

M- Learning: A Contemporary Mode of Instructional Technology in Education

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Abstract.

The aim of this research was to find out the modern developing trends to adaptation of m-learning in education system in order to enhance interactive teaching learning performance, achievement, positive social and economic impact and to determine whether m-learning is more effective mode of learning than traditional modes. The study was survey type. Population was consisted of various field of life. The sample size was consisted on 250 participants by using randomly sampling technique. The data were collected from survey, analyzed and interpreted by using mean, standard deviation and t-test through the use of statistical package SPSS. The survey results were very positive and in favor of the mobile phone-based teaching learning system. So it is recommended that the m-learning should be widely used at various levels of education as a contemporary mode of teaching learning process.

Keywords: M-learning, Educational technology, interactive learning, individualized learning, socialization, economic factor,

Introduction

In the field of teaching and learning we now observe a significant influence of the "constructivist" approach. In this approach a strong stress is placed on the student as a dynamic agent in the process of obtaining knowledge. As in the objectivist tradition, where they were followed and encouraged by the learning environment based on computer, in formal and informal school contexts (Ally, 2009). If universities are serious about promoting learning through the use of innovative technologies, much needs to be done to demonstrate how this can be done (Kennedy et al., 2006). It is a need to re-conceptualize the learning for the mobile era, to recognize the fundamental role of mobility and communication in the learning process, and also to indicate the importance of the context in which the meaning and transformative impact of digital networks is set to support virtual communities that transcend age barriers and culture. The available mobile technology can improve the transition from teacher-centered classroom to pure constructivist student-centered learning environments outside the classroom. Due to the fact that mobile phones are excellent communication devices, the opportunity for discovery learning is also furnished: Students can collaborate in a way that supports cooperative problem solving. While, there is a growing interest of both business and academic institutions, as how to promote the adoption of student mobile learning seem to be largely unresolved, and therefore is a challenge for service providers (Azevedo and Moos, 2009).

There has been an interest and a significant growth in the number of institutions using mobile devices to support learning and teaching. Mobile learning or m-learning for short, is a new concept, and is very closely related to e-learning. Taylor (2014) defines m-learning as a "special type of e-learning" bound by a number of special properties and the ability of the devices, bandwidth and other features of network technologies used'.

Milrad (2003) defines e-learning as "learning supported by digital tools and electronic media 'and m-learning as" e-learning using mobile devices and wireless transmission. According to Huang et al. (2010) mobile learning applications can provide students learning content conveniently, but also opportunities for interaction with others anytime, anywhere.

The scale of the mobile phones has declined as much as their skills have waxed. Common features of these devices now include Internet access, voice messages, SMS text messages, cameras, and even video recording. In learning languages, all these features allow the communicative language practice, access to authentic content, and performing tasks (Chinnery, 2006).

While mentioned above are traditionally text-based blogs or audio pod casts are essentially downloadable, transmissions with RSS (Really Simple Syndication) allow listeners to subscribe. Subscribers to such podcasts automatically receive updates, once downloaded material; audio can be transferred to a media player. Still in its nascence, pod casting is already widely used in classroom learning, both to access the real content and burn. Myriad subscriptions are available for other students and English language. Lessons in main languages as well as languages translated, for example, are accessible for download (Winter, 2005). English launcher provides a list of podcasts created specifically for language learners. Voice of America special programs have also been made available via podcast and instructor EFL. Whereas, Stanley (2005) has developed

a podcast on the use of podcasts for English language teachers.

Mobile technologies clearly offer many practical uses in learning. In many cases, they are readily available. In Japan, for example, ownership of cell phones has been reported to be almost universal among college-age people (Dias, 2002).

However, Gilgen (2004) has established the potential for development of mobile laboratories for schools with limited funds. Potential disadvantages include their limited nonverbal communications, limited message lengths, lack of cultural context and social interaction. While mobile technologies are advancing, their production is rapidly moving from verbal to visual, a clear disadvantage for language learning and to some extent for the learner (Colpaert, 2004).

