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Teaching Multimedia Documents to LIS Students

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ABSTRACT

Multimedia documents (MMDs) are connected to education in two different ways: future professionals have to be educated to perform the complex task of multimedia creation, and multimedia is also successfully used in various phases of the educational process. This paper focuses on education for multimedia from the point of view of four of its different aspects: technology, design, purpose and content. The present status of education for multimedia is illustrated by an analysis of the academic scene in Serbia and neighboring countries, as well as through some other illustrative examples. The results of this analysis show that the content aspect of multimedia is covered mainly in the Library and Information Science (LIS) curricula. We present the place of the obligatory course Multimedia Document in the LIS curriculum at the Faculty of Philology, University of Belgrade. It is organized as a team project of a whole generation of students in the last year of their studies, where each generation has to tackle a different topic important from the perspective of preservation of cultural heritage and present it in a multimedia form. In this paper, we show how successful this approach has been, both from teachers' and students' point of view.

INTRODUCTION

The term *multimedia* implies "means of communication through multiple media", while a *multimedia document* is "a document (a set of structured information) which comprises information coded in at least one continuous (time-dependent) medium and in one discrete (time-independent) medium" (Parekh, 2006). According to the IFLA (International Federation of Library Associations) Guidelines for Audiovisual and Multimedia Materials in Libraries and other Institutions (IFLA, 2004) multimedia "contains two or more audiovisual expressions, e.g. sound and image, text and animated graphics", while interactive multimedia in addition "has the order and/or nature of its presentation under user control".

Multimedia is connected to education in two different ways: on the one hand, future creators of multimedia and multimedia documents have to be educated to perform this complex task while, on the other, multimedia is successfully used in various phases of the educational process. Various early studies have proven that in some specific situations the use of multimedia can help people learn (Najjar, 1996), which led to the emergence of a new field — Multimedia Learning (Mayer, 2005). More specifically, in the Guidelines for Professional Library/Information Educational Programs (2012), IFLA stresses that information technology resources for LIS education should comprise "computer hardware and software and *multimedia* resources available for students and staff". However, in this paper, we will concentrate mainly on education for multimedia, and not on multimedia for (or in) education. The need for such education is corroborated by the production of this new form of documents. In Serbia, a relatively small country with a modest market, the production of multimedia, published in DVD format, as a combination of text, pictures, audio and/or video recordings has been stable in the last five years, ranging from 1140 in 2007 to 1370 in 2011. A proper education is needed for such a production.

Our paper is organized as follows. In the section 'Education for multimedia (documents)' we present education for multimedia with respect to its different aspects. In the section 'LIS curriculum at the Faculty of Philology, University of Belgrade' we briefly present LIS education in Serbia, while in the section 'Multimedia documents in the LIS curriculum — an experience' we present the content and place of the course Multimedia Document in the LIS curriculum at the Faculty of Philology, University of Belgrade. In the section 'Lessons learned' we analyze the observed benefits from this course from the point of view of professors and students, and in the 'Conclusion' section we give some conclusions.

EDUCATION FOR MULTIMEDIA (DOCUMENTS)

According to the already mentioned IFLA (2012) guidelines "The need for training in this field (multimedia) consists of three

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complementary and indissociable dimensions: intellectual, legal, and technical." Our analysis of the various curricula that feature a course in multimedia or multimedia documents led us to distinguish four main aspects of multimedia documents that determine how and where their future developers will be educated:

1. The *technology* used to support multimedia elements in documents (text, images and graphics, sound, video and animation);
2. The *design* of documents that has to be both appealing and functional;
3. The *purpose* for their production and their target *audience*;
4. Their *content* that can be expressed through traditional and/or multimedia means.

These aspects are naturally intertwined and all curricula that include a course in multimedia or multimedia documents have to take that into consideration. We will illustrate this by providing an overview of the academic scene in Serbia,[2] and, to a certain extent beyond. The complete list of the analyzed curricula is given in Appendix A, in which each curriculum is assigned an acronym by which it is referenced in the text.

TECHNOLOGY OF MULTIMEDIA

Today in Serbia there are a number of schools and faculties that offer education in computer science and information technology (IT), both as a part of academic and professional studies. These programs are offered either by faculties of sciences (usually at a department of mathematics) or faculties of technology (usually at a department of electrical engineering), but sometimes also at independent IT schools established in recent years. It does not come as a surprise that practically all of them offer at least one subject devoted to multimedia either at an undergraduate or at a graduate (masters) level. One of these faculties offers even a complete Multimedia Systems professional program (UN-EF-EIF). The courses offered by more general programs (Computer Science, Software Engineering, Software and Information Technology and the like) are usually entitled: Multimedia (UU-RAF), (Development of) Multimedia Systems (UBG-MATF, UBG-ETF, UNS-TF-Zr), Multimedia Databases (UBG-FON), Development of Graphical and Multimedia Applications (UNS-TF). The description of these courses in the respective curricula, as well as of other courses offered by them (some frequently appearing are: Web Applications Programming, Computer Graphics, Web Design, Computer Games, etc.) undoubtedly shows that these courses are aimed at mastering the *technical aspect* of multimedia documents. Only some of these curricula contain courses that are aimed, to a certain extent, at understanding and preparing their content (at UBG-ETF and UNS-TF). Some technology faculties offer professional studies of Graphic Design (UNS-TF, UMet-FIT) which focus both on the *technical aspect* of multimedia documents and their *design aspects*.

DESIGN OF MULTIMEDIA

Fine arts and applied arts schools seem to be the right place to learn about the design aspect of multimedia, particularly in the graphic design curricula. However, the majority of such curricula in Serbia have no multimedia or related courses (UUBG-FPU-GD, ALUBG-GD, UKG-FILUM-DU-GD). The only exception is the Graphic Design curriculum at the Faculty of Arts, University of Niš (UNI-FU-GD) that has some courses related to multimedia: Graphic Communication and Digital Audio Processing (but, surprisingly, not Digital Video Processing). It is interesting that faculties of drama arts both in Belgrade and Novi Sad, in their Camera (UUBG-FDU-Kam) and Multimedia Direction curricula (UNS-AUNS-DD-MR), respectively, have courses related to multimedia production, like (Technology of) Audiovisual Media, Editing of Audiovisual Media, and Mass Communication Media. The Department of Fine Arts, University of Arts in Novi Sad has two curricula that have courses that can be seen as prerequisites for multimedia: Graphic Communication (UNS-AUNS-DU-GK) with courses like Digital Image, Introduction to Techniques of Animation and Visual Effects, and New Media in the Arts (UNS-AUNS-DU-NM) with courses like Digital Art and Intermedia Art.

The conclusion can be that while multimedia is taught at many art schools, it is usually connected to some particular form of art, like performing arts, and that the production of multimedia documents is not in their focus.

APPLICATIONS OF MULTIMEDIA

The natural target audience of MMDs are pupils and students at various levels of education. To that end, we first analyzed the curricula of numerous teachers' training faculties in Serbia that educate future teachers in elementary schools. This analysis reveals that most of them do not have a specific course aimed at the use of MMDs in the teaching process. They usually have some general course in information technology at an undergraduate level (UBG-UF, UK-UF-Uz, UK-PFJ) and a few more specific courses at a graduate (masters) level (like ICT in Teaching, Web Portals, Distance Learning (UK-PFJ)). The Faculty of Education in Sombor (UNS-PF-So-MDO) is an exception, since it has a complete Media Designer in Education professional program, with the aim to educate professionals who could plan and create learning material and shape the teaching and learning process. To that end, this curriculum has courses like Designing Media for Education, Educational Software, Multimedia Technology in Education, Multimedia and Graphical Applications, etc. This list of courses shows that this specific curriculum, despite the proclaimed aim to concentrate on the teaching process, covers to some extent the technological and design aspects of MMDs as well, while their content aspect is not in the focus.

