Usage of Mobile Learning in Malaysian Secondary Education: Stakeholders' View

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Abstract — 21st century learning has given impetus to the exponential growth of mobile learning. It fosters engaging personalized learning where students can optimize their understanding and learning gratification via wireless mobile devices. Nonetheless, in the context of Malaysian schools, mobile learning is not yet fully explored due to policy constraints towards mobile learning utilization in primary and secondary education. Yet, Connectivity Scorecard in 2013 reported how Malaysia is in second place behind Russia for digital connectivity among the resource and efficiency-driven economies worldwide. This indicates a vast potential for the usage of mobile apps and mobile devices amongst the students and teachers who are the stakeholders. Hence, this paper discusses myriads of perspectives on mobile learning from educational researches that later leads to stakeholders' analysis on the mobile learning in Malaysian secondary education. In order to verify and validate these perspectives, a survey on stakeholders' views and usage of mobile learning and mobile devices are carried out from September to November 2013. Data were collected randomly from 130 respondents comprise teacher trainers in university, teachers and students from secondary schools (rural and urban). The result indicated that almost all teachers and students in Malaysian secondary schools own smart phones and mobile devices. The findings will propagate future studies on development of prototypes on suitable mobile apps for secondary education that caters to the needs of the stakeholders.

Keywords - Component; mobile apps, secondary education, Malaysian schools

1. INTRODUCTION

The robust development of mobile technologies has led to incorporation of mobile devices in learning ecosystems [1] worldwide. One of the potential approaches is mobile learning where it is defined as utilization of "advanced mobile technologies, such as high bandwidth infrastructure, wireless technologies and handheld devices."[2] In Malaysian context, mobile learning is widely implemented at tertiary education level [3]. It is widely used to scaffold the teaching and learning ecosystem via its Bring Your Own Device (BYOD) policy that empower the flexibility for the stakeholders; namely teachers and students to engage in meaningful lessons and communication via their mobile devices. On the other hand, the situation differs for secondary education due to existing education policy that restricts the use of mobile devices amongst students in secondary schools. One of the justifications on this ruling is to prevent misconduct of digital citizenship where it is defined as "civic engagement, social externalities and equality of opportunity" in accessing and disseminating knowledge and information on cyberspace. [4]

Apart from that, based on empirical studies, there are limited studies conducted on stakeholders' analysis and perspective on mobile learning in Malaysian secondary education. Albeit the scarce implementation and usage, the inception of 1BestariNet in all 10,000 schools nationwide and revision of Malaysian Educational Blueprint in 2012 [5] envisaged to Malaysia' optimistic education transition towards mobile learning. The report conducted by ComScore in 2013 further exemplifies the potent usage of mobile learning where 55% of students in secondary schools in Malaysia who own mobile phones use 3G/4G smartphones. Thus, this paper aims to contribute better understanding on stakeholders' views on the incorporation of mobile learning in secondary education. The views are discussed via two ways; (1) Stakeholder Analysis and (2) Questionnaire Deployment. These methods are used to further identify ways to optimize mobile learning for effective knowledge dissemination and personalized learning paradigms.

This paper is divided into five sections. The first section will touch on the impact of mobile learning to education in schools. Section 2 will elaborate more on the development of mobile learning in schools, generally worldwide and specifically, Malaysian school context. Next, Section 3 will touch on survey carried out in Malaysian schools pertaining to Mobile Learning and Mobile Apps in Malaysian Schools. Section 4 will further analyze and deduce the findings from the

aforementioned survey. Last but not least, Section 5 will summarize the potentials of mobile learning for secondary education and propose further studies on its implementations in Malaysian schools.

2. LITERATURE REVIEW

Due to the ubiquitous revolution of borderless education, mobile learning is now considered as a knowledge-centric catalyst in supporting personalized and collaborative learning in secondary education. It is imperative to identify the role and the views of teachers and students who are the stakeholders in secondary education as they are responsible in utilizing the mobile devices. Deployment of state-of-the-art mobile technologies alone would not suffice sans taking consideration of the end-users or stakeholders' views, needs and wants. Nonetheless, challenges are inevitable in the mobile learning management pertaining to classroom issues, security measurement and monitoring concerns. The paradoxical impacts of mobile phones are extensively discussed by [6];[7];[8] who conclude it as "disruptive technology" at schools. On the other hand, some empirical studies being carried out on mobile learning, positively propose the usage of mobile learning and the usage of mobile devices in the teaching and learning process due to its "educational advantages". [9]

