THE PREPARATION OF TEACHERS IN THE FIELD OF MULTIMEDIA EDUCATION

Lukáš Kostolanský, Miroslav Šebo, Viera Tomková
University of Constantine the Philosopher in Nitra, Faculty of Education (SLOVAKIA)

Abstract

The current large development of information and communication technologies is also reflected in the education process, its modernization and the introduction of new technologies into education. Multimedia as a modern technology has entered the traditional teaching system and it can be a useful tool in the hands of future teachers with the necessary theoretical and practical knowledge. The teacher can have a positive impact on the learning process and on the students themselves by using multimedia in education. Therefore multimedia education is now becoming an educational trend as an integral part of the preparation of future pedagogues.

E-learning as the most sophisticated way of education provides many opportunities how to use multimedia in the teaching process. Multimedia education courses can be accessed through communication networks and they enable students to get the latest educational content from multiple sources at any time and from anywhere. The contribution provides information about multimedia and its use in the education of future teachers. It also describes the issue of creating the content of an e-learning course that aims to teach future teachers how to create a multimedia aid suitable for inclusion into the education. Through our research and its analysis, it describes the impact of our e-learning course on students as future teachers and the results determine recommendations for the teaching practice.

Keywords: Teacher education, multimedia, multimedia tools, education support, e-learning.

1 INTRODUCTION

In the context of the advent of computers and the development of their use, multimedia is nowadays a term that we more often meet up with. We are surrounded by it in all areas of our everyday life. The field of education could not avoid it as well, in which they are becoming increasingly popular. Not only because of their widespread use in various subjects and teaching units, but also in modernizing and introducing new ways of teaching and learning into education.

Multimedia education enables teachers to present the curriculum according to the requirements of the educational institution. The curriculum can be prepared in a way to meet the specific needs of pupils or students from primary school to universities. Multimedia education enables students to absorb information through multiple senses at the same time. This way the teacher can supplement his or her interpretation with an interesting multimedia product, which is mostly projected on screen, displayed on the monitors of students, or it can be presented by using the more and more popular interactive whiteboard. An important factor in education is the motivation of students and their interest toward the activity. It is much easier to motivate and attract students with the multimedia education. We can find in scientific literature sources, many journals and internet articles that multimedia education largely supports these two factors. It is therefore an important element that should be further developed in education.

The aim of the paper is to define terms multimedia and multimedia education and to focus on the description of tools used for multimedia creation. Furthermore, to introduce the creation and application of an e-learning course, which was focused on the preparation of future teachers in the field of multimedia education. Completing this course leads to the acquisition of the knowledge and skills needed for the creation of multimedia tools suitable for use in education.

2 THE CHARACTERISTICS OF A MULTIMEDIA EDUCATION

The first step in the creation of our training course, focused on the education of future teachers through multimedia, was to define and characterize multimedia and multimedia learning. If we would like to literally describe the word multimedia, we would divide it into the term *media* that comes from
the Latin *medius* - the environment to which is related the word *mediar* - to convey. In the current sense of the word, it is mainly about mediation of information. And then the word *multi* is from the Latin *multus* - many. Thus, multimedia is a mediator of information and perception in a single device at the same time, more in ways with interactivity options. [1]

There is a simultaneous combination of sound, image, graphics and text in multimedia and what distinguishes multimedia from classical media is their interactivity - the ability to influence what we will see and hear. Multimedia puts an emphasis on individual choice, generally counting with the response of one particular user. [1]

From the multimedia definitions outlined above, we can characterize multimedia education as a computer-based learning, in which multiple types of digital media and information are integrated, and that allows pupils/students for an interactive input to the education process. This type of training offers not only to use a combination of media for teachers, but also to work with the Internet that can give them an immediate access to millions of available resources. In addition, it provides space for cooperative problem solving for students, develops critical thinking, gives room for discussion and brings many benefits over traditional education. [2], [3]

3 E-LEARNING COURSE MULTIMEDIA IN THE EDUCATION

The practical part of the work, that we present in the paper, was the creation of an e-learning course to teach future teachers how to create a multimedia tool suitable for inclusion in education. The aim of the course was to motivate students as future educators to target-oriented activities, to educate pupils through new interactive technologies. These are those that are bringing the opportunity to gain knowledge and acquaintance in a form that is very close to them today. After the study of literature sources needed to master the issue, we decided that educational videos will be a suitable content of the proposed e-learning course, which will enable the trainees to acquire the skills needed to work with graphics, audio and video processing programs and applications.