High school teachers of the Serbian language and literature are mostly educated at faculties of humanities. The analysis of their curricula shows that some of them have as optional courses, at an undergraduate level, subjects like "Internet, Hypertext and Hypermedia in Teaching Literature" (UN-FF-P) and "Internet and Literature in Teaching" and "Literature and Media in Teaching" (UBG-FilF-SKJ). The description of these courses reveals that they are concentrated more on the Internet and the retrieval of information relevant to the Serbian literature than on multimedia as a specific form of a document.

The other natural applications of multimedia, besides education, would be in connection to the traditional media and their adaptation to new forms. However, the curricula of the faculties in Serbia that educate future journalists and other communications professionals do not support this belief — they have neither a course devoted to multimedia nor a similar one (UBG-FPN-NiK, UN-FF-N, USing-FMiK). The only exception is the graduate studies of Communicology at the Faculty of Philosophy at the University of Novi Sad (UNS-FF-Kom). Their course in Electronic Publishing is devoted to the production of *content* for the new media and its implications for the work of publishing houses, educational institutions and libraries.

CONTENT OF MULTIMEDIA

At present, in Serbia, there are only two faculties that educate future librarians and information specialists. The Faculty of Education in Sombor (UNS-PF-So-SBib) has a three-year major program for future school librarians. Their program contains a set of obligatory information science oriented subjects – Information Science in Education, Educational Technology, Databases and a set of optional subjects – Internet Tools, Software Tools and Their Use and Multimedia Technology in Education. The last one is fully devoted to various aspects of multimedia

[2] This analysis is made possible by the fact that all Serbian universities and faculties have undergone the process of accreditation in the course of joining the so-called Bologna process in 2006, with the adoption of the Law on Higher Education (No. 76/2006, No. 44/2010). As a consequence, all of them, with a few exceptions, have made their curricula publicly available on the web.

documents, primarily to its technological aspects and use in the educational process.

The other LIS program and its course Multimedia Document are in the focus of our paper and they will be presented in more detail in the following sections.

Since relevant conclusions concerning the presence and content of courses devoted to MMDs in LIS programs cannot be drawn from only two such programs in Serbia, we included LIS curricula of the faculties in the region (the neighboring countries and the Western Balkans) in our analysis: University "St. Kliment Ohridski" in Sofia (Bulgaria), University of Ljubljana (Slovenia), "Ss. Cyril and Methodius" University in Skopje (FYR Macedonia), universities in Sarajevo and East Sarajevo (Bosnia and Herzegovina) and universities of Osijek and Zadar (Croatia). All of these universities have reformed their curricula in accordance with the Bologna process.[3] In a few curricula, the stress is on librarianship (e.g. UES-FF-OKB and US-FF-LIS), while in the most of them, information science courses are well represented. However, none of these curricula have a subject devoted to MMDs, at least not by name. Most of the curricula contain courses devoted to digital libraries, either at an undergraduate (ULj-LIS, UKMS-PF-B, USa-FF-KKB) or a graduate level (UES-FF-OKB). The other relevant subjects are Digitization (UKMS-PF-B, USa-FF-KKB), Development of Web Pages (US-FF-LIS, USa-FF-KKB), and (Traditional and) Electronic Publishing (ULj-LIS). The University of Osijek (UO-LIS) and the University of Zadar (UZ-LIS) have similar programs. The course most relevant to our analysis at an undergraduate level is Design of Content for the Digital Library. Since this subject is preceded by subjects Information Technology and Metadata and Identifiers, which cover the necessary basics of markup languages for the description and presentation of content, it can be concluded that the content of digital material is given due attention. At a graduate level, both faculties have two interesting programs: Librarianship and Written Heritage in the Digital Environment, with subjects such as Digital Archives and E-publishing. Graduate courses in information science and librarianship at the University of Ljubljana (ULj-LIS) also offer some interesting optional courses: Educational Publishing, Video Information in Digital Libraries, Audio Information in Digital Libraries, and Preparation and Editing of Content from Manuscript to Publishing.

A comprehensive analysis of LIS curricula outside the region is outside the scope of our paper. The IFLA guidelines mention two programs that have such a course: University of New South Wales, School of Information Systems, Technology and Management, Audiovisual Management (UNSW-SISTM-AM) and University of California Los Angeles, Department of Information Studies, Masters in Moving Image Archive Studies (UCLA-DIS-MMIAS). A brief overview of the literature provides additional insight. Hong Xu (2003) carried out a study based on 42 ALA accredited LIS programs that showed that a group of information science courses named E-doc, containing, besides other electronic document topics, the design and production of multimedia, was represented in these programs by 58 courses. However, none of the courses from this group were among the five most represented. In an extensive overview of LIS curricula in Korea (Noh, Ahn, & Choi, 2012), the authors point out that the number of some courses is decreasing (e.g. those devoted to old books) while the number of others is increasing, especially those devoted to multimedia *content* — Multimedia Structure, Multimedia Organization, and Multimedia Management. The analyses of the LIS curricula in the European Union (EU) and the applicant countries (Juznic & Badovinac, 2005) that covered nine countries and their respective LIS schools were performed using the methodology presented in the paper by Wilson (2001). It showed that information science courses, covering not only information systems, communication, and information technology, but also computer science (group "C") were represented in their curricula by 14% on average (ranging from 6% in Poland and Lithuania to 25% in Hungary). The authors do not mention multimedia documents either as a course or as a topic.

This indirect study of LIS curricula worldwide cannot give us conclusive answers: the surveys and studies mentioned were performed in different time periods and for different purposes. However, it shows that in some parts of the world, information science courses are still underrepresented in the LIS curricula and therefore multimedia documents could not be given proper attention. Also, an adequate coverage of information science in the LIS curricula in schools in the developed countries does not necessarily mean that a course devoted specifically to multimedia would be present.

An additional conclusion from this analysis is that a lot of practical work is envisaged as part of information science courses, for instance, students have to perform some specific tasks, such as developing small digital libraries, creating web sites for individuals or institutions, or creating or editing articles in Wikipedia. In some cases, practical work is organized in the form of hands-on workshops and the assessment is based on the successfulness of projects (UD-ILS). This practical work is usually done either individually or in small groups.

LIS CURRICULUM AT THE FACULTY OF PHILOLOGY, UNIVERSITY OF BELGRADE

The first complete LIS undergraduate curriculum was established in Serbia in 1990 at the Faculty of Philology, University of Belgrade (Vraneš, 2008). Even this first curriculum respected the interdisciplinary nature of library and information science and tried to establish balance between the theoretical issues and training in the routines and techniques, which is in line with the orientation towards liberal, rather than technical, LIS education (Arms, 2005). The introduction of such a LIS program was very important because, at that time, professional degrees could be obtained only through complete undergraduate studies — graduate studies (masters) were only seen as a continuation of previous studies. This first curriculum was prepared in accordance with the same principles that applied to the studies with a much longer history at the University of Belgrade. Some common characteristics of these traditional curricula were: all courses were obligatory with a duration of at least two semesters; they were given broad names that could accommodate various topics according to the professor's views, and were lacking a detailed description of courses and student responsibilities (again open to the professor's views). These particular features were often seen as an obstacle to modernization of the curricula and keeping up with new trends.

