A. W. Altaher

Kazan Federal University
Derevnya Universiady, Kazan, 420010, Respublika Tatarstan, Russian Federation

smart.computing@yahoo.com

PERFORMANCE EXPECTANCY WITH USABILITY RELEVANCE
FOR M-LEARNING TECHNOLOGY IN EDUCATION

The challenges faced in using new technologies in the classroom are numerous, but contributions generated with their resolution can proportionately provide original and efficient teaching practices more in tune to students' eager learning needs. This article presents some statistical of Kazan federal university / Russia student data analysis perception to help teachers in transversal themes classes using m-learning by review the (Tabulation for Age group * Gender, Year of study , Phone Category , course materials) and analyzing the independent factors like (Performance Expectancy, Effort Expectancy, Behavioral Intention to Use, Content Accuracy, and Usability, relevance). The use of mobile devices and the choice of applications in teaching revealed important data, indicating that the expansion and intensification of the use of these devices in the classroom is possible. In university Education, the situation emerges as an opportunity to make up for lost time and space in the restitution of studies, as well as furthering advancement in teaching, itself. Competent m-learning practice rises to situations that reach beyond the concept of technological resources. They imbue teaching with intrinsic characteristics that facilitate and motivate teaching and learning situations to the benefit of all participants. The classic approach of adhering to a fixed professional code of conduct or having your proposed methods first evaluated by an ethics committee does not deal well with the rapidly changing contexts so often found in mobile learning research. Previous work (Andrews T., Dyson L. E., Wishart J. (2015) Advancing ethics frameworks and scenario-based learning to support educational research into mobile learning, International Journal of Research & Method in Education, Vol. 38, Iss. 3, pp. 320–334) concludes that collaborative scenario generation framed by an agreed ethics structure is an effective way forward for supporting researchers planning data collections in mobile learning contexts.
Keywords: M-learning, readiness, ubiquity, availability, personalization.

Introduction

In the publication: Education for Global Citizenship: preparing students for the challenges of the twenty-first century – the text elucidates ideas that contribute to reflection on changes in educational practices and the need to resolve global issues. Society hopes that education will facilitate international cooperation and promote social transformation in innovative ways toward a humanity that is more equitable, pacific, global, tolerant, inclusive, secure and sustainable. In an increasingly interconnected and interdependent world, a transformative pedagogy is fundamental; one which enables students to work out persistent questions that encompass all humanity, related to sustainable development and peace [2].

[3] adds that motivation for an activity will be present if the motivational strategy demonstrates this instrumental value, which is shown in several ways. In other words, "a viable motivational goal of teachers in day-to-day schooling is to pursue the advancement and maintenance of motivation in learning activities they must provide students with engaging interest and satisfaction in activities.

learning only occurs if four basic conditions are coexistent: motivation, interest, the ability to share experiences and the ability to interact in different contexts. The author further reiterates that once these conditions transpire, meaningful learning becomes possible. The most important concept in Ausubel's theory is meaningful learning. According to him, meaningful learning is a process by which new information interacts with an important aspect of an individual's cognition [4]. Currently, mobile technology is the increasingly used in different sectors of society. Education, in turn, needs to be constantly updated in order to support its students. This brings new challenges in the educational sector, such as the Mobile Learning approach (M-Learning).

M-Learning, incorporates the use of mobile technologies, separately or together with other Information and Communication Technologies (ICT). Thus, this type of technology can provide students with possibilities to construct and improve knowledge at any time or place. According to [5], M-Learning can occur in situations where technologies can offer the student means to build their knowledge. However, a simple random use of a mobile device to perform an isolated activity in the classroom is not mobile learning. In order to be effectively understood as such, the teacher needs to integrate the use of technology with pedagogical planning that involves the study of content, teaching materials, implementation strategies and activities.

In addition to supporting academic activities, this type of learning can also aid the interaction and communication among those involved in the educational process. According to [6], M-Learning provides opportunities to unite people in real and virtual worlds, creating learning communities among teachers and students. This occurs with the aim to integrate the process of teaching and learning with the use of mobile technologies. Therefore, there is the need to create one or more teaching strategies to support this educational process, or a possible set of educational activities that can be applied according to the individual and/or collective needs of students [7].

