

THE PRACTICAL EXPERIENCE WITH TEACHING SUPPORTED BY COMPUTERS AND COMMUNICATION TECHNOLOGIES

J. Budik, O. Schlossberger

University of Finance and Administration (CZECH REPUBLIC)

Abstract

The aim of the contribution is to present our experience gained in teaching organized in such a way that all processes connected with teaching were supported by computers and communication technologies.

The authors characterize the results of their own pedagogical research, which was conducted with the idea of using a computer and available computer networks to get more active students, who will be involved in the teaching process. Moreover, they obtain immediate feedback about their knowledge and more information on the most recent development in their relevant field of interest.

The starting point for our research was an analysis of previously published studies of other authors, who were focused in a very detailed way on the various parts of the educational process; for instance, their attention was centred on the preparation of teaching content. However, they do not address the activation of students in the course of the study.

In contrast, the authors of the submitted contribution recommend that the whole process, i.e. from the preparation of training content to the final exam, is also about the promotion of active attitude of students who get the immediate feedback about the relevant topic and new knowledge. They were encouraged to actively participate in special student network and share their views in the form of "chats". The authors also used the computers for the final knowledge testing of their students.

Research has shown that the students use their computers in their private activities primarily for social networking. And sharing information about finding, sorting, and presenting technical and economic information can help them in a number of cases. On the other side, the wider application of the research results is restricted because not everyone has laptop, there is not an obligation to attend lessons with computer, and the computer-equipped auditoriums are limited in number.

The result was created within the project IGA No. 7773 entitled „Current Trends in the Development of Financial Markets“ using institutional support for the long term conceptual development of the research organization of the University of Finance and Administration.

Keywords: Pedagogical research, computer, technology, learning, experiences.

1 INTRODUCTION

Analysis of learning processes that takes place in schools, including universities, is a difficult task. Each learning is the result of a comprehensive combination of teaching skills, motivation and currently also the possibility of technological support. At their current practice, the authors have gained experience using computers in different stages of the learning process. To support their interpretation, they use PowerPoint presentations, they are the authors of e-learning courses, study materials for the distance form of learning; they have developed several tests for nationwide proficiency test and participate in other activities related to teaching. Some theorists even see PowerPoint presentation as a precursor to e-learning. It is therefore natural to ask whether other ways to improve teaching at the university can be found so as to better achieve the objectives of education. The point is for students to receive sufficient formal knowledge and skills and also to be able to combine these skills with situations occurring in everyday life. Individual investigations mentioned in the presented text were carried out in various study groups in 2018. The aim was to select suitable currently available computer applications that would fit continuous improvement of all processes within the teaching, try them and, ultimately, formulated them as a case study for potential improvement of the quality of teaching. The authors are presenting the result of that research in the following text.

2 METHODOLOGY

The starting point for our study was an analysis of studies previously published by other authors. Červenka has published a scholarly text recognized by the Czech National Bank as material for teaching future advisors on the capital market [1]. It was a traditional print publication. The issues of learning requirements were dealt with by Budík et al., whose findings were presented at the conference INTED 2017 [2]. The fact that information and communication technologies have become an important tool in education was introduced by Choeda [3]. Other authors have focused very closely on various parts of the educational process. Clark quoted other experts who agreed with the view that the debate on the impact of technology in the teaching processes is not new. [4]. Clark did not address how computer can through the Internet help authors of PowerPoint presentation to obtain current information for their presentation. Even despite the fact that the use of the PowerPoint application as a presentation tool has the potential to increase and maintain the interest of students and their attention to the lecture.

2.1 PowerPoint and RSS feeds

The authors of the presented text however needed to link in the teaching of economic subjects theoretical foundations available in specialist books with updated information related to the real economy and financial markets. They considered it important to explain the links between theory and practice in individual subjects. As one of the solutions, the Internet offers to obtain current data using RSS software. RSS (Rich Site Summary) is a family of XML formats designed to enable user read easily the news on websites. RSS technology allows Internet users to set up links from a selected Internet site where the content changes and new is very often added through a RSS feed into their own browser. Editing a presentation based on information from the RSS feed is considerably simpler than random search of news. Theoretical basis of scientific and reviewed publications was hard to get because the resources registered in the ProQuest database deal with RSS feeds only marginally. But the Internet offers quite understandably described procedures how to use computer to search for news.

The next step in teaching, a lecture using PowerPoint presentation, is a teaching method that is based on the assumption that students are essentially passive recipients of the message. They themselves choose which part of the presented lecture they are going to pay attention to, what they will write and which lectures they do not attend at all.