A thorough reorganization of all Serbian university programs, following the so-called Bologna process, started in 2006. The Faculty of Philology, University of Belgrade entered this process in the same year, with the introduction of new curricula, and finalized it in 2009, with the adoption of revised curricula accredited by the Commission for Accreditation and Quality Assurance, a body established by the National Council for Academic Education. The new curricula follow the 4 + 1 system, that is, four years for undergraduate studies and one year for graduate (or masters) studies. By introducing both obligatory and optional one-semester courses, and by offering a detailed description of course goals and content, student responsibilities and forms of

[3] The Bologna Process is an agreement between European countries designed to ensure comparability of the standards and quality of higher education qualifications. The Bologna declaration was signed by education ministers of 29 European countries in 1999 and today 47 countries participate in the Bologna Process. The basic framework adopted consists of three cycles of higher education qualifications, which are defined in terms of learning outcomes. These are proof of students' knowledge and abilities upon completion of their degrees. In describing the cycles, the framework makes use of the European Credit Transfer and Accumulation System (ECTS): the 1st cycle is typically worth 180–240 ECTS credits, usually awarding a bachelor's degree; the 2nd cycle is typically worth 90–120 ECTS credits, usually awarding a master's degree; while the 3rd cycle is dedicated to the doctoral degree for which no ECTS range is given. In most cases, one academic year corresponds to 60 ECTS credits. In Serbia, the implementation of the Bologna Process started in some schools in 2005. The existing *diploma* academic degree was transformed into bachelor's degrees and the program lasts 4 or, in some cases, 3 years. The *magistratura* degree was mostly eliminated or transformed into master's degrees, awarded after 5 years of study. The degree of *doktorat* (PhD) remains.

final student assessment, these new curricula, in many respects, corrected the previously listed deficiencies of the old curricula.

Information science courses were given proper attention already in the old LIS curriculum (Krstev, 2002). Certainly, in view of the introduction of the Bologna process and the dramatic changes brought to libraries and librarians by the Internet and the web, in the last two decades, they had to be revised. Their presence in the new curriculum is 20.5% (measured by the number of courses) or 23.75% (measured by the number of the European Credit Transfer and Accumulation System (ECTS) credits; European Communities, 2009), meaning that it significantly exceeds the average of 14% given in the paper by Juznic and Badovinac (2005) for a number of LIS schools in the EU. However, the aim of these courses remained twofold — they had to provide students not only with practical skills, but also with the necessary theoretical background that would enable them to be advanced users of information technology and creators of digitized material, that is, they should enable students to achieve the "emerging technologies literacy" by understanding new developments in IT (as proposed in Shapiro & Hughes, 1996). It is understandable that such a complex goal was not easy to achieve. Theoretical knowledge covers, to a certain extent and not in depth, the foundations of information science, like elements of mathematical logic (propositional logic and predicate calculus), the basic concepts from the set theory (operations, relations and functions), coding theory, statistics, and also data structures and the basic algorithms that manipulate them. On the other hand, students have to acquire practical skills by mastering the standard office package (word processing, presentation preparation, table manipulation), formatting programs (LaTeX and BibTeX), basic programming applied to the office package (Visual Basic Environment — VBE), mark-up languages (Extensible Markup Language (XML) and the languages based on it, like HyperText Markup Language (HTML), and Really Simple Syndication (RSS), Cascade Style Sheet (CSS) and Unimarc), database programs and query languages (Standard Query Language — SQL). There is also a wide area of knowledge lying in-between, like character encoding, typesetting principles and font design, the use of the Internet and its services, search engines and their options, information retrieval, etc., which is also covered by various courses in the course of undergraduate and graduate studies.

Theoretical knowledge is taught mostly *ex cathedra* and its acquisition is checked by tests and written exams. The teaching of predominantly practical skills is done in a more interactive environment and student assessment is done not only by means of tests and written exams, but also through various homework tasks, like the creation of web pages, compilation of Wikipedia articles, preparation of BibTex bibliographic items, and evaluation of information retrieval and extraction systems. The list of acquired practical skills is certainly not exhaustive and it can never cover everything in use today in libraries and information centers. However, as stated in Gilster "digital literacy is about mastering ideas, not keystrokes" (Gilster, 1997), the acquired theoretical knowledge, coupled with mastered practical skills can enable motivated students to learn more easily whatever will be required of them in their future jobs. For instance, the knowledge of data structures and basic algorithms, VBE programming and HTML will help them to acquire Java Script programming skills, while the knowledge of XML, DTD (Document Type Definition) and XML Schema will help them understand TEI (Text Encoding Initiative), as well as various metadata schemas used for the description of digital objects, like Dublin Core, EAD (Encoded Archival Description), METS (Metadata Encoding and Transmission Standard), and LOM (Learning Object Metadata).

MULTIMEDIA DOCUMENTS IN THE LIS CURRICULUM — AN EXPERIENCE

DEFINING THE COURSE "MULTIMEDIA DOCUMENT"

It is not easy to develop an academic course devoted to MMDs for several reasons. If we adopt the four foundation fields of information studies: A — People, B — Information Content, C — Information Systems, and O — Organizations, as proposed in the paper by Wilson (2001), then multimedia documents would belong to the intersection of three of them, ABC. Besides, the versatile aspects of MMDs naturally place the courses devoted to them in a wide variety of faculties and schools, ranging from technology and design oriented ones to humanities schools, as shown in the analysis of the position and content of courses devoted to MMDs given in the previous sections. As a consequence, in each of these schools and faculties, only some aspects of MMDs are given due attention. Also, the topics related to MMDs are often distributed between several related topics, like Computer Graphics and Web Programming at technology faculties and Digital Libraries and Information Technology in the LIS programs (this problem was already stressed in the paper by Friedland, Hurst, and Knipping (2008) for multimedia courses in computer science programs). Next, defining a really adequate MMD course is impeded by the quickly growing pervasiveness of multimedia, as well as by the development of the technology behind it. However, the results presented in the paper by Heinrichs and Lim (2009) showed that the competence for developing multimedia (text, audio, video) was highly desired by graduate students of one LIS program (level 4.00 on the scale 1–5), but was far from being achieved (the perceived level was 2.19).

When developing the Multimedia Document course for the first LIS curriculum prepared according to the Bologna process, we tried to address these problems and offer some innovative solutions, as this course was not represented in the old curriculum either by name or in essence. Its place in the new curriculum was such that it was aimed at achieving three main goals. The first one was to address all the aspects of MMDs in it, while the *content* of MMDs was the main focus of attention because: (a) it is least represented in the courses offered by other programs, and (b) it naturally fits into the LIS program, since it connects well with other LIS courses. Moreover, our aim was to enable students to understand how the knowledge acquired so far can be successfully merged with the addition of some new skills. Further, with this subject we wanted to eliminate the one deficiency of academic teaching that remained untouched with the inclusion into the Bologna process and which can be described as "asynchronous education": first a professor talks, and then at testing and exam time students talk. Students are not even encouraged to "talk" before their time comes and their influence on the teaching process is minimal.

In order to achieve the aforementioned goals, the course Multimedia Document concentrates each year on one topic chosen by the professor. The criteria by which a topic is chosen are not very strict, and can be briefly summarized as follows: a topic has to be adequate for multimedia presentation (it almost "asks" for it) and has to be of unquestionable cultural importance, which excludes political and trivial topics, such as sport and entertainment. It does not mean that the topic has to be dead serious and boring — on the contrary, it is carefully chosen to attract student interest. Also, the topic chosen for each generation has to differ significantly from previous topics, so that each generation has to find its own way of dealing with it.

After a topic is presented to students, some time is left for them to familiarize with it, and then a list of institutions is made that can provide a material of interest. Depending on the chosen subject, this list can include libraries, museums, archives, theaters, radio and TV stations, print media, foundations, cultural centers and publishing houses. The next two months are devoted to the visits to these institutions where the material is collected; in the meanwhile, periodical meetings are held with the students when problems are discussed and the list of institutions is revised, if necessary. At the end of this period, the discussion on the concept of the future MMD starts, the selection of collected material is done and possible software solutions are analyzed. At this moment, the students are divided into groups according to their knowledge and inclination: some will deal with textual material, others with images and video recordings; one group of students will prepare the blog of the project, while the most advanced group will work on the software

solution and design. Periodical meetings are held at this stage; moreover, each student has her/his say concerning the content and visual presentation of the topic. However, most of the job is done using Google collaborative tools: Gmail, Google docs and Google Drive.

