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RICH MEDIA PRESENTATIONS IN BLENDED LEARNING

BOGATE MEDIJSKE PREZENTACIJE U KOMBINIRANOM UČENJU

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Abstract

With the advancements in ICT, involvement of teachers and learners in teaching and learning significantly changed. Traditional learning became interwoven with multimedia based e-learning systems which eventually stretched outside classroom world into e-learning universe. Recently, traditional face-to-face classroom learning and e-learning merged their characteristics into promising combination named blended learning. The most important benefits of blended learning are: students can manage their study time, they can select the delivery format of learning content and improved learning interaction. Synchronous and asynchronous communication and teacher-centered and learner-centered approaches are combined to maximize the efficiency of learning. One of important factors for successful blended learning is efficient e-learning material. Its efficiency is further dependent also from the type of material and the ability of software for preparing the e-learning material. In the paper we present the blended learning approach used for the last three years in course Software, and the research we perform on using rich media presentations prepared with Microsoft Producer and AuthorPoint that are specially suited for blended learning.

Sažetak

Sa napretkom u ICT-u, uključenost nastavnika i učenika u nastavi i učenju značajno se promijenila. Tradicionalno učenje postalo je isprepleteno s multimedijski utemeljenim sistemima za e-učenje koji se na kraju pružaju izvan učionice u svijet e-učenja. Nedavno, tradicionalne licem-u-lice učenje u učionici i e-učenje spojilo se u kombinirano učenje. Najvažnije prednosti kombiniranog učenja su: učenici mogu upravljati svojim vremenom učenja, oni mogu odabrati način isporuke sadržaja učenja i poboljšati interakciju učenja. Sinkrone i asinkrone komunikacije i nastavniku i učeniku usmjeren pristup se kombiniraju kako bi se povećala učinkovitost učenja. Jedan od važnih faktora za uspješno kombinirano učenja je učinkovit materijal za e-učenje. Njegova učinkovitost dalje ovisi i od vrste materijala i sposobnosti softvera za izradu e-learning materijala. U radu predstavljamo pristup kombiniranog učenja koji se u posljednje tri godine na kolegiju Softver, te istraživanja koja vršimo o korištenju bogatih medijskih prezentacija pripremljenih uz Microsoft i Producent AuthorPoint koji su posebno pogodna za kombinirano učenje.

INTRODUCTION

Technological era significantly impacted how technology evolved, become widespread available, easy accessible and more user friendly. It has changed the public in the way of thinking, living and educating. It is for sure pervasive and also integral to the teacher development process /**1**/. Distance education has been in use for over a century, both educational and non-educational institutions adopted it. Recently the advent of quick acceptance of the World Wide Web offered new possibilities for teaching and learning /**2**/, consequently institutions implemented distance learning mainly as an e-learning in the form of web-based learning. Web-based learning systems serve as a platform to facilitate teaching and learning and provide new approaches of it /**3**/. There is also increasing interest in delivering degree programmes without requiring students to attend traditional classroom-based classes /**4**/. However, there are many differences between traditional classroom-based and web-based courses that must be addressed to have effective courses – on of them is delivering efficient course materials.

The Bologna process in general for some study programs suggests less time for lectures and more time for students work commitment. As a result

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lectures have to be prepared with more caution, be more time efficient and allow students to get and use appropriate course materials which help them by their obligations. Many have argued that educational institutions, especially of higher education, should focus on developing and adopting information communication technology (ICT) to facilitate student learning /5/. ICT has been a component in many recent educational reforms in many countries /6/. Education programmes have been responding to ICT development and adopting it, some of them with pedagogical approach some merely on technological approach, and although e-learning approaches are incorporated in many educational programs, there is still evidence that suggest that these are often piecemeal and have little impact on the wider curriculum /7/. Teachers' use of ICT continues to be criticized, many researchers report that teachers have good ICT equipment but have been using ICT infrequently and when used, it is for information transmission rather than effective integration of technology into teaching and learning and facilitation of students' knowledge construction /8/, /9/, /10/. Establishing, adopting and efficiently using technology-enhanced learning environments is an especially challenging set of processes. Important integral part of that are course materials and software tools to prepare and facilitate them. The paper considers narrated presentations also named rich media presentations as a category of course materials, two tools to prepare them and evaluation of their usage for the last few years. The structure of the paper is as follows. In Section 2 we present the blended learning approach as an approach which facilitates web-based learning, and in Section 3 two authoring tools to prepare narrated presentations. In Section 4 the results of an evaluation on using narrated presentations are presented and Section 5 concludes the paper.

