

Maria BERNDT-SCHREIBER\*

## **BLENDED TEACHING AND LEARNING FOR GRADUATE STUDENTS**

### SHORT NOTE

Explorations of e-learning platforms in preparing the courseware for graduate students of medical physics and informatics is shortly described. Preliminary reflections and conclusions focused mainly on essential content building are presented.

#### 1. INTRODUCTION

Long–Life-Learning as an educational style for the future is a commonly accepted challenge nowadays. There are many efforts undertaken to develop and update various tools for providing effective distributions of teaching materials across the networking systems. The problems of e-learning platforms and authoring tools are hot topics in different aspects – both methodological, social and economical ones (comp.e.g.[1-5]). In a way technical problems prevail in the available publications on the subject. Much less literature may be found on the essential discussions concerning the contents. Below, some remarks on preliminary experience in using the e-learning platforms for teaching graduate students are reported - with the main attention being paid to the content essentials.

#### 2. THE CONTENT AND THE PLATFORMS

##### 2.1. CONTENT ESSENTIALS

The developed teaching materials are addressed to graduate students of medical physics and informatics, and cover the subject of signal and image processing on the one hand, and computer modelling of dynamical systems on the other hand. It should be noted that both subjects are especially suitable for multimedia computer aided on-line individual teaching and learning (which cannot be said of various other fields where hands-on experiments are needed during or prior to simulations). It is also worth noting that the graduate level of studies requires a specific attitude towards the students, in which the tests controlling the basic knowledge are not as important as the stimulating issues for individual discussions, assignments and projects.

---

\* Faculty of Mathematics and Computer Science, Nicolaus Copernicus University, Toruń, Poland  
berndt@mat.uni.torun.pl.

2.2. APPLIED PLATFORMS

The MOODLE platform as an Open Source environment has recently become very popular in Poland [6]. It appears quite useful to start with, but, unfortunately, the common opinion that it is all we need to begin e-learning and teaching procedures may be confusing, particularly when considering all the aspects of university level education. In our case the availability of the alternative TLM platform has been possible due to a collaboration with the designers of the Danish TLM based platform NETSTUDIER, involving mainly teachers to develop the content [7-9]. Part of the translation work for the TLM platform has been done within the Leonardo da Vinci EU supported project recently carried out at the Faculty of Mathematics and Computer Science of Nicolaus Copernicus University. It is worth to notice that comparing to the MOODLE environment the TLM platform provides in *extenso* all the assets necessary to design various teaching scenarios in a flexible way – immediately adaptable to different levels of student groups. It is a particularly useful feature both from the teacher’s and student’s points of views – excellent and unavoidable in the performance of all the updating and modifying procedures on-line. The TLM environment provides a digital library in which it is possible to place, build and rebuild digital learning content. E.g. for a particular group of teachers it is possible to search the content of the shared library to construct an appropriate course. Sample interfaces of both the applied environments are presented in Fig.1, below.