Connection problems are also an apprehension: Apprentices of web-based content may choose to limit their online time connection, or may not have access to all. However, as a result of this problem, Trifanova et al (2004) are developing a program that allows students to learn through Web content, a process similar to that provided caching so if learner may not be online, can be used during periods of disconnection. Consequently, it seems that there is an urgent need to understand the factors that influence the intention of user behavior in order to keep rising costs of communication gadgets and make services appropriate and although the process of acceptance of the technology has been widely studied in an organizational context, there is therefore a need to explore the potential of the theory of current acceptance in a social context alike. In this sense, this paper attempts to fill a gap in the literature by deepening the knowledge related technological problems of acceptance within a social context, while the behavior of users with a new role of a student. The remainder of the paper is well thought out as follows. In the next section, we review the studies in the context of the adoption of mobile services and needs to integrate additional factors related to the unique characteristics of mobile learning in order to explain the intent of student behavior.

During the last decade, mobile devices have developed so rapidly, both in hardware and software especially in terms of processing power, memory and mobile operating systems, which makes mobile devices capable of performing many rigorous tasks that only powerful desktop could carry out. Existing mobile devices have many highly developed capabilities such as rich text processing, ability to process images of high excellence, HD videos (HD) and vocals. In accumulation, wireless broadband access (BWA) networks have provided high-speed connections with low costs. This technology increases the opportunities for applying mobile devices and wireless networking technologies in the learning environment, especially for access to educational applications in handheld devices at different locations. The assimilation between these two technologies (mobile devices and wireless network) represents a great opportunity to improve and facilitate the process of education (Sarrab, 2013)

For example, according to Corbeil and Valdes-Corbeil (2007), accessibility of different mobile devices for students not guarantee their use for educational purposes that is, on the one hand, the motivation for students, to expand their learning resources. Apprentices receive additional sources of scaffolding, and winning by the powers of the other group members. However, the moralistic and pedagogical approaches to achieve these constructivist environments contain exploratory, learning co-discovery, scaffolding and situated learning. Whereas, fundamental to all these approaches it is problem solving.

Kiernan and Aizawa (2004) set out to study whether mobile phones were useful learning tools and to explore its use in the task-based learning. They concluded that a second language is best promoted through the use of tasks that require students to close any gap and thereby concentrating students on meaning. In the traditional classroom, however, these activities are easily defeated by the proximity of students. The use of mobile technologies would be a way to segregate the students. They found that mobile phones represent a learning resource worthy of further research in the area of languages learning.

Although, research of this type is limited, but not non-existent. Phone use in distance education is not unique to mobile learning. And Dickey (2001) uses teleconferencing to teach a course in English conversation in South Korea. He found that personal digital assistants (PDAs) are more often associated with m-learning cellular phones. Its use has been integrated into various disciplines within schools, universities and high schools of medicine.

Ferry (2009) concludes that modern mobile phones can be used to help students access web-based substance, remixing, sharing, collaborating with others and creating rich media can be delivered to teachers as well as to the global audience. According to Cui and Wang (2008), universities in the United Kingdom (UK) have made the use of mobile phones to store and retrieve information, such as electronic books, instructional materials, review of students' grades this thereby making teaching practices and more effective learning.

In a recent study of students in higher education in the United States Kvavik (2005) found 82% owned cell phones. He found that mobile technologies are generally less expensive than standard equipment such as personal computers. Mobile Interactive Learning Objects (MILO) of m-learning in general, can be structured in the same way as learning objects for e-Learning. The apparent differences remain in the presentation and the amount of information presented. Due to the limitation of screen size, very little continuous text should be used.

Instead, different types of media should be applied. For example: figures and pictures, videos or audio and most importantly - the possibility of spoken text output. Mobile learning postulates unprecedented opportunities for both educational institutions and governments. In the context of educational institutions, many higher education administrators have seen mobile learning as a way to extend the access and therefore increasing revenue (Murphy, 2006). Mobile learning as a strategy expands learning opportunities for students, in particular the students for whom it was previously difficult to reach through conventional approaches to education.

Mtega, et al (2014) found that most respondents use their mobile phones in the teaching and learning process. They reported using traditional mobile learning applications, including text messages and calls, few respondents had smart phones with a series of m-learning applications most of them are teaching staff. He also found that among teachers many were not aware of the capacity of their mobile phones so that these devices were underused. The costs associated with downloading multimedia content was another limitation.