From the wide range of available media-processing software we have chosen free programs with an intuitive, easy-to-learn environment for our purposes. Those programs were targeted which can be operated by non-technically oriented teachers without any problems, thus confirming the wider usability of the course as well as multimedia learning in practice.

- Pixlr Express graphics application has been selected for creating and processing graphics, [12], [13]
- Audacity has been selected for audio processing, [14], [15], [16]
- Youtube video editor was selected for the processing of digital video. [17] [18]

The created e-learning course entitled Multimedia in Education took the form of PIXLR Express video training courses, YOUTUBE VIDEO Editor and AUDACITY, named after the program that students learned to work with. For the purposes of research and use of the course in practice it was put into the Educational Portal (EDU) of Constantine the Philosopher University (UKF) in Nitra. Individual educational videos, which were the content of the course and visually demonstrated the work with the selected programs/applications, were divided into 10 sessions according to the term weeks of teaching - for PIXLR Express 4 weeks, 3 weeks for YOUTUBE VIDEO Editor and 3 weeks for AUDACITY. The students thus had enough time to study the individual videos in detail, via which they progressively learned to work with selected programs/applications. The total number of videos created for the Multimedia in Education e-learning course was 50 and together they were 120 minutes of learning time.

3.1 The research and its methods

Based on the e-learning course Multimedia in Education, we have carried out a research to verify its functionality and usability in practice and through this research we wanted to find out whether future teachers will be able to independently create multimedia tools by completing our course. At the same time, we wanted to verify the suitability of the course for students - future teachers from non-technical oriented fields of study and thus confirm its wider application in practice. For research purposes, we selected the questionnaire as the way giving method. We chose this quantitative research method mainly because of its objective and verifiable data, which could be mass-recorded and then processed in a relatively short time. [10], [11]

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The research was conducted in the summer term at the Department of Technology and Information Technologies, Faculty of Education of the Constantine the Philosopher University (UKF) in Nitra in the academic years 2017/2018 and 2018/2019. The e-learning course involved groups of students attending the subject Multimedia in Education. The research sample consisted of 132 students, of which 37 were students from the first to third class of the Bachelor's degree studies and 95 were students of the first class of the Master's degree. The questionnaire was distributed to the participating students after completing the e-learning course and its total return was 87%, it means that 115 students out of a total of 132 respondents completed the questionnaire.

4 RESULTS AND DISCUSSION

After the completion of the research, we focused on the analysis of the results of several individual questionnaire items. Of the total of 15 items we have selected only those that we consider to be crucial for drawing conclusions in the presented paper confirming the research problem defined in the introduction to this paper and then to formulate appropriate practice recommendations.

Evaluation of item n.2: Please indicate your type of approbation.

The questionnaire item 2 offered two closed possible answers. We investigated the exact representation of technically and non-technically involved approbation of students on the e-learning course Multimedia in Education. Respondents could only choose from "technical-information focus" and "other non-technical-information focus".

![Figure 1 Evaluation of the questionnaire item n.2. Source: Lukáš Kostolanský](image)

According to the results shown in the figure 1 even 97.4% of the respondents chose the second option “non-technical-informational focus” and only 2.6% chose the “technical-informational focus”.

From the results we can conclude that out of 115 students who worked with the e-learning course created by us and then filled out the questionnaire, there were 112 non-technically focused students and only 3 students had technical-information approbation.

Evaluation of item no. 7: Select the suitability of the tools we choose for creating multimedia elements from the following options.

Item 7 verified the appropriateness of using our choices of programs/applications in creating multimedia elements suitable for educational purposes. We gave the respondents five closed response options (very suitable, suitable, cannot assess, unsuitable, very unsuitable) from which they could indicate one for each type of program. These were PIXLR Express, Youtube video Editor and Audacity.
In figure 2, we can see that 112 (97%) respondents rated PIXLR Express as a suitable or very suitable graphical application for creating multimedia elements. Youtube video Editor, for the processing of video recordings, was evaluated by 96 (83%) respondents also as a suitable or very suitable choice of application. Auditive program Audacity was evaluated by 77 (67%) respondents largely as being suitably or very suitably used to create multimedia elements, with 35 (30%) respondents failing to assess suitability. The remaining percentage could be caused by a statistical error or subjective opinions of respondents. We have stated that for educational purposes and for the creation of multimedia tools usable in education, we have chosen appropriate programs and applications.

Evaluation of items no. 3 and no. 14: From the following options, please select your level of ability to work with individual tools (programs, applications), to create multimedia elements, before and after the e-learning course Multimedia in Education.