Since the subject Multimedia Document is based on teamwork, by the end of the school year, the preliminary version of the MMD has to be ready and it is presented to all students, the suggestions for improvements are collected for the last time, and a group of the most enthusiastic students finalizes it during the summer. By the end of this process, each student receives her/his own copy of the MMD. Grading is done on the basis of the work done on the preliminary version — everything done after that is volunteer work. The factors on which grading is based are: activity, initiative, creativity, involvement of students, dexterity in retrieving the needed material, autonomy in research, readiness for teamwork, active application of the previously acquired knowledge, regularity in the performance of tasks and attendance, respect of deadlines for submission and finishing of the material, readiness to learn how to use new tools and applications to create the MMD, and overall motivation.

The three MMDs, which have been produced so far, will be briefly presented in the following subsections. The fourth MMD is being prepared.

STUDENT MMD TOPICS

A PERSON — ALEKSANDAR ACA POPOVIĆ

The first MMD was devoted to the well-known Serbian playwright Aleksandar Aca Popović (1929–1996). This particular writer was chosen, not only because of his distinguished contribution to the Serbian culture, but also because some other factors made him suitable for this purpose. First of all, his name is very "ungoogleable" being almost like John Smith in English, which means that students could not easily find information about him by performing a simple Google search. Moreover, although he is a figure from the recent past – his written works belong to the last decades of the 20th century when they were very popular – the students were unfamiliar with his work and at the start of the project none of them could answer precisely who he was. Last but not least, maybe the most important reason for selection, Aleksandar Aca Popović was truly a multimedia person. Not only was he a prolific author, who in addition to theater plays by which he will be mostly remembered wrote, novels, movie scripts, television plays and series; he was also loved by the media. He was loved by printed media and electronic media — radio and TV alike, because he was known for his wit and unexpected comments on various topics, past and present.

In the course of their work, the students collected 293 photographs of theatrical performances, portraits and posters, 91 articles from newspapers and magazines — interviews, reviews of plays and films, ending with obituaries, 130 min of audio recordings from interviews and radio plays, 8 h of video material, movie trailers, TV shows and TV plays. HTML, CSS, SMIL (Synchronized Multimedia Integration Language) and Flash were used for document production. All material selected for the MMD was provided with metadata, including precise information about copyright. For the production of the first MMD, cooperation with graduate students of Computer Science at the Faculty of Mathematics of the same university was established. Additional information about Aleksandar Aca Popović and the production of this MMD can be found in the papers by Trtovac (2010) and Andonovski, Lukić, and Đorđević (2011).

A TIME PERIOD — CULT RADIO SHOWS

It is a known fact that radio lost the influence and popularity it had not so many years ago. The time is gone when children at school and people at work would discuss their favorite radio shows first thing in the morning. However, only 25 years ago that was still the case. The topic of this MMD was to rediscover some of the radio shows that had gained popularity by the 1990s.

This topic posed some serious challenges for the students. First, it was not a trivial task to find the multimedia aspect of it. Next, we were not interested only in shows once broadcast by major Belgrade radio stations. On the contrary — since most of the students at the LIS department are not Belgrade residents, they were encouraged to find in their places of permanent residence the information about radio-shows broadcast by their local radio-stations.[4] Out of a vast quantity of material that was at their disposal, the students chose to include in their MMD: 11 videos, 26 audio recordings (229 min in total), 16 newspaper articles and 81 photos. The selection of the material and its length was sometimes limited by the owners (radio stations) permitting, in certain cases, only the use of segments or introductory clips lasting several minutes. The selected material was then catalogued, so that it could be included in the document, while the technical part was produced afterwards. The document was created by using HTML, CSS and SMIL. Additional information about this MMD can be found in the paper by Lazić and Poklopić (2011), and on the project blog.[5]

A WRITTEN WORK — POP ĆIRA I POP SPIRA (FATHER ĆIRA AND FATHER SPIRA)

The topic of the third MMD was the novel *Pop Ćira i pop Spira* written by the famous Serbian writer Stevan Sremac (1855–1906).[6] One of the reasons for selection was the popularity of this novel that has not diminished over time. It is written in a humorous vein – it can be said that the plot resembles *Pride and Prejudice*, the famous novel by Jane Austen – two mothers are trying to find the best match for their daughters no matter what it may cost them.

We cannot say that the students were unfamiliar with the given topic, since this novel is on the mandatory reading list for 7th graders in elementary schools, so most of them had already read it. Its challenge lay elsewhere. First, a very successful movie and a TV series were made based on the book, as well as numerous theater productions, so it has multimedia value. Also, despite all its qualities and popularity, this novel is very demanding for contemporary readers, especially young ones, since it is full of obsolete terms, localisms and also references to everyday implements, customs, occupations, food, etc. unknown to the average reader today. The students' task was to detect these occurrences, retrieve their meaning and find the best way to explain it in the form of a text, photograph, video clip, etc.

The final MMD contains 150 terms, each accompanied by a short explanatory text (like a dictionary entry), or by a photo, video or audio recording. Students were encouraged to make photographs, video and audio recordings themselves. The introduction to each chapter of the novel is represented by an audio recording, and students themselves acted out several interesting scenes from the novel in a short sketch, and recorded and edited the performance. Students chose to include 7 video recordings (27 min in total) and 172 photos in their MMD. In addition to HTML and CSS, the students used Adobe Flash to create this MMD. More information about the project can be found in the paper by Kovrlija, Tasić, and Topalović (2012) and on the project blog.[7]

LESSONS LEARNED

PROFESSORS' POINT OF VIEW

It is obvious from the presentation of the already produced MMDs that each of them is in some way dedicated to the preservation of

[4] It should be noted here that students prepare their MMDs without any financial support. We can only make use of their regular visits to their home towns where they visit institutions of interest for the creation of the MMD in question. That is why in this case they could not afford to visit some otherwise interesting radio stations.

[5] http://2012mmd.blogspot.com/2012/05/blog-post_23.html.

[6] http://en.wikipedia.org/wiki/Stevan_Sremac.

[7] http://multimedijalnidokument.blogspot.com/.

cultural heritage. Each topic selected refers to some important person, institution, event or work belonging to the Serbian cultural heritage and the aim of the produced MMDs is not to forget them. In this section we will stress other benefits of MMD production: one benefit is, obviously, the knowledge students acquired about working with multimedia data (we will discuss it in the Subsection 'Processing of multimedia data') while some other ones that are difficult to achieve in the traditional classroom environment are addressed in the Subsections 'Information loss' to 'Presentation of achieved results'.

PROCESSING OF MULTIMEDIA DATA

As already stated, at an advanced stage of the production of each MMD, students had to decide on which aspect of its production they would like to be involved. Not all groups were equally populated — that depended both on the topic of the MMD and the chosen software solution, as well as on the inclinations of students themselves. For instance, for the first MMD, a blog was not produced and students did not work on its design, as the design-related work was mostly done by the students of the Faculty of Mathematics. For the production of the third MMD, students did not need to scan any textual material and perform OCR (optical character recognition), as the book they worked on had been in the digital form already. Also, this MMD was produced using Adobe Flash, thus learning SMIL was not necessary. As can be seen in Fig. 1, the groups processing photographs, audio and video material, and text and HTML (which included preparation of metadata) were well-populated for all three MMDs.

Once placed in a certain group, students had to organize themselves. Usually, there was at least one student in each group with some experience in the domain that the group was focusing on who would not only organize the others, but also give the necessary instructions. Sometimes, employees at the cultural institutions students visited volunteered to help as well, and sometimes students got help from their friends attending technical faculties. Although they knew that they could always ask their teachers for help, they were very eager to solve as many of the problems as possible themselves. As a result, most of the students learned something new about at least one of the aspects of multimedia documents.