Pertaining to the implementation of mobile learning in classrooms, it is perceived as "new opportunities for increasing engagement, motivation and learning" [10] As a result, it fosters critical thinking skills, [11] which are fundamental in the foundation of knowledge-centric and tech-savvy community in schools. [12] opined that most of the concerns and challenges identified from the existing literature have more bearing on the features of mobile devices and a few regarding user's expectations. Hence, it is important to study more on the end users' views and expectations which will contribute to the development of mobile applications that cater to the needs and wants of the education community. [13] emphasized the importance of studying the strategic planning and implementation of mobile learning in order for it to be successfully executed and carried out. Table 1 illustrates the three concepts of mobile learning that streamline the strategic planning needed for education purposes.

TABLE 1 : The concepts of mobile learning
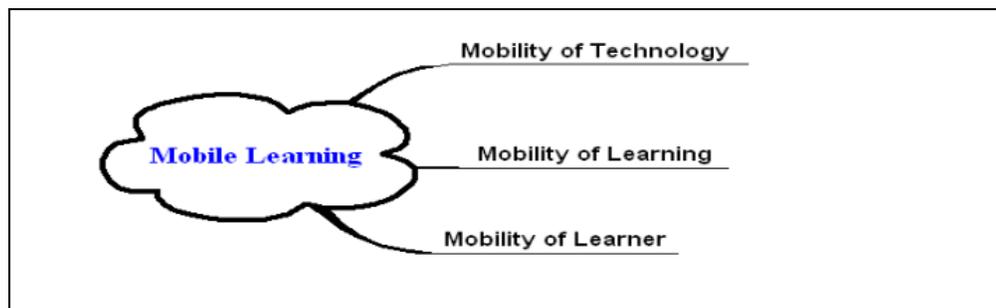
The proliferation of mobile learning in Malaysian education landscapes have been examined thoroughly by [14] where the consideration on education policies and stakeholders' acceptance in Malaysia are discussed. [15] proposed a gradual approach in incorporating mobile learning in schools where it can be perceived as alternative learning tools outside of the classroom boundaries. Although the current policy imposed by Malaysian Education System disallow the use of the mobile devices in schools, smart phone is professed to be "one of the key emerging technologies" that would elevate the status of Malaysian schools to smart schools holistically. [16]

The incorporation of mobile learning has been extensively studied and comparative studies on the instrumental values on education have been analyzed in order to increase the engagement and learner's gratification. In the context of this research, empirical studies on stakeholders' views on mobile learning are discussed and analyzed. The table 2 below describes the array of authors that have written extensively on the key factors in the development of mobile learning and use of mobile apps that are studied in advancement of teaching and learning experiences.

TABLE 2: Key Factors in The Use of Mobile Learning In Classrooms

Factors	Authors
Accuracy	Prensky (2004) [17]
	Weyn and Anderson (2013) [18]
Accessibility to media	Idrus and Ismail (2009) [19]
	Houde (2006) [20]
Interactivity	Traxler (2005) [21]
	Dawson (2007) [22]
Portability	Knowles (1990) [23]
	Sharples (2006) [24]
	Koole (2009) [25]
Convenience	Parsons (2007) [26]
	Kuszpa (2006) [27]
	Ring (2008) [28]
Pricing	Roschelle (2003) [29]
	Laurillard (2007) [30]
	Donner (2008) [31]
Flexibility	Cavus and Al-Momani (2011) [32]
	Idrus and Ismail (2009) [19]
	Kolb (2008) [33]

3. RESEARCH METHODOLOGY

In order to gauge teachers and students' perception on the use of mobile learning and mobile devices in Malaysian secondary education, quantitative method is used to underpin the study. There are four phases in research methodology which are illustrated in Figure 1 below.
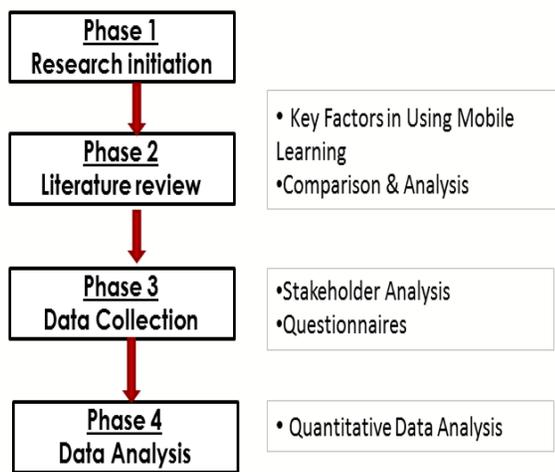

FIGURE 1: Research Framework

Stakeholder Analysis is chosen in order to study the roles of stakeholders and their influences in imposing impact on the use of mobile learning in secondary education. The aim is to facilitate divergent viewpoints from stakeholders on the policy reform revision, specifically the mobile devices policy. Thus, identification of variables on the needs and wants of the stakeholders can be leveraged accordingly. This method is chosen as the current needs of the stakeholders are addressed and potential strategies can be drawn from the synergy of viewpoints.