As mentioned above, mobile learning emerges as a new mobile application generally used in a social context and its fundamental constructs do not fully reflect the unique influences of the factors that can alter user adoption (Sarica and Cavo, 2009). With this, expansion and adaptation of the appropriate original model is requisite. Therefore, in addition to the four basic structures of learning factors, as shown in Figure 1, the basic understanding and rationales for the structure of our research model are specified as follows.

Mobile devices offering rich multimedia learning experiences, but the models for the use and learning development for mobile applications are somewhat lacking. As such, educators and instructional designers face a challenge to determine how to use these powerful new tools in learning applications. In order to effectively support mobile education, early education should be identified that are both pedagogically and address the context of mobile learning in terms of ease of use.

This study was designed for teaching and learning in the distance so MOLT has been developed by Cavo and Ibrahim (2007) for teaching these students, which stands for mobile learning tools operation. The system can be enhanced and used for teaching other subjects as well. For example, a brief summary of lecture notes can be sent to students before the start of a conference. MOLT system is currently unidirectional, ie for the university students. The system can be bidirectional so that the student responses, an answer or answers to particular questions can be received and processed by the teachers. The use of Java is increasing as most cellular phone manufacturers now offer such phones at low cost and with rich features. It is recommended by the authors that future mobile phone based teaching must be supported by the use of Java enabled mobile phones. Students, then, will be able to perform learning tasks of more complex and more enjoyable nature e.g. resolution of multiple choice questions, watching short interactive films about conferences and lectures, etc instead of reading a simple text, as was the case in this study.

Literature review

There has been significant interest and growth in the number of institutions using mobile devices to support learning and teaching. Mobile learning, or m-learning for short, is a new concept, and is very closely related to e-learning. Stone (2004) defines m-learning as a 'special type of e-learning' bound by a number of special properties and the capability of devices, bandwidth and other characteristics of the network technologies being used'. Milrad (2003) defines e-learning as 'learning supported by digital electronic tools and media', and m-learning as 'e-learning using mobile devices and wireless transmission.

The commercialization of mobile services is reaching a critical stage in Europe (Carlsson et al. 2006). In contrast to a growing mobile phone penetration rate, average revenue per user (ARPU) in traditional mobile service, such as voice telephony and SMS, is declining (Knutsen et al. 2005). To neutralize decreasing ARPU, advanced mobile data services are often portrayed as sources of remediation (Knutsen et al.2005).

During the last decade, mobile devices have developed so rapidly both in hardware and software especially in terms of processing power, memory and mobile operating systems. That makes mobile devices capable of performing many rigorous tasks that only powerful desktops could perform few years ago. Existing mobile devices have many advanced capabilities such as rich text processing, aptitude to process high quality pictures, high definition (HD) videos and voices. In addition, Broadband Wireless Access (BWA) networks have provided high speed connections with low costs. This technology increases the opportunities to apply mobile devices and wireless network technologies in the learning environment, particularly for accessing pedagogical applications on hand-held devices in different locations. The assimilation between these two technologies (mobile devices and wireless network) represents a huge opportunity to improve and facilitate of the education process. Mohamed Sarrab, (2013)

For illustration, according to Corbeil and Valdes-Corbeil (2007), the availability of various mobile devices for students does not guarantee their use for educational purpose this is, on the one hand, motivating for the learners, means of expanding their learning resources. The learners receive additional sources of scaffolding since they gain by the competencies of the other group members. However, didactical and pedagogical approaches to achieve such constructivist settings contain explorative, co-discovery learning, scaffolding and

situated learning. Fundamental to all of these approaches is problem solving.

Kiernan and Aizawa (2004) set out to study whether or not mobile phones were useful learning tools and to explore their use in task-based learning. They argued that second language acquisition is best promoted through the utilization of tasks, which require learners to close some sort of gap, thereby focusing the learner on meaning. In the traditional classroom, however, such activities are easily defeated by the close proximity of students. The use of mobile technologies would be one way to split learners.

