Challenges and Opportunities in Virtual and Electronic Learning Environments

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Abstract—: The influence of accelerated technical and economic progress in the ICT (Informational and Communicational Technologies) supported world of atypical teaching and learning methods, as well as the learning environments, has been rapidly developing recently. At the same time, students’ roles and their characteristic way of life can mainly be followed by different controlling and assessing systems. The author has brought ICT-based methodic opportunities and technical supports that are inherited in electronic learning environment into focus in this study, considering the solutions employed for the conveying, practising and controlling of new information and knowledge. In the era of educational systems, which seem to be reformed on a daily basis, besides educational and teaching functions, one should pay increasing attention to the results of students and graduates. The reason is that this determines the opportunities they will have to continue their studies or their chances of establishing themselves in a job. The results obtained are naturally not only issue in the learning environment or teaching methods, but they can firmly be influenced by numerous different factors like learning habits, ways of learning, and attitudes.

I. INTRODUCTION

Taking teaching-learning aspects into consideration, the following trends may be determined in the latest national and international practice in the field of the ICT support.

On account of Internet-penetration, network access is ensured for almost all users. One can hardly speak about a gap, above all internationally. Thanks to this, the greater part of newly developed trends is built on network access, such as web 2.0 services. Concerning ICT device parks, the development of mobile-communication devices and their usage is an increasingly common practice. The presence and application of integrated, complex ICT-devices and systems in everyday life and the process of learning is also becoming more and more common. Regarding the generations of ICT, the main trend tends towards making the existing generations more perfect, in spite of introduction of newer generation inventions. Concerning the contents of web 2.0, it is becoming an approved practice that programming knowledge is not necessary for the handling of single portals. The spread of simpler and application-friendlier CMS (Content Management System) systems can be seen instead. Among these frame-systems the LMS, CMS and LCMS are widely applied. The LMS (Learning Management System) is a software-pack which can be applied to the information support and performance of teaching-training programs and courses, the organic handling of courses and students, and in the support of the entire teaching process. LCMS (Learning Management System) systems are able to provide further support to the collocation of the curriculum and themes, as well as in the progress of e-learning-based, interactive and multimedia courses. The CMS (Content Management System) is a system which is responsible for operating contents. It was developed in parallel with the PHP, and its organizing base is the application of PHP and SQL engines. Its benefit can be found in its simplicity. Even users who have neither the appropriate level of technical qualification, nor programming learning are able to edit websites and assorted electronic and web-based publications. While using these frame-systems, they can be personalized, modified, amplified and structured [1] [2].

II. CHALLENGES AND OPPORTUNITIES

In recent times the support of information technology has displayed a trend where one does not need to have any kind of programming knowledge in order to start online or operate electronic systems. In Hungary the CMS system is the most widespread: Drupal – http://drupal.hu, Joomla – http://joomla.org.hu, Moodle – http://moodle.org, Wordpress – http://word-press.hu, or Olat – www.olat.org. Major grouping of them is based on as below:

• Those which are open source or for which a royalty is payable
• Those which can be written in a different programming language (php/.NET asp)
• Simple or modularly - organized frame systems, which can be enhanced by the addition of further functional modules and plug-ins
• Corresponding to EU practice, the protocols and frame systems depicted in the next illustration have been introduced and applied to the web 2.0 model. In this way it can be seen that beyond content management systems (CMS), the management of web 2.0-contents is encouraged by a special content creating tool (CCT). On the other hand, a supporting system (SMS) has appeared which is able to support students’ activities in addition to the learning management systems. Finally, a financial-accounting system has been created for the performance of administrative and statistical tasks, especially dealing with these.

• More and more ICT-based solutions have appeared, with the emphasis on learning environments, as well as in communal and collaborative engines (ELGG – Engine of Legal/Open source community portal engine).
In addition to real, traditional educational stages, the micro and mezolevel application of virtual classrooms and learning environments, supported by atypical learning forms, are increasingly frequent. Such systems are, for example, a ‘second life’, where you can study by the avatars, or the ‘ning’ system, which allows you to reach a classroom online.

