Mobile Applications Support
in the Educational Process

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Abstract: The paper deals with the use of mobile devices in the educational process. Mobile phones and tablets have become essential technology in the learning process for both teachers and students. Their role is important not only in terms of communication, but the area of creating, sharing and presentation of teaching materials. The article deals with role of m-learning in education, as well as offering educational mobile applications market.

Key words: mobile technology, smart phone, tablet, m-learning, mobile application, education.

Abstrakt: Příspěvek se zabývá využitím mobilních zařízení ve vzdělávacím procesu. Mobilní telefony a tablety se stávají technologií nezbytnou v procesu výuky jak pro učitele, tak pro studenty. Jejich role je důležitá nejen v rovině komunikační, ale v oblasti vytváření, sdílení a prezentace výukových podkladů. Článek se zabývá jak rolí m-learningu ve výuce, tak i nabídkou výukových mobilních aplikací na trhu.

Klíčová slova: mobilní technologie, chytrý telefon, tablet, m-výuka, mobilní aplikace, vzdělávání.

Introduction

Mobile devices such as smartphones and tablets have become an essential part of almost every one of us but not only in personal and professional life. Extensive functionality of these devices with the deployment of the operating system was strengthened in the area of data services and opened the way for further application in various fields of activity. Mobile device for their properties (mobility, communication, multimedia data types, affordability) suitable tool for making multimedia presentations (videos, photos, video, etc.) as well as in educationat all levels of the educational process.

Applying mobile devices the learning process is often referred to mobile learning (m-learning). This term is often however inaccurately interpreted. Let's take at least one definition of m-learning. Degani (2010) defines a term m-learning as follows:

"... *the ubiquitous use of mobile technology connectivity via wireless and mobile networks, in order to facilitate, promote, improve and expand the reach of teaching and learning*."

The notion of ubiquity here means that the mobile device worn by their owners at all times a day regardless of when and where just happen. Also it should be noted that mobile devices are not worn due to the very possibility of self-education, but that their owners carry their activities due to which they normally perform daily, in the case of mobile phones such as calls, sending SMS and MMS messages, taking photos, use diaries, etc.

Another important fact is the possibility of a mobile device to connect to the internet using a wireless telephone networks. The baud rate is the default criterion is offered and mobile service provider. The use of specific internet decides a large number of factors, which may be the availability of the Internet, bit rate, tariffs for operator tors to connect to the Internet.

The word mobile in the term mobile learning represents two important properties:

- **The mobility of the learner**: students can realize their educational activities without having to be present at a precise location, in a certain area at a certain time. Learners can learn out of the office, classroom, i.e. outside the premises, which are the classic way of learning identified. Mobility of students is ensured by the use of suitable mobile devices. It is therefore not required nothing more than a learner's motivation to learn anytime and anywhere with mobile learning opportunity arises. Unlike other IT resources (such as PCs or laptops) can be studied e.g. Even when riding on public transport, in the waiting room at the doctor, during the lunch break and so on.
- **Mobile devices**: portable, lightweight devices that are large in size so as to fit into your pocket, palm or it can be held in one hand. Typical examples are mobile phones, smartphones, tablets, and personal media players. These devices are easily portable and can be used for communication and collaboration activities associated with teaching and learning.

Mostly we understand by m-learning a tutorial (a learning application) using mobile device. Mobile learning, however, includes both theory and research, but also any educational process in which they are in accordance with the ethical principles of the use of information and communication technologies that work with data in electronic form via mobile devices.

M-learning also includes software tools (the portable LMS) for preparation and distribution of learning courses and study materials for the treatment of this type of study. It includes tests and evaluation of the learning outcomes, as well as an organizational support for the study.

M-learning can be used in teaching differently. An example might be the involvement of m-learning into traditional teaching, distance learning, training programs, etc. Possibilities of its use in teaching are wide and if applied correctly, ie. tailored to the specific situation, budget and needs, can achieve an effective and fun way of learning.

Options of m-learning can be divided into five different categories (Gadd, 2010):

The basic method of communication

Nowadays all mobile phones provide features such as call, SMS or email. Smartphones also allow their users to interact with the applications for this purpose. Tablet might like smartphone, phoning replace applications which are designed to directly. Examples of these applications may be Skype, Whatsapp, Google Hangout, Viber. All these applications provide features such as chat, group chat, calls, and send files. This means that within m-learning seamlessly communicate or send and receive messages between student and teacher, or between pupils, for example in the context of a group project.