INFORMATION LOSS

It is a known fact that the production of information is enormous today. However, information loss is another well-known fact. This acknowledged truth was presented to students as part of different courses, but it can be best understood and accepted when faced with it. The work on MMDs gave students plenty of examples of this phenomenon. Here are two of them. When working on the MMD about the writer Aleksandar Aca Popović, students came across the fact that he was featured on the poster of the 30th anniversary edition of Bitef,

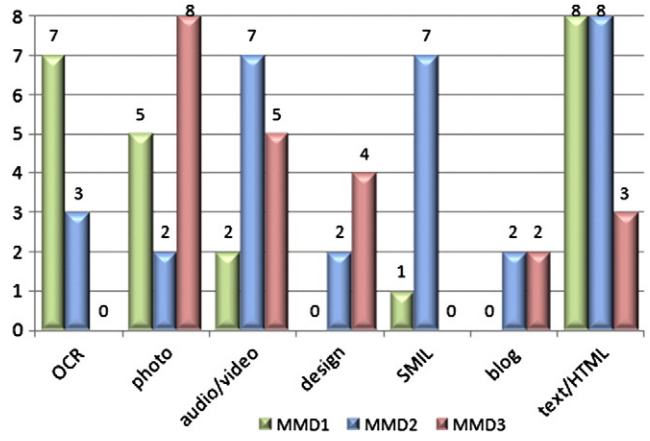

Fig. 1. Distribution of students of various generations by different tasks.

a major Belgrade theater festival in 1996 and wanted to include it in their MMD. Those were very turbulent years in Serbia in which one system was collapsing and the other had not yet been consolidated and cultural issues were not top priority. As a result, the poster could not be found, not even in the National Library of Serbia which is bound by law to keep copies of such material.

The situation the students faced when preparing the MMD on cult radio shows was much more dramatic. Many local radio stations were privatized since 1990 and new owners have literally effaced the past — they kept no records of past broadcasts.[8] And even if they kept them, the new owners see in them only a potential pecuniary value, and consequently had no intention of sharing them with students. However, thanks to the individuals who are fully aware of the importance of archiving radio shows, the students managed to obtain some of them.[9] In many cases, the only recordings found originated from private collections of former journalists or editors.

INTELLECTUAL PROPERTY RIGHTS

Intellectual property rights (IPRs) and the respect of IPRs is still a painful question in Serbia (for software piracy problems see Kalezić, 2010, and for authorship and copyright see Prlja, 2011). This problem is addressed in several courses in the LIS curriculum (software is covered by Information Literacy, and authorship and copyright by Foundations of Librarianship). While working on their MMD projects, the students could see what this all means in practice. They were encouraged to use only legal or open code software, collect material from authorized institutions only and produce as much material as possible on their own. They were instructed to draw the attention of copyright owners to the articles of the Serbian Law on Copyright (No. 104/2009, Nr. 99/2011, Article 46, 49, 50) that state the conditions of use of copyright-protected material for educational purposes. However, no matter how much they wanted to respect IPRs they realized that it was not always easy to do everything by the book. Here is one example. When preparing the MMD based on the novel *Pop Ćira i pop Spira* they wanted to include clips from the above-mentioned film and/or TV series. Due to the fundamental changes in the society in the past two decades, when production houses were privatized in a way that was not quite transparent, the rights to the film and TV series were transferred several times. It was either impossible to establish who has the rights today (film), or the current owner was not willing at all to cooperate (TV series). Not surprisingly, parts of the film and the TV series can be downloaded from the web, from YouTube. In such circumstances, the students decided to use only very short clips, about 30 s long for the MMD, which is perfectly acceptable according to the Serbian Law on Copyright (No. 104/2009, Nr. 99/2011, Article 44).

ORGANIZATION OF THE ARCHIVES WHERE DIGITIZED MATERIAL IS KEPT

The next lesson concerns the organization of archives of the institutions we believed to be collecting the material of interest to us. Students had prior knowledge of the role of archives and the principles of their organization, which they acquired by attending Archival Science and Documentation Science courses. These principles are certainly respected by national institutions, but, as has already been mentioned, some cultural institutions simply do not maintain their archives or their organization is not as it should be. For instance, the documentation

[8] It hardly comes as a surprise to us that local radio stations do not preserve old audio recordings, since major Serbian radio station Radio Belgrade fails to perform its archival task systematically. It was recently revealed that the magnetic tapes containing recordings of the radio shows that had been broadcast for six years on Radio Belgrade III (devoted entirely to culture) hosted by the distinguished Serbian writer and philosopher Radomir Kontantinović (http://fr.wikipedia.org/wiki/Radomir_Konstantinovi%C4%87) were effaced (presumably "to save space").

[9] Some of these individuals are: Mr. Radovan Mišović from Radio Valjevo who put the entire material related to radio programs and shows at students' disposal, Mrs. Indira Hadžagić who did the same on behalf of Radio Polimlje, and Mrs. Zdenka Golubović from whom students obtained an interview about Regional Radio Krajina.

center and radio archive of the Serbian Broadcasting Corporation is well-known for its richness, so the students expected to easily find information about popular radio shows there. It turned out that their archives are categorized using people (editors, journalists, guests, etc.) as a criterion and information about shows was difficult to retrieve.[10] Radio Belgrade has a centralized strategy for digitization, but the second-largest running radio station, Studio B, relies on the initiative of editors who independently digitize and store digital copies of their own programs and contributions. Smaller institutions (the category to which all but the biggest radio stations belong) usually do not have professionals in their documentation centers, so students were encouraged to represent themselves and their faculty in the best light, in order to make them realize how their institution can benefit from employing professionals with versatile knowledge.

PRESENTATION OF ACHIEVED RESULTS

During the creation of the presented multimedia documents, students were encouraged to apply the knowledge acquired during their studies and to learn something more. Moreover, the students who were the most active and usually volunteered to improve and finalize the MMD usually got additional possibilities to present the MMD itself and the process of its development. Each year an international conference is organized by the Faculty of Philology and students have an opportunity to present the most interesting aspects of their MMD there. The presentation, in the form of an article, is published in the proceedings of the conference. In addition to that, the journal *Infotheca*[11] publishes their finalized MMD, accompanied by an article or a review. Sometimes the students' work receives even broader attention — the multimedia document on radio shows was presented at the poster sessions of the European Summer School in Digital Humanities: "Culture & Technology" in Leipzig 2012 by the students of our LIS department.[12] Students readily accept these duties and perform them with great enthusiasm. As a result, they gain experience in presenting papers and writing articles and reviews.

Thanks to all these activities, students' MMDs attract more and more attention each year. Students are invited to present their work in various radio and TV shows, in cultural centers and at cultural events.

Each new generation obtains help and support from graduate students at the LIS program who have already worked on a MMD project. Some students, inspired by their work on the multimedia document choose digital humanities as a topic of their master's theses.

