

# E-learning in College on the Example of Academy of Special Education

Miłosz W. Romaniuk

**Abstract**—This article is a report on the research on the perception of e-learning conducted among students of the first year of full-time studies at the Maria Grzegorzewska Academy of Special Education in Warsaw who were participating in the information technology course. The aim of this study was to evaluate the e-learning course of Windows Live Movie Maker program intended to create movies prepared by the author and to gather the opinions of students on e-learning. The author presents the most popular model for creating e-learning courses and suggests programs in which teachers can create their training. The author acknowledges a course he created as well received by students and advocates the implementation of this method of teaching in academic education.

**Keywords**—e-learning, information technology, distance learning, Windows Live Movie Maker, ADDIE, students

## I. INTRODUCTION

THE vast majority of young people studying in higher education at the undergraduate and secondary education belongs to the generation of digital natives. Born in the nineties they gained consciousness and brought up in a world where modern technology can be met at every step. Computers and gadgets are seen as parts of a natural environment. Students are also used to various forms of teaching. One of these forms is e-learning.

## II. A WAY TO EFFECTIVE DISTANCE EDUCATION

The idea of distance education appeared at the beginning of the eighteenth century when in 1728 in Boston Gazette printed an announcement by Caleb Phillips, a teacher who was looking for volunteers willing to take part in his correspondence stenography course. In the forties of the nineteenth century, Sir Isaac Pitman organized a similar course in the UK. He was sending materials and tasks to his trainees, which he checked after receiving them from the students in return post. The next step were radio and television courses. Today, the most known method of distance learning is the one led with a computer connected to the Internet, known as e-learning.

Skilful searching for information, selecting the received content, arranging, interpreting and processing it and, finally, generating your own, original and creative transmissions is a domain of competent citizens of the modern information society. Technological changes and progress in all fields of science impose certain social and environmental change. There are new problems coming out. Fortunately, there also new ways of solving them being invented. Removing the barriers of

time and space in communication, thanks to mass media and to the Internet, gave humans a powerful self-development opportunities. The significant role of the Internet in the processes of teaching and learning is particularly evident when examining the possibility of distance learning. The popularity of e-learning is growing among the information society, who value the information and the continuous, fast and easy access to it above all. It is regarded by the academic and business world as an effective method of teaching.

Investing in the development of e-learning and the increasing use of this method in education is dictated by its undeniable advantages. Universal access, convenience, the ability to independently adjust the time and duration of learning and bigger audience than in the traditional teaching are the most popular of them. Direct factor conditioning the desire to treat e-learning as an equivalent teaching method is its efficiency. Evaluation of e-learning courses, a study of the effectiveness of teaching and the results achieved by the students, as well as checking the participants perception of courses allow a full measurement of effectiveness of teaching by e-learning.

Hyla M. [1] distinguishes three main determinants of the effectiveness of distance learning via computers. These are the applied technology, the choice of educational content and ways of its presentation and additional services supporting the learning process. Institutions offering more e-learning courses highly appreciate the efficient system of course management. Human factor cannot be overlooked during the evaluation process. Courses are created for a certain target group. The way of e-learning reception by addressees is, beyond any doubt, an effect worth working on. The aim of an effective e-learning is to provide its customer certain competences. The measure of e-learning effectiveness is the quality of the student's products arising from the use of the knowledge and skills acquired during work with the information provided in the form of e-learning materials. They can be transmitted in the form of text documents (full electronic books, manuals, source documents, etc.), multimedia presentations, databases, audio and video, interactive computer programs, simulations, games or web conferences or live streaming media. The existing multiplicity of content forms allows them to be transferred in many ways, which positively affects the increasing efficiency of education.

The issue of teaching with e-learning can be analysed from a technical or social point of view. The technical aspect is related to, inter alia, the type of technology used for teaching, appropriate choice of the content and, of course, the quality and simplicity of the transmission. A suitable model of the education process should be developed in order to effectively implement teaching using information technology. Adaptation

of teaching methodology, essential changes and appropriate organization of the knowledge transfer are necessary to achieve the expected educational effects.

It should be emphasized that the methods, content and means are gaining true value only in the context of their relationship with the person who is the subject of education. The social aspect of the course includes its perception as a whole, its impact on the education, the understanding level of the material, the quality of acquired knowledge, acquired competences and, above all, whether and to what extent the student is able to apply that knowledge into practice, use new acquired skills and utilize acquired competences. Providing a high level of technical preparation significantly increases the likelihood of achieving the desired education effects. [2]

### III. DESIGNING E-LEARNING COURSES

There are many methods for designing and developing e-learning courses. The most popular of these is the ISD (Instructional Systems Design). ISD covers the creation of tutorials and practical experience for the audience, that makes the acquisition of knowledge and skills more efficient, effective and attractive. The most commonly used model for the creation of e-learning courses is a five step ADDIE model (analysis, design, development, implementation directory, evaluation).