Educational programs

These programs are mainly used by schools and training centers. Experience and knowledge of education charged include both the actual learning new skills, so refreshing and repeating the knowledge gained through previous training course. Here can include both mandatory and optional tasks that can be supported integrated tests, quizzes, educational games or surveys.

Access to information

It is not a form of classical education, but the type of education that corresponds to the current problem or needs of the user. If a user is away from the office, classroom or another job and facing a problem or has a need to get that information, he can use his mobile device to obtain. This information can be obtained, for example from web sites, RSS feeds, educational applications, etc.

Social networks

Using social networking student or teacher can retrieve information from the real experts or across the wider learning community. Social networks are also a tool for fostering teamwork. Current mobile devices are due to easy movement on social networks equipped with the necessary software, which allows them easy to find and work with information.

Preparation and production of documents

Nowadays, online stores offer a large number of applications, applications that allow for using mobile devices to create and then process the documents. The contents of the document may be of different size and may be accompanied by audio recording, photo or short video. Builder and using teaching materials describes and demonstrates practical activities or procedures to deal with specific issues. From these available teaching materials can then benefit other people.

All five categories mentioned above are integrated with each other and complement each other. Their share or role change based on training techniques, forms, training course and teaching topic.

How can be m-learning in education applied?

What forms of application of m-learning may improve the quality of teaching? Forms of application of m-learning in education are different. An example might be the involvement of m - learning into traditional teaching, distance learning, training programs, etc. Possibilities of its use in education are wide and if applied correctly, i.e. tailored to the specific situation, budget and needs, can achieve an effective and fun way of learning.

Blended learning

The concept of blended learning refers to the mixing of different forms of learning. The goal of blended learning is to provide the most efficient and most effective teaching methods through the use of both classical and new forms of teaching.

Rob Darrow (2012) presented blended learning as follows: *"Blended Learning is a pedagogical approach facilitated by a teacher where students have some control over their learning; and the teacher seamlessly incorporates the use of online learning tools (e.g. discussion boards, online collaboration, blogs, etc.), technology tools (computers, digital white boards, cameras, etc.), and face-to-face instruction so that*

instruction and learning can be accessed at any time by the student through multiple electronic devices."

It can be interpreted as a way of teaching, where a role represents a lecturer and students have control over their studies. Teaching involves the use of online tools to support teaching groups (forums, blogs, etc.), technological tools (computers, cameras, mobile phones, tablets, digital signs) and classical (face-to-face) form of learning. The mere possibility of teaching and learning, students may be available at any time through electronic devices.

Harriman (2004) defines two important options of blended learning:

- Blended learning combines online with face-to-face learning. The target of blended learning is to provide the most efficient and effective instruction experience by **combining delivery ways**.

- The term blended learning is used to describe a solution that combines several different delivery methods, such as collaboration software, Web-based courses, EPSS, and knowledge management practices. Blended learning also is used to describe learning that mixes **various event-based activities**, including face-to-face classrooms, live e-learning, and self-paced instruction*."*

Blended learning is a broad platform of teaching techniques, technology, organization, access and mobile learning is a part. Blended learning is something between online and traditional schooling. Being a hybrid with no strictly defined combination, it can be anywhere between.

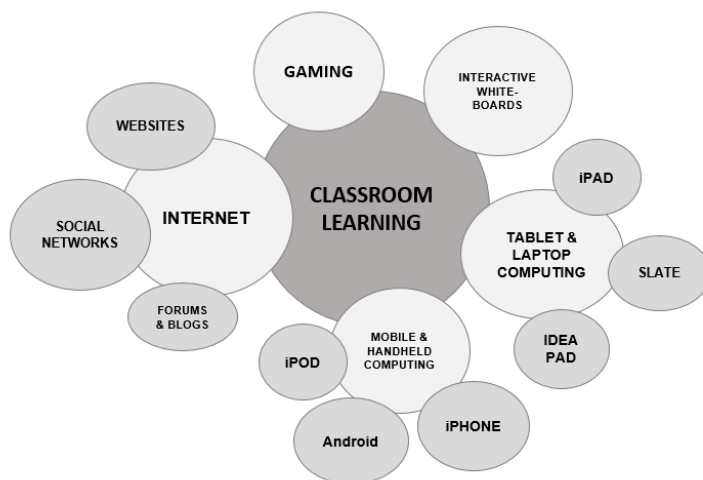Figure 1 presents a schema of technology tools included in blended learning:

