

**THESIS OF DOCTORAL (PHD) DISSERTATION**

**INTERNET USE AND INTERNET-BASED LEARNING  
ACTIVITIES OF STUDENTS OF PEDAGOGY AT THE  
FACULTY OF CHILD AND ADULT EDUCATION AT THE  
UNIVERSITY OF DEBRECEN**

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## **The objective of the thesis, topic definition**

Electronic learning environments, network-based forms of learning have increasingly manifested themselves as elements of teaching practice – not only the developments in technology and related content show significant growth, but scientific analyses more and more often examine the phenomenon of e-learning. The significance of electronic forms of learning is expected to increase; in certain situations they might even replace traditional teaching methods.

The aim of our thesis is to examine the experience and attitudes of the students at the Faculty of Child and Adult Education, who already belong to the so-called net generation (Tapscott), thereby providing a solid empirical foundation for optimizing electronic learning environments. In order that we receive a more accurate interpretation of the results, it was inevitable to examine the data collected from faculty members as well as the datalines retrieved from the servers of the faculty. We hope our findings will facilitate to develop the practical application of up-to-date e-learning systems not only at the faculty under investigation but also at other faculties of the University of Debrecen, and that they will provide more general experience as well. In order to achieve the objective of the thesis the relevant literature on the conceptual and theoretical foundation for this practice had to be surveyed. Special attention has been paid to clarify the technical terms which often overlap one another or are inaccurately used in the literature.

The population under survey was made up of students studying in three Bachelor level majors (kindergarten pedagogy, social pedagogy and andragogy) at the Faculty of Child and Adult Education at the University of Debrecen in two programmes (full time and correspondence), as well as members of staff.

The faculty has several interesting, relevant peculiarities from the point of view of our survey. On the one hand, it is an institution of teacher training, though it does not train teachers but kindergarten teachers, social pedagogy experts and andragogists dealing with adult education and learning. Thus the institution embraces a major segment of the less mainstream activities of pedagogy. On the other hand, the faculty does not yet utilize the opportunities offered by electronic frameworks (e.g. Moodle). As a consequence, the vast majority of the students surveyed are unaffected by formal, web-based teaching and learning processes. These two factors create a special field for research. In Hungary there are several 'small' faculties and 'small' institutions which have very similar features to

those of the Faculty of Child and Adult Education. Concentrating more intensively on modern information technology solutions could be a breaking point, a means of survival for these institutions at the time of the economic crisis, which coincides with the abrupt development and spread of infocommunication technologies. International trends also clearly indicate that quality training, quality higher education, regardless of the size of the institution, become hard to imagine without the development and constant improvement of e-learning environments. In order to manage the technology-based teaching-learning methods it is essential that the prior cognitive and affective factors of both students and instructors be revealed.

In the theoretical chapters of the thesis the basic concepts and their specialised meanings are discussed both from a pedagogical perspective (e.g. Computer Managed Instruction, Computer Assisted/Aided Instruction, Computer Based Instruction, Computer Aided Learning, Web Based Learning, Network Based Learning, Technology Based Training, m-learning, e-learning 1.0, e-learning 1.3, e-learning 2.0 etc.), and from a technological perspective (e.g. hypertext, hypermedia, internet, web 1.0, web 1.5, web 2.0, web 3.0, computer, terminal etc.). When analyzing the device-centric methodologies from a theoretical perspective, a paradigm shift in the theory of teaching from instruction to learning could clearly be traced, also in the so called Bathory approach from learning in a narrow sense of the word (attention and memory) to learning in a wide sense of the word (definite activation of other psychic functions [e.g. imagination, emotions]).

Through theoretical-historical and semantic analyses we managed to formulate a possible wide sense model of e-learning. The development of the model is especially justified by the inconsistent use of terminology in literature.

In our model the concept of a computer is used the way Turing and Neumann used it, thus it became clear that e-learning is a broader category than computer assisted instruction-learning (e.g. an e-book reader can be an e-learning tool though it does not meet the requirements for a computer). The network-based forms of learning are also special cases or segments of e-learning (and web-based learning can only be a subset of the above). At the same time the broad framework of Technology Based Training, which, in our interpretation, incorporates at least second generation tools of Schramm's learning tool typology, includes e-learning. All the above categories have or could have overlaps with first generation learning tools (such as blended forms) as well as with distance learning. In

this frame of interpretation it is obvious that we have discarded the theoretical models which consider e-learning as a special form of distant learning.

A thorough examination of the changes in technology was inevitable as recent years (e.g. success story of web 2.0, introduction of web 3.0) and even recent months (e.g. tablets, Kinect) have seen significant changes, all of which influence e-learning management. The processes are discussed within the modern interpretation framework of learning (e.g. informal learning, constructivism and connectivism), while the generation aspects of the population surveyed were also investigated.

### **Methods applied**

The research consists of three complimentary empirical methods conducted among the students and instructors of the faculty. We used questionnaires to reveal the opinions of students and staff, and analysed their actual web activities with the help of webmining methods. The investigation of students was conducted between January and March 2010, while that of staff was carried out in September 2010.