STUDENTS' POINT OF VIEW

After the preliminary version of an MMD had been done, all students were asked to fill in a questionnaire (shown in Appendix B). Its main objective was to assess whether: (a) the course Multimedia Document was satisfactorily positioned in the LIS curriculum; (b) the students were satisfied with the new organization of work and whether they found it beneficial; and (c) they learned to work with some new technology and/or to perform some specific tasks. This is not obligatory and the questionnaire is anonymous. After three years, 64 students out of 76 (84.21%) answered it. As presented in Fig. 2, most of the students were satisfied how the work was organized (Question 1 in the questionnaire), they thought they learnt something new about

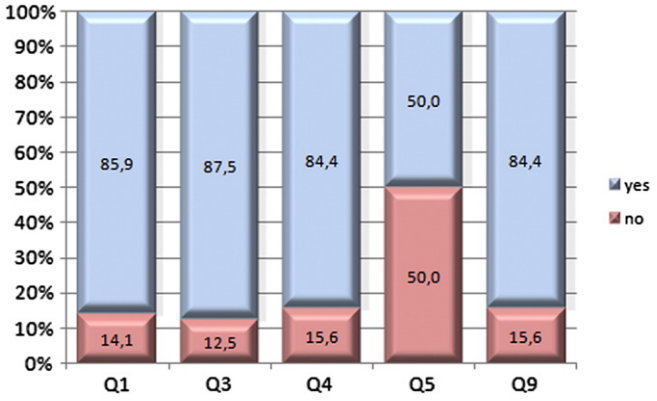

Fig. 2. Students' answers to Questions 1, 3, 4, 5 and 9 in the questionnaire.

multimedia (Question 3), they were satisfied with the choice of the topic (Question 4), and most of them found that the expectations they had about this course were fulfilled (Question 9). Students were only divided on the issue of learning how to research an unknown topic (Question 5) — half of them thought that they learnt how to deal with a new topic, while the other half thought they didn't. The final question was different from the preceding ones: with it we tried to gain an insight into students' beliefs as to whether the experience obtained by attending this course would help them to find employment in the future. That question is of utmost importance in Serbia, as it is very difficult for young professionals to secure an employment. 46 students (71.9%) thought that it might be beneficial because they learnt something (30 students — 46.9%), made useful contacts with institutions (11–17.2%), or learnt how to work in groups (30 students — 46.9%).

Students were asked to assess how much each of the 13 different tasks involved in the production of their MMD corresponded to their interests and skills by rating each of them on a scale from 1 to 5. The results are shown in the chart in Fig. 3 (after combining the lowest rating — 1 and 2 and the highest rating — 4 and 5 into a single rating). Seven out of thirteen tasks were rather well accepted by most students — the white bars corresponding to the highest rating — 4 and 5 start at 50% or below. It can be seen that the most popular tasks with students were presentation of the collected material and HTML processing of the MMD — their white bars in Fig. 3 start around 40% or below). While the latter is understandable, since they have learnt HTML/CSS in detail in the previous years, the former is very significant — it shows that students want to be given more space for the presentation of their work outside the stressful exam setting. The most "unpopular" topic is SMIL processing of the MMD (the white bar in Fig. 3 starts above 70%). SMIL is the topic with which most students are not familiar and are not really interested in. They have not learnt it before and it seems that most of them do not feel prepared enough to learn it by themselves. This task has to be given more consideration in the future.

Students were also asked to assess how much each of the 19 obligatory courses they have previously taken in the course of their studies helped in the production of their MMD. The results are presented in the chart shown in Fig. 4. Students found only four subjects – all of them from the information science group – to have been undoubtedly useful (the corresponding white bars start below 50%). The subjects that were the most useful according to students are Internet and Web Technologies, Information Literacy and Text Processing, which does not come as a surprise. The most helpful subjects belonging to the Library Science group are Knowledge Organization and Public Relations in Libraries — their dark gray bars in Fig. 4 start at 40%. According to the students, eight out of 19 subjects offered were not very useful — their dark gray bars in Fig. 4 start above 50%). The subjects which the

[10] The database of the audio archive of Radio Belgrade (that is, everything that was preserved on magnetic tapes) is fully digitized. It consists of 3500 h of audio material. The data is stored on compact disks, as well as on the original magnetic tapes. Since 2007, the program has been recorded in a digital format and stored in two databases — Info (news program) and 24 h (365-day, a program which is stored in the mp2 format and can be processed by the Quick Edit Pro software). The UNESCO-developed CDS/ISIS software and processing format for audio material is free.

[11] *Infotheca* — Journal of Information and Library Science, published by the Serbian Academic Library Association, available at: http://infoteka.bg.ac.rs/index.php?where=100&Jezik=engleski.

[12] http://www.culingtec.uni-leipzig.de/ESU_C_T/node/75.

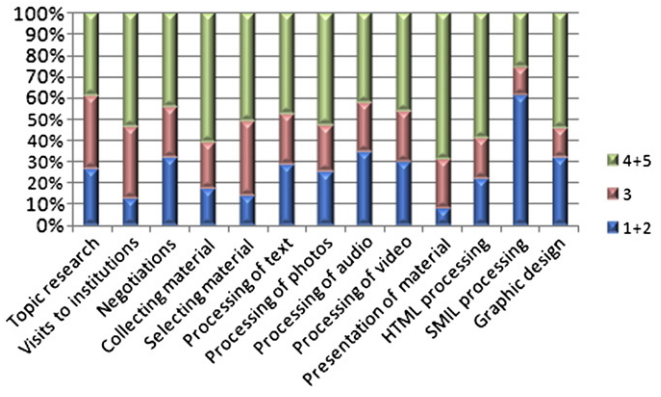

Fig. 3. The results of students' answers to Question 2: How much do the various tasks involved in the preparation of an MMD correspond to your interests?

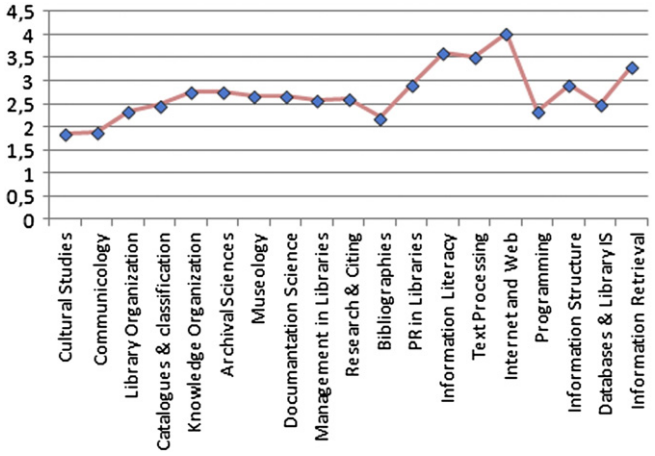

Fig. 5. The average rating for Question 6.

students found the least useful are Culture Studies and Communicology. It is probably, surprising that students found Programming and Databases and Library Information Systems not very useful. It may be that students were prejudiced towards these subjects that have a reputation of being "difficult", and consequently not popular, and decided to "punish" them. This is corroborated by the results presented in Heinrichs and Lim (2009) — database competence was the least desired by students, and the perceived level of competence was also the lowest. The average rating shown in Fig. 5 corroborates the overall impression that students found information science subjects to have been quite useful (rated between 2.34 for the least useful Programming to 4.02 for Internet and Web Technologies), and Librarianship subjects were seen as useful, but not particularly (the rating is rather stable and varies from 2.2 for the least useful theory-oriented course Theory and History of Bibliography to 2.77 for Archival Science).

It seems that students were satisfied with the job the professor and the graduate teaching assistant had done in teaching this subject. The answers "my expectations were completely fulfilled" or "they were fulfilled to a great extent" outnumbered any other responses regarding all listed activities (see Fig. 6 — the white bar starts below 40% for seven out of eight activities offered). However, it can be noted that the last two activities, consultations about MMD design and MMD production were rated somewhat lower on the scale. One remark should be made here. The first generation of students, attending the course, cooperated with the students of the Faculty of Mathematics who had more experience and skill in programming and other advanced technologies than LIS students, and they took initiative in designing and producing the MMD. Our students didn't like that and that was reflected in the answers to these particular questions. On the other hand, most LIS students do not want to make an additional effort in learning SMIL and other more advanced technologies (as seen in the answers to Question 6), so some compromise has to be reached in order to overcome this problem. One solution was found by the third generation of LIS students — one of their friends (who is not a LIS student) with an experience in design and programming volunteered to help.