TABLE 2: Stakeholder Analysis on Mobile Learning for Malaysian Secondary Education

Stakeholders	Role	Potential Impact	Influence/Power	Impact of Research on Stakeholders
Ministry of Education	Design, revise and implement policy pertaining to mobile learning in secondary education	High	It has power to revise and amend the changes pertaining to mobile learning policy in secondary education	Result findings might affect current policy on future implementation of mobile learning in schools
Teachers	Facilitate and engage teaching and learning support via mobile technologies	High	They have great influence in optimizing learning gratification and establish digital literacy via mobile learning	Result findings may motivate teachers to explore multitude ways of using mobile technologies in facilitating learning
Students	Conduct personalized learning via mobile technologies	High	The student's pervasive exposure and swift adaption on mobile technologies will proliferate learning process	Result findings may motivate students to fully optimize mobile devices for learning and knowledge productivity

All the three stakeholders depicted are primary stakeholders that have significant influence on the success of mobile learning implementation for Malaysian secondary education. The first stakeholder is Ministry of Education Malaysia which is the governing body pertaining to education management and policy implementation in the realm of education. However, for the purpose of this research, the scope of dispersing mobile learning policy and knowledge dissemination would be studied from the perspective of academia, namely lecturers who train the teachers in secondary education. The second key stakeholder comprise teachers as their viewpoints on the mobile learning policy and management in classrooms would impact the success of mobile learning per se. The third key stakeholder would be students as the utilization of mobile technologies in student-centered learning would expedite knowledge-centric exploration in teaching and learning paradigms. The stakeholders are identified based on their roles in secondary education where the extent of their influence and power in usage of mobile learning are identified and the impacts are further elaborated.

After conducting the Stakeholder Analysis, a questionnaire is constructed to verify their perceptions on the usage of mobile learning in secondary educations. The questionnaire survey is part of an ongoing research study titled Mobile Learning for Malaysian Secondary Schools. The data that have been gathered from the survey were analyzed using statistical package for social science (SPSS), Release 13.0.0, to investigate the number and percentage of teachers and students who own mobile devices and utilize it for teaching and learning.

There were one hundred thirty respondents (students, teachers, lecturers) from urban, semi-urban dan rural parts of educational institutions. (secondary and tertiary) The study was conducted between September to November 2013. The aim of the survey is to analyze user's acceptance on mobile learning in Malaysian schools and the purposive sampling is to ensure equal sampling from teachers and students who are the stakeholders in Malaysian secondary schools. The questionnaire covers seven key factors that should be given high consideration in mobile apps development, that were identified from aforementioned empirical educational researches mentioned in Table 1:

a. User's view on accuracy of information

b. User's accessibility to media

c. User's view on interactive features

d. User's concerns on portability of mobile devices

e. User's perspective on convenience of mobile learning

f. User's thoughts on impact of mobile device's price

g. User's ideas on mobile learning's flexibility

4. RESULTS AND FINDINGS

Figure 1 portrays the profile of the respondents with the males being the majority of the respondents where 83 of the respondents were female, while 47 were male respondents. All of the respondents are connected to secondary education whether directly or indirectly in the execution of teaching and learning process. In the context of teacher/instructors, female respondents were the highest number, indicating the current demographic scenario of learning facilitators in secondary education.
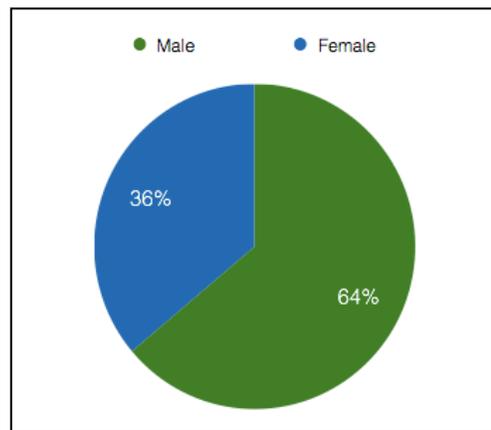