2.2 Computer assisted exercises

Participation and activity of students is expected in exercises. It is desirable that students are able to discuss information that was heard at the lecture. And, provided they have understood, to supplement it by other information and create their own conclusions. Thus the University will support the preparation of students for practice. In practice, as Sinclair and Vogus showed in one of the latest researches among top executives of nearly one hundred large global corporations, social networks are increasingly being used [5]. Also Sabrina Leone and G. Biancofiore stated that in the past organisations focused on the hierarchy, coordination, formalisation of roles and standardisation of tasks and rules. Even the people development model was based on the concepts of obedience and submission. Since organisations have been evolving and become more knowledge-and-innovations-development-oriented, new models of work organisation are critically important. The new principles are cooperation and communication, ability of appreciating talents and hence support of innovation. [6] Cooperation and communication can be the foundation for online community. The characteristic of online community is determined by the type of social interactions among its members, as well as its rules. Decisive factor is also the type of technology that the community uses to interact with each other. Christensen and Levinson [7] state that teaching at university may quite effectively prepare students for cooperation within social network. Collaboration of a group can be supported by a variety of software products. From Internet forums in particular are known conversational threads. In recent years, contacts in communities have also been joined by the so-called social networks like Facebook or Twitter. Other available applications include Google Drive (Google Disk - in the Czech Republic) or Dropbox.

The use of conversational threads to chain conversation is a function that is used in many e-mail clients. Users messaging is usually grouped visually in hierarchy by a subject. A set of messages grouped in that way is called a thematic thread or simply a "Thread". The advantage of the hierarchical display of threads is that they allow the reader to quickly evaluate the overall structure of the

conversation: namely who answers to whom. The effects of the use of conversational networks were investigated by Dover and Kelman. They showed that conversational activity in an online community has considerable interaction between the participants, and grows with their number [8].

Other useful application useful for collaboration inside an online community is the Google Drive (Google Disc) service developed for storing and synchronising files with Google. It allows users to store files on their servers, synchronise files between devices and share files. Similarly, Dropbox can create a special folder on user's computer. Its content is synchronised to Dropbox servers and other computers and devices where the user has Dropbox installed. Santoveña-Casal and C. Bernal-Bravo analysed the effect of social media on the learning process and concluded that it was not a new idea. Nevertheless, due to its importance to students and then teachers, it is advisable to conduct research and continue to explore the educational potential of social media. Social network can be considered an environment that facilitates the adoption of new educational models. In addition, students have explicitly expressed that social network can help overcome initial fears and shyness when discussing particular topics of a studied subject. As is evident from the research, students attached greater importance to a student-student interaction, i.e. discussions among students, rather than a student-teacher interaction [9].

2.3 Verification of authenticity of text created by students

Detailing a teaching topic in discussions on social network may sometimes give rise to a multi-page text. Text should be an original work of authorship of an individual or a group of students. In other words, text should not be plagiarised. According Bretag and Mahmud, the process of identifying plagiarism cannot be isolated and must be integrated in the educational process. Besides students receiving a clear and ongoing guidance on the ethics of academic work, students should be encouraged to use electronic detection software features to improve their work before submitting it for assessment [10]. To verify authorship and detect plagiarism, tutor can use any of the software that, according to Macdonald and Carroll, searches identical text strings [11].

2.4 Final knowledge testing

The process of terminating teaching of most subjects usually involves a final test of knowledge. Within the first generation, using computers for testing involved conventionally assigned tests in a pencil – paper form. The number of tasks, their sequence and timing of assigning tasks in this form of testing does not depend on previous answers of the examined. The theoretical basis of making tests and their variants is the classical theory of tests. Computer aided testing against no-computer testing may indicate progress in obtaining and displaying responses even in processing and evaluating of results. Computer testing also provides greater safety in testing and allows random changes in the order of test tasks. When using computer for testing, it depends on the decision of the teacher, whether the test is performed on a computer monitor, or whether s/he pre-prints the test and allow students to work with paper with the questions being formulated as open or closed.

3 RESULTS

For the final processing of the facts published in peer-reviewed studies and experiences of the authors, it was necessary to find a suitable method. The authors chose the method of case study and incorporated into the study the findings of their research. The result is similar to a simple methodological instruction.

3.1 Preparation and presentation of lecture

Based on their experience, the authors created a new procedure that respects a pre-defined content of the subject. With the help of RSS technology in the preparation of teaching, they attach important but rather boring parts of the presentation prepared for a lecture with the latest facts, which are often cited in media. By incorporating news into a PowerPoint presentation, lecturer completes the preparation of the lecture content. S/he saves the PowerPoint file in the information system of the university to use it in the interpretation. Availability of materials for lecturing simplifies the preparation of the tutor for each of the lessons. During lectures students can also ask questions on theory and news. During the lecture the authors observed that only some of the students were really focused on the presentation, wrote notes and asked questions if necessary. Other students were sitting at the

lecture rather passively. The remaining students took advantage of the rule that attendance at lectures is not obligatory, and were not present in the classroom at all.