Smartphones offer high potential for teaching and learning . Students use them increasingly in everyday life. The market penetration rate of the smartphone among American adults in 2015 was 65 %. Among youngsters (ages 18–29) it was 85 % [8]. 88 % of American teens (ages 13 to 17) had access to a mobile phone of some kind in 2015 [9]. Teachers can take advantage of the availability of smartphones to create an interactive and interesting learning experience. By utilizing the special features of the phones, the teacher can create a new learning experience and engage students in the classroom and outside it and thus increase learning motivation among students Smartphones can enrich learning by providing authentic and contextual learning conditions . Learning through mobile devices can be spontaneous and needs driven. It offers new possibilities for learning: learning outside the classroom, learning anytime and anyplace and learning on the move [10]. The only constraints that limit the use of mobile phone is bad reception conditions, since reception isstill not possible in certain places and the duration of the battery [11].

Organization of mobile learning as a new technology in Education

In accordance with the results of the study [12], we can point out the main requirements for the organization of mobile learning in education system (4C):

– **Communication**: possibility to communicate through a variety of software tools: e-mail, forums, video-conferencing;

– **Collaboration**: mobile learning tools and software must be ergonomic and easy to use;

– **Creation**: e-learning tools and services must meet the creative needs of the students, such as programming, editing music, video, images and text;

– **Content**: availability of the necessary content for the effective teaching and learning process and the integrity of the discipline.

The most important benefits of the implementation of m-learning in the higher education process

– **Ubiquity**: the possibility of obtaining information online;

– **Availability**: access to personal and learning resources through the wireless network;

– **Convenience**: the possibility to store personal data and necessary learning materials in mobile devices, instant connection to the Internet through a mobile phone;

– **Personalization**: the possibility of personalized learning.

In recent years, special attention is paid to the rapidly developing concept, named as BYOD ("Bring Your Own Device"), which is closely connected with the technology of mobile learning. The implementation of BYOD in teaching and learning process involves the introduction of technologies and services into the university educational environment which are focused on providing personalized access to information resources through mobile devices (curricula and programs, academic progress and attendance reports, results of the session, workload, timetable for a student and a teacher etc.); provision of distributed online access to content (podcast broadcasting, webinars, electronic magazines, personal library of educational and scientific resources, social media, etc.). Successful implementation of BYOD as a component of IT strategy of the higher education institution is due to the following factors [13]:

– High level and dynamics of the spread of mobile devices in the student and teaching environment and sustained interest in their application, formed by outside socio-psychological factors;

– Significant cognitive potential of the students of a higher education institution, who are flexible enough and appropriately respond to changes in the established practices of the education process organization and easily adapt to new approaches and technologies;

– Learning materials can relatively easy be turned into media content and the content for interactive mobile services;

–Mobile services and content can be easily enough integrated into the infrastructure of educational and research space, both technologically and methodologically.

Mobile devices have shown their impact in the present and future in the following way:

1) Form factor: easy to handle when compared with laptops and notebooks.

2) Long battery life and instant-on: Lasts longer without power connection and has instant connectivity.

3) Price: costs twice as less and decreasing dramatically.

4) Touch interface: no clumsier mouse or touchpad.

5) Improved Digital reading: crisp quality of the display.

6) Integrated Multimedia: audio/ video, images.

7) Collaboration: educational value of social networking.

Impact of Mobile Apps in Education:

Positive Impacts:

Nowadays, Internet has become a part of life of every student to search for the information at any time and use of mobile phones for internet access has become a routine. The number of mobile consumer accessing the Internet is increasing day by day. The Increase in demand of android phone to access of Internet with high speed browsing resulted in providing options in Educational sector. Which provide an opportunity to the End users to utilize their Smartphone for educational benefits in limited time irrespective to their location. **Distance education** is a learning mechanism that focuses to liberate students from limitations of time and place for flexible opportunities in education. It also enables students to utilize their time such that they can continue their education without impacting their work and family life. Smartphone within and without the classroom make it easier for students and teachers to collaborate. Students missed there lectures for any reasons would be able to attend class through their Smartphone and keep the record of their missed class , without any issues to keep them separated.

