

SUPPORTING THE M-LEARNING BASED KNOWLEDGE TRANSFER IN UNIVERSITY EDUCATION AND CORPORATE SECTOR

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ABSTRACT

The evolution of today's connective forms of teaching and learning draws attention to expansion of 'space ' in which teaching and learning moments: engaging the attention, knowledge transfer, acquisition, demonstration, experience, experiment research and practice, conclusions are organized around a more free method. Due to these phenomena and the previous experience gained, the aim of the article is to present the possibilities of mobile learning and ICT-based environment. It shows how the mobile device based (independent of place and time) short content access, control of learning self-issues, customized test questions (centralized storage of results) or per item assessed curriculum can be implemented. In the background of the solutions presented are assessments of a 2012 and 2013 based empirical studies carried out among an electronic framework and online forms. The results support the need for a new type of mobile learning support systems.

KEYWORDS

ICT, mobile learning environment, micro content, digital communications, knowledge management, m-learning

1. INTRODUCTION

The main feature of the information society is that the information has become primary value. Because of economic globalization and corporate governance crisis the main engine of information society is computer technology and the rapid development of telecommunications, its most important stages are the spread about of personal computers and the emergence of broadband networks, its symbolic technological innovations are the Internet and mobile phones. As the result of this rapid development no area of life can avoid the application of information technology. It also involves important social changes: the rate of employment in the information sector grows dramatically, telework and life- long learning becomes possible and necessary the same time. As a result, the development of digital literacy and the dissemination of information infrastructure may appear as primary strategic objective. The same time, living in the information society, people may face many previously unknown problems such as unlimited quantity, but various quality of available information, which needs proper assessment, filtering and processing or the protection of privacy over control of economic or political powers. This effects the environment of the society. The nature of work is changing, the changes are related to the individual learning processes, attitudes, developed learning habits, or the altered teacher and student roles [1],[2].

2. HISTORY

Higher education institutions have begun to adapt to the new generation of student attitudes, customs and learning style, which are switching to e-learning based educational systems. As a result the e-learning environment is introduced and operated by educational institutions. Such a learning environment can be created using Moodle, Olat, Ilias, Claroline, or Coospace systems, some of which are present in higher

education administration and educational system, such as Neptune, ETR, and operated in synchronized connection. Also, another trend is video capture and online sharing of university lessons by institutions.

Using this system, the multi-annual higher education experience in micro and macro level has shown that while the teaching activities in the learning environment can be made mostly in the daytime period, while most of the students' activities are in the late evening or night (full-time pupils). And the aforementioned online, Web-based learning support systems ensure continuous communication between network nodes in synchronous or asynchronous format, which means the new type of student-instructor communication.

The current teacher training courses (graduate and postgraduate training) at Budapest University of Technology and Economics, Department of Technical Education have gone through a paradigm shift. Namely, had to give up the curriculum-centered, teaching-oriented traditional learning theories and methods, and instead has switched to the so-called ICT-based atypical learning forms.

This attitude change in education can be supported by different ways and tools. In the world of the interactive ICT-based systems and digital natives (who are today's information society generation) smartphones, iPads, Kinect units and associated interactive games as well as a range of network-based Web2.0 services, (for example shared documents, presentations, electronic surveys, mobile applications, shared calendars, blogs, social networking sites producing a realistic simulation online tests, shared calendars (Google)), 3D worlds (Leonar3Do), and finally, the virtual environments (Second life) all support learning. These systems and mobile devices are necessary for the use of the so-called "new media skills" learning [3].

2.1 M-Learning in the Teaching-Learning Process

Under the concept of m-learning in general we refer to learning activities done on any mobile device and learning content available from anywhere. Specifically, the type of learning, where an existing online CMS, LMS system can be reached from any network device suitable for mobile communication. These conditions are primarily met in case of smartphones, tablet PCs. For example a Samsung Galaxy Tab touchscreen Android device is suitable for web browsing and multimedia ready. Mobile devices are limited by the intelligence of available content (Web 2.0, flash, audio, video). The smartphones are running on different operating systems, which makes it difficult to meet various compatibility. Such system has long been known as Symbian, Windows Phone, Android, Apple iOS, Bada and Blackberry platforms. The other major challenge to this means that online content should be provided by a seamless content management system and optimized for web (custom CSS, optimized content). In addition to all of these aspects are various existing m-learning opportunities. Many of the developments also point in this direction, for example the well-known Moodle LMS system will be ready soon in a version of official Moodle mobile client as well. This sub-chapter and subject of research is dealing with the iPad as a mobile communication device that is capable of supporting M-learning [4].

