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Features of Mobile Devices and Its Implications into Education: A Literature Review

Mobil Araçların Özellikleri ve Eğitime Etkileri: Bir Literatür İncelemesi

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Abstract

Computers have changed such as the size, weight and usefulness, and they have become portable devices with the developing technology. This has led to the creation of mobile learning concepts. Devices supporting mobile learning are called mobile devices such as PDAs, Smart Phones, Netbooks, and Tablet PC etc. Computers use in educational environments as it is devices that enrich the educational process, grant to a student-centered education, and facilitate access to sources of information, support individual and lifelong learning. The main purpose of this study is to evaluate the education supported of mobile devices and to use of mobile devices in education. For this purpose, the literature examined is about the subject and the data obtained from literature have been discussion under the headings, reading, writing, communication, interaction and integration.

Key words: Mobile Learning, Mobile Devices; Interaction; Integration; Educational Environments

Öz

Gelişen teknoloji ile birlikte bilgisayarlar boyut, ağırlık, kullanışlılık gibi özellikleri yönüyle değişmiş, taşınabilir araçlar haline gelmiştir. Bu durum Mobil Öğrenme kavramının oluşmasına sebep olmuştur. Mobil öğrenmeyi destekleyen PDA'lar, Akıllı Telefonlar, Netbooklar ve Tablet PC'ler gibi cihazlar mobil cihazlar olarak adlandırılır. Bilgisayarlar eğitim ortamlarında eğitim sürecini zenginleştiren, öğrenci merkezli eğitim vermek, bilgi kaynaklarına erişimi kolaylaştırmak ve bireysel ve yaşam boyu öğrenmeyi desteklemek için kullanılmaktadır. Bu araştırmanın temel amacı, eğitimin mobil araçlarla desteklenmesinin ve eğitimde mobil cihazların kullanımını değerlendirmektir. Bu amaçla konu ile ilgili literatür incelenmiş, elde edilen veriler okuma, yazma, iletişim, etkileşim ve entegrasyon başlıkları altında tartışılmıştır.

Anahtar Kelimeler: Mobil Öğrenme, Mobil Araçlar, Etkileşim, Entegrasyon, Eğitim Ortamları

Introduction

Using computer is increasing every day in educational environments. Computer has the distinction of being the most widely used device in the technological devices. It is a device that enriches the educational process, provides a student-centered instruction. It

DOI: 10.18009/jcer. 45957

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makes easy to access to sources of information, supports individual learning, lifelong learning, without being aware of learning, and time of need learning. Educators use the technological devices in education and training environments for reasons such as; to enrich the materials used in multimedia elements, to move easily materials created in class, to share with their students, to make corrections, to make them comply with the situation and the requirements, to provide students performing certain more effective learning by establishing material-student interaction, to facilitate classroom management, to increase interest of students to examined and discussed the subject in lesson, and to improve students' attitudes towards the course (Isik & Cukurbasi, 2012). Due to this features of computers, it will be expected to have positive effects on mental development of students and has been widely used in educational settings.

In addition, with developing technology, computers have changed for properties such as size, weight, usability aspects. Thus, technological devices such as PDA, smart phones, netbooks, tablet PC have emerged.

Mobile learning, through the use of mobile technology, will allow citizens of the world to access learning materials and information from anywhere and anytime (Ally, 2009). It can be said to tablet computers to be an alternative for mobile distance learning (Bulun, Gulnar & Guran, 2004) but the cost of tablet computers prevents the use of tablet computers for some students (Loch, Galligan, Hobohm & McDonald, 2011). It was found that a small part (4%) of Computer Education and Instructional Technologies teachers who participated in the Yilmaz & Akpinar's (2011) study have the tablet computer. But mobile learning is supported by many devices. The mobile learning environment is created by mobile devices belong to the student.

Mobile tools have changed the way of construction more process. It is done screen-reading in mobile devices. The shape of writing differs in mobile devices. Writing process is done via keyboards or virtual keyboards. Learning materials has become prepared more interactive and enriched in multi-media elements depending on the electronics content that used in educational settings. Individual learning environments is created with all of the students have their own mobile device, learning based on individual differences is supported. Creating and sharing of material during group work has become electronics. In

the same way, written communication used instant messages in addition to verbal communication has been used in educational environments. All of these developments have caused the changes in the interactions between the students, teachers, and content.

Methodology

The method of this research is "document review". Document analysis covers that analysis of written materials which included information about the researched topic (Yildirim and Simsek, 2008). This review article starts with presenting an overview of mobile concepts which are based on scientific works, then goes on how mobile tools are used to supporting the educational environment. Key issues related to the relationship of mobile tools and educational environment were identified through reviews of the literature.

The aim of this study is to evaluate the features of mobile devices and using mobile devices in educational environments. In this context, the literature examined is about this subject and the data obtained from literature have been the discussion under the headings, reading, writing, communication, interaction and integration.