BLENDED LEARNING

Some faculties have been early adopters of distance education, others were cautious or just needed more time /11/, and most of them now offer at least one form of distance education. In fact, many institutions have implemented web-based learning systems. Some authors describe e-learning and name it web-based learning, as a learning process in which web-enabling technologies were used to encourage interaction and communication between students and instructors /12/. The IEEE Learning Technology Standard Committee (www.ieeltsc.org) defined a web-based learning system as ''a learning technology system that uses web browsers as the primary means of interaction with learners, and

the internet or an intranet as the primary means of communication among its subsystems and with other systems''. Any e-learning system that enables that, for example learning management system (LMS) Moodle, can be defined as a web-based learning system.

The population of students has expanded from regular students to all kind of learners and all kind of sectors; educational, health, military and commercial. It is reported that web-based learning is the fastest growing form of delivery in education in the United States /13/. Several researchers report about steep increases of percentages of organizations and users using such systems /14/, /15/. Levels of usage canbe found in /16/; factors influencing adoption of web-based learning systems by instructors are given in /17/, /18/; perception of web-based courseware as a supplement to face-to-face instruction in /19/; seven strategies (more factors) for successful web-based learning can be seen in /20/; faculty satisfaction about online environments is given in /21/; factors for continuing using of such systems in /22/, and factors influencing teachers in technology integration in /23/. Some researchers report that students who used web-based learning systems performed better than students who used traditional way /24/.

Despite the trend of using web-based learning systems, the number of their users is not increasing as fast as expected /25/. There are also users who discontinue to use it after initial acceptance of its usage /26/. It has also become evident that the nonlinear, learner-centered style of many web courses is not viable for some learners and some topics /27/.

In last fifteen years, technologies and pedagogies have collected many cases of best practices. Completely web learning is often tedious, and students prefer meeting face-to-face in the traditional classroom /28/. It seems that a solution can be in form of blended learning, as a hybrid approach where face-to-feet meetings are combined with traditional classrooms. It has all the potential to promote student-centered learning by emphasizing authentic experiences, and encouraging active learning. However, from the instructor point of view it is important to recognize that instructor workload is increased; usually between twice the usual amount and three times for complete online courses /29/.

AUTHORING TOOLS
Teaching and learning with ICT significantly depends on quality of resources. Design and creation of them further depends on people involved and the authoring software tools used.

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Probably the most used tools are presentation tools. Using presentation software is not just a technical matter but also raises deeper issues of teaching style, views of teaching, learning and pedagogy /30/. Many teachers are familiar with presentation tool Microsoft PowerPoint, perhaps it is the most known and used software tool for teaching in higher education. Originally it was designed for marketing, instructors find it helpful to organize and present lecture materials, and to easily provide handout resources for students. Its pedagogical constraints and potentials are discussed in /31/ along with some other presentation software.

Main focuses of the paper are narrated presentations and authoring tools that facilitate them. In /32/ three primary instructional applications of narrated presentations in higher education are given: audio-visual archives of traditional classroom lectures; audio-visual archives of major presentations in graduate courses; on-demand lectures with hybrid courses. Traditionally, the process of creating a finished video presentation includes three main phases: preproduction, production and postproduction, or in abstract terms, planning, execution, and polishing /33/. From video presentations we can induce this process into creating finished narrated presentations, except that emphasis in planning is on narration text. Instructors need not to aim for professional television quality, but because of the mispronunciations, oddities of speech and slips of the tongue remain recorded in such resources, some instructors spend excessive amounts of time attempting to reach perfect resource /34/.

There exist several authoring tools for creating narrative presentations, in the continuation we present two of them used in the evaluation in the next Section. Regardless of the tool instructors have to consider quality of materials /35/, /36/ and psychological correlates of multimedia computer supported instructional resources /37/.