Negative Impacts:

Along with merits, it has some limitation such as, Smartphone's give access to other activity such as Whatsapp, social networking sites, e-mails, play online games, and even watch TV channels. This may mislead to the student to focus on other perspectives which lead to disturbances to other students around them and even at time the whole class. In addition, it wouldn't be easy for students to make calls during exams to cheat but it may be easy for student in a classroom or examination hall to use their Smartphone's to access information online to cheat in exams. In fact some are there about the use of Smartphone's for cheating in the classroom. The dependency of Smartphone could be through the use of message with other students, solution on the Internet, using scientific calculators and various applications, answers are also saved on their phones to help on the exam. Smartphone's can Encourage harassment and threat also. Smartphone are embedded with

high profile Audio / video systems, which can be used to record and photograph harassment in schools and colleges.

Maximum Universities are using apps for basically for this reason:

a. Authorize the entire student to access as well as update their details.

b. Add and Update the records of students as well as give online Exam, Class Test and various Project Submissions within the deadline given to them and keep record of all the submissions to measure the performance.

c. Some apps may work as an integrated communication and location based service which allows alumni to automatically log their position and see the approximate location of nearby alumni – alumni are also able to send short messages to each other without disclosing their own phone number or email address. E.g. AberWorld.

d. Some includes prospectus, time tables, library app for details location in the campus. E.g. University of Southampton.

As per the statistics, there are more than **30 universities** and nearly **50 colleges** that have a mobile app in **the Apple store**. Some Universities and colleges, institutes are also have number of key areas where direct communication with the student through their mobile handset can assist them in putting information at their fingertips quickly and efficiently, such as interactive maps for when students first arrive on campus, timetabling put straight into their mobile calendar, accessing staff directories, utilizing mobile for small payments on campus and access to course work. Some work on the focus on enhancing the student experience through the Mobile Campus Assistant. Future plans feed the lessons learnt and experience accumulated within the IT services research and development team into all aspects of the University's have now adopted various mobile strategy**,** with the help of technical Assistances into informative and knowledge sharing website and intranet**,** along with research support systems. Education providers strive to open up new opportunities to learners of various levels and skills. Nowadays Institute and universities are adopting new systems for identifying the progress ,assessment and reporting, and help in doing regular activities. We are using expertise method to simplify the teaching process to enable both teacher and the students into more efficient and responsible.

Analysis of technical
and psychological readiness of students to Mobile learning

The researcher plans to have respondents from undergraduate students from different major in Kazan universities Institute of Computational Mathematics and Information Technologies / Department of Programming Technologies to answer the questionnaires. This is due to the reason that university students were found to have a high penetration rates for mobile phone usage due to high quality telecommunication infrastructure. In this research, the overall sample size is 135 respondents. Only 124 answers were good to conduct. The size limited to enable faster and easier collection of data to aid analysis. The study will be in Kazan University Institute of Computational Mathematics and Information Technologies / Department of Programming Technologies and the students within the university they will choose basis of their ability of Knowledge to answer a questionnaire paper.

Questionnaires are restricted to two basic types of question:

• Closed-ended (or "closed question") is a question for which a researcher provides a suitable list of responses (e.g. Yes / No). This produces mainly quantitative data.

• Open-ended (or "open question") is a question where the researcher doesn't provide the respondent with a set answer from which to choose. Rather, the respondent is asked to answer "in their own words". This produces mainly qualitative data.

The table 1 is a cross tabulation of the age group and the gender of the research participants and Fig 4.1. is a visual display of this relationship. From the relationship, It is seen that out of a total of 124 research participants, 53 are aged 18–20, 27 are aged 21–23 , 20 are aged 24–26, and 24 are aged 27 and above.

The table 2 above is a visual display of the frequency distribution of the research participants' year of study. As seen, out of a total number of 124 respondents that took part in the survey, 53

(42.7 %) were in their first year, 27 (21.8 %) second year, 20 (16.1 %) Third year, and 24 (19.4 %) forth years.

The table 3 above is a visual display of the frequency distribution of the research participants' phone category. As seen, out of a total number of 124 respondents that took part in the survey, 12 (9.7 %) they have color LCD, 112 (90.3 %) they have smart phones.

