning. Some undergraduates have started using e-learning as a tool to enhance learning among students. However, the acceptance of e-learning by HEIs and their students is somewhat unknown. As e-learning starts to gain popularity, consideration needs to be given to the delivery system to be used, the faculties and also students that will be using the system. There is a need for HEIs to expose and train their faculties before adopting an e-learning system. In short, all stakeholders should be taken into consideration.

For example, a study in China states that the conception of e-learning in HEIs is still considerably low as many instructors do not believe in e-learning (Wang et al., 2009).

II. Literature Review

E-Learning

E-learning or internet-based learning is the technology that has facilitated student's learning activities through online delivery of instructions and supply of electronic resources of knowledge. Many HEIs incorporate web pages to deliver learning and teaching besides the usual face-to-face classroom. E-learning can be described as the use of technology in the learning process, therefore other terminologies such as virtual learning, online learning and online education also refer to e-learning. The term used can be different but essentially it refers to the same idea.

Target audience of e-learning is almost everyone from primary school students to mature adults who undertake lifelong learning courses. There is a lot of infrastructure resistance and barriers during the early days of e-learning deployment (Koper& Tattersall, 2004). As technology improves, nowadays e-learning facilitates better quality of online interaction between instructors and students as well as interaction among students and has added positive social elements to the benefits of e-learning (Ettinger et al., 2006). For example, Baldwin-Evans (2004) interviewed 200 respondents who were using e-learning in 14 countries and found that 93.5% of the students enjoyed their experience and 98% would suggest it to others.

Factors of Adoption of an Innovation

The theory of diffusion of innovations by Rogers (1995) is a well-known theory that can be used to explain factors why students adopt or resist new technology. Diffusion is defined as the process by which an innovation is communicated through certain channels over time among the members of a social system. Roger's theory of individual innovativeness suggested that people are inherently more or less predisposed to innovative behaviour. He theorised that individual adoption rates of innovations are usually distributed which is similar to normal distribution where innovators represent 2.5% of the population, early adopters 13.5%, early majority 34%, late majority 34% and laggards 2.5%.

According to Rogers, there are five attributes of innovations which influence an individual's attitude towards innovation during the adoption process:

1. **Relative Advantage:** It is the degree to which an innovation is perceived to be better than the idea it supersedes. Basically, if there is greater advantage in the innovation, then it is more likely to be adopted.
2. **Compatibility :** It is the degree to which an innovation is perceived as being consistent with the existing values, past experiences, and media of potential adopters. Basically, if the innovation is compatible with existing needs and expectation, it is more likely to be adopted.
3. **Complexity:** It is the degree to which an innovation is perceived as difficult to understand and use. It means that if the innovation is simpler and not making it more difficult, then the innovation is more likely to be adopted.
4. **Trialability:** It is the degree to which an innovation may be experimented on a limited basis. It means that if innovation can be used for trial without any commitment to change current practices, then it is more likely to be adopted.
5. **Observability:** It is the degree to which the results of an innovation are observable to others. Basically, if the innovation can be seen and observed by peers and friends, then it is more likely to be adopted.

Ultimately, an innovation should be seen, imagined, or described to the potential adopter. With e-learning, the technology and pedagogy of e-learning allows students to see the environment in which online teaching and learning occur. E-learning demonstration activities could assist potential adopters (Shea et al., 2004).

Motivation to Use Mobile Apps

There is a lot of literature on motivation with regard to student's motivation. For example, question such as what does one has to do to motivate students to learn may sound simple but responding to such questions is not straightforward (Kember et al., 2008). In this research, the relevant question would be what motivates students to continuously use Mobile Apps in their learning process.

Since there are many dimensions of motivation, factors suggested by Clayton et al. (2010) and Blumberg et al. (2008) will be applied:

1. **Engaged Learning:** It refers to learning environment that actively involves students in learning where interactive learning takes place. It means that if there is greater engagement in e-learning, there will be greater motivation to use Mobile Apps.
2. **Learner-Instruction Match:** It refers to the matching of student's style of learning retention and the faculty's style of learning delivery. Basically, if e-learning induces greater match between the two of them, then students are more likely motivated to use Mobile Apps.
3. **Familiar:** It refers to a situation whether students are familiar with the learning environment. It means that if e-learning leads students into unfamiliar environment, motivation to use Mobile Apps will be reduced.
4. **Lifestyle Fit:** It refers to the convenience of learner's daily routine and schedule to suit learning environment. It means that if e-learning helps to suit the student's lifestyle; there is greater motivation to use Mobile Apps.
5. **Personal Control: It** refers to the level of control the learners have in the learning process. Motivation to use Mobile Apps will be greater if students have more control.
6. **Augmented Learning:** It refers to a situation where learning is enhanced with the inclusion of technology. Motivation to use Mobile Apps will be greater if technology is widely used.