The students were interviewed with the help of a 70 item self-report questionnaire. The sample contained 363 students. The questionnaire focused on six major areas:

- basic demographic data
- previous IT experience and studies
- general use of computer (excluding internet)
- general use of internet
- academic use of internet
- experience in and attitudes to electronic (primarily internet-based) study environments

The questionnaire based survey was supplemented by the examination of web logs of students living in dormitories. Webmining was conducted for four weeks (one week exam period, three weeks during the term), and in several cases it helped clarify the data received from the questionnaires.

This basic series of examination was followed by a 40 item questionnaire targeting faculty in September 2010. Thus instructor attitudes and behaviours influencing students' behaviour were also analysed even if it meant only a small sample. Out of the 39 instructors

questioned only 20 filled in the questionnaires. Despite the low figure we could gain relevant information about the determining segment of the population.

The instructor questionnaire consisted of 40 items scattered around the following areas:

- the instructor's general use of computer and internet
- the role of computer and that of internet in the instructor's teaching and scientific activity
- experience in and attitudes to electronic environments, frameworks and distant learning
- experience related to students' learning habits and their use of computer

The hypotheses of the thesis in line with the material gained from processing relevant literature and also in line with the author's teaching experience are as follows:

1. Traditional sociological background variables (e.g. place of living, education of parents) do not show significant correlation with the use of the internet in our specific target group. Previously there had been no such research at the faculty, thus making it clear will lay the foundations of the current survey and those of future research.
2. The vast majority of students use the internet for keeping contact and finding entertainment. They emphasise the significant length of time they use the internet for academic purposes, but in reality the rate of this time is negligible.
3. Of the devices of web 2.0 social webpages are absolutely dominant, while beside these other options are present at a minimum rate.
4. The duration and frequency of the use of internet do not correlate profoundly with academic results, as students do not exploit the learning potentials of the internet.
5. Despite the recognition of the learning potentials students are unfamiliar with the professional webpages.
6. Students are averse to electronic learning environments. They reject the connection of the internet, which primarily means entertainment to them, and learning; their attitudes are negative in this respect.

From among the descriptive statistical methods frequency and mean calculations, as well as the major dispersion calculation methods (range, interquartile, standard deviation, co-efficient of variation) have been used. From among the statistical tests and comparative statistical procedures primarily linear correlation calculation, regression calculation, Chi

square statistics, variance analysis, discriminant analysis and cluster analysis have helped our research.

When processing the data of the questionnaires we used SPSS 13.0 for Windows and Microsoft Office Excel 2003, which, for the purposes of webmining, was supplemented by Microsoft Office Access 2003 (mainly in the form of SQL queries). Preliminary data cleaning was implemented by a program written in Borland C++ deliberately for our research.

114 frequency and contingency tables and 35 diagrams help to provide a visual overview of the three test results.

Our series of investigation is in line with the increasingly wide range of Hungarian internet research (e.g. studies by Csepeli György – Prazsák Gergő 2008-2010, Molnár Gyöngyvér – R. Tóth Krisztina 2009, Fehér Péter – Hornyák Judit 2010, etc) both in the complexity of the topic and in its methodology.

### **Results of the thesis**

The datalines of the tests have verified our prior assumptions in several cases, they also tinged and enriched our assumptions in the hypotheses at some points, as well as they yielded some unexpected but remarkable results.

The first hypothesis says that in the second decade of the 21st century we can give up the idea that the main variables of family and social background (place of residence, parents' level of education, financial status, type of secondary school) substantially influence students' (students of the faculty in our case) home internet access and use. This is clearly shown in the answers of the questionnaire. The absolute majority of the students have a computer and access to the internet at home (regardless of their social variables), the remaining small minority also has access to the world wide web at their temporary residence. The duration of internet use shows no correlation to other variables, however, the internal structure of internet use and the use of certain sites show age and, to a lesser extent, gender characteristics. At the same time the effects of other variables are minimally detectable (e.g. the mother's level of education correlates significantly with three, that of the father correlates with one internet application, whereas age correlates with eleven applications, and also the intensity of correlation is more marked). On the basis of the above it can be stated that the general purpose use of the internet among the youth surveyed

depends on their own individual decisions, and the impact of other social variables is of less importance.

The assumption that students consider the internet as a modern means of keeping contact (Hypothesis 2) was also verified. Such applications are especially popular with younger students. Not surprisingly, according to the attitude scales students are less afraid of the isolating effects of the internet than the instructors who are not registered on social sites. Students acknowledge and appreciate the learning potential of the internet, they also emphasize this potential, but when it comes to using the internet this can hardly be seen, and they mainly use internet for keeping contact (social sites, instant messaging, etc.) and for entertainment.

The average daily internet use of somewhat more than two hours already anticipates that the majority does not live such an internet-centric life as it is assumed of 'modern students'. The 'netgeneration' of students is surprisingly ignorant of the internet world, their internet use means only a few applications. (Hypothesis 3): of web 2.0 tools social sites are predominant, even video file sharing or the Wikipedia are not generally used. Other web 2.0 applications (like microblogging) are negligible because of their low level use by the students surveyed. The active, content-providing attitude – other than editing social networking profiles - is characteristic of a very small minority of students.