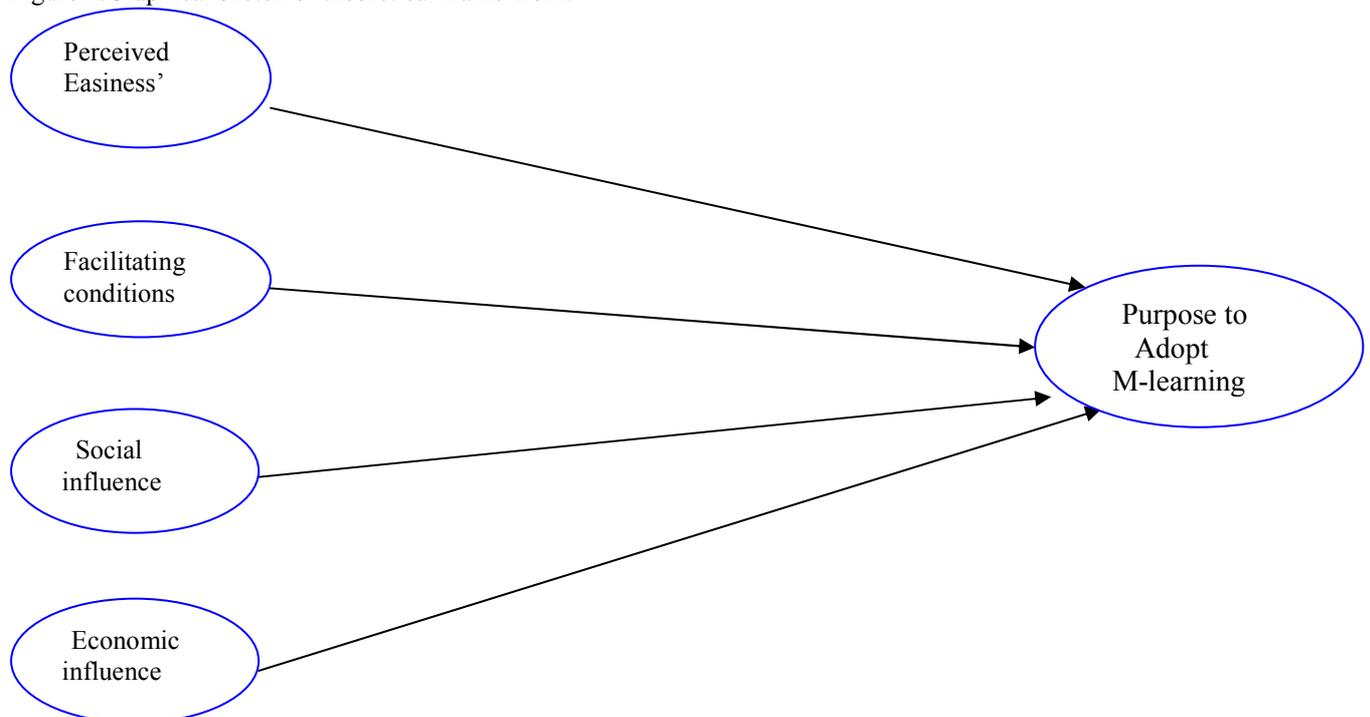
Though research of such uses is limited, it is not non-existent. The use of telephones in distance learning is not unique to m learning. Twarog and Pereszlenyi- Pinter (1988) used telephones to provide distant language learners with feedback and assistance. In 1996, instructors at Brigham Young University-Hawaii taught a distance-learning English course from Hawaii to Tonga via telephone and computer (Green, Collier, & Evans, 2001). And Dickey (2001) utilized teleconferencing to teach an English conversation course in South Korea. Personal digital assistants (PDAs) are more often associated with m-learning than cell phones. Their use has been integrated into various disciplines within high schools, universities, and medical schools (Carlson, 2002). In language learning, one of its primary functions has been as translator. Software programs such as MobiLearn

allege to turn PDAs into 'talking phrasebooks. Thornton and Houser, 2005). In a recent study of students in higher education in the United States (Kvavik, 2005), 82% owned cell phones. In the same study, however, less than 12% owned PDAs. Even in cases where they must be acquired, mobile technologies are usually less expensive than standard equipment, such as PCs. Mobile Interactive Learning Objects (MILOs) for m-Learning can generally be structured the same way as Learning Objects for e-Learning .The apparent differences remain in the presentation and the amount of information presented. Due to the limitation of the screen size, very little continuous text should be used. Instead, different kinds of media should be applied. For example: figures and pictures, videos or audio and most important – the possibility of the output of spoken text. Mobile learning posits unprecedented opportunities for both education institutions and governments as well. In the context of education institutions, many higher education managers have seen mobile learning as a way of extending the reach and hence increasing revenues (Murphy 2006). As for government, mobile learning has been anticipated to extend learning opportunities to mass learners, in particular to those previously hard-to-reach via conventional education approaches.