By the items No. 3 and No. 14 of the questionnaire we measured the level of students' skills and abilities in the e-learning course Multimedia in Education with programs and applications aimed at creating multimedia elements. With the difference that item no. 3 measured the level before passing the course and item no. 14 the level after completing the course. Specifically, we focused at the programs and applications for bitmap graphics processing, video processing and audio processing. The items contained closed responses, from which respondents had the option to select one of each for the listed programs/applications. In this way we found out what shift of abilities in the creation of multimedia tools happened by completing our e-learning course.

![Figure 2 Evaluation of the questionnaire item no.7. Source: Lukáš Kostolanský](image_url)
From the comparison of the items No. 3 and No. 14 of the questionnaire in the Figure 3 it is clear that the ability of students to work with individual types of programs aimed for the creation of multimedia tools increased one level higher. We have stated that the benefits of our own e-learning course, designed to create multimedia tools that can be used in education, have a positive impact on the achieved results and skill level of students with the separate programs and applications.

**Evaluation of items no.15: Are you able to create a multimedia tool that can be used in education on your own by completing our e-learning course?**

In the last item of the questionnaire, we wanted to find out the positive impact of our e-learning course Multimedia in Education on the achievements of students as future teachers. The item offered 5 closed answers (yes, mostly yes, mostly not, no, cannot assess) to the respondents to choose one of them, in order to determine their ability to independently create a multimedia tool for use in education.

![Figure 4 Evaluation of the questionnaire item no.15](Source: Lukáš Kostolanský)

Figure 4 shows that the answer was "Mostly yes", the largest proportion of which was reported by 46.1% of respondents. The second most elected answer item was "Yes" with 45.2% of respondents. Only 2.6% of the respondents chose the answer, "Mostly not," and 6.1% said "Cannot assess". From the results pointing to the 91.3% success rate, we state that the e-learning course Multimedia in Education created by us has had a positive impact on participating future educators who, through its content, will be able to develop a multimedia tool for use in education.

### 4.1 Discussion

From the analysis of the received data we state that students, as future educators, will be able to create independent multimedia tools for use in education through our e-learning course. These conclusions showed positive results of the carried-out research. It is also positive to note that 97.4% of students working with the course did not have a technical-information focus. Since a substantial part of the Multimedia in Education respondents' sample was made up of students from non-technical-oriented study programs, the positive results of the research analysis showed the appropriateness of using the course in practice, regardless of the direction of the study of future teachers.

From these findings, we recommend for practice:

- **We recommend using PIXLR software in education for educational purposes with bitmap graphics creation and processing tools, which is freely available and spread almost anywhere and on any device. Its simplicity and availability without the need for installation (if necessary, it can be installed) makes it a suitable application for less skilled and non-technically-oriented students or teachers.**

- **We recommend the use of Youtube Video Editor in education for educational purposes with video creation and processing tools, which is freely available anywhere and on any device. Its easy-to-use design and no install accessibility also make it a suitable type of education software, whether for advanced or less technically skilled and educated teachers.**

- **We recommend using Audacity for educational purposes with audio creation and processing tools in education, which is freely available and spread. Its simple environment, ease of**
installation and small system requirements make it a suitable software to support the auditory learning of students and teachers.

- We recommend the Moodle software package to create multimedia learning tools, which is used to create online learning systems and electronic courses. It is provided free of charge as an open source software and has also been used to create our e-learning course Multimedia in Education, which had positive results in the subject Multimedia in Education.

- In the education of students and future teachers, we recommend the use of multimedia in education, as a suitable tool for improving the quality of both technical and non-technical education.

5 CONCLUSION

In the paper we focused on the preparation of future teachers in the field of multimedia education. As it is written in the introduction our aim was to closer describe the concepts of multimedia and multimedia education, their characteristics, description and definition of multimedia creation tools. The practical part of the paper, from which the research problem came, was the creation of an e-learning course with the aim to teach students - future teachers for independent creation of multimedia tools usable in technical and non-technical education.

The execution of the research, its processing and analysis of the results confirmed positive findings. We consider the extraordinary contribution of the implementation of the proposed course and its subsequent verification through research to the fact that we have also confirmed the appropriateness of its wider application. By verifying the e-learning course, we can confirm that multimedia has a positive impact on education. Multimedia education provides for the teacher new opportunities of presentation and mediation of the curriculum, encouraging pupils' interest in the curriculum and at the same time it allows pupils to better understand it.

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