Our assumption that internet use does not correlate significantly with academic results (Hypothesis 4) has also been verified by the questionnaires. A rather negative correlation might be traced when considering the duration of internet use (those using the net longer have weaker results). The lack of correlation can presumably be contributed to the fact that students use the internet basically for keeping contact and having fun, while for academic purposes only to a minimal extent. Although the questionnaires showed a different result with regard to this (students acknowledge the role of the internet in learning, they also assert that they use it extensively etc.) but later weblog analyses show hardly any sign of this. All these point out that students are not motivated to use the internet for academic purposes, which is the responsibility of all of us. First, the colourful, lively, easily accessible world of the internet which offers more exciting opportunities than learning is distracting in itself. Second, the instructors do not build upon internet-assisted learning. Third, the faculty does not rely on electronic framework options either. Fourth, students, due to the lack of their knowledge of the internet, do not really exploit the learning potentials of the net, and fifth, using the internet for learning purposes requires more

independence of students, for which the traditional school system does not prepare them. All these factors might contribute to the fact that using the internet for learning is hardly detectable among students. This is slightly similar to the syndrome called 'false activity' in education theory literature but this time in a digital context: the majority of students claim to use the internet for learning purposes while they basically use it for other purposes.

Students primarily use Google's search engine for learning purposes (Hypothesis 5), according to the questionnaires as well, beside the 'compulsory' Neptun system and faculty web pages, but even then the main aim is to reach the Neptun system or to look at pictures. We hardly found any sign of using magnetic pages. Reality has proved worse than our prior expectations (concerning Google's search engine and Wikipedia): even Wikipedia is not extremely popular with students, other sites are rarely mentioned in their answers, neither are they present in the weblog analyses.

Students have hardly any experience in web-based learning, and they do not intend to acquire any either: they have strong aversion to such forms of learning. They consider the internet basically as fun, for this reason they are negative concerning electronic forms of learning (Hypothesis 6). Those who have already had real experience are not too enthusiastic either, but their more positive attitude was measurable. So there is hardly any trace of the openness assumed of the netgeneration.

On the other hand, instructors seem to be the other extreme: their internet use is centred upon their job, they afford less fun, fewer informal contacts than students. They are distrustful of the professional materials available on the internet except when they feel they can control them. In spite of all this, they are slightly more open to electronic forms of learning than students. It is remarkable how low level their self-confidence is concerning IT, they feel that students are way ahead of them.

One of the most important results of the research for the given faculty and for other academic units with similar conditions is that students and instructors alike show reluctance to use internet-based forms of training. It should be emphasized, though, that openness to use the internet is not age-related, however, there are well noticeable differences in the applications used. It could often be observed that younger and/or full time students showed a more negative attitude to modern solutions than those of the older generation. So we should not assume that it is the 'old' and the 'conservatives' who hinder innovation. Prensky's dichotomy of 'digital natives' and 'digital immigrants' has quickly become popular, but it is far from describing the diverse attitudes to IT. Aversion, independent of

age, can easily be eliminated by increasing the level of competence. On the basis of the tests formal IT education at schools seems to have an important role in the life of students, however, the traditional, prior-to-web concepts (the overuse of office applications) have to be abandoned: internet related knowledge has to be put into the foreground. It has also become clear that students entering higher education need to be monitored continuously. Without the accurate knowledge of their prior skills, experience, and attitudes it is impossible to create an efficient electronic learning environment.

Comparing the results of the questionnaires and those of webmining it proved true that students are secretive in certain areas: (e.g. in their responses to the questions they neglect web contents which mismatch their concept of students' role, whereas these sites can be particularly popular according to their attendance), or students can perceive processes incorrectly (e.g. time spent on web pages visited for learning purposes). To sum up, we can say that students try to create a youthful (e.g. use of social networking sites) but modest picture of themselves in their answers to our questions while they show a strong aversion to incorporating the internet into formal education. On the other hand, the webmining database unfolds a different picture of students, who care less for learning, who are less familiar with modern web applications, but who are more open to various web contents (not related to learning). Instructors, meanwhile, tend to think of students as young people who are susceptible to internet-related learning, and who feel comfortable on the web but in many ways are at risk (especially full time students, e.g. excessive use of the internet, impairment of social relationships, somatic and physical problems, deterioration of verbal communication). On the basis of this we can say that by using both the questionnaire method and webmining we can get a more accurate picture of the real conditions than we would if we used only one or the other method in isolation. It is advisable to keep this in mind in future studies.

Computerisation has accelerated at an unbelievable rate, and it will become even more intensive in the following years and decades. This accelerated pace is difficult to follow not only for the elderly but more and more for the younger generation as well – the 'handicaps' of the students surveyed are harmful proofs of this fact. Whether they like it or not, concepts of web-based learning have to bear this in mind: theoreticians and practitioners of e-learning have to start from the real generation attributes, otherwise the digital revolution will not be less harmless than any other forced transformation. In a quickly changing, more and more computerised world it is still important that study

management should reflect upon students' abilities and attitudes, technological solutions should be incorporated into this environment.

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