As abovementioned, mobile learning emerges as a new mobile application generally used in a social context and the fundamental constructs of hence do not fully reflect the unique influences of mobile learning context factors which may alter user adoption. With this, proper extension and modification of original model is indispensable. Hence, in addition to the four core constructs of factors of learning, as shown in Figure 1. The basic understanding and rationalities for the structure of our research model are specified as follows.

This m- learning adoption frame work is designed to discuss main thematic views.

Figure 1. Graphical sketch of theoretical frame work.



The focal point of the study is m-learning, on which the study is based on and all other are its indicators i.e. Perceived Easiness (device usability), Facilitating Conditions (Device aspect), Economic Influence (Learner aspect) and Social Influence (Social aspect, Social technology and Interaction learning), which we want to explore. This paper looks at ways that mobile devices with and without cellular connectivity improve learning and engage students and teachers. It provides new content and facilitates information access wherever a student is located. It enables, empowers, and engages learning in ways that transform the learning environment for students inside and outside of school.

Objectives of the study

The objectives of this study have been to find out the prospective effective usage of mobile phones in education system at various academic levels of students to support their learning process and to find out the factors affecting m-learning. In order to reach this objective the following hypothesis was framed:

Perceived usefulness, facilitating conditions economic cost and social influences positively affect intention to adopt m-learning.

Material and methods

The aim of research was to study the modern developing trends to adaptation of m-learning in education system in order to boost interactive teaching learning performance, achievement, social and economic impact and to determine whether m-learning is more effective modern mode of learning than traditional methods. In order to test the relative effectiveness of independent variable, i.e. an instructional paradigm (m-learning) the selection of most suitable design for the research was the main step. The study was survey type, cluster sampling was used to select the subjects from defined population. The composed data were analyzed and interpreted by using, standard deviation and t-test, r and f-test and conclusions were drawn.

Sample

The sample of the study constituted of 250 subjects from different fields of life, the demographics of the study sample are given in the table 1.

Instrumentation

TAM (Technology Acceptance Model) is the most usually utilized structure to look at components impacting the reception and adaption of information systems. Initially created from Fishbein and Ajzen's Theory of Reasoned Action (TRA), TAM evaluates the elements that impact users' expectations to acknowledge or dismiss data information systems (Wu and Wang, 2005). The model recommends that the client selection of another information system is controlled by two components: perceived usefulness and perceived easiness. Perceived usefulness is characterized as the degree to which an individual trusts that utilizing a specific information system will improve his or her employment execution, and perceived easiness is characterized as the degree to which an individual trusts that utilizing a specific information system will be free of exertion. These perceptions structure the state of mind and attitudes which thus drive the actual system utilization. A limitation of TAM model is the oversight of other significant variables that affect user acceptance such as trust-based construct and financial construct. Some constructs were added into the original TAM model to facilitate understanding of the information system adoption (Gefen, Karahanna and Straub, 2003). These include social influence, economic conditions, some other studies suggest even more, but the present study focuses only on these factors.

Furthermore, a questionnaire was developed to assess the appropriateness of the factors of m-learning. The subjects of study in each cluster were required to rate each statement/item in the questionnaire on a five-point Likert scale, i.e., Very Low (1), Low (2), Moderate (3), High (4) and Very High (5). The demographic factor variable was measured using level of education, gender, marital status and age. These items were then converted into the form of a Likert scale.

The research instrument was validated by four specialists in the field. Factor analysis was deemed appropriate for the study data, as the value of KMO was 0.724, which is considered as a good value. The Bartlett's test was highly significant ($p < .001$); therefore, the factor analysis was appropriate, meaning that the R-matrix is not an identity matrix. After pilot-testing the research instrument, their reliability was determined by calculating the Cronbach's alpha and appropriate amendments were made in their items. The value of Cronbach's alpha for the questionnaire was 0.874.