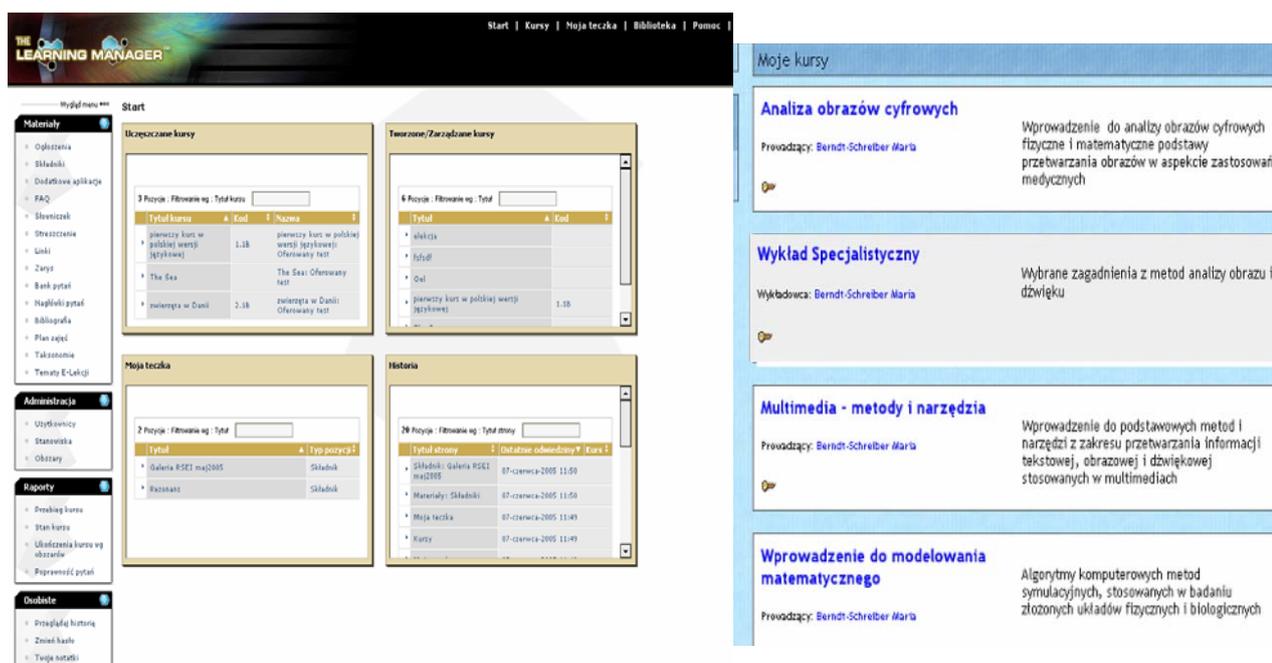


Fig. 1. Interfaces of TLM and MOODLE platforms, both available in the Polish versions

3. ADVANTAGES AND DISADVANTAGES

3.1. SHARING KNOWLEDGE AND AVOIDING PLAGIARISM

The availability of the teaching materials and submitted papers for all the students enrolled in a platform environment is essential for sharing knowledge. The checked experience is that it is much easier and more effective to discuss some case studies in such situations – focusing e.g. on the drawbacks and positive sides of the previous projects. On the other hand, paradoxically, the stored

resources open for the group also prevent from plagiarism - helping to recognize it and undertake appropriate strategies to avoid it in the future project designs.

### 3.2. INTERACTION AND COLLABORATION OF STUDENTS

For the new generation of students, growing up with computers, the new e-learning/ teaching approach is not a barrier and may be attractive in itself. Therefore, stimulating students to participate in the course design is very important and may often appear quite successful.

In my comparatively short experience in the field there are at least several examples of such successful co-operation results: e.g. an atlas of ophthalmology data, dynamic models of epidemics and a specific cancer therapy model elaborated in consultation with the local hospital staff. A sample educational database system interface is shown in Fig.2, below.

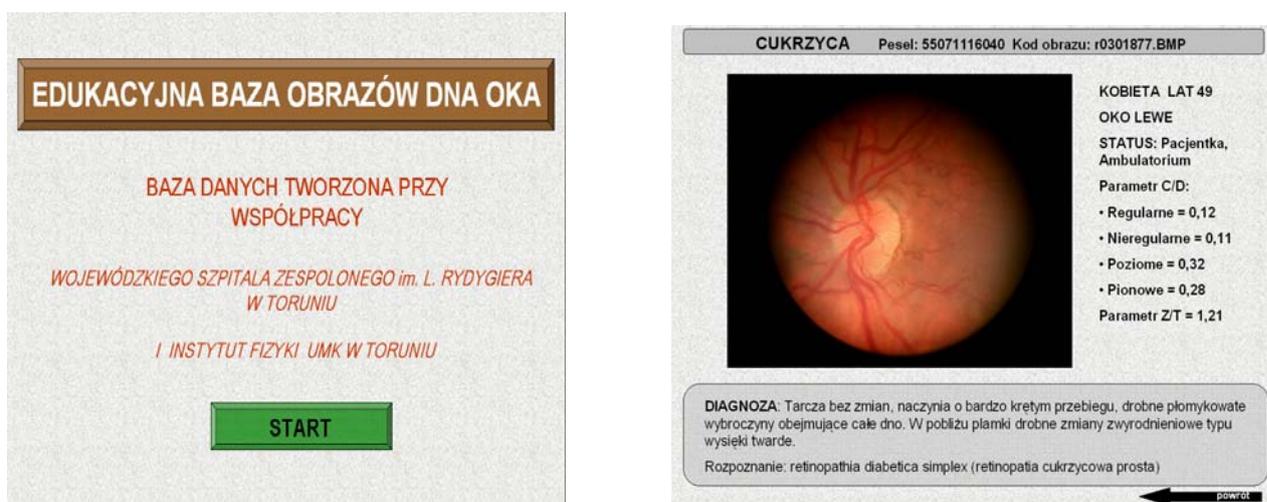


Fig. 2. Ophthalmology data collected in a hospital for educational purposes [10] – partly prepared as a student project