Discussion

There are few studies on the use of mobile devices in educational environments. For this reason, the results of the research about the use of mobile devices in educational environments, possible problems and solutions related to using mobile devices in educational environments do not contain too much information. Whereas the determination of the effects of read and write for students in mobile devices and will be the level of students, teachers and content interactions is important for to demonstrate the effectiveness of mobile learning. In this section, the use of mobile devices in education is evaluated and discussed under the headings of reading, writing, communication, interaction and integration.

Reading in Mobile Devices

The mobile devices are electronics and they transfer texts to the user in a screen. This situation has led to the emergence of the concept which is defined as "screen-reading" by Gunes (2009). While horizontal movements during reading printed materials, both horizontal and vertical movements are carried out using mobile devices. In addition, reading

is made in where displaying a part of the page depending on the size of the screen. Gunes (2011a) who stated that screen reading is different from reading the paper, states that the situation which is while page moves vertically, the eye moves horizontally, made complicate the eye movements and mental processes. In addition, Gunes states that not see all of the text cause of the visible part of the page is constantly changing may cause problems such as the hierarchy of titles not detect, mind should make further efforts to combine and understand information on the screen between departments of appears and missing. In the study, which is done by Aydemir & Öztürk (2012), primary 5-grade students' motivation levels of screen-reading are examined. Results showed that students read on screen received significantly lower scores than the students using printed text in reading motivation scale and its dimensions which is the perception of the difficulty of reading, reading proficiency, reading effort / recognize and social aspects of reading. In view of all these factors, it comes out the necessity to develop specific criteria for the screen reading can be made more robust and effective.

The page layout on the screen is made sure for ensuring the integrity of the text, to be detected the information transmitted as a whole. Image size can be adjusted according to user's request in mobile devices. The whole page can be placed or only part of the enlarged can be displayed on the screen. Screenshot of the enlarge shrink operation can be easy with more than one finger movement detected by the device. Display of the entire page on screen leads to reading problems because of a reduction of the image, but it may give the reader the idea such as the integrity of the text, between the hierarchies of headings. In accordance with the automatic rotation of the image to the device with the vertical or horizontal position of detection of the device makes it easy for the user. In this way, the line length can be changed by the user with two options. Effects such as unable to read the small size of text eliminated expansion of a portion of the image. Another advantage of adjusting the size of the text is that it aids to readings of individuals who use reading glasses to read because of the problem of farsightedness. However, this process will cause experiencing problems of perception of the integrity of the text because it will change the page size display on the screen. To resolve these effects, the user must change the page size of the continuously if this is an extra burden on the user.

Writing in Mobile Devices

The advent of computers has led to changes in writing skills. To write used the keyboard takes instead of pen writing, beautiful writing copy, upright and italic fonts, writing fancy with ink, and locating the keys, accurate and fast typing skills stand out (Gunes, 2011b). In Ozcelik & Yildirim's (2002) study, it indicated that students' ability to use the keyboard is an important factor affecting the use of cognitive devices at web-based learning environments. Students' using the keyboard skills will gain more and more importance with the use of mobile devices in education. In addition, the on-screen keyboard is used in tablet computers, unlike personal and laptop computers. In addition, mobile devices allow that people writing hand-written, record the writings to the device, and place easily these records as a course material to the website (Loch, 2005; McCabe, 2011).

During the use of the onscreen keyboard at mobile devices, be proportional to the size of the finger and size of letter keys significantly affect the ability to use the keyboard. When used in lower-case keys, pressing more than one case at a time and using the wrong letters situations are experienced. But the area covered by the letter keys grows, the number of lines displayed on the screen decreases. It may be encountered find it difficult to control the meaning of the sentence cause of cannot display lines of long sentences at the same time on the screen.

There is also a keyboard bracket mounted mobile devices except for the onscreen keyboard. In this species, the entire screen is reserved into the text to be displayed. However, in today's conditions, this apparatus must become cost-effective, as well as an additional apparatus has a need transport next to the mobile devices. To use the keyboard or the on-screen keyboard, people must be improvements in skills such as keys identification, knowledge of locations of the keys, effectively using his fingers in addition to need to know tasks of the keys on the keyboard. The individuals who do not know to need which key to use punctuation marks, which key to use to delete a misspelled word or letter, don't expect to write using the keyboard or the virtual keyboard.

Communication in Mobile Devices

One of the indispensable elements of education is the communication. Communication is required an effective planning and implementation for effective education

in the classroom. The first of communication to be effective in the classroom depends on effective teacher-student communication and student-to-student communication. Certain rules are established to keep a healthy way of communication in the classroom in traditional classroom environments. The teacher calls for all students, knowledge transfer and asks questions in class. Students must ask for permission to contact a teacher. Student-to-student communication restricted as much as possible in this environment or is carried out via the teacher.