Table 1: Age group * Gender Cross Tabulation
Which category describes your age

		Frequency	Percent	Valid Percent	Cumulative Percent
	18–20	53	42.7	42.7	42.7
	21–23	27	21.8	21.8	64.5
Valid	24–26	20	16.1	16.1	80.6
	27 and above	24	19.4	19.4	100.0
	Total	124	100.0	100.0	

Table 2: Year of study
Year of study

		Frequency	Percent	Valid Percent	Cumulative Percent
	1st year	53	42.7	42.7	42.7
	Second year	27	21.8	21.8	64.5
Valid	Third year	20	16.1	16.1	80.6
	Forth year	24	19.4	19.4	100.0
	Total	124	100.0	100.0	

Table 3: Phone Category
In which category does your current phone belong

		Frequency	Percent	Valid Percent	Cumulative Percent
	Color LCD	12	9.7	9.7	9.7
Valid	Smart Phone 4G	112	90.3	90.3	100.0
	Total	124	100.0	100.0	

Table 4: Course Materials

Would you agree that having course materials such as slides, lecture notes, and practice quizzes available on your mobile phone would be beneficial to your study process

		Frequency	Percent	Valid Percent	Cumulative Percent
	Not Sure	4	3.2	3.2	3.2
Valid	Completely Comfortable	120	96.8	96.8	100.0
	Total	124	100.0	100.0	

The table 4 is a visual display of the frequency distribution of the research participants' response to having course materials such as slides, lecture notes, and practice quizzes available on your mobile phone would be beneficial to your study process. As seen, out of a total number of 124 respondents that took part in the survey, 4 (3.2 %) they Not Sure to having course materials such as slides, lecture notes, and practice quizzes available on your mobile phone would be beneficial to your study process, 120 (96.8 %) they Completely Comfortable to having course materials such as slides, lecture notes, and practice quizzes available on your mobile phone would be beneficial to your study process.

The table 5 is a visual display of the frequency distribution of the research participants' response to whether the Mobile learning will improves the overall success for the student in his/her (as he/she think) courses study efficiency and convenience. As seen, out of a total number of 124 respondents that took part in the survey, 117 (94.4 %) they agree and they think that Mobile learning will improves the overall success for them, 6 (4.8 %) they Not sure and they don't know if the Mobile learning will improves the overall success for them or not, while 1 (0.8 %) responded "Disagree".

The table 6 above is a visual display of the frequency distribution of the research participants' response (Effort Expectancy) if they think that interaction with mobile learning will be clear and understandable for them, It is seen that out of a total of 124 research participants, 87 (70.2 %) are Mostly agree, 25 (20.2 %) are agree, 10 (8.1 %) they (Neutral) don't know if the interaction with mobile learning will be clear and understandable for them or not, 2 (1.6 %) they Disagree with the Effort Expectancy (if they think that interaction with mobile learning will be clear and understandable for them).

The table 7 above is a visual display of the frequency distribution of the research participants' response to (Behavioral Intention to Use) if the student intend to use the mobile learning system in the future to save time and money. As seen, out of a total number of 124 respondents that took part in the survey, in response to the question 74 (59.7 %) said "Mostly agree", 43 (34.7 %) responded "Agree", 6 (4.8 %) responded "Neutral", 1 (0.8 %) responded "Disagree".

The table 8 above is a visual display of the frequency distribution of the research participants' response to the (I think the mobile learning system provides information you need at the right time) As seen, out of a total number of 124 respondents that took part in the survey, 45 (36.3 %) said "Mostly agree mobile learning system provides information you need at the right time, 74 (59.7 %) responded "agree", 2 (1.6 %) responded "Neutral" and only 3 responded "Disagree"(2.4 %).

Table 5: Performance Expectancy
**I think Mobile learning improves my overall success
in my courses study efficiency and convenience**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Agree	117	94.4	94.4	94.4
	Not sure	6	4.8	4.8	99.2
	Disagree	1	.8	.8	100.0
	Total	124	100.0	100.0	

Table 6: Effort Expectancy
I think my interaction with mobile learning will be clear and understandable for me

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Mostly agree	87	70.2	70.2	70.2
	Agree	25	20.2	20.2	90.3
	Neutral	10	8.1	8.1	98.4
	Disagree	2	1.6	1.6	100.0
	Total	124	100.0	100.0	

Table 7: Behavioral Intention to Use
I intend to use the mobile learning system in the future to save time and money