Students were also asked to state their objections and negative impressions of the subject. We received only 11 comments from the total of 64 students that completed the survey. Most of the comments (5) refer to the unsuccessful cooperation with students of the Faculty of Mathematics (joint work on the first MMD). Some of the comments put forward objections to fellow students who were not involved enough in the teamwork, as well as to the unsatisfactory communication between the participants in the MMD project. However, 11 comments is a very small number compared to the total of 64 surveyed students (17.18%).

It would be good if we could compare the results obtained with the evaluation of other courses in our LIS program. However, such evaluation is not performed on a regular basis. Students' evaluation of their faculties is just beginning in Serbia — together with the adoption of the Bologna process, and students' response is still very poor. Also, at present, students are evaluating only their professors and not the courses, and this evaluation, having a different focus is not comparable with our survey.

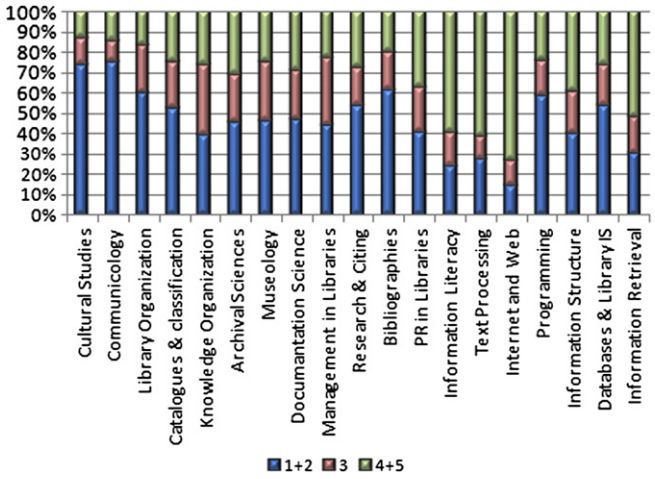

Fig. 4. The results of students' answers to Question 6: How useful were the courses taken previously for the production of your MMD?

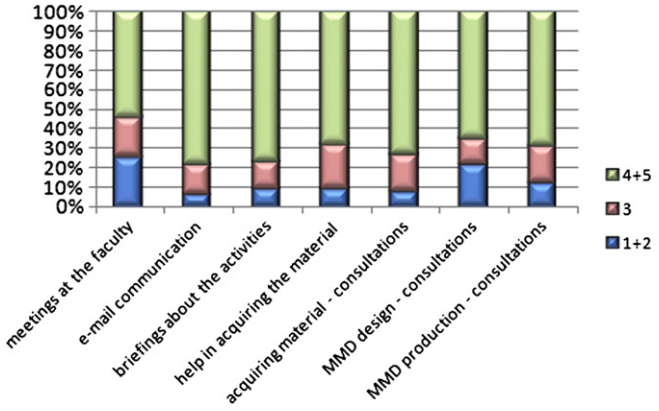

Fig. 6. The results of students' answers to Question 7: How satisfied are you with the way in which professors performed various duties involved in the production of your MMD?

CONCLUSION

Multimedia Document, an innovative course in the LIS curriculum at the Faculty of Philology in Belgrade, addresses the principle LIS curricula skills referred to as "transferable skills", given in the IFLA Guidelines for Professional Library/Information Educational Programs more than any other course from the information science group. This statement can be corroborated by several qualitative indicators:

1. Students were more relaxed as a result of the fact that a classic exam is not envisaged for this subject, which raised their motivation significantly.
2. Students showed strong initiative in all stages of the work process. Besides, each generation of students enters in a healthy competition with previous generations, trying to show that they can do more and better.
3. Students had the opportunity to apply their prior knowledge. They were capable of recognizing the institutions and collections where they could find the necessary material; they were familiar with collection searching, selection and processing of the material, as well as with the methods and techniques of information retrieval. All this improved their self-confidence.
4. Students showed good negotiation skills in their contacts with responsible persons in the institutions they were visiting. The last generation was very successful in presenting and promoting their MMD.
5. Students showed willingness to become familiar with the operational procedures at the institutions they were visiting. As a result, several of them were taken on as volunteers performing digitization tasks in the Museum of Theatrical Arts of Serbia, University Library "Svetozar Marković", the Museum of the National Theatre, Ethnographic Museum and Nikola Tesla Museum.
6. Students were very successful team players, and finally learned and understood why the assigned tasks had to be done on time.
7. Finally, quite a number of students that during previous four year studies showed no particular knowledge, skill or interest suddenly found tasks that suited them perfectly and through which they could express their creativity. There is no greater pleasure for a professor than to see their "ugly ducklings" get transformed into "beautiful swans".

Acknowledgments

We are grateful to students of the Library and Information Science at the Faculty of Philology, University of Belgrade for participating in our survey. We are also grateful to Jelena Bajić, MA in English, for carefully proofreading and correcting our paper.

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APPENDIX A. LIST OF ANALYZED CURRICULA

All university Web sites were visited in the period October–December 2012.

(UBG-MF) University of Belgrade, Faculty of Mathematics http://www.matf.bg.ac.rs/m/97/master-informatika/

(EBG-ETF) University of Belgrade, School of Electrical Engineering http://www.etf.bg.ac.rs/index.php?option=com_content&task=view&id=459&Itemid=158

(UBG-FON) University of Belgrade, Faculty of Organizational Sciences http://master.fon.bg.ac.rs/download/2009/10/Informacioni%20sistemi%20i%20tehnologije.pdf

(UBG-FilF-SKJ) University of Belgrade, Faculty of Philology, Serbian Literature and Language http://www.fil.bg.ac.rs/katedre/skjsk/akreditovani_s_p.html

(UBG-FF-Ped) University of Belgrade, Faculty of Philosophy, Pedagogy http://www.f.bg.ac.rs/pedagogija

(UBG-FPN-NiK) University of Belgrade, Faculty of Political Sciences, Studies of Journalism and Communication http://www.fpn.bg.ac.rs/en/undergraduate-studies/journalism-and-communication/

(USing-FMiK) Singidunum University, Faculty of Media and Communication http://www.fmk.singidunum.ac.rs/

(UBG-UF) University of Belgrade, Teachers' Training Faculty http://www.uf.bg.ac.rs/

(UNS-TF-Prof) University of Novi Sad, Faculty of Technical Sciences, Undergraduate Professional Studies http://www.ftn.uns.ac.rs/_data/planovi/2012/osnovnestr/e2.pdf

(UNS-TF-Acad) University of Novi Sad, Faculty of Technical Sciences, Undergraduate Academic Studies http://www.ftn.uns.ac.rs/_data/planovi/2012/osnovne/grid.pdf

(UNS-TF-Zr) University of Novi Sad, "Mihajlo Pupin" Technical Faculty, Zrenjanin http://www.tfzr.uns.ac.rs/Content/akreditacija/Informacione%20tehnologije%20osnovne%20studije.pdf

(UUBG-FPU-GD) University of Arts in Belgrade, Faculty of Applied Arts, Graphic Design http://www.fpu.edu.rs/programi/Osnovne/GrafickiDizajn.html

(ALUBG-GD) Academy of Fine Arts Belgrade, Graphic Design http://www.alu.edu.rs/dizajn-program-grdizajn.html

(UUBG-FDU-Kam) University of Arts in Belgrade, Faculty of Drama Arts, Camera http://www.fdu.edu.rs/cms/index.php?option=com_content&view=article&id=134&Itemid=155

(UNS-AUNS-DU-GK) University of Novi Sad, Academy of Arts Novi Sad, Department of Fine Arts, Graphic Communications http://www.akademija.uns.ac.rs/wp-content/uploads/doc/oas/graficke-komunikacije.pdf