Analysis is the first step. Before creating the course authors begin by defining its purpose. They also define the subject matter and scope of the course material and the target group to which the course will be addressed. Authors determine the knowledge transfer and course evaluation methods. The first stage in the formation of the course is also a SWOT analysis (strengths, weaknesses, opportunities, threats) of the situation and design. During the analysis, the resources which authors dispose should be taken into account. The amount of time, resources, access to technology, creator's skills and knowledge plays a significant role on the final shape of the course.

The second stage is the design. The authors choose the tools that will most fully communicate the material and determine its scope. At this stage, a shape of the whole training and individual lessons is developed. Not only the form but also content that should interact with each other is selected. Templates of individual modules, later filled with content are created. At this stage teacher support for pupils, its availability, contact method etc. should also be considered.

The third phase is the main part of the creation of the course. The authors collect and develop materials that will be put in the previously prepared modules. They strive to achieve the effect in the form of an interesting and rich content presented in an accessible and interesting shape and placed in an easy and intuitive to use form. The course should provide the pupil knowledge, motivate him to learn and encourage to check the acquired competencies in practice.

The fourth step is the implementation of the course, which is its start-up and application in practice. This includes introducing it to students and providing information how to use it. Teachers involved in training are ready to serve remote help to students during the course. Tech support constantly watches over the correctness of the technical process of e-learning.

Evaluation is the last step. The participants, their work quality, achieved results are being evaluated. The teaching

staff is being rated in terms of their support to pupils. Technical support of the course is also being judged. The evaluation process is based on the information gathered from questionnaires, observations and tests. Longitudinal studies can show the effectiveness of the course by testing participants abilities before and after the training. Student's opinion on training can be found with polling.

ADDIE model is a recursive cycle. After the evaluation phase, analysis phase occurs again. Repeating the cycle improves the course which can be adjusted to changing conditions, and updates it. Thanks to a clear explanation of each e-learning building step which ADDIE model provides, creating courses can become more organized and systematic.

### IV. E-LEARNING FOR EVERYONE

Form of distance learning which is e-learning is accessible to everyone. Properly prepared course is universal. It cannot be harmed by linguistic limitations, because options allow you to customize the language to the recipient. People with physical disabilities can benefit from learning at home, without having to make the effort associated with the movement. People suffering from a chronic lack of time and not finding it to be present at live classes can attend courses at any time and place, even while traveling. Lector or speech synthesizer will read the course to partially sighted or blind people. Those who do cannot afford live course due to financial constraints or because lack of such course in the neighbourhood will choose the cheaper option of e-learning. There are many types of target groups that are potential beneficiaries of such a method of knowledge transfer.

E-learning is a modern form of teaching, which is also valued by teachers. A decent course can be prepared and created with computer skills at the intermediate level. There are many tools for creating distance learning courses via computers. Each teacher can work with Microsoft PowerPoint, which in addition to the multimedia presentations creating allows to prepare the e-learning course. Two commercial products are Adobe Captivate and Adobe Presenter. Handling them is not complicated, when their possibilities are enormous. They allow to create a professional e-learning course. High price is their disadvantage. Producer allows you to use the free version of the program for only 30 days. Xerte and eXe Learning are examples of free programs dedicated to create courses. Their options are much more limited than those offered by commercial programs. It is still possible to use them when creating a full-fledged e-learning course.

Designing and creating courses requires a lot of time and is a labour-intensive process. The preparation of one minute training in Adobe Captivate takes about one and a half to two hours. Hence a full, professional and well done course including interactive content, audio and video recordings, teacher, tools for controlling and checking the progress of the student's knowledge which lasts for one hour may arise effort of about 90 hours of teachers work. Time dedicated to the creation of the course is teacher's investment in a modern form of knowledge transfer. Course can be used at any time and at any place. In case of illness or need to cancel classes lecturer do not lose the possibility of transferring knowledge to students. Moreover tames them with this way of teaching, so

there is a greater chance that when they became teachers themselves, they will be willing to create e-learning course which will popularize the use of such solution. [3]