FIGURE 2: Gender of respondents

Age-wise, most of the respondents (47) were dominantly in the 30-39 age range, followed by 24% (32) respondents between the ages of 21-29 years old. Figure 2 shows the age category for the respondents.
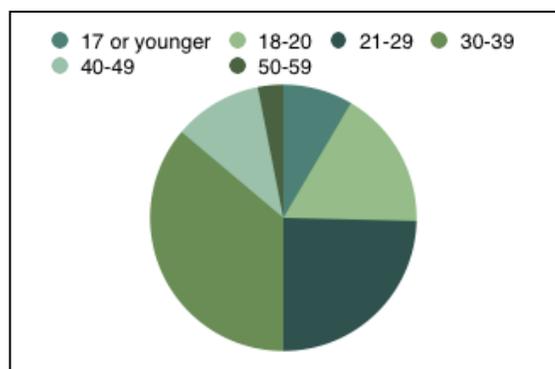

FIGURE 3: The age of respondents

Figure 3 shows the respondents' positions in academic realm where it comprises lecturers, teachers and students as they are the stakeholders in secondary school education. The respondents are chosen based on the outline specified from the Stakeholder Analysis of Mobile Learning for Malaysian Secondary Education.
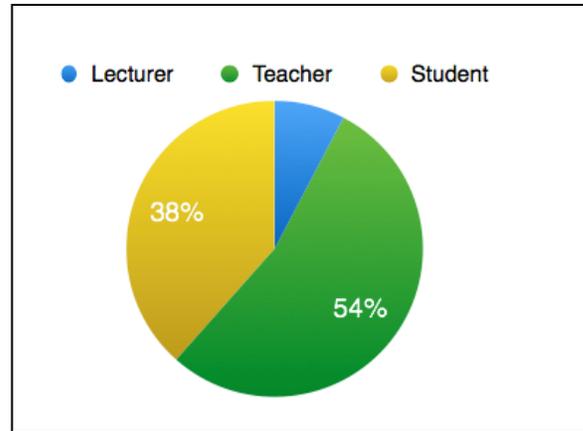

FIGURE 4: Positions/Role of Respondents

Respondents were from the all 15 different states in Malaysia. Nonetheless, the respondents were from different educational institution. 50 respondents (38%) were from university, while 40 (30%) where from urban secondary school. On the other hand, 29 respondents (22%) were from rural secondary school. Only 11 respondents were from boarding school and vocational college.

One of the most interesting findings on this survey was that 103 (89%) of the respondents are using mobile phone for learning purpose outside their classrooms albeit the current restriction of bringing mobile devices to Malaysian schools. Majority of the respondents utilize their mobile devices for learning in order to get in-depth understanding or acquire new knowledge where it is indicated by 100 out of 130 respondents are using smartphones for learning purposes. 89% are using their mobile device to contact people for educational purposes while 82% of the respondents are using mobiles to access learning resources. 74% are using mobile for sharing educational purposes.

From the findings, 87% of the respondents believe that mobile learning will play an important role in the future of teaching and learning in Malaysian schools, while only 1 respondents think that is not true, 13 respondents (12%) are indecisive on the move to use mobile learning. This indicates an optimistic outlook on mobile learning adoption in schools.

TABLE 3: Case Processing Summary

		N	%
Cases	Valid	108	83.7
	Excluded[a]	21	16.3
	Total	129	100.0

a. Listwise deletion based on all variables in the procedure.

Table 3 is the Case Processing summary for this survey, which illustrated the respondents' number and the valid responses. This clearly illustrates the reliability analysis using Cronbach's Alpha. .959 is verified as high merit and verified reliable and recommended for this survey.

TABLE 4: Reliability Statistics

Cronbach's Alpha	N of Items
.959	7

For the reasons of using the mobile device for learning process there were 7 Likert features. Table 4 shows the communalities factor analysis for this features with the variables on it. These features are:

(a) Accurate and updated information.
(b) Can play and store media easily.
(c) Quick access to information.
(d) Easily connected to friends
(e) Easy to store information.
(f) Relatively inexpensive
(g) Portable and mobile.

TABLE 5: Communalities

	Initial	Extraction
Feature (a)	1.000	.771
Feature (b)	1.000	.869
Feature (c)	1.000	.940
Feature (d)	1.000	.927
Feature (e)	1.000	.877
Feature (f)	1.000	.353
Feature (g)	1.000	.914

Extraction Method: Principal Component
Analysis.