3.2 Exercises

Exercise follows the lecture. According to the practice of our university, i.e. the University of Finance and Administration, JSC, after lecture there is usually time to practice the study content in exercises. The teaching itself works with students' intuitive knowledge of the use of computer applications. The easiest seems to be the use of conversational threads. In teaching, the willingness of students to use them was investigated. The syllabus of each subject has twelve topics determined that need to be discussed and practised. It was not a big problem to assign a group of master's degree students that every one of the group wrote a scholarly text using information from lectures, unrolling it on one specific topic based on their own knowledge of the practice. The discussion group was supported by the information system of the university. The students saw a PowerPoint presentation and uploaded texts they had prepared under their own password. Complication arose in the next step, when students of the same study group were supposed to comment, gloss and develop the topic. Most responses were: "agree", "OK" or "I have the same experience."

Teachers expected a better result when a discussion developed on given topics and the students were fully engaged. Essentially they however received similar types of reactions, i.e. ... "O.K".

The second type of reaction was related to the already recorded discussion. It was a new scholarly text on a topic in a thread. Or the text concerned one of the assigned topics, but was embedded by a student into a discussion forum at some random place, without any links to the original list of topics and with no ties to the group discussion. When asked why there was no logic and continuity of the conversation, the student replied that he was not able to paste the file to the correct place in the conversation because he was not a computer expert.

The research has shown that active debaters are a relatively small group among students. But when they decide to debate, they actively use the tools of feedback and communicate with other members of social group on the server. Repeatedly they return, respond to comments and further develop topics of discussion.

The question of narrating and managing discussions at exercises is an important topic. Debaters may have definite opinions that do not always correspond with the lectured and generally accepted theory. They do not have to accept ideas of other debaters and concisely, without logical links and complex considerations only condemn the opinions of other commenting. It is up to the presenter of teaching to actively enter the debate and guide it towards the set goal of learning.

3.3 Original texts of students and plagiarism

Works of students can quite easily get beyond the border between paraphrasing and plagiarism. According to Carroll and Appleton, who prepared the study [12], recent years have seen a growing awareness about the incidence of plagiarism. The only proper response seems to be deterrence of intentional plagiarism, its detection and punishment. However, plagiarism is a much more complex problem than what a simple solution could be found to. The research has however shown that electronic plagiarism detection and search, combined with manual analysis, logical judgment and clear processes, can provide a clue to determine whether plagiarism has occurred.

The information system at the University of Finance and Administration (VŠFS) in Prague will provide its authorised users with information on whether the file stored in a folder accessible to students and teachers is an original work of authorship, or to what degree it is a text identical to other compared texts. As Křipač et al. report, the functioning principle of this system is simple: when uploaded into the MU IS (Information System), every document is first processed and compared to other previously stored documents. Real similarities are searched for, it means that such document will display as similar that was copied and partly changed by the author (for example by using other terms, changing certain parts of the text, etc.). The effectiveness of that comparison and protection against the possibility of finding similarities by circumventing it through modifying the text was gradually increased and is now at a very high level. It is obvious no programme is able to reveal a copied idea that has been described by own words of the author. This is however often not the objective, since adding own invention into existing knowledge can be the objective of the work. The system for detecting plagiarism thus aims mainly to increase the difficulty of copying a work compared to the difficulty of developing a totally new work. The principle is therefore simple – rather than students trying to avoid plagiarism

detection, they would better write the work themselves, because it is more efficient for them [13]. Currently, the system compares an uploaded work with texts published on the Internet as well as texts available in the databases of other universities.

3.4 Final knowledge testing

Learning outcomes may not be as noticeable in the knowledge of individual students. Therefore, the results of teaching of the presented text's authors were determined in tests. Creating a test in the classroom is often essentially considered an occasional work, not a full-time job at a professional level. It is however desirable to have a quality test that will serve as information on the level of knowledge of the student. Therefore, the authors of the research tried for a balanced test that evenly covers the entire curriculum. The test included exercises on memorisation, as well as those focused on practical application.

The tests were evaluated primarily in terms of validity, accuracy and reliability of results. Some of the tests were done by teachers for their needs. It was a combination of surveys of student's knowledge and feedback for the teacher. The feedback served as the basis for possible modification of future lectures. Final testing of students' knowledge is in principle useful universally. If lesson is only attended by a small group of students, the completed test is proof of participation in the test and knowledge of the student. If the group is larger, the test helps get a basic idea of the level of students' knowledge in a relatively short time.

There is a function of the University's information system that is used to test knowledge. Test may include one or more correct answers. You can also create multiple sets of questions and generate a test upon their combinations, such as use only a few questions of each set. Popular is structure by topic, difficulty or teacher. Once created questions can be used for training, midterm and final test without further copying.