The amount of information which determines the foundation stone of a society has reached such a high level, causing such an information (over-)load for society that it is preferable for it to be shown in pictures, in illustrative forms (info graphics), which are more conducive to its comprehension and assimilation [3] [9]. The number of first-generation web services, web 1.0s accessible in the world, is continually decreasing. On the contrary, the number of web 2.0 portals, which are capable of ensuring a common editing of content – i.e. interactively – is significantly increasing. The following list describes the general features of the web 1.0 tool system:

- Content services: textual, pictorial (photos, drawings, graphs), video (audio-video) contents
- Contents found on IT Media/Storage (CD-enclosures, USB drives, DVDs)
- Internet (web)-based content access: hyperlinks, HTML 4.0, HTML 5.0, placed on static webpages. The features of 2.0 tool system:
- Web 2.0 is a kind of IT-medium, in which users arrange and operate the contents collectively
- Only the IT frame systems are ensured by the host of the portal, restrictions on the content are avoided
- It features organization ‘from below’ upwards (from the user ‘upwards’ towards groups, for example blogpages, forums)
- It is characterized by service-approach and service-progress
- The handling of Personal particulars is relative: it has data-protecting anomalies, as users’ business, public and personal data might become known
- Web 2.0 services, which are being used even today and are becoming essential in individual study, can be seen on the list of webpages containing the 100 most popular web 2.0 applications below:
  - Twitter (microblog tool)
  - YouTube (video hub)
  - Google Documents (office group-work tool)
  - Delicious (common book-marker tool)
  - SlideShare (demo host)
  - Skype (instant messaging/VoIP)
  - Google Reader (RSS/feed reader)
  - Wordpress (blog tool)
  - Facebook (network of acquaintances)
  - Moodle (LMS system)
  - Prezi (Application/Presentation Software)
  - Google (web-kind searching system)
  - Video, streaming, podcast, animation

After the second-generation web portals, let me also mention the web 3.0 family. This notion is not of recent origin, inspite of the fact that not all the functions of the second generation are yet known. The web 3.0 generation provides the combination of content, commerce, community and context with personalization and vertical search. The phenomenon can be described by the simple formula: Web 3.0 = (4C + P + VS). The division of our age into digital generations also characterizes the relation of a given group to learning, changes and the ICT. On the basis of the literature and empirical research the new mobile, and tool systems of electronic learning environments comprises the following:

- Communities, organizing communities: Iwiw, facebook, hi5, myspace, linkedIn, google+, ning, moly
- Online learning environments: Moodle, Olat, Ilias, Mahara
- Blogs, microblogs: blogger, inda,wordpress, twitter, csacsa, netvibes
- Cooperative, collaborative, social hubs
- Pictures, picture-sharing, infographics: youtube, video
- Presentations, concept maps
- Document editing and sharing
- Geo-local information and services
- Virtual environments

The tool systems and the environments listed above are always present, surrounding the individual and providing him or her with informal encouragement in the world of cognition, synchronically or asynchronically. With an empirical questionnaire survey the author investigated how the young graduate generations (X and Y generations), between the ages of 18-22 relate to electronic learning forms, which dispense with personal presence. Out of 18 standard questions 75 % of the 36 subjects marked 14 or more answers. This means these respondents would take part in this kind of course with success. The graph below shows a webinar service appearing in a Moodle-system, which – above and beyond the common work – allows oral exams, instant messaging (through a chat channel), the editing of common contents, and the online usage of audiovisional channels and fixing of activities – so this is a good example of synchronic digital communication in groups (See Figure 2.) [4] [5].
E-portfolio support system

Portfolio is a word of Italian origin meaning a dossier or folder of documents, or an expert’s dossier, or in more prosaic terms it refers to a collection of a student’s work. Many definitions have been proposed, the one used here is that cited by Iván Falus and Magdolna Kimmel: “The portfolio is a purposeful, systematic collection of works completed by a student on one or more courses”. It has two objectives: on the one hand it is for assessment purposes, on the other hand to aid in learning [6].