Figure 1 Integrating mobile devices in the context of blended learning
(Source: Carter, 2013)

Figure 1 presents the role of mobile devices in the classroom. Their use in class is really wide and necessary for teaching today. It seems that mobile devices and

training applications can support either a formal education in classical classrooms or informal learning. For teachers and students m-learning brings the following benefits:

- Interaction: Student interaction with instructors and among each other.
- Portability: Tablets are lighter than books and enable the student to take notes or input data directly into the device regardless of location either typed, handwritten or using voice.
- Engaging learners: People like mobile devices such as tablets, and smartphones as seem by recent marketing data.
- Bridging of the digital divide: Since handhelds are more affordable than larger systems they are accessible to a larger percentage of the population.
- Increase motivation: Ownership of the handheld devices seems to increase commitment to using and learning from it.
- Collaborative option: Enables several students work together on assignments even while at distant locations.
- May assist learners with some disabilities.
- Just-in-time learning: increases work/learning performance and relevance to the learner.

Advantages of m-learning are aligned communication, content from the viewpoint of availability. The above properties are confirmed by the fact that students can be more and for them a very natural way in the process of communication with the teacher. Materials are readily available to them, regardless of location. And with the coming of intuitive mobile devices dropped out the barrier even for those students who have problems on your PC (Šedivá, 2011).

Disadvantages of m-learning are rather technical in nature. Let us to appoint some predominant negatives of m-learning:

- Small screens of some mobile phones.
- Limited storage capacities smaller phones.
- Battery life/charge.
- Lack of common operating system.
- Lack of common hardware platform make it difficult to develop content for all students and teachers.
- Less robust.
- Limited potential for expansion with some devices.
- Devices can become out of date quickly.
- Wireless bandwidth is limited or costly and may degrade with a larger number of users.
- Difficulties with printing, unless connected to a network.

Many technical challenges must be addressed if the school management decides to use mobile applications in education. Must be deployed not only software for managing teaching materials and applications (LMS-learning management system), but must be dealt with security and management of mobile devices. Must be applied to management of mobile devices (mobility management). This solution requires expert

IT support and service (Šedivá, 2013). And it can be a barrier for the implementation mobile applications in learning process at school.

The markets for mobile learning application

While you can currently on the mobile phone market to find a wide range of companies in the field of mobile operating systems, the situation is a little different. There are currently five major mobile systems. They BlackBerry OS, Windows Phone, Symbian, Android and iOS. The latter two OS dominate their market share. (see Figure 2 and Figure 3).
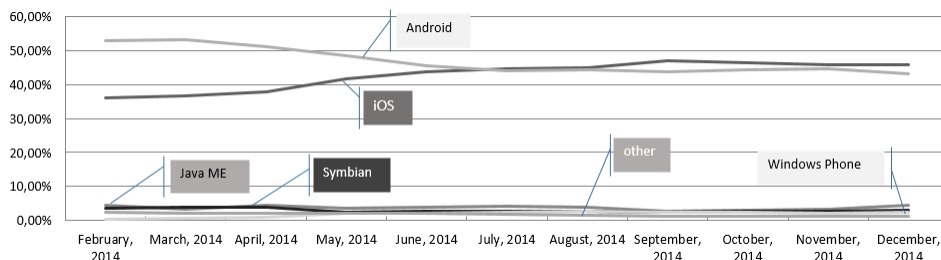
Figure 2 Mobile/Tablet Operating System Market Share 2014
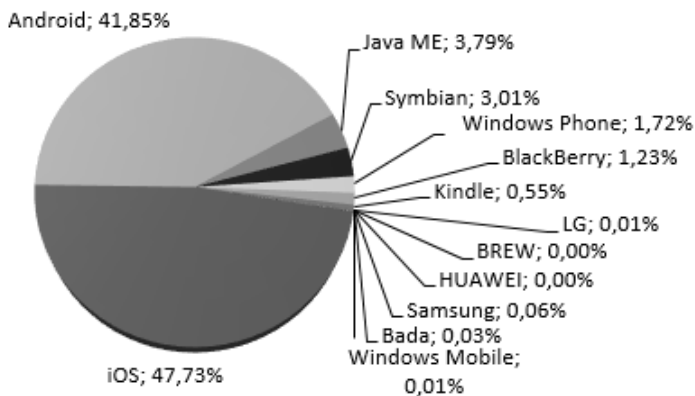*(Source. Marketshare,2014)*

Figure 3 Mobile/Tablet Top Operating System Share Trend in 2014
(Source. Marketshare,2014)

The above charts on the Figures 2 and 3 represent the evolution of the market in 2014 (February - December).