Upon entry into mobile devices in learning environments, classroom communications have changed. Unlike traditional classes, students and teachers can also use verbal communication as well as written communication. Everyone respond in writing to question asked in the classroom at the same time, assessment of all students can be made the same questions at the same time. Communication takes place through e-mails, SMS, MMS, and it is important for students a feedback on their progress (Vinci & Cucchi, 2007). The teacher could instant feedback to responses received, misunderstanding could be corrected immediately. Sharing of material in the classroom will be held through mobile devices, the teacher will not have to pull off the face-to-face communication with students, classroom management occurs in a healthy manner. Materials used in the classroom copied to students' mobile device, students may be provided to repeat the course up to they need (Loch & Donovan, 2006), these materials can also be transferred to the students who took the course and lag of students can be prevented.

Student-to-student communication that restricted in order to avoid the distraction of other students in traditional classrooms will be provided in writing in classrooms which use of mobile devices. However, this communication is required by teacher supervision for preventing loss of their interest in the lesson and crossing the different issues.

Interaction in Mobile Devices

Use of mobile devices with wireless communication such as the cell phones, laptops, handheld computers, smartphones and tablet computers, allows freedom of movement, and mobile learning (Adar & Kandemir, 2008). With these devices, individuals learn information in the time of need and unconsciously.

Mobile devices include different features such as voice recognition and it offers the user the opportunity to control your personal device with sound (Yilmaz, 2011). This situation allows the creation of an environment where is enhanced to students interact with the device. With mobile devices, students have carried out a more effective learning can be achieved with establishing content-student interaction (Koile & Singer, 2006). It is thought that serve the realization of a permanent education due to technological devices appealing to the eye and the ear, in some cases showing the events lived with simulations (Isik, 2010).

Interaction is not the only emergence of a higher level of learning, effect on students' attitudes. Students' attitudes towards the course affect positively the success of the course (Geban, Ertepinar, Yilmaz, Altan, & Şahpaz, 1994; Saka & Kiyici, 2004).

Integration in Mobile Devices

Mobile devices allow that teacher transfer image in their own tablet computer to students via the projection and tell the voice during the lecture. Also in the same course, it provides to recording of the projected image, publishing online on internet and monitoring again at any time (Henrich, Hub & Sieber, 2011). In Yoon & Sneddon's (2011) study, it was made course registration with the mobile device and it was taken positive opinions of students.

Cakmak (1999) advocates that multimedia is significantly increased the learning and understanding because it is a system that offers effective combination of the things that people' ways of learning and knowledge acquisition such as vision, hearing, reading, and displays intriguing. Cakmak explains the reason for the shift to the computer learning environment so in terms of a one-minute moving image information is about 12 times more effective than a one-minute speech. Students will gather a lot of attention and stimulating during the course thanks to video, audio, animation and images, that using for increasing students' interest and curiosity of the subject in class (Koile & Singer, 2006).

Conclusions and Recommendations

In this study, the use of mobile devices in education evaluated according to the features of mobile devices. As mentioned above, it is expected to change in reading, writing, interaction, communication and integration with the mobile devices into learning environments.

Technology-rich activities can sustain high levels of student engagement and peer collaboration compared to less technology focused activities (West, 2013). Many studies show that mobile devices are effective tools in the educational environment. Thonton and Houser's (2005) study shows that students learn words in English more with the mobile phone than with materials on paper or the Web. The research done by Jairak, Praneetpolgrang, & Mekhabunchakij (2009) shows that a positive attitude leads to the behavioral intention to use m-Learning. The research done by Swan, van 't Hooft, Kratcoski, & Unger (2014) shows that use of mobile computing devices may increase student motivation to learn and increase their engagement in learning activities, and it expressed in this research that use of mobile computing devices could lead to an increase in time spent on learning activities and higher quality work. The research done by Fernández-López, Rodríguez-Fórtiz, Rodríguez-Almendros & Martínez-Segura (2013) shows that the use of electronic devices and multimedia contents increases interest in learning and attention of students who have special educational needs. Corbeils & Vandes-Corbeil's (2007) study shows that students and faculty already have a mobile tools, use these tools and they feel ready for mobile learning.

As Korucu & Alkan (2011) pointed, the fact that mobile technologies progress and it meets people's needs faster has increased the interests in mobile technologies and their usage. While a majority of students and faculty already use these tools in many of their daily activities (Corbeil & Valdes-Corbeil, 2007), so it is inevitable that they use in the educational environment. According to the results obtained in this study, the following suggestions about using mobile devices in educational environment have been made:

1. The students should be allowed to use books more efficiently during the course for the page size of textbooks will be determined by taking into consideration the size of the screen.
2. Students to be taken preparatory education or information technology courses in which develop their skills of using the onscreen keyboard for before using mobile devices.
3. It must be established applications will be included to maximize communication and necessary control mechanism will be creation for to keep a healthy way of communication in mobile devices.

4. Material-student interaction must be removed to maximize in the e-contents prepared for mobile devices.
5. It should not be forgotten that will enable and facilitate the integration of development of e-content prepared for mobile devices by multi-media elements, provide the necessary infrastructure and aids, and this effect should be considered in future studies.

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Citation Information

Işık, A. D. (2015). Features of Mobile Devices and Its Implications into Education: A Literature Review. *Journal of Computer and Education Research,* 3(6), 188-198.