III. Objectives of the Study

Based on the literature review, this study aims to address the following objectives:

1. To know student's attitude towards E-learning.
2. To know the factors that influence student's adoption or resistance of e-learning.
3. To find out the motivating factors for students to continuously use Mobile Apps in learning process.

IV. Scope of Research

This study investigates the attitude of undergraduate students because of the new e-learning system that has been adopted by all undergraduate students, ease of access to the student's data, as well as, the protection of information of students and undergraduates involved in the survey. The other reason for studying undergraduate students is the usage and intensity of e-learning tool is higher than other degree levels.

V. Research Methodology and Size of Sampling

Survey instrument incorporated open-ended questions regarding their experiences with Mobile Apps. The questions sought to determine whether students perceived that they had used the e-learning tool effectively, benefited by the tools, motivation of using the tools and what elements of Mobile Apps they like to use, what difficulties they might have encountered, and their overall opinions regarding this e-learning tool.

The sample size of the study was 252 students that have been invited to participate in the survey through Mobile Apps and through student emails. Student name list was taken from one of the university core courses so that all schools and discipline are involved in this survey. Survey was posted on Mobile Apps for 45 days. A total of 134 students participated in the survey using online forum function in Mobile Apps undertaken at the end of the semester, after they have experience in using the courseware tool for various activities and tasks.

VI. Result Analysis and Interpretation

Profile of students participating in the survey is indicated in Table 1. Item (iv) "Attitude towards Mobile Apps" is the

researcher's interpretation of the student's overall opinion and experience of using Mobile Apps, which can be categorized as positive, negative or mixed opinion. "Positive" means the student finds Mobile Apps useful in their learning process. "Negative" means the student had used Mobile Apps but they do not like it. "Mixed opinion" means that the there is an issue with Mobile Apps although they may find it helpful in their study.

Participants in this study were 134 students who were studying in undergraduate level. Table 1 shows that most of the respondents think that Mobile Apps are beneficial to them (59%), while only 11% are of the opinion that Mobile Apps are neither good nor useful.

Table 1: Respondents Profile

Profile		**Respondents (n=134) (%)**
Gender	Male	115 (85.8%)
	Female	19 (14.2%)
Age	18 or below	-
	19-20	20 (14.9%)
	21-22	65 (48.5%)
	23 and above	49 (36.5%)
Ethnicity	Arabic	95 (70.9%)
	Indian	20 (14.9%)
	Pakistani	19 (14.2%)
Attitude towards Mobile Apps	Positive	79 (58.9%)
	Negative	15 (11.1%)
	Mixed Opinion	40 (29.9%)

Table 2 presents the coding of responses to factors of adoption of e-learning based on the factors suggested by Rogers (1995) as well as the examples of statements of each theme respectively. Content analysis was applied in order to identify the theme. Content analysis "measures the semantic content or the aspect of a message which is useful to analyze written, audio or video data" (Cooper & Schindler, 2008, pg. 421-423). This inductive technique is commonly used in the qualitative-based approaches.