#### V. E-LEARNING COURSE OF WINDOWS LIVE MOVIE MAKER

During the lecture of the Information Technology conducted by the author with the students of the Maria Grzegorzewska Academy of Special Education in Warsaw e-learning course of Windows Live Movie Maker (WLMM), also prepared by the author, had been conducted. WLMM is a program used to create and edit videos. It allows you to create a movie consisting of a single video clips and pictures. Soundtrack, background music and narration can be added, like as opening titles, end titles and signatures appearing during the movie. Additionally, video can be speeded up or slowed down. Individual frames can be cut and copied. Transitions between successive elements of the film can be added, etc. After finishing the making process the program can generate a video file using the chosen mode of video and audio compression recording the video to the selected format. Film can be immediately shared through social media (i.e. Facebook) or sent to online storage (i.e. OneDrive).

The course has been prepared with Adobe Captivate 7.0. It discusses all of the options available in WLMM. It consists of nine modules, each dedicated to a thematic category. In the menu student can choose the course activities, which he or she wants to learn. User can choose between categories of adding new items to the project, adding a title, captions and end credits, adding narration and audio track, adding transitions, animations and cropping, audio editing, video editing, adding and use of visual effects, setting view options and, finally, learning how to save the project. Menu also contains an e-mail to the author of the course, who is also the subject teacher, coordinator of content and technical support in one person.

After selecting the menu item by the user a screencast (a recording of events happening on the screen) is displayed, during which the functions of the program are described. Buttons and menu items which are being used are highlighted during the lesson, which makes it easier to draw attention to specific items. In addition, explanations of the features were also placed in text form. All the text in training is read by the lector of IVONA speech synthesizer. After playing a single module the course automatically returns to the main menu. The user can repeat each module without limitations. The training does not include elements dedicated to test the degree of knowledge acquired by students. Creating a movie using WLMM is a way to check the level of the material assimilation.

The movie must meet certain conditions. First of all, the film should be a logical whole. In addition to this, it is the evidence of student's ability to use the program. It also has to be the result of student's individual work. It has to make sense and be interesting. Transitions shall be developed in such a way to form an unitary film. The minimum number of elements that the movie consists of is four independently recorded clips and four independently captured images. The project should also include title, subtitles that appear during the movie and end titles including the author's name, the cast and used music. In addition to audio recordings, background music and narration should be added. Visual effects,

transitions and animations framing should also be applied. Minimum duration of the movie is set to avoid too short films, so the movie cannot be shorter than 2 minutes and 30 seconds. The maximum resolution of the final movie is limited so film could be seen on most computers and that is not taking too much place on hard drive. The last condition was to uploading video to the Internet drive (i.e. GoogleDrive, OneDrive, Dropbox) and sending the link to a file to the teacher. E-learning course is designed to give the fullest possible knowledge of using the program. The training covers all the options available in the program. Conditions of course ending exam have been designed in order to accurately test the student's ability to use the program, and thus examine the effectiveness of e-learning.

Students were given two weeks to record the video recording and to present their work to the teacher. The author believes that required amount of time required to create a movie that is entirely meeting the conditions, assuming that student did not know WLMM before participating in a prepared e-learning course, is approximately two to four hours. This time includes familiarization with the requirements, self-study of the program using the supplied WLMM course, thinking about the film structure, taking pictures and recording video clips, transferring data to a computer, developing them in the program and generating a movie file.

Preparation of the course took about 40 hours of authors time. This time includes recording and developing screencasts, adding explanations describing options, recording comments using a speech synthesizer, synchronization text appearing on-screen with audio narration, refining the transitions between successive screencasts, creating menu and testing the course. The course was presented to beta testers, whose comments have been taken into consideration during making amendments to the final version. The revised version, which has been successfully tested and had received positive reviews has been approved by the author and was introduced to the students.

#### VI. E-LEARNING COURSE EVALUATION

The e-learning course was attended by 96 first year full-time students of pedagogics and special education at the Maria Grzegorzewska Academy of Special Education in Warsaw. Only five students had previously worked with WLMM. Participating students were asked to complete an evaluation questionnaire after finishing the course. It consisted of eight questions. Two of them were related to the technical aspects of the course, six related to e-learning as a modern way of teaching.

In the first question, students were asked to evaluate the course in terms of transparency, narration quality, video quality, intuitive handling rate, explanation brightness, descriptions of quality and topic exhaustion. Each of these characteristics were evaluated on a five-point Likert scale. A question "How do you rate the e-learning course in relation to..." was asked. Allowed answers were "very bad", "bad", "medium", "good" and "very good". Respondents were also asked to rate the overall assessment. The vast majority of students rated the course positively. Author regards checking "good" or "very good" as a positive rating and "bad" or "very bad" as negative rating.