Results:

Table1. Demographics of the study sample

Sample size	250		
		Frequency	Percentage
Age	49-58	48	19.2
	39-48	65	26.0
	29-38	58	23.2
	19-28	79	31.6
Gender	Male	148	59.2
	Female	102	40.8
Marital Status	Single	121	48.4
	Married	129	51.6
Professionals	Engineers	21	8.5
	Doctors	20	8.0
	Teachers	27	10.8
	Students	33	13.2
	Bankers	25	10.0
	Businessmen	24	9.6
Mobile Phone Operating Systems	RIM's Blackberry	16	6.4
	Android	56	22.5
	Apple iOS	22	8.8
	Nokia	52	20.8
	Samsung	46	18.6
	Microsoft windows	29	11.6
	Q-Mobile		14.7
Educational Qualification	Undergraduate	75	30.0
	Graduate	125	50.0
	Postgraduate	50	20.0

No individual capable of giving informed consent was enrolled in this research study unless he or she freely agreed. Each subject was adequately informed of the aims, methods, and sources of funding, any possible conflicts of interest and institutional affiliations of the researcher, the anticipated benefits and potential risks of the study. The subjects were also informed of the right to refuse to participate in the study to participate at any time without reprisal. The above mentioned table describes the personal characteristics of the subjects of study and the sort of mobile operating systems they possess. It is evident fact that insight into human behavior comes from many sources. The views presented in this study are based principally on scientific investigation. The patterns—as revealed by scientific investigation—may show people that their long-held beliefs about certain aspects of human behavior are incorrect or this is the right change needs to be adapted. So the study sample is selected from different segments of the society because the selection of a subset of individuals from within a statistical population to estimate opinions of the whole population because distance learning is non-formal learning and any person may attempt to resume his study at anytime and also because m-learning is especially devised for the distant learners.

Table 2: Mobile technology percentage which can be used for m-learning

	Technology	Frequency	Percentage
Mobile gadget	Mobile phone	212	80.8
	PDA/palmtop	50	20.0
	Both mobile phone & PDA/ palmtop	26	10.4
Mobile capabilities	Large screen display	50	20.0
	External memory card	49	19.6
	Internet browsing	101	40.4
	Edge technology	50	20.0
Internet subscriber	Yes	174	69.6
	No	76	30.4

The mobile telecommunications sector is seeing very large year-to-year growth in Pakistan. Approximately 90 percent of Pakistanis live within areas that have cell phone coverage and more than half of all Pakistanis have access to a cell phone. From the above table it is clear that 40 percent of the sample is involved in internet browsing, about 81 percent of the sample can utilize mobile for m-learning.

Table 3: Descriptive Statistics of Factors affecting M-Learning

	Mean	SD
Perceived Easiness (PE)		
M-learning would enhance my effectiveness in learning due to its portability features.	2.8280	.95186
Using Mobile applications for learning would lead to timely achievement of goals.	3.2440	1.10877
M-learning would improve my learning performance by immediate access to streamline learning-task (dictionary access and quick access to learning resources).	3.4880	1.04221
M-learning gives high effects of learning as compared to traditional mode of learning.	3.6080	1.17467
M-learning system intends for acquiring knowledge in an active way.	3.8200	1.25934
It's easy to remember the content that I received on mobile devices.	3.5840	1.24303
Using M-learning will motivate curiosity.	3.5600	.85400
M-Learning helps in conducting field work across the discipline of study.	3.7400	.89195
M-Learning helps in implementing the classroom theory into real life situations.	3.4200	1.06213
Facilitating Conditions (FC)		
I have the resources necessary to use m-learning	3.0720	1.16974
M-Learning field work support materials and observational learning activities included in curriculum.	3.2320	1.06145
Internet speed is appropriate for m-learning	3.4360	1.01688
Economic Influence (EI)		
Cost is a major barrier to introducing M-learning into learning and teaching practice.	3.9600	.97684
High charges by telecommunications provider is the major barrier to introducing M-learning.	3.9440	.95945
Social Influence (SI)		
M-learning supported the individualized rather than group discussion.	3.1200	1.31167
M-learning will force students to become irregular in class as they may catch the missed classes on Mobile devices.	3.2080	1.08362
In general, the institutions supported the use of m-learning	3.5160	1.14849

For users, perceived ease of use is the important factor. The factor which is most significant for users is economic one, user in third world countries are conscious of the economic factor. The second important factor is perceived easiness.