Table 2: Content Analysis of Innovation Adoption Factors

Themes	Statements
1. Relative Advantages ▪ Communication ▪ Convenience ▪ Interactivity ▪ Information Source ▪ Users Freedom ▪ Alternative Learning ▪ Cost Saving ▪ Environmental Friendly	*"... to emphasis the bond between students and faculties ..."* *"... no time boundary, thus we can log in at our convenience to keep abreast ..."* *"... able to get latest information and announcement from my faculties and course-mates ..."* *"... save time to wait in the queue at photocopy shops to copy notes ...." "... don't have to wait for class to discuss my problems with the faculties and friends ..."* *"... the information is up-to-date ..."* *"... save the environment as less paper used ..."* *"... save money to photocopy the class notes ..."*
	"... important news/ information can be spread very fast compared to writing notice and pasting on the faculty notice board ..." *"... if I miss the class I can still cover the topics myself and get the lecture notes and other information precisely ..."*
2. Compatibility ▪ Relevant ▪ Perception ▪ Skills/ Experience ▪ Accessibility ▪ Intensity ▪ Persistence	*"... we can express our ideas freely without feeling shy because we don't have don't have to talk in front of class ..."* *"... we can exchange ideas and opinion especially those who are quiet in class ..."* *"... I can study the slides/ topics before coming to class ..."* *"... the students must know how to learn and use the technology themselves as it is not taught in the university ..."* *"... quite difficult for students who use Mobile Apps and don't have internet access or smartphone..."* *"... as the Internet is the prerequisite – the university must make sure the internet security is at the highest level ..."*
3. Complexity ▪ E-learning system ▪ Web design ▪ Infrastructure ▪ Web features ▪ Online functions ▪ Ease of Use	*"... should make the e-learning more warm with videos or moving icons ..."* *"... Mobile Apps means everything will be in softcopy ..."* *"... this application is the favourite tool for the students especially during the final exam month ..."* *"... can be better if there is an informal forum for all student to change their opinion and idea ..."* *"... a fun factor – it's easier to memorise specific points and topics ..." "... make sure the university make an effort to keep improving the internet speed and Wi-Fi facilities ..."* *"... theme, colour, background should be more trendy and attractive ..." "... add more functions that can attain students interest such as link to Facebook, plug-ins, etc ..."* *"... the campus connection is unstable ... it took so long to download the slides ..."* *"... Mobile Apps should be more user-friendly like Facebook and Twitter ..."* *"... It is good if we could be notified via SMS or email that there is a new post on Mobile Apps ..."*

It can be summarized from table 2 that students experience in using Mobile Apps has been good and beneficial in their study. We can also see that two factors of the theory of diffusion of innovations (Rogers, 1995), namely, trialability and observability are not relevant. Triability is not relevant because most of lecture notes and slides presentations are available from Mobile Apps, and therefore students have to use Mobile Apps, whether they like it or not. Similarly, observability is more relevant to innovations that might have impact on the user's reputation or image among peers and friends. Mobile Apps is definitely not one of them.

Since students have positive experience using Mobile Apps, hence it positively affects attitudes towards adoption of Mobile Apps. In other words, students will continuously use Mobile Apps in their study.

Largely, the model of diffusion of innovations can be applied to show students attitude towards Mobile Apps. This is summarized and illustrated in Figure 1. Note that the factors have been reduced from five to three due to the unsuitability of factors for this innovation.

