

Extension of Networked Learning Modes in Higher Education

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Introduction

Mainstream teaching/learning environments have dramatically changed, that is characterized by the contemporary term of atypical learning modes. The learning environment connected to these learning modes heavily relies on ICT supported technologies.

The paper discusses new theories of learning realizing knowledge generation coming into formation as a result of technical integration, networking, atypical learning modes, being a long way from knowledge transmission. Author primarily focuses on the significance of technology-based connectivism in the perspective of higher education experiences, where learning occurs by means of social interactions, by means of learning communities (cooperation, collaboration) being networked.

Description

One of the basic conditions of technology-based learning, networking, the formation of knowledge networks is the appropriate level of digital literacy of those wishing to learn, which as the most important key competence of adult learners (higher education students) should be highlighted by state, social and educational institutions as well providing the frames of formal and non-formal education and training.¹¹³

On the part of teachers and lecturers in addition to digital literacy the improvement of ICT competence is essential for applying networked, interactive learning modes. It is understandable if we take into consideration the social media applications favoured by Y and Z generations, such as blogs, twitter, facebook, hi5. These non-formal applications, learning networks are increasingly usable, connectable to formal learning environments. Of course first it is essential to understand the functions of social media, the limitations of their application, users' needs, adaptation possibilities before introducing a new methodological culture including social media applications into the formal learning environments.¹¹⁴

Various networks are used today at macro, mezzo- and micro level as well. At macro level it can be a traffic network topology, a social network, at mezzo

¹¹³ Borsi Árpád: Digitális Írástudás a felnőttképzési jogszabályokban és a mindennapokban, In: Felnőttképzés IX. évfolyam, 2011/2.

¹¹⁴ Petra Newrly, Tony Toole, Simona Pede, Lara Marcellin: Digitális A munkába állás előtti tanárképzés – e-portfólió mellett és ellen szóló érvek, In: Felnőttképzés IX. évfolyam, 2011/2.

level it can be each member of this knowledge network who connect through the neural network of the human brain (by means of 10^{18} neuron connection points) to the mezzo- then the macro level networks. The point of networked information exchange, that is the operation of knowledge networks, is the fact that each tiny terminus connects a new knowledge network to the already existing one.

The mathematical model of the description of network structures has long been available, e.g. the Erdős-Rényi model came into being in the 60s. This model was used for the description of the random networks, consisting of nodes and connecting wires, and was characterized by means of Poisson distribution. The BACON game was based on such an algorithm, which was mainly popular in the USA.

In the sense of the recent research work and in accordance with Albert-László Barabási it is only possible to understand the operation of complicated networks by means of structures implying the interpretation of complex systems, which needs the preparation of maps. All this needs a paradigm shift in human thinking to be able to interpret the available data bases appropriately. These complex systems mean more than the behaviour of one network. Such a system can be the human brain or an economic system or the system of learning processes. Furthermore, the given complex system changes over time, and we need to understand how it changes. The measurement, examination of human behaviour patterns, learning modes can help with understanding. This involves the measurement of human movements and learning spaces. The examination of ICT tools, social webpages, electronic learning environments can contribute to it. These complex systems can be modelled as scale independent networks – such are the worldwide web and the learning network – whose precise measurement can be performed by means of ICT tools, only needing modern theories. The definition of these theories is our task today. This is the science of the future, and the paper means to help this model by presenting the ICT environment and student behaviour patterns.¹¹⁵

The constructivist approach to learning includes in a hidden form the networked character, e.g. the iwiw social webpage. By the common using of content by means of networks the characteristics of the new constructivist approach can be got to known, whose example might be the facebook portal. Several such media applications are available as shown in the following figure.

¹¹⁵ György Molnár - András Benedek: The empirical analysis of a web 2.0-based learning platform, In: Constantin Paleologu, Constandinos Mavromoustakis, Marius Minea (ed.): ICCGI 2011, The Sixth International Multi-Conference on Computing in the Global Information Technology, Luxembourg, June 19-24, 2011., ISBN: 978-1-61208-008-6, pp. 56-62.

Social Media Landscape



1 Figure 1: Social media applications. Source: <http://www.flickr.com/photos/fredcavazza/2564571564/>

The Moodle system introduced in 2006 at the Department of Technical Education, Budapest University of Technology and Economics can be considered a formal social network, which has significant results both in the field of learning management (LMS) and content management (CMS) according to national and international special literature and statistics. The system provides the possibility of teacher-student communication, the measurement of activity, the operation of social forums, measurement and evaluation of performance in an electronic environment in addition to access to downloadable instructional material. The behaviour of almost 3,500 students of the system noticeable in the Moodle learning management system can be monitored by means of different statistical measurements. One of them is the built-in statistical measurement system of Moodle, which can monitor all students' activities and differentiated students' activities. The system provides detailed report of the statistical data of the student activity of those using the system. The following figure shows the activity tendency of three years, red colour showing students' activity. It is noticeable that the maximal amplitude was to be found during the periods of testing such as assignments were due or written tests were due. (See Figure 2.)