### 3.3. BARRIERS FOR THE TEACHERS

Contrary to the students attitudes, described above, for many university staff members in this country using the modern e-tools is still a new task, both tedious, time consuming, requiring systematic testing and monitoring feedbacks etc. Many of these problems are often unnoticed in the discussions focused mainly on the future financial profits of e-methods in education. It should be kept in mind that transforming the teaching procedures to e-platforms at the first stage always requires significant investments not only due to the needed purchases of software and hardware, but also, and sometimes first of all, due to necessary support for the teaching staff to be involved. It is indispensable for the qualified teachers to contribute to the content production and its methodical updating and modification during the confrontations with the students. The content can never be consistently created and maintained by even the best experts of e-tools alone.

## 4. CONCLUSIONS

When considering the methodology of content production for e-learning and teaching it is crucial to differentiate both the delivered subjects and the groups of students. Not all the subjects, covering e.g. natural science, are equally suitable for distance learning. There are some for which a prior experiment experience is absolutely fundamental. Eventually, blended methods, both the

distance and instructor guided ones, are the most reasonable in the teaching process. It is essential to support teachers in the content production and also to provide reliable tools of controlling the results. In particular, the teachers should have access to different types of platforms to follow the best approaches in their own designs, and there are not only the technical tools that matter in this respect – it is the creative proposal of the way to present and discuss a particular subject/problem for a given group of students. It is a common opinion that the best production results are achieved on platforms developed for years and regularly tested on-line by different groups of users (e.g. Cisco Academy Connection [11]). From the practical point of view it is advantageous to involve graduate students in the content creation – it works, both, as a positive feedback and monitoring.

### BIBLIOGRAPHY

- [1] PIECHA J Characteristics and Evaluation Procedure of e-Learning Units, *Journal of Medical Informatics and Technologies*, Vol.8, MD31-37, 2004
- [2] KRÓL R., OLSZEWSKI A., PIECHA J., Distance Learning Packages Organization and Distribution Principles, *Journal of Medical Informatics and Technologies* Vol.8, MD13-29, 2004.
- [3] AYUB M.N., VENUGOPAL S.T., NOR, N.F.M., Development of Multimedia Authoring Tool for Educational Material Dissemination, *Informatics in Education*, Vol. 4, pp. 5-18, 2005.
- [4] BRĘKIEWICZ A., JEŃDRZEJOWICZ J., NEUMANN J., SUSKI R., The application of XML for Developing Tools Used to Create Online Courses, *Pro Dialog*, Vol.18, pp.1-12, 2004 [in Polish].
- [5] KUSZEWSKI A., ŁAPIENKO K., Implementation of a Distance Learning System, *Pro Dialog*, Vol.17, pp.25-41,2004[in Polish].
- [6] MOODLE <http://moodle.org/>
- [7] ILSOEE B., The Danish Experience in the Distance Teaching XX Konferencja Informatyka w Szkole ( ed. M.M Sysło) pp 232-234, Wrocław, 2004 [ in Polish].
- [8] NETSTUDIER [www.netstudier.dk](http://www.netstudier.dk)
- [9] TLM [www.thelearningmanager.com](http://www.thelearningmanager.com)
- [10] ARLUKOWICZ M., BERNDT-SCHREIBER M., BIEGANOWSKI L., BROŹEK M., JAZOWIECKA A., KAŹMIERSKA H., KOWALCZYK A., MUTRYNOWSKA J., Digital Imaging in Ophthalmology and Data Base Management System Supporting Medical Diagnoses, *Acta Medica* Vol.2, 5-15, 2004
- [11] Cisco Academy Connection [www.cisco.com/netacad/](http://www.cisco.com/netacad/)