TABLE I  
 WLMM E-LEARNING COURSE RATING

Feature	Positive rating*	Average rating*	Negative rating*
Transparency	79.2	16.7	1
Narration quality	64.6	22.9	3
Video quality	78.2	16.7	2.1
Intuitiveness	69.8	26	1
Explanation clearness	70.8	25	1
Descriptions quality	75	19.8	2.1
Topic exhaustion	66.6	24	6.3
Overall	74	17.7	2.1

\* Percentage of students

From the interpretation of the results can be inferred that the weakest of the course was an unnatural voice-over speech synthesizer.

Second question concerned the items that students considered as needing improvement. The vast majority of respondents left a question unanswered or claimed that the course does not require any amendments. 11 students (11.4%) felt the need to improve the narration quality, 8 persons (8,3%) needed more detailed explanation, and 2 persons (2%) had the need to expand the information on the video uploading and sharing on the Internet. There were also 6 students (6,2%) wanting to have more options in WLMM.

Analysing the answers given by the respondents it can be concluded that the course was prepared carefully and did the job. Feedback from the students served to improve the course, which after adjustments resulting from the suggestions of its audience and participants will be reused in the next semester. Analysis of student's movies show, that an equal level of their films could be seen. Individual movies stand out positively from the crowd. Usually, those higher rated movies were not only better made with refined technical details, but also presented interesting and custom idea and involvement more people in the project (often as actors). All works confirmed the achievement of the assumed learning outcomes. Some projects required improvement to meet requirements fully. Author recognizes the lack of diligence during the realization of the project and careless analysis of the requirements as a likely reason for the lack of compliance with the requirements for the first time. The requirements were clearly defined, and all the necessary skills and knowledge were provided in the course.

## VII. STUDENT'S OPINION ON E-LEARNING

Six remaining questions concerned the experiences and opinions of students on distance learning via computers. 33,3% had previous experience with e-learning, for the 66,7% this course was the first e-learning ever. 12 students (12,5%) participated in the course of the foundations of education, 5 students (5,2%) in language courses, individuals in a computer course and a not specifically listed course on the platform ioki.com.pl. Interestingly, the majority of students who admitted to participate in other e-learning courses, attended them only at college. This leads to the simple conclusion that e-learning is not widespread among the students of pedagogy.

Students were asked to compare a few features of e-learning with traditional teaching. These were the motivation for learning, reliability of knowledge, permanence of acquired knowledge, the required amount of work, achieved results and the benefits of learning in the chosen way. The respondents were also asked to reveal their preferences for learning in the traditional manner or using e-learning courses. Student could mark his or hers answer on a five step Likert scale which consisted of answers that were attributing a particular trait to traditional teaching or learning via e-learning.

 TABLE II  
 TRADITIONAL LEARNING COMPARED TO E-LEARNING

Feature	Traditional learning*	No difference*	E-learning*
Motivation to learning	35.4	39.6	25.0
Reliability of knowledge	16.7	38.5	44.8
Permanence of knowledge	18.8	31.3	50.0
Required amount of work	24.0	36.5	39.6
Achieved results	17.7	28.1	54.2
Benefits of learning in a way	17.7	24.0	58.3
Personal preferences	27.1	32.3	40.6

\* Percentage of students

Study shows, that students value knowledge from e-learning more as more reliable. Because of higher amount of individual work, permanence of knowledge obtained from e-learning is higher. This is also connected with achieved results, which are better in e-learning, and so are benefits in learning this way. Students also tend to prefer e-learning than traditional learning.

61,5% of students (59 persons) responded affirmatively to the question "Should the university provide e-learning courses?". Only 9,4% (9 persons) of the responses were negative ones. 29,2% (28 persons) did not have an explicit opinion on this issue. However, students asked about whether they would take part in the e-learning course if the university had provided such training, 74% (71 students) declared their willingness to participate in this kind of learning. Only 26% (25 students) marked the negative answer.

After analysing the results it can be concluded that e-learning is not common method of teaching in elementary school, middle school, high school and college. Despite this, the students recognize it as a reliable source of proven expertise. The quality and durability is judged as being the same as or higher than traditional teaching. The lack of a significant difference in the evaluation of e-learning and traditional methods of teaching, the relative balance of responses and preferences of respondents showing slight advantage of distance learning using computer may indicate openness to new ways of transferring knowledge, increasing independence and changing the mindset of the young generation of network society. The author sees the need for research on the implementation of e-learning in higher education on a larger scale.