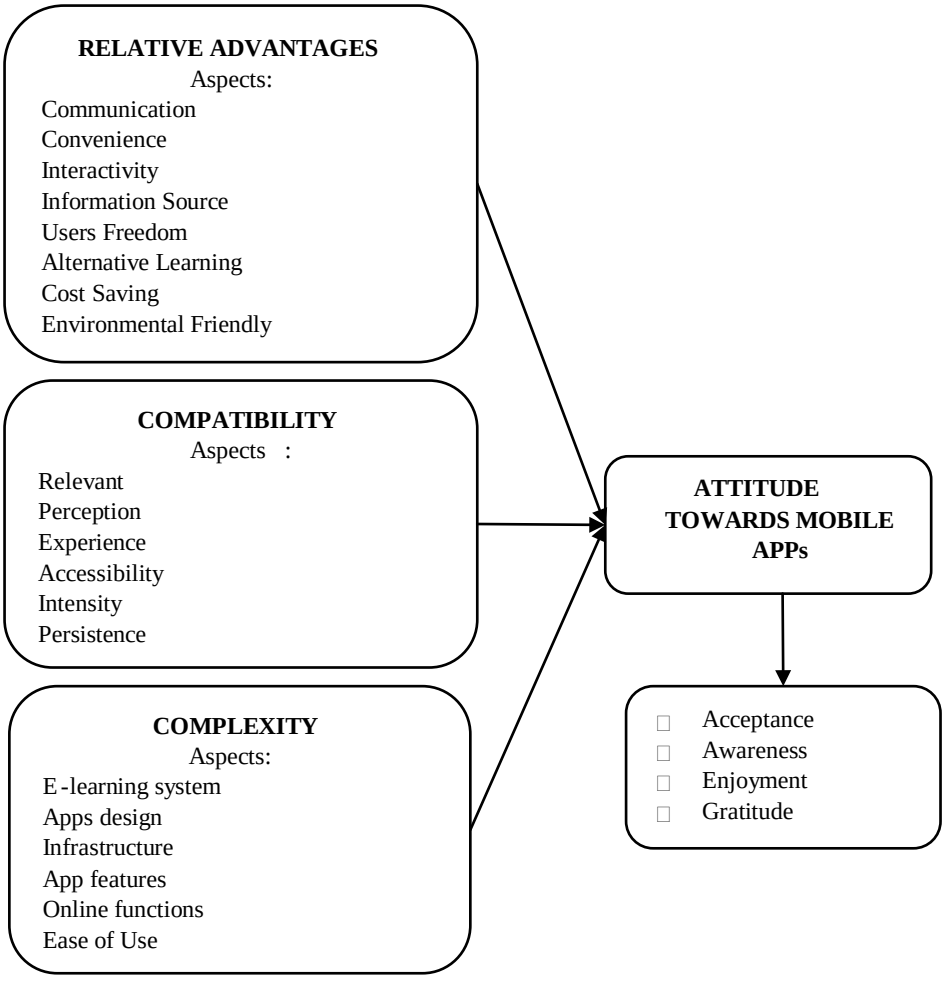

Figure 1: Model Showing the Factors Influencing Attitudes towards Mobile Apps

Table 3 shows some responses which represent the motivational aspects of the students in adopting Mobile Apps. It should be noted that some of the statements in table 2 are also related to student's motivation in the adoption of

e-learning. Therefore, table 3 presented only a few statements that can be interpreted as motivational factors based on Clayton et al. (2010). Nevertheless, there is evidence that the factors mentioned in table 3 are supported by student's responses. Although students have no choice whether or not to use Mobile Apps, students are motivated to use Mobile Apps because it makes learning more engaging and have two ways interaction. Moreover, some students have different way of learning preference and Mobile Apps provides the channel to match the needs of students.

Table 3: Content Analysis of Motivation Factors

Themes	Statements
Engaged learning	*"... (Mobile Apps is) effective way to increase the interaction between faculties and students as well as among students themselves...".* *"... I like looking at my friends photos in Mobile Apps"*
Learner Instruction Match	*"... (Mobile Apps) suits to all students ..."* *" ... Time in class is limited and students do not have enough information during class..."*
Familiar	*"... it is easy for us to get class notes and assignments ..."* *"... I didn't face difficulties in using Mobile Apps..."*
Lifestyle fit	*"... (Mobile Apps is) quite convenient for all the parties because they can communicate easily and not necessarily meet face-to-face ..." "...I could catch-up the subject although I have missed the class..."*
Personal control	*"... the internet line is so slow ...".*
Augmented Learning	*"...Can carry out our studies easier and smoother ...".* *".... When I lost my hard copy notes, I always know I have the backup on Mobile Apps."*

VII. Findings of the Study

This study examined student's adoption of, or resistance towards the use of e-learning or holistic learning tools such as Mobile Apps in enhancing their learning environment. Some undergraduate students have started combining traditional and online approaches. It shows that learning is now a combination of one-to-one classroom and online learning materials.

Findings indicated that students who used Mobile Apps found it useful and helpful in their learning process. They have recommended students and lecturers to use it. Although there are some issues regarding accessibility, affordability and connectivity to the Internet, in general the student's experiences are consistent with the factors of innovation adoption (Rogers, 1995) and the motivation to use new learning tools (Clayton et al., 2010). There is no reason why students should not adopt Mobile Apps as one of new innovations in learning tools. Despite the evidence of positive experience among students, there is a resistance among lecturers to use Mobile Apps. The usual reason is that Mobile Apps means more work for the lecturers. It is because Mobile Apps are a web-based application which means that students may contact lecturers any time during the day. Faculties may find this annoying when they have other commitments to attend to. Kirkup and Kirkwood (2005) reported that faculties found it time-consuming and ponderous to use e-learning tools in learning and teaching. However, faculties at the undergraduate level are required to put learning and teaching materials in Mobile Apps. Some

students prefer direct interaction with faculties which has the elements of spontaneous, immediate feedback and relationship with other students (Clayton et al., 2010). In other words, e-learning is not suitable for everyone.

VIII. Summary and Conclusion

This study shows that Mobile Apps are a useful tool for every level of students. As it is easy to use and user friendly to the students, the adoption rate of Mobile Apps is rather fast among students. Students are comfortable with the technology and do not encounter serious technical problems with it apart from the infrastructure issues. However, there are always issues for future research in this area. Further research needs to be conducted to determine whether Mobile Apps is being accepted by students and/or whether it is better than traditional instructional methods. It is also recommended that qualitative methods should be undertaken to confirm the theme and categories found in this study. In short, the readiness of internet infrastructure, student's affordability, student's learning preference and orientation as well as the institution's design of e-learning activities should be taken into consideration before the deployment of e-learning across the institution.

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