From Table 5, the entire extractions of the features are above .7 out of 1.0, which is considered high and above the par. Therefore, all the mentioned features earlier are highly recommended by the survey respondents. The findings from the questionnaire indicate optimistic prospect of deployment of mobile learning for Malaysian secondary education. Majority of the stakeholders opined that mobile technologies are important and their optimization for learning purposes will transpire multitude of learning engagement through its rich multi-sensory attributes. Apart from that, stakeholders perceive mobile technologies not merely as tools but alternatives in knowledge sharing and social networking that transverses boundary of conventional learning landscape. This is parallel to the Malaysian Educational Blueprint that outline digital literacy in optimization of digital technologies in accelerating learning engagement, intellectual capital building and collaborative learning.

Another aspect that binds the stakeholders' views on mobile learning is connectivity which fares high amongst the key stakeholders. Connectivity is perceived as an important factor in faster and effective learning catalyst for personalized learning. As mobile devices such as smartphones, iPad, tablets and netbooks are portable; its swift accessibility features unify the stakeholders in naming mobile learning as highly potential learning mechanism.

In consideration of learners and teachers' stance, mobile devices ability to store media and information are some key factors outlined by the stakeholders. The stakeholders' responses also indicated that there is a possibility of changes in the policy at school in order to execute the plan to implement mobile learning for secondary education. Apart from that, price

issue is a main concern among the stakeholders as it might impede the accessibility to mobile learning as most smart phones in the market cost more than RM300 which may be exorbitant for students' expenditure. Nonetheless, this is a factor that can be a yardstick when devising a mobile device or mobile apps that could cater to the stakeholders' needs yet do not financially burden the end users.

5. CONCLUSION

In conclusion, mobile learning is immanent in the dynamics of learning and teaching in Malaysian schools. In order to get clearer validation of the significance of mobile learning, it is vital to take serious considerations of views of the teacher trainers, teachers and students who are the key stakeholders in secondary education. Management of mobile learning in secondary education should not just cover the skills enhancement in using mobile technologies alone but needs to be supported with attributes and factors that are streamlined from both educational studies and stakeholders' viewpoints. The development mobile learning and incorporation of Mobile Learning in Malaysian secondary education will expand the learning horizon where it caters to personalized learning that suits the learner's mobility and learning pace. The seven key factors outlined in empirical education researches on mobile learning were in tandem with the stakeholders' perspectives on the usage of mobile learning in the Malaysian education landscape. This research is vital in accommodating the stakeholders' needs with the important elements required in the contextualization and technical aspects of the mobile application. This is also an opportunity to leverage technologies that are in vast usage and utilize it for the purpose of effective teaching and learning process. In consideration of their views, revision of policy and gradual adoption and adaptation of mobile learning amongst students and teachers should be in continuous phases, supported from the administrators down to grassroots level. For future work, the author plans to develop prototype of mobile apps that cater to the stakeholders' needs yet in parallel with the education syllabi and requirement set by the Ministry of Education Malaysia.

REFERENCES

[1]   S.A.Ariffin, 'Mobile learning in the institutions of higher learning for Malaysia students: culture perspectives', 2011. International Conference on Advance Science, Engineering and Information Technology. Putrajaya, Malaysia, 14 -15 January.

[2]   M.Sharples, "The design of Personal Mobile Technologies for Lifelong Learning", Computer and Education, 2000, vol. 34,177-193.

[3]   Singh, Devinder, and Zaitun Abu Bakar. "Mobile learning in wireless classrooms." Malaysian Online Journal of Instructional Technology (MOJIT) 3.2 ,2006 : 26-42.

[4]   Mossberger, Karen, Caroline J. Tolbert, and Ramona S. McNeal. "Digital citizenship". Cambridge: MIt Press, 2008.

[5]   Ministry of Education Malaysia,   Malaysia Education Blueprint, 2012. accessed 10 October 2013 from http://www4.unescobkk.org/nespap/sites/default/files/Preliminary-Blueprint-ExecSummary-Eng_0.pdf

[6]   G.A. Rosile, " Cheating: Making it a Teachable Moment.", Journal of Management Education, 2007. 31 (5) , 582613.

[7]   K.E. Smith and J.Welsh, "Cheating and Bullying using Cell Phones and PDAs: The Dark Side of Mobile Technology." Humanity Conference, 2005, retrieved from http://h05.cgpublisher.com/proposals/509/index_html

[8]   J. Katz, "Mobile phones in educational settings." In K.Nyiri (Ed) A Sense of place: the global and local in mobile communication.", 2005, Vienna,Passagen Verlag.