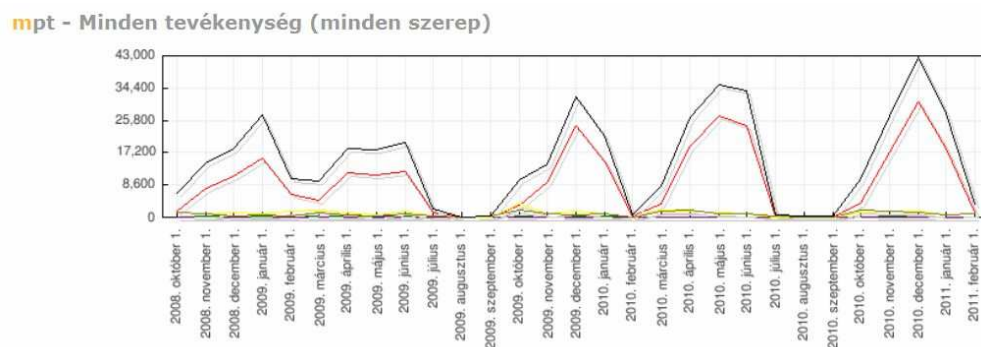


Figure 2: The activities of the Moodle platform of the Department of Technical Pedagogy. Source: Own diagram

The other such means of measurement was the Google analytics system, which used for the Moodle courses can also provide useful, informative statistical data, as the following figures show (See Figures 3 and 4.) of a selected course (Digital Pedagogy).

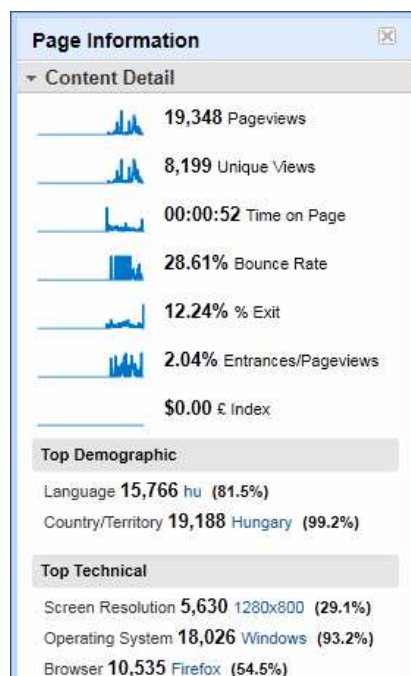


Figure 3 The activity of the participants of Digital Pedagogy course. Source: Own diagram

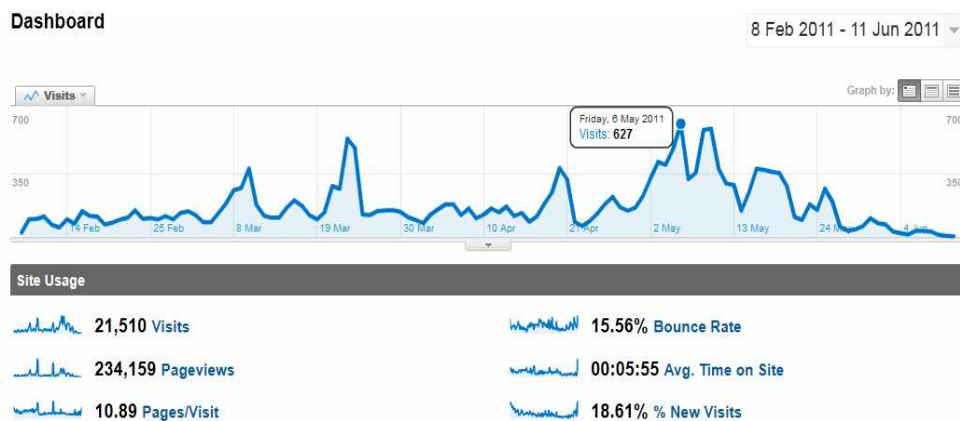


Figure 4. Student activity of the Digital Pedagogy course measured by google analytics tools Source: own diagram

Conclusion, the future

A significant student attitude, learning process noticeable in higher education is the fact that students fail to use a great part of the services, such as chatting and blogging communication channels, provided by the electronic learning environment (Moodle) to be considered as a formal system, during the learning process or measurement and evaluation, however, these services are provided. They fail to use them, although they tend to use this type of services of informal social media, such as chat module, walls daily, furthermore hourly, e.g. in case of facebook, whose content can also relate to learning. These networked informal learning processes in most cases occur inside an open or closed group in relationship to a given course.¹¹⁶

The tools and the student activity described in the paper help us understand the scale-independent networks, which can result in our understanding the behavioural patterns of the learners' society. This can orient us towards the future routes of educational development. By means of educational development a new learning model could be formed to be adapted in the new learning environment, based on the structure of networks and taking into consideration learners' characteristics as well.

Today the so called virtual networks, such as the Second Life or Virca 3D environment are well-known. The latter, an interactive virtual environment for collaborative manipulation of robots, is a Hungarian technological development making possible operations at a distance. (See Figures 5 and 6)

¹¹⁶ András Benedek - György Molnár, János Horváth Cz. (2010): Moodle-based E-portfolio used in teacher training. (In: Sixth EDEN Research Workshop, User Generated Content Assessment in Learning. Enchancing



Figure 5: Virtual Second Life space. Source: own photo



Figure 6: The 3 D space of VIRCA.

Source: <http://www.youtube.com/watch?v=aZ4ZTT0iNyE>, downloaded 04.07.2011.

Literature

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