Microsoft Producer

Microsoft Producer is a free extension for licensed users of Microsoft PowerPoint and provides lectures presentations with streaming media functionality. It allows users to use their presentations and add (or use existing) music, graphics, screen-capture animations, full motion videos and especially voice narration. Learners experience a user-controlled, high fidelity lecture presentation, with a table of contents, and controls to pause and review lecture at will. PowerPoint slides are placed on a timeline, a presentation template can be selected, and the multimedia elements are placed on the timeline and synchronized. Especially useful feature is capability to record voice narration which is automatically synchronized with the slides. The product is a set of files (presentations are converted to images to

reduce overall file size) that can be put to web or CD from where students can start lecture by single click. Its biggest disadvantage is the need of Microsoft Internet Explorer. An example of lecture can be seen on Figure 1 while several cases of its usage are given in /38/, /39/.
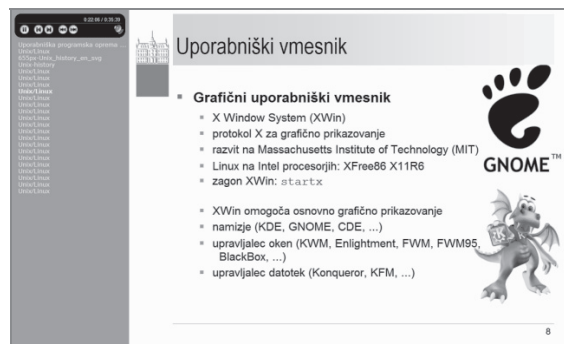

Figure 1: An example (operating systems with emphasizes to Unix and Linux) of narrated presentation in Microsoft Producer

authorGEN authorPoint

AuthorGEN's authorPOINT is an easy-to-use rich media presentations creation tool that works as a toolbar inside Microsoft PowerPoint as a starting point to create final product in the main part of the application. While free version (authorPOINT Lite) is limited in functionalities, commercial version offers all the functionality of Microsoft Producer and extend it in sense of usefulness, user friendliness and better visual output. For example, instructor can also annotate important details or use pointer tool to call the attention of the viewers to a specific point on the screen. The product is a set of files that present Flash-based narrated presentation or can be packed as a SCORM compliant content for sharing across learning platforms. The Flash files are smaller, secure, and in a streaming media format that's ideal for posting presentations to web sites, intranets or self-running CDs. Additionally, presentations can be converted to video format that can be send to YouTube or to transfer as a podcast to iPods, or to be uploaded to streaming server authorSTREAM or on a free online presentation sharing platform WiZiQ. An example of lecture can be seen on Figure 2 /40/.
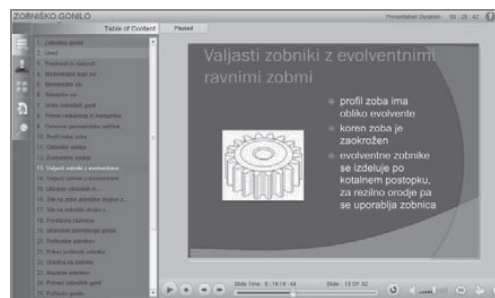

Figure 2: An example (all about gear drives and transmission) of narrated presentation in AuthorPoint

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COURSE SOFTWARE AS BLENDED LEARNING

Decision to introduce blended learning to study program was taken at academic year 2007/08. Students from two studying programs 'mathematics-techniques' and 'physics- techniques' which study for future teachers have course Software where they learn about several areas related to user and system software. The content model is centered on 11 modules covering that areas, one of them covers operating systems with emphasize on Unix and Linux. At each start of the module (the same applies for lectures and exercises) students participate in shorter version of lectures (or introduction to module in case of exercises), they are introduced to their tasks and obligations for that module, and they are given a deadline to finish their work. Until the deadline they work individual or collaborative, based on the given tasks. At the end of the module students meet again in class with instructor to reflect the outcomes and jointly explain any misunderstandings or raised questions. All the time students use forum where they have to answer on questions given by instructor, or they post their questions relating the module's subject. For individual issues they use e-mails to instructors. Students used different software and resources to fulfill the objectives and obligations of the course. They used Moodle LMS as their starting point of their activities and forum functionality, Joomla! content management system to prepare simplified version of portals for e-resource repositories for their future work, Mahara e-portfolio to publish their artifacts, critical thinking and reflections on specific tasks, and several software tools to prepare their artifacts and get acquainted with them for their future work. In all these academic years students used the narrated presentation for module on operating systems prepared in Microsoft Producer instead of traditional start of the module. Last two academic years they were also introduced to another narrated presentation as a didactical resource to learn about gear drives and transmission as an example of AuthorPoint's product. For the first one, instructor simulated lecture and voice recorded it, than prepare the transcript of the lecture, polish the transcript (remove duplication of facts, correct grammar mistakes, add some new sentences and overall improve narration to be more time-efficient), and then record lecture again using prepared narration. After that voice recordings were manipulated to remove unwanted noise and equalize the voice level and then recordings were combined with presentations and images in Microsoft Producer. For the second resource, simulating lecture was skipped and narration was prepared first, and then combined in AuthorPoint with other materials into final resource. First one lasts 35:39 minutes and the second 28:42 minutes.