(UNS-AUNS-DU-NM) University of Novi Sad, Academy of Arts Novi Sad, Department of Fine Arts, New Media in Fine Arts http://www.akademija.uns.ac.rs/wp-content/uploads/doc/oas/novi-likovni-mediji.pdf

(UNS-AUNS-DD-MR) University of Novi Sad, Academy of Arts, Novi Sad, Department of Drama Arts, Multimedia Direction http://www.akademija.uns.ac.rs/wp-content/uploads/doc/oas/multimedijalna-rezija.pdf

(UKG-FILUM-DU-GD) University of Kragujevac Faculty of Philology and Arts, Department of Arts, Applied Arts, Graphic Design, http://www.filum.kg.ac.rs/index.php?option=com_content&view=article&id=52&Itemid=65

(UNI-FU-GD) University of Niš, Faculty of Arts, Graphic Design http://www.artf.ni.ac.rs/wp-content/uploads/2012/10/T.5.1.-OAS-OP.pdf

(UNS-FF-Ped) University of Novi Sad, Faculty of Philosophy, Pedagogy http://www.ff.uns.ac.rs/studije/osnovne/studije_osnovne_pedagogija.html

(UNS-FF-Kom) University of Novi Sad, Faculty of Philosophy, Master Studies, Communication Studies http://www.ff.uns.ac.rs/studije/master/studije_master_medijske_studije.html

(UNS-PF-So-DMO) University Novi Sad, Faculty of Education in Sombor, Design of Media in Education http://www.pef.uns.ac.rs/index.php?option=com_content&view=article&id=10:studijski-program-dizajner-medija-u-obrazovanju&catid=16:osnovne-studije&Itemid=23&lang=en

(UNS-PF-So-SBib) University Novi Sad, Faculty of Education in Sombor, School Librarian http://www.pef.uns.ac.rs/index.php?option=com_content&view=article&id=12:studijski-program-kolski-bibliotekar&catid=16:osnovne-studije&Itemid=23&lang=en

(UMet-FIT) University Metropolitan, Faculty of Information Technology http://www.metropolitan.edu.rs/sr/osnovne_studije/fakultet_digitalnih_umetnosti/dizajn_interaktivnih_medija/index.dot

(UU-RAF) University Union, Belgrade, School of Computing http://www.raf.edu.rs/Racunarske_nauke_Osnovne_akademske_studije.htm

(UN-EF-EIT) University of Niš, Faculty of Electronic Engineering http://www.elfak.ni.ac.rs/rs/studije/osnovne-strukovne-studije-elektrotehnika-i-informacione-tehnologije

(UN-FF-SRB) University of Niš, Faculty of Philosophy, Serbian Language and Literature http://www.filfak.ni.ac.rs/preuzimanje/knjige-predmeta/osnovne-akademske-studije/srbistika.html

(UN-FF-N) University of Niš, Faculty of Philosophy, Journalism Studies http://www.filfak.ni.ac.rs/studije/osnovne/novinarstvo.html

(UK-PFJ) University of Kragujevac, Faculty of Education in Jagodina http://www.pefja.kg.ac.rs/

(UK-UF-Uz) University of Kragujevac, Teachers' Training Faculty in Užice http://www.ucfu.kg.ac.rs/

(UKMS-PF-B) The Ss. Cyril and Methodius University in Skopje, "St. Kliment Ohridski" Faculty of Pedagogy, Studies of Librarianship http://www.fakulteti.mk/vou/drzavni/uklo/pfbt/biblio.aspx

(USa-FF-KKB) University of Sarajevo, Faculty of Philosophy, Studies of Comparative Literature and Librarianship http://www.ff.unsa.ba/index.php?option=com_content&task=blogcategory&id=22&Itemid=14

(UES-FF-OKB) University of East Sarajevo, Faculty of Philosophy, Studies of World Literature and Library Science http://www.ffuis.edu.ba/category/129/

(US-FF-LIS) University of Sofia, Faculty of Philosophy, Library and Information Science Department http://www.uni-sofia.bg/index.php/bul/fakulteti/filosofski_fakultet/specialnosti/bakalav_rski_programi/filosofski_fakultet/bibliotechno_informacionni_nauki/obuchenie

(ULj-LIS) University of Ljubljana, Department of Library and Information Science and Book Studies http://www.ff.uni-lj.si/oddelki/biblio/studij/dodiplomski/bolonjski/predmeti/3letnik/DigitalnaKnjiznica.html http://www.ff.uni-lj.si/oddelki/biblio/studij/dodiplomski/bolonjski/index.html

(UO-LIS) University J. J. Strossmayer of Osijek, Department of Information Science http://web.ffos.hr/infoznanosti/?id=86

(UZ-LIS) University of Zadar, Department of Information Science http://ozk.unizd.hr/?category_name=preddiplomski-studij http://ozk.unizd.hr/?category_name=redovni_studij_knjiznicarstva

(UNSW-SISTM-AM) University of New South Wales, School of Information Systems, Technology and Management, Audiovisual Management http://www.dirarchives.org/organization/showprograms?id=64)

(UCLA-DIS-MMIAS) University of California Los Angeles, Department of Information Studies, Masters in Moving Image Archive Studies http://is.gseis.ucla.edu/academics/degrees/mias/program/missionstatement.htm

(UD-ILS) University of Dublin, School of Information & Library Studies http://www.ucd.ie/sils/undergraduatestudents/programmedetails/

APPENDIX B. QUESTIONNAIRE FOR STUDENT ASSESSMENT OF THE SUBJECT MMD

1 Are you satisfied with the organization of the subject Multimedia Document (work in groups, teamwork work, etc.)?

Yes	No

2 Please rate the various activities involved in the creation of the MMD on a scale of 1–5 (1 — the activity is not at all in line with my interests and skills; 5 — the activity fully corresponds to my interests and skills).
- Topic research
- Visits to institutions
- Negotiations with heads of institutions
- Collecting material
- Selecting material
- Processing of text
- Processing of photographs
- Processing of audio recordings
- Processing of video recordings
- Presentation of the collected material
- HTML processing of the MMD
- SMIL processing of the MMD
- Graphic design of the MMD

3 Have you learnt something new about multimedia, while working on the MMD?

Yes	No

4 Are you satisfied with the topic of the MMD?

Yes	No

5 Have you learnt how to do research on an unknown subject?

Yes	No

6 Please rate the various courses you had during your studies on a scale of 1–5 based on the extent to which they helped in the creation of the MMD (1 — the course didn't help at all; 5 — the course helped a lot).
- Library Organization
- Cataloguing and Classification
- Knowledge Organization
- Archival Science
- Museology
- Documentation Science
- Management in Librarianship
- Methodology of Research and Citing
- Theory and History of Bibliographies
- Library Public Relations
- Information Literacy
- Text Processing
- Internet and Web Technologies
- Programming
- Information Structure
- Databases and Library Information Systems
- Information Retrieval
- Culture Studies
- Communicology

7 Please rate the professor and the graduate teaching assistant performing various activities involved in the creation of the MMD, on a scale of 1–5, assessing the extent to which your expectations were met (1 — my expectations were not fulfilled at all; 5 — my expectations were completely fulfilled).
- Classes and meetings at the faculty
- E-mail communication
- Information about the ongoing activities
- Help in acquiring the material
- Consultations about acquiring the material
- Consultations about MMD design
- Consultations about MMD production

8 Please state your objections, if any, about the organization of the work in this course and your suggestions for improvements.

9 Did the work on the production of the MMD fulfil your overall expectations?

Yes	No

10 Do you think that the work involved in the production of MMD will help you in finding a job in the future? (multiple choice question)
- a No, it has no relevance.
- b Yes, I learnt something new.

c Yes, I made contacts with some potentially interesting institutions.
d Yes, I gained some experience of collaborative work.

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