2.2 The Micro Content (μ content)

As new and faster forms of communication are discovered, we immediately try to involve them in the education process. Inherent in these experiments is the initial large flare ("this new form will solve everything"), and the disillusion ("it may not solve all problems and learning difficulties"), massive disappointment ("so far it looked good, but I do not believe that could be really useful") and agreement ("and in this particular learning situation it is good, more than anything else to be found"). The technical possibilities for expansion follow the English-speaking world's learning terms: learning , distance learning (d) , flexible learning (f) , electric learning (e) , blended learning (b) , mobile or micro learning (m), nano-learning (n). In Hungary, e-learning term has been agreed, the professionals and the wider range of interested parties agreed on its importance, but it is far from being surrounded by so much fanfare, as it was before (for example, the government supported developments have been completed, but the corporate sector has a preference for it nonetheless). The m-learning (mobile-learning or micro-learning) is so new that we are not through even with the initial stage. The micro content's whole point is to relieve the stress nature of our fast world, highlight the corresponding nodes, wrap information in particular size (300 * 500 pixels), incorporate visual elements and corresponding interfaces into space limitations through compliance. The following figure shows an example of such a micro-content [5].

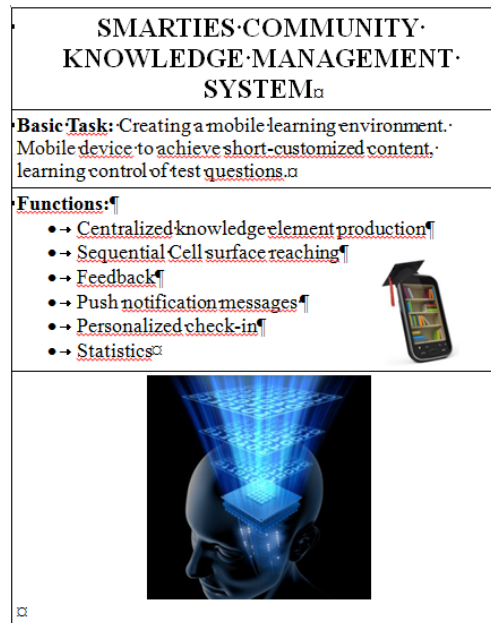


Figure 1. Example of such a micro-content. Source: own figure

3. PRESENTATION OF THE EMPIRICAL RESEARCH

3.1 Characteristics of the Study and the Circumstances

The survey took place between 2013. September 10 and 25 with the involvement of individual units within the BKV and MÁV. The study questionnaire was made with the Google form designer and form sheet. The introductory survey questions were supposed to explore the sociological characteristics of individual respondents, they enquired about equipment requirements, use of knowledge, and assessed the capability of the application of the modern distance education methods. 73 people attended the anonymous data reporting. Of these, 64 worked at BKV and 9 were employees of the MÁV. Target segment of the study included all selected, as employees engaged in intellectual work or work in lower and middle management at their workplace.

The assessment was made with the respondents involved. Accordingly, the results revealed can only be locally representative. Representativeness in a general sense, cannot be applied nationally to the identified characteristics in other companies, or only with significant restrictions to the interpreted data. Isomorphic representativeness therefore replaced with the homomorphic approach. In order for the results to be interpreted in other areas in connection with other companies, in the following we intend to establish characteristic of the sample rate of 95 % confidence intervals. In case of companies with these characteristics which fall within the confidence intervals, the results can be accepted without reservation (the survey is representative) . The greater differences can be observed for a particular company, the more necessary is for the results to be taken as approximates.