STUDENTS OPINION

Motivation

As stated in the introduction Bologna process suggests time efficient facilitation of the study on both sides considering all the changes in the student-centered approaches and the staff's burden. Some instructors had to shorten their contact hours and still had to manage the delivery of information and students' activities. On the other hand, students need to compensate shorter lectures by their own, they need to invest more of their time and need to better focus on their study, but unfortunately many fail in achieving the results. Therefore it is crucial to deliver students efficient materials for which we observed how narrative presentations are suitable. Some of authors use slides, some video materials, we have combined those two.

The second motivational reason was the fact that material must be updated and the comments and grades will be taken into account.

Preliminary observations

Before the end of the module on operating systems all students were interviewed on how often they used the resource, how they used it from the interactivity viewpoint and their general opinion about it. On average on all academic years they used it 1,53 times; either they use it for first not so much focused listening and then second focused listening by using narration controls (back, pause, and skip to specific part), or they focused listened already the first time. From total 70 students in four academic years, only 8 (approximately 11%) students reported to watch the resource more than 2 times (Table 1). Students that were repeating academic year are excluded in table results, except for academic year 2007/08 when we started with such material. It also need to be emphasized that the interview was conducted before final exam where some of students listened the resource again.

Table 1: Frequency of repeating watching material on operating systems for different academic years

year	1	2	3 or more	maximum	mean
2007/08	8	5	2	3	1,60
2008/09	10	6	1	4	1,53
2009/10	17	1	3	3	1,33
2010/11	10	5	2	5	1,65

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An example of typical comment about the resource is the following:

Maja (2010/11): Resource is very useful, especially for students who can not participate at lecture and can learn about the subject on such a way. It is also good for the other students to repeat the subject. The problem occurs when we don't understand something and we can not ask like on lectures.

Not all students were satisfied with it which proves the everlasting issue there is no "one size fits all" providing the next typical comment:

Tina (2009/10): Such resource is useful but I prefer notes.

Instrument

Opinions of students were collected and from them a questionnaire containing 39 statements to grade them using Likert scale (1 – total disagree, 5 – total agree) and one open question regarding their opinion on differences from both narrated presentations was prepared. Statements are covering their general opinions about narrated presentations (such materials), advantages and disadvantages of them, quality issues of them, how they can be used, their influence to lecture notes, and their opinion on learning with such materials. They can be seen in Table 2.

Methodology

Students (repeaters were included) from academic year 2010/11 were invited to participate in anonymous web survey. Statements from questionnaire were randomly showed to diminish the influence of statements order. In total 17 students from 19 in this (2010/11) academic year responded. Reliability of questionnaire was tested with Cronbach's alpha resulting 0,63. Descriptive statistics analysis of statament grades was done with SPSS.

Results

Summary of students grades of opinions are given in Table 2. Each statement is accompanied with the mean value to show overall value, and the minimum, maximum and standard deviation value to show range of answers.