In 2009, the BME Department of Technical Education and the BME Institute for Applied Pedagogy and Psychology (APPI), recognising the difficulties of implementing a traditional portfolio system drawing on experience garnered from the final examinations of the first graduating year, while bearing in mind environmental protection, and the growing power of electronic forms of learning, introduced an electronic portfolio framework employing the Mahara electronic environment integrated into the Moodle system, which has been in use since 2006. The applications of an electronic learning environment and computer based learning have become widespread in Hungarian higher education [7].

The e-portfolio, that is, an electronically-based portfolio, aims to face the challenges of the constantly and rapidly evolving ICT environment and fulfill the learning needs of the digitally savvy “generation Z” as well as the need to optimize the process of gathering work for assessment. The e-portfolio is especially suitable for the following tasks:

- Management of multifaceted complex dossiers
- Handling large quantities of documents in a single system
- Continuous preparation and monitoring (by mentor teachers)
- Gaining experience in the use of current technology-centered theories of learning
- Excellent ICT support

The Mahara system can be directly accessed at the http://e-portfolio.appi.bme.hu/. It can also be reached through the Moodle system via a link in the bottom right hand corner of the page (See Figure 3.). The figure below shows the main options page (“dashboard”) after logging on:

Using this interface is relatively simple for users, and the “drag and drop” technique can be used to edit the user profiles. Uploading files and blog posts is also straightforward, by means of the browser function and text box editing (See Figure 3.).

The e-portfolio system facilitates the creation of community forums and groups, and it even has an instant messaging function. Employing this model, for example, the BME Department of Technical Education established a group for mentor teachers and students pursuing engineering teacher training, for which all participants had to register and create their own profiles. The members of the groups could thus directly contact each
other through the system, as well as the mentor teacher and a maximum of 4-5 trainee teachers assigned to them. The interface also facilitated the tracking, monitoring and evaluation of work added to the portfolios over the course of the semester.

The uploading of documents takes place by means of the file management interface on the first page of the site. Trainee teachers belonging to the group are able to edit the folders containing work they have already uploaded, which they can then share to make them accessible to university students and mentor teachers. The structure of the portfolio, in accordance with the theoretical elements of the relevant legislation, is organized into 3 main folders. A student’s e-portfolio created in this way is shown in the following screen capture image (See Figure 4.).

![Figure 4. A Trainee Teacher’s portfolio in Mahara, source: own photo](image)

### III. CONCLUSIONS

On the basis of tertiary education practice and experience, not only the concrete application or programme, but also the function emerges as an essential element in the new, ICT supported electronic world. It is characteristic of these that instead of the whole tool-system, rather just basic functions appear independently of age, but at the same time on the basis of digital ‘immigrants’ or ‘natives’. Besides the criterion of these fields is that they do not necessarily have pragmatically formed the rules (for example facebook, slideshare, pinterest, linkedIn) [8].

In relation to learning support in formal learning environments, it can be ascertained empirically on the basis of the surveys which show that time spent with relatively little revision in a formal system can lead to positive results; however, with respect to functions on offer which encourage learning, a kind of indifference is dominant among young students. Concerning informal learning environments, a very great number of learning opportunities is provided; we only need to make the relevant narrowing-down and find a healthy balance between the virtual and real learning environments. According to the study, even the Y and Z generations of digital natives cannot handle and adopt multi-tasking learning forms. Among the dangers, that can be found is the increasing convenience of learning and a good supply of smart-phones in the Z generation, the constant usage of social networking. Communications in the 21st century.

The effectiveness of teaching methods which can be used in virtual environments lies in the fact that, detached from real world, one can make better use of one's abilities, and dare to do this in a virtual environment. At the same time, due to its special characteristics and origins in the world of gaming, it is extremely motivating for the students. However, joining in a course of this kind demands more intense and constant attention from lecturers as well as from students [11].

### REFERENCES