3.2 The Results of the Survey is Used in the Context

In respect of communications modes used the 3 spaces of communication do not differ. Both in business, workplace and private communication of e-mail, telephone calls and personal conversation (negotiation) is dominant. Also, all three spaces are limited area of SMS expression. The traditional mailing, chatting, Skype and Facebook use and communication using framework is negligible.

In terms of means of communication the 3 spaces are very similar to one another, smaller (but significant) differences may discovered between them. All of them feature primary orality (exluzive of any devices),

desktop computer (with the exception of private communications, where laptop and smartphone are increasingly taking over the role). The use of the traditional postal services are increasingly pushed to the background, the IP phone, video phone, tablet, notebook and netbook is not widespread.

In corporate training based on e-learning 86% of employees would participate, 44% of them study with desktop (not mobile) computer. The majority (82%) would use their own devices, but there is a significant proportion of those (22%) who would learn with tablet provided by their company. The further training could take 2 hours a week for an average respondent, but every 9th respondent would learn 5 hours a week, one in six would dedicate less than an hour a week.

In respondent segments the most noticeable difference is between the sexes. Women use more varied forms and tools of communication, but in case of some higher priced means generally men are early adopters. In terms of education there were significantly less differences, but it can be said that the more educated use a wider spectrum of modes and instruments. Analysis from the position taken in company show that only a few differences can be seen. Generally speaking, the lower-level level employees use bigger variety of tools to communicate. The rest of the analysis did not show significant differences.

Among the respondents the awareness of the teachers' group in forms and means of communication is significantly higher than among the others. The use these means in different spaces (work, private, etc) is both higher than the use of others, and the spectrum is wider too.

Testing latent variables clarify that with minor differences in both test target groups (private sector, public education) in all communications arena personal conversations, e-mailing and phone calls are the crucial method, while the primary orality, a desktop computer and phone (mostly traditional version) are the tools most often used. Between the two spheres there are a number of minor differences that can be revealed, but in whole they do not affect the high degree of similarity.

4. CONCLUSIONS AND FURTHER DEVELOPMENTS

Formulated from the view of micro-content, based on the results of the needs assessment study, a management client-side software development system is to be developed which can simply and easily create micro-content, utilizing the capabilities of smart phones with multimedia (images, text, audio and video). Formulated from the view of the client-side framework, the use of Android mobile phone operating system is preferred. The m-learning framework has been in the construction phase and will be able to manage the following activities:

- Centralized knowledge element production
- Sequential mobile phone reaching
- Feedback between users and content producers
- Sending push notification messages (e.g. when new content is embedded into the system)
- Personalized check-in
- Statistics on activity and result accountability

In order to develop the tasks above during the planning process we set a complex independent relationship graph which is shown in the following figure. The first demo of the m-learning system is based on this.

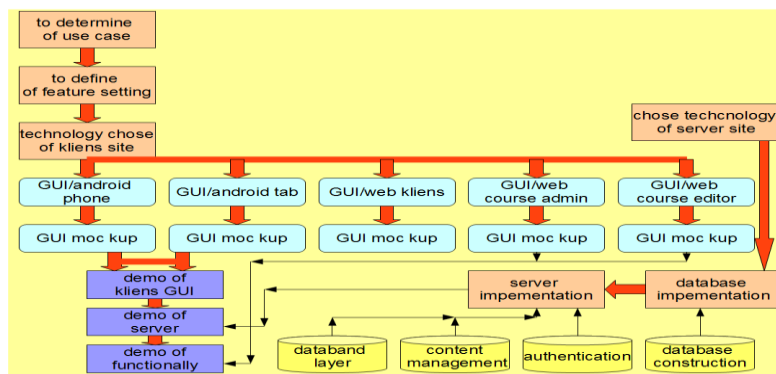


Figure 2. Server-side client dependency graph. Source: own figure

The following figure shows the client-side interface on Xamarin surface running a simulation.



Figure 3. Client-side user interface development environment. Source: own figure

The results of the research disseminated bring plans which include further development of the clear predictions of correct and preferred ICT-based learning programs.

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