Table 2: Students' grades on statements about using narrated presentations and learning with them

statement	min	max	mean	stdev
1 Such materials are useful	3	5	4,00	0,61
2 I don't like such learning materials	1	4	2,47	0,94
3 Such materials are suitable for students who were unable to attend classes	3	5	4,29	0,69
4 Such materials can replace traditional lectures or exercises	1	4	2,88	0,86
5 Such materials should be used as an additional source for lectures or exercises	2	5	3,94	0,75
6 Such materials are more useful for recurrence then learning of new topics (items)	1	5	3,41	1,23
7 Such materials can promote problem based learning	2	5	3,47	0,87
8 Such materials can be student-centered	3	5	3,53	0,62
9 Such materials promote the individual's personal development (information retrieval, independence, new learning methods, ...)	3	4	3,71	0,47
10 Such materials are more monotonous then lectures and exercises	1	5	3,35	1,06
11 By too long narration, concentration and perception ability are significantly lower	1	5	3,94	0,90
12 I prefer more natural presentation of subjects (some parts quicker, some parts slower, repeating of the important parts, ...)	1	5	3,82	1,13

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13 It is easier for me to follow the lectures then such learning materials	1	5	3,24	1,15
14 The effectiveness of such materials depend on the presented topics	3	5	3,82	0,53
15 Such material should be used for complex content only; simple contents I rather learn in the classroom	1	5	2,71	1,10
16 Advantage of such materials is in fact that selected parts can be replayed	4	5	4,53	0,51
17 Repeated listening of material enables better understanding of the learning topics	2	5	4,12	0,78
18 Repeated listening of material enables better retention of learning topics	3	5	4,41	0,71
19 Advantage of such materials is to skip parts of materials that I already know	3	5	4,29	0,59
20 Advantage of such materials is that viewer can adjust his/her time schedule to view them	4	5	4,41	0,51
21 Effectiveness of my learning is better when I adjust my time schedule	2	5	4,06	0,75
22 Advantage of such materials is that viewer can choose place where he/she watch them	3	5	4,24	0,56
23 Advantage of such materials is that viewer can adjust the speed of learning (watching)	4	5	4,24	0,44
24 Advantage of such materials is their constant availability	4	5	**4,59**	0,51
25 Disadvantage of such materials is in the loss of social contacts with classmates (no or less comments and questions inside the group)	1	5	4,18	1,07
26 Disadvantage of such materials is that it is not possible to ask additional questions	1	5	4,24	1,03
27 Learning materials always can raise additional questions	1	5	3,65	1,06
28 It would be nice if I could ask lecturer in the classroom the questions that arise while watching the material	3	5	4,06	0,56
29 It was nice that I could send the questions that arose while watching the material in the LMS (Learning Management System)	3	5	3,94	0,66
30 Sound quality of such materials significantly affects the quality of learning	3	5	3,94	0,66
31 Image quality of such materials significantly affects the quality of learning	3	5	4,29	0,69
32 Such materials should be accompanied by short summaries	3	5	4,12	0,70
33 Such materials should be accompanied by longer textual explanations (as in textbooks)	1	5	3,06	0,97
34 The ideal study consists of lectures and exercises on the faculty	1	5	3,18	1,13
35 The ideal study is in form of e-learning	1	4	2,41	1,00
36 The ideal study is in form of blended learning	2	5	3,71	0,77
37 Such materials allow making higher quality notes than frontal lectures	1	4	3,12	0,93

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| 38 For the exams I primarily use my notes from lectures | 1 | 5 | 3,76 | 0,97 |
| 39 If such material could be played on mobile devices (mobile phone) I would use them | 1 | 4 | 2,29 | 0,92 |