		Frequency	Percent	Valid Percent	Cumulative Percent
	Mostly agree	74	59.7	59.7	59.7
Valid	Agree	43	34.7	34.7	94.4
	Neutral	6	4.8	4.8	99.2
	Disagree	1	.8	.8	100.0
	Total	124	100.0	100.0	

Table 8: Content Accuracy
I think the mobile learning system provides information that I need at the right time

		Frequency	Percent	Valid Percent	Cumulative Percent
	Mostly agree	45	36.3	36.3	36.3
	Agree	74	59.7	59.7	96.0
Valid	Neutral	2	1.6	1.6	97.6
	Disagree	3	2.4	2.4	100.0
	Total	124	100.0	100.0	

Table 9: Usability, relevance
I think the mobile learning system can provides information that is relevant to my course (Usability, relevance)

		Frequency	Percent	Valid Percent	Cumulative Percent
	Mostly agree	48	38.7	38.7	38.7
	Agree	60	48.4	48.4	87.1
Valid	Neutral	11	8.9	8.9	96.0
	Disagree	2	1.6	1.6	97.6
	Mostly disagree	3	2.4	2.4	100.0
	Total	124	100.0	100.0	

The table 9 above is a visual display of the frequency distribution of the research participants' response questions if they think the mobile learning system can provides information that is relevant to their course (Usability, relevance). As seen, out of a total number of 124 respondents that took part in the survey, 48 (38.7 %) said "Mostly agree they think the mobile learning system can provides information that is relevant to their course , 60 (48.4 %) responded "agree", 11 (8.9 %) responded "Neutral", only 2 responded "Disagree"(2.4 %) and the last 3 (2.4 %) responded "Mostly disagree".

Acknowledgements

Conclusion

M-learning has already started to play a very important role in e-learning in the world. It should be noted that m-learning has brought e-learning to the rural communities – to learners that we never imagined as e-learning learners just a few years ago. M-learning is the gateway to e-learning for most learners in Russia as the rapidly growing wireless infrastructure increasingly fulfills their access needs.

Distance education is intrinsically linked to technology in education. Mobile telephony is the most widespread technologyever. There are 1.5 billion of them for a world population of 6 billion. Their use for learning and training is essential.

All the problems associated with presenting full mobile learning courses on PDAs have been solved. There should be no difficulties in developing learning materials for these devices and running full courses on them. The problem with PDAs is that there are only 7–8 million of them in the world today and sales are not increasing. Industry experts suggest that PDAs may eventually be merged into smartphones.

There are 1.5 billion of these devices in the world today and the Chinese market alone is growing at the rate of millions per month. The problems of presenting courseware on these devices have not yet been solved. This is the task for the present development of mobile learning. The awkwardness of wiring and wired devices is giving way everywhere to wireless connections. This development is now impacting education and training. The development of mobile learning is the new cutting edge in development, the next generation after e-learning.

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А. В. АльТахер

Казанский федеральный университет
Деревня универсиады, Казань, 420010, Республика Татарстан, Россия

smart.computing@yahoo.com

**ОЖИДАЕМАЯ ПРОИЗВОДИТЕЛЬНОСТЬ
С УЧЕТОМ УДОБСТВА ИСПОЛЬЗОВАНИЯ ДЛЯ ТЕХНОЛОГИИ M-LEARNING
В ОБРАЗОВАНИИ**

Проблемы применения новых технологий обучения многочисленны. Но влияние технологий на улучшение обучения несомненно. В данной статье приведены статистические данные о мнении и ожиданиях учащихся при использовании технологий мобильного обучения в Казанском федеральном исследовательском университете. Эта статистика учитывает такие показатели? как возраст, пол, год обучения, тип мобильного устройства и пр. Такие данные позволяют сделать детальную гибкую настройку обучающих технологий на целевую аудиторию. Практика мобильного обучения выходит за рамки только технологических проблем. Изменчивость ситуаций и контекстов мобильного обучения влечет за собой изменения в классической этике обучения. В частности, необходимо совместно с комитетом по этике генерировать новые сценарии для сбора данных и поддержки исследований в сфере мобильного обучения.

Ключевые слова: M-Learning, готовность, доступность, персонализация, удобство.