Table 4: Effect of Indicators on m-learning

	Const.	Perceived Easiness	Supporting Conditions	Economic Influence	Social Influence
Coefficient	1.222	.195	.249		-.074
Std. errors	.316	.067	.061	.064	.060
T-stats	3.872	2.890	4.080	.282	-1.230
P-value	.000	.004	.000	.778	.220
F-stats	47.210				
P-value	.000				
Adj. R square	.482				

The model was found to be significant (P-value = .000). The above table shows that perceived usefulness (.004), facilitating conditions (.000) significantly affect the adoption of m-learning; whereas, Economic influence (P-value = .778) has a less significant impact on the intention to adopt m-learning. Social influence (P-value .220) has a negative impact on the intention to adopt m-learning. The coefficient estimates are all significant because their p-values are less than 0.05. It also shows that the social influence and facilitating conditions affect the acceptance and utilization of m-learning.

Discussion

Yet despite the emergence of digital learning, most countries still design their educational systems for agrarian and industrial eras, not the 21st century world. This creates major problems for young people who are entering the labor force as well as teachers and parents who want children to compete effectively in the global economy. Inclusive and accessible education should aspire to include all learners. Mobile devices allow students to connect, communicate, collaborate, and create using rich digital resources. Learning to be comfortable with such devices prepares students for shifts in the global economy and helps them adapt to quickly evolving new technologies. Mobile learning appears to have the potential to do that. SMS and MMS technologies offer excellent opportunities to open up education to many who have long been excluded from it. So, M-learning provides

further flexibility for the learner to learn anytime, anywhere. The learning utilizes the networking technology and there is the freedom of the learners to exist in different location than the teacher, learners have the freedom to study in the time that suits them, provided that they have the required hardware and network infrastructure.

It is great motivator to learners to take the knowledge not in conventional way but to take it anytime and anywhere by just connecting to the server to receive the SMS, announcement or home tasks. The main service in the system is the quiz part with the addition of self pacing which includes a novel idea in the education field that uses the new generation of technologies. Thus, students can get the quizzes and solve the questions and get evaluated directly using available components like cell phones and PDAs. The present paper creates social interaction gap that caused lack of interpersonal communication skills and system over killing in the students. The most important individuals who might be interested are teachers, students, and educational organization such as: universities, schools, institutes, or anyone else who may look for a proper m-learning system that exactly suits his or her demands.

Conclusions

There is an extensive variety of digital material accessible to students and educators. This incorporates instructional games, interactive websites, and personalized instruction. The asset of m-learning is that it gives students more remarkable control over their educational programs, thereby permitting students to continue at their own pace and in their own particular learning styles. It is concluded that being individualized learning tool M-learning gives high effects of learning as compared to traditional mode of learning, this system intends for acquiring knowledge in an active way and helpful in conducting field work across the discipline of study. It is concluded that m-learning empowers constant appraisal of student performance, if m-learning is adopted then students have not to sit for weeks to get evaluation with respect to their challenging assignments. The subjects of the sample agree that instructors can establish pop-up tests in online content delivery and students can be assessed on an on-going premise. This gives general, constant evaluation and comprehension of the study material to students, and permits instructors to see which people require additional assistance and which ones require additionally difficult assignments. It is also concluded cost is a major hurdle to initiate M-learning into teaching and learning practice and also the High charges by service provider is the major barrier to introducing M-learning. It is an impetus for making impactful change in the current framework and vital to students' academic advancements and accomplishments in the areas of critical thinking and collaborated learning.

Recommendations

It is recommended that the m-learning should be widely used at various levels of education as modern mode of learning to enhance the usage of instructional technology in reciprocal educational process.

It is also recommended that before purchasing mobile phones people should try to study their provisions. Moreover, web content generators should consider mobile phones versions of their web contents as many people use their phones for accessing such contents. Mobile phone operators should reduce internet service tariffs so that more can afford and use mobile internet services. Furthermore, Web 2.0 awareness among students and teaching staff should be raised as these tools are believed to be efficient in teaching and learning.

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