Discussion

1: students in general believe that they can benefit from such materials; 2: preliminary observation showed some negative comments which are here dispersed and in overall students didn't agree to dislike such materials; 3: students are aware that they can't or sometimes won't attend classes and such materials are suitable for such cases; that also suits the trend of less traditional lectures favoring distance learning; 4, 5: students don't agree or disagree that such materials can replace traditional classes, but agree that they should be used as an additional source; 1, 3-5: in general such materials are useful, are positive contribution and confirms the work in this direction; 6: students recognize importance of such materials for learning new topics and for recurrence, giving slightly better degree to recurrence; 7-9: during the study students learn about the importance of problem based learning, student-centered approach and individual's personal growth, to whom they agree that such materials are suitable, however with low agreement grades; 10: based on the fact they used different materials with different monotony and their range of grades they believe that materials can be monotonous or dynamic; proper care should be done when preparing materials to get the best out of them; 11: range of grades indicate that long materials can be successfully used with controls widgets, however mostly they agree that one of effects of long materials is in decreasing concentration and availability of perception, therefore it is important to efficiently integrate narration controls and to enable own control of narration overall watching/ learning speed; 12: used materials differ slightly in 'naturalness' of narration, students agree that they prefer lectures with more humanizing effect therefore voice tone, speed and repeating are essential aspects of instructional communication which we should not be quick to dismiss; 13: in the viewpoint of following the lectures, such materials are in general equal to lectures; 14, 15: they used two different topics and topic complexities in materials based on which they agreed that effectiveness of such materials depend on topic but not so much on complexity; again they pointed out to proper care when making such materials; 16-18: they agree that repeating selected parts of materials is important advantage of such materials and this functionality enables better understanding and retention of learning topics; repeating is otherwise naturally present in traditional lectures; 19: related to repeating is skipping already known parts which is for them also important advantage because they can save their learning time; 20, 21: they wish to learn when they dedicate time for that and believe that this significantly influence their effectiveness of learning; they recognize this advantage in such materials; 22, 23: important advantage for them are also location and speed of using such materials; they typically study on three possible locations (at home; where they live in the time of study; faculty facilities – free accessible computers, library, using their laptops connected to faculty wireless network); 24: the most important advantage for them is nonstop access and availability of materials to which they grade the most; it would be interesting to use techniques of web log mining to examine how and when they accessed the materials; 25, 26: social contact and asking questions (individual or collaboratively in groups) about learning topics is an important part of active student-centered learning and they agree that it is important for them; 27: based on the range of answers some of them believe that such materials can't be prepared so good that no question will arise, some disbelieve that; again we can see a strong indication about proper care when preparing such materials and maybe the need for non-linear narrated presentations that would answer raised questions; 28, 29: regarding the asking questions they agree that there should be possibility to ask questions and that using LMS is suitable for that; we have to stress that although they see potential in LMS this academic year some of them sent e-mails and some of them waited for meeting in class at the end of the module; 30, 31: from the quality of such materials both materials slightly differ in sound and image quality; students agree that sound quality is less important than image quality, but both are very important; for the sound the most important are good enough clarity and understandability; they are more sensitive for the image quality, probably because one of materials contained schemes and planes and with low quality images they would spent more energy

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for recognition than cognitive learning processes; 32, 33: they agree that such materials should be accompanied with short summaries, and from the range of answers about longer textual explanations we can observe that some would like to deepen their understanding and some just to study in the 'line of least effort'; by providing short summaries instructors have to be careful not to offer too much and not to promote laziness instead of learning processes such are listening, understanding, analysis and synthesis of information; 34-36: during the study students get acquainted with different learning forms in sense of traditional, e-learning and blended learning forms; to latter they give the biggest grade as to be ideal form of studying; 37, 38: in preliminary observations students emphasized the importance of lecture notes for their study; they agree that notes are important for the exam and they believe that comparatively good notes can be done in lectures and at using such materials; in lectures instructor usually emphasizes and repeat important parts and indicates what to note while in narrated presentations viewer can use control widgets; 39: although mobile learning is very promoting recently students expressed their opinion that they probably wouldn't use it which helps designers of narrated presentations to focus on usage on personal computers (higher resolution, larger files, and less limitation on used software technology).

Students were also asked about their opinion on differences in two used materials. Main comments are expressed in Table 1, additional comments were that first material contained simple and illustrative explanations sometimes spiced with additional associated information and one negative comment about forced using of Internet Explorer while the second material was too monotone but used animations and pointer tool to simplify following the lecture and possibility to see table of contents with images in the part of the screen (similar to handouts). It was a surprise that students were not significantly bothered with the forced usage of Internet Explorer since not all of them primarily use Microsoft platforms. On other occasion students reported that because of other studying obligations they use virtual computers having Microsoft operating system.

CONCLUSION

Bologna process affected the implementation of course Software, among becoming electable course the biggest change is in shortcut of hours for lectures and exercises. By using blended learning in this course for the last four academic years we believe to be prepared for that change and offer students still enough qualitative course, and to meet most of the objectives of non-Bologna version of the course. Experimental usage of rich media presentations showed several advantages versus traditional lectures, students in general appreciate them and they can be improved to be standalone lectures or additional resources to lectures to which authors tend to. It would be interesting to observe these issues in doctoral studying programmes where number of students is small, the study is more individual and time efficiency is more sensitive.

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