### VIII. ADVANTAGES AND DISADVANTAGES OF E-LEARNING IN STUDENT'S OPINION

The last two questions included in the survey were open questions. Respondents had to write down three recognized advantages and disadvantages of the computer distance learning.

The most frequently mentioned (40,6%) advantage of e-learning was possibility of multiple repetition, pausing and replaying the course. Students could focus on most important things. Students also value working in home in friendly environment (23,9%) and choosing time of learning (29,1%). They see a time saving potential of e-learning courses, which frees them from having to travel from home to college. 18,7% of students like to work at own pace, and 16,6% do not feel stress during e-learning. Some (12,5%) also like to choose the place of learning. Rarely mentioned advantages were the possibility of division of work into stages, the opportunity to do a few things at a time, the formation of self-reliance, the lack of working time constraints and modernity. In addition, there are voices that recognize the e-learning to be more specific and giving more time to search for their own solutions.

TABLE III  
ADVANTAGES AND DISADVANTAGES OF E-LEARNING

Advantages		Disadvantages	
Feature	Percentage of students	Feature	Percentage of students
Possibility of multiple repetition	40.6	Inability to ask the teacher	65.6
Ability to learn when you want to	29.1	No motivation	31.2
Time save	28.1	No contact with people	16.6
Ability to learn in home	23.9	Underdeveloped courses	8.3
Own rate of work	18.7	Internet issues	7.2
No stress	16.6	Not owning a computer	7.2
Any place of learning	12.5	Procrastination	7.2
Independence	7.2	Hardware issues	7.2

The most frequently mentioned (65.6%) of e-learning drawback was the inability to ask direct questions to the professional. In fact all well-designed courses give you an opportunity to e-mail with teachers. 31.2% considered that e-learning motivation is not enough. 16.6% treats the lack of contact with people as a disadvantage. 8.3% of students rate courses as underdeveloped. 7% focus on Internet, issues, hardware problems, procrastination and that not everyone owns a computer. Rarely mentioned disadvantages were the need for independent search for solutions, occurring technical problems, the inability of the current assessment of the work by the teacher and the lack of self-control of the student's work. Suggestions on performing tasks on the course just before the deadline were found among answers. In addition, students admit to working unsystematically, postponing work, unwillingness to think for themselves and to looking for reasons not to learn. Individuals found knowledge taught in training e-learning as an encyclopaedic and difficult to

understand and assimilate. Also, some do not find working alone as competitive.

Analysing advantages and disadvantages of e-learning mentioned by students it can be seen from the one hand awareness of the value of e-learning among students and from the other the lack of maturity to use this form of teaching. Respondents recognize and emphasize the opportunity to focus on the analysis and use of reliable knowledge delivered them to their homes, but also admit a lack of ability to work independently. They cannot self-motivate themselves, as well as they fear of making independent decisions without the supervision of a teacher.

### IX. IMPLEMENTATION OF E-LEARNING IN HIGHER EDUCATION

It can be concluded that e-learning is a modern and attractive way of teaching, a well-known and accepted by the students. Despite the lack of experience with this method of educating, students are open to a computer distance learning. Indications of students on the course evaluation show that practically every teacher who has computer skills at the intermediate level is capable to create, with a little effort and using the ADDIE model, an e-learning course which will be a full-fledged training and will meet the needs of students. The author proposes to take courageous attempts by teachers to create their own e-learning courses. In addition, there are noticeable tendencies of dependence and immaturity in the field of self-motivating, working and learning among students. Knowing these facts steps should be taken to educate self-reliance, courage and motivation to learn. E-learning courses offer should be widened in higher education to familiarize students with this form of education. It is necessary to conduct extensive research on the perception of e-learning among students of other universities, and to change this perception after self-motivation and self-reliance training. E-learning is a modern way of transferring knowledge which should be developed and used in academic teaching. [4]

### X. ENDING

Analysis of the author's research shows that despite the fact that students, as representatives of the generation "Z" should be familiar with the various forms of education, including that conducted remotely by a computer, most did not have to deal with e-learning till WLMM course. Their openness to new experiences should be used to educate them and to develop skills that they lack to achieve the full figure of a competent citizen of the digital world, and which they are not able to learn independently. The multitude of available resources lets to achieve the outstanding results. Appropriate education, however, is necessary. Teaching and upbringing of young people is needed so that man can control and use technology for their own purposes and development. These activities should start from an early age of living in the digital world.

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