[9]   M. Mohamad and J. Wollard, " Bringing change in secondary schools : Can mobile learning via mobile phones be implemented in Malaysia?", Electronic Education: Towards An Immersive Learning Environment, 2010, Pearson.

[10] Lin, M.-F., Fulford, C. P., Ho, C. P., Iyoda, R., & Ackerman, L. K. (2012). Possibilities and challenges in mobile learning for K-12 teachers: a pilot retrospective survey study. In Proceedings of the seventh IEEE international conference on wireless, mobile and ubiquitous technology in education (WMUTE'12)(pp. 132–136). Takamatsu, Kagawa, Japan: IEEE Computer Society

[11] Hwang, G.-J., & Chang, H.-F. . A formative assessment-based mobile learning approach to improving the learning attitudes and achievements of students. Computers & Education, 2012, 56, 1023–1031.

[11] Bidin, Samsiah, and Azidah Abu Ziden. "Adoption and Application of Mobile Learning in the Education Industry." Procedia-Social and Behavioral Sciences 90 ,2013: 720-729.

[12]Baloch, H.: Mobile Collaborative Informal Learning Design: Study of Collaborative Effectiveness using Activity Theory. International Journal of Interactive Mobile Technologies, 2012, 6, 34–41

[13] I. Ismail et al, "Mobile Learning via SMS Mobile Technology: Can it be accepted by distance Learners?" Electronic Education: Towards An Immersive Learning Environment, 2010, Pearson.

[14] S.Siraj and M. Saleh, "Pembelajaran mobile dalam kurikulum masa depan" (Mobile learning in future curriculum), Masalah pendidikan, 2004. 27, 128-142.

[15] UNESCO (United Nations Educational, Scientific and Cultural Organization), "How will ICT change the future of education.", 2010, retrieved from http://www.unescobkk.org/information/news-display/article/how-will-ict-change-the-future-of-education

[16] M. Prensky. What Can You Learn from a Cell Phone?-Almost Anything, 2004.

[17] D.Weynn and J. Andersson, "On the challenges of self-adaptation in System of Systems", 2013.

[18] R.Idrus, "Development of SMS Mobile Technology for M-Learning for Distance Learners." International Journal of Interactive Mobile Technologies (iJIM), 2009, 3 (2),55-77.

[19] J.Houde, "Andragogy and Motivation: An Examination of the Principles of Andragogy through Two Motivation Theories. Paper presented at the Academy of Human Resource Development International Conference (AHRD) (Columbus, OH, Feb 22-26, 2006) p90-97 (Symp. 4-3).

[20] J. Traxler. " Learning in a Mobile Age." International Journal of Mobile and Blended Learning, 1(1), 1-12, January-March 2009

[21] D. Dawson, " Handheld technologies for mobile learning. Leicester: Niace Hartnell-Young, 2007.

[22] M.S. Knowles. "The adult learner: a neglected species" (4th ed.) Houston: Gulf Pub. Co., Book Division., 1990.

[23] M.Sharples, "Big issues in mobile learning." (2006).

[24] M. Koole, "A model for framing mobile learning." Mobile learning: Transforming the delivery of education and training (2009): 25-47.

[25] D.Parsons, "Mobile Learning in D. Taniar (Ed.) Encylopedia of Mobile Computing and Commerce, IGI Global, 525-527.

[26] M. Kuszpa, "The Future of Mobile Learning-A survey of expert expectations about learning on mobile phones. In online Educa 2005.

[27] G. Ring, Case study: Combining WEB and WAP to deliver E-Learning. Learning Circuits, ASTD Online Magazine, 2001 rieved from http://www.learningcircuits.org/2001/jun2001/ring.html

[28] J.Roschelle, "Keynote paper: Unlocking the learning value of wireless mobile devices." Journal of Computer Assisted Learning 19, no. 3 (2003): 260-272.

[29] D.Laurillard, "Pedagogical forms of mobile learning: framing research questions." (2007): 153-175.

[30] J.Donner, "Research approaches to mobile use in the developing world: A review of the literature." The Information Society 24, no. 3 (2008): 140-159.

[31]]Cavus, N. & Al-Momani, M.M. Mobile system for flexible education. Procedia Computer Science, 2010. 3, 1475-1479.

[32] L.Kolb, "Toys to tools", International Society for Technology in Education, 2008.