4 CONCLUSIONS

The authors used purposefully the support of computer and communication technologies in the process of preparing the content of lectures, i.e. in the lectures, for an active systematic work of students in the exercises, for searching unoriginal, copied passages of individually created texts, as well as in the final knowledge testing. And they noticed some effects.

From the perspective of students, greater motivation was found to acquire new knowledge and interlink it with known processes in the economy and on financial markets. They sought separately latest information from practice that applied to the theoretical ideas of scientific peer-reviewed texts. The activity during exercises was rewarded with creating separately prepared notes which would enable that the information source for reviewing and practical use of the knowledge from the study was not the hard-to-get "classic" literature that is not available in electronic form and in many cases may be somewhat outdated.

Another effect is that the topics of the lecture contents were actively discussed by all learners from various angles. The authors of the presented text considered that fact the most important outcome of their research.

The research has also shown that watching the current events in the economy and comparing it with the theory for teaching needs creates good conditions for finding topics for theoretical discussions and for teachers to participate in scientific conferences.

ACKNOWLEDGEMENTS

The result was created within the project IGA No. 7773 entitled „Current Trends in the Development of Financial Markets“ using institutional support for the long term conceptual development of the research organization of the University of Finance and Administration.

REFERENCES

- [1] M. Červenka, D. Ircingova and M. Škvára, *Spotřebitelské úvěry 2017. Consumer Credits 2017*. Praha: Miroslav Škvára, 2017.

- [2] J. Budik, O.Schlossberger and V. Ezr, "Inovations, New Rules and Teaching Requirements," Proceedings of INTED2017 Conference. pp. 3512 - pp. 3518, 2017.
- [3] Choeda et al, "The state of Integration of the Virtual Learning Environment and ICT into the pedagogy of the Royal University of Bhutan: A descriptive study," *International Journal of Education and Development using Information and Communication Technology*, vol. 12, (1), pp. 71-88, 2016. Available: <https://search.proquest.com/docview/1792794836?accountid=37662>
- [4] J. Clark, "PowerPoint and Pedagogy: Maintaining Student Interest in University Lectures," *College Teaching*, vol. 56, (1), pp. 39-45, 2008. Available: <https://search.proquest.com/docview/274681631?accountid=37662>
- [5] J. K. Sinclair and C. E. Vogus, "Adoption of social networking sites: an exploratory adaptive structuration perspective for global organizations," *Information Technology and Management*, vol. 12, (4), pp. 293-314, 2011. Available: <https://search.proquest.com/docview/904512114?accountid=37662>. DOI: <http://dx.doi.org/10.1007/s10799-011-0086-5>
- [6] S. Leone and G. Biancofiore, "Leveraging teamwork by Google+ in a lifelong learning perspective," *Knowledge Management & E-Learning*, vol. 7, (2), pp. 215, 2015. Available: <https://search.proquest.com/docview/1955094886?>
- [7] K. Christensen and D. Levinson, *Encyclopedia of community: from the village to the virtual world*. Thousand Oaks, Calif.: Sage Publications, 2003.
- [8] Y. Dover and G. Kelman, "Emergence of online communities: Empirical evidence and theory," *PLoS One*, vol. 13, (11), 2018. Available: <https://search.proquest.com/docview/2133411908?accountid=37662>. DOI: <http://dx.doi.org/10.1371/journal.pone.0205167>
- [9] S. Santoveña-Casal and C. Bernal-Bravo, "Exploring the influence of the teacher," *Social participation on twitter and academic perception*. *Comunicar*, 27(58), 75. doi: <http://dx.doi.org/10.3916/C58-2019-07>
- [10] T. Bretag and S. Mahmud, "A model for determining student plagiarism: Electronic detection and academic judgement", *Journal of University Teaching & Learning Practice*, 6(1), 2009. Available at: <http://ro.uow.edu.au/jutlp/vol6/iss1/6>
- [11] R. Macdonald and J. Carroll, "Plagiarism—a complex issue requiring a holistic institutional approach", *Assessment & Evaluation in Higher Education*, 31:2, 233-245, 2006. DOI: 10.1080/02602930500262536
- [12] J. Caroll and J. Appleton, *Plagiarism, A Good practice Guide*. 2001 [online]. [cit. 2019-01-20]. <https://i.unisa.edu.au/siteassets/staff/tiu/documents/plagiarism---a-good-practice-guide-by-oxford-brookes-university.pdf>
- [13] M. Křipač, M. Brandejs, J. Kasprzak, and J. Brandejsová, "Systém pro odhalování plagiátů na českých vysokých školách. Plagiarism Detection System at Czech Universities. *Zpravodaj ÚVT MU. Bulletin of the nstitute of Computer Science*", Masaryk University. ISSN 1212-0901, 2008, vol. XVIII, No. 5, p. 5-6 available online on 21.1.2019 at <http://webserver.ics.muni.cz/bulletin/articles/585.html>