Market trend is decisive for the selection of mobile device platforms (OS), but also for the future supply of mobile applications available for used operating system – see Figure 3.

Table 1 shows the ten categories in which there is the most applications of the species. Certain categories are present in both stores, the order is different. Sometimes it is difficult to clearly classify the application, therefore the number may be misleading in some cases.

Table 1 Number of applications by categories
(Source:AppBrain,2014, 148apps,2014)

	iOS - App Store		Android - Google Play	
Score	Category	Share (%)	Category	Share (%)
1.	Games	18,66	Entertainment	8,31
2.	Education	10,64	Lifestyle	7,48
3.	Business	8,43	Personalization	7,36
4.	Lifestyle	8,22	Education	7,05
5.	Entertainment	7,86	Tools	6,23
6.	Tools	5,38	Books	6,22
7.	Books	5,11	Business	5,81
8.	Travel	4,95	Travel	4,98
9.	Music	3,4	Puzzle	4,23
10.	Sport	2,85	Music	4,23

On the Android side of the differences between the categories of approximately equally distributed, with the first item occupies Entertainment. Within this group, large numbers of inexpensive entertainment apps, some games or applications to consume audiovisual content (such as Youtube, Netflix, Twitch, etc.). Category that is used solely for Google Play in the column is Personalization. Under this title are included applications that allow users to customize the appearance of the user device smartphone. This is due to the closeness of iOS is not possible. In the Apple Store there is the dominant category Games and second Education. Dominance games is completely unfounded. Mobile phone manufacturers and publishers of applications are trying their devices more attractive and thus compete with the pure gaming devices such as gaming or portable consoles (Xbox 360, Xbox One, Playstation 3, Playstation 4, Nintendo Wii U, Nintendo 3DS).

It is interesting that in second place is an educational application in the event of App Store. In the ranking of Google Play this category is also high due to minimal differences in ratios of second to fourth item.

It should also closely monitor the category Books and Tools. These mentioned categories include applications with electronic or interactive books, as well as

applications for digital photo processing. Both categories are very beneficial also for education, especially in the preparation and presentation of information resources.

Today's mobile phones are becoming more competitors for eReader. Analysis of the most popular category indicates that this trend in the future is not going to retreat and for two basic reasons. The first reason is the increasing quality of displays, in which reading becomes more comfortable, and also because the people it is easier to carry one device that will serve multiple purposes.

The same can be said about mobile digital photo. The amount of smart phones has an inbuilt camera that quality exceeds conventional digital cameras. Cameras with high resolution images are proof that one does not rely on classic and quite large camera, but conveniently do with what is in your phone. With the addition of a wide range of applications and filters used for the photo shoot, the mobile camera becomes a professional tool, with which you rotate a cool feature film or took pictures of unique places.

Conclusion

M-learning in education can be represented in many forms - whether it's a use for the transfer of educational materials for learning or through mobile applications. An important role now have social networks or other social resources (forums, shared blogs, shared storage videos or photos), which is used only for communication within the workteam or study group, but also for sharing information and knowledge. Both in the form of formal education and especially in the field of non-formal education.

It would seem from the foregoing that the mobile lessons already because of its advantages strongly represented the learning process. But it is not so. So what prevents increased use of m-learning? There are mainly two major constraints: technical and personnel.

Given that teaching quality is dependent on the level of technical and communication environment, it is necessary that every student had the same resources available. And it can be a major obstacle, since it can be removed if students school facilities and provide services and so the school will have to spend large sums of money. Or a student has to mobile devices and services to pay himself. And it is sometimes a big limitation.

Greater barrier to application of m-learning, however, is thinking traditional approaches in teaching and inability to learn new technologies on the part of teachers. Creating background materials using multimedia content seem to be many teachers very time consuming because it requires thorough preparation. For older teachers can be a barrier as well as the need to communicate via social networks and blogs.

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