

Article

Technology-Enhanced Learning in Audiovisual Education: The Case of Radio Journalism Course Design

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Abstract: Journalism is in a state of perpetual change due to the implementation of technological tools on an everyday basis. In the contemporary news distribution environment, the boundaries between media are no longer distinct, therefore media/journalism educational institutions should adapt curricula according to the needs of each type of medium. The aim of this paper is to present the incorporated technologies in the radio journalism undergraduate course of the School of Journalism and Mass Communications at the Aristotle University of Thessaloniki and evaluate their necessity according to the students themselves. After the completion of the course, which involves the use of specialized technological tools in audio recording and editing, a survey employing quantitative method based on the technology acceptance model was conducted. The results indicate that the students, despite the difficulties that were encountered due to the initial lack of knowledge on the technology applied, evaluated very highly both their satisfaction with the produced outcome and the usefulness of the procedure. In fact, the major result is that perceived usefulness is a key factor that determines the utilization of specialized technology.

Keywords: radio journalism; specialized technology tools; digital recording; audio editing software; radio production; technology-enhanced learning; technology acceptance model

1. Introduction

Journalists nowadays are faced with a perpetual demand to incorporate technological tools in the fulfillment of their final forms of news distribution. Either they work for print, electronic media (radio and television) or the Web. The necessity to present complete productions in diverse modes leads to the inevitable need for education with respect to the corresponding technologies during their studies. As Gillmor [1] (p. 815) states “a progression leading from school to jobs in the media and related industries, is (at best) in jeopardy, thus educators—recognizing the realities of the twenty-first century—should make some fundamental shifts”. In the contemporary era of Web 2.0 and beyond, in which the advent of chatbots in the news media has created a new journalistic narrative, the evolutions in technology cannot be neglected in the educational phase [2]. The critical thinking and good writing skills of a journalist will not be replaced, however, technology will help in the procedure of collection and analysis of the data in a faster and more reliable way, and ultimately deliver news in a more enhanced and complete form; especially nowadays given that credibility maintenance is an emerging issue due to the increasingly involvement of citizens in content production facilitated by technology use [3]. Information and communication technologies (ICTs) are crucial in the journalism profession; therefore journalists are expected not only to be familiar with, but also to be able to use many different software packages, besides word processing and spreadsheet, which are considered

as basic knowledge. Although image processing, video editing, desktop and Web publishing are some of the tasks that journalists might come across while performing their job [4], they are not required to become technicians. Nevertheless, competence in the utilization of audiovisual equipment and software in multimedia productions that are communicatively effective are highly evaluated qualifications. Universities adapt their curricula according to the requirements of the cross-disciplinary profession, besides the traditional teaching areas of communication, sociology, language, history, public and international relations, and legal issues technology-related fields, which are also included [1,5–8]. In addition, since technological tools are constantly evolving, and new versions with altered features are added, “journalism education must be continuous and must be focused on ‘learning to learn’ and adapting to new tools and platforms” [9] (p. 266).

In the past, education in audio-visual courses was not easy due to hardware and software limitations. Of course, even nowadays, socio-economic factors between, and within countries of different regional and demographic characteristics, all over the world, can cause inequality in access to technology, thus creating a digital divide in communities, reflected in higher education institutions [10]. That fact determines the availability of resources and equipment, and results in different opportunities for the students to gain knowledge and skills. In other respects, current small, low-cost capturing devices (cameras and digital voice recorders), smartphones that record high resolution videos, as well as free high-performance audio and video software are accessible to a large scale of students and their utilization is very helpful to the achievement of the goals of learning in the specific domain. Furthermore, powerful computers and graphical interfaces provided the “ease-of-use” factor to the potential users. Moreover, in contemporary university journalism and communication programs, there are many courses that either belong to the same broad scientific field (radio or television courses) or utilize the creations (i.e., courses on advertising) leading to the need for well-equipped laboratories that may facilitate the overall needs.

Learning involves a variety of procedures other than receiving and memorizing information, such as thinking, analysing, coming to conclusions, and producing products among others [11]. In that framework, training in audio-visual courses cannot be fulfilled unless the students create a production on their own, operating practically, with integrated material they have acquired themselves. The educational concept behind that trend is that students are asked to pursue knowledge on their own under the guidance of the teacher, and learn through their actions something they consider important. This is in accordance with the cognitive dimension of learning, which claims that new concepts and skills are most effective when associated with creativity [11,12]. On this basis, technology is enhancing learning because the theory is successfully implemented and students’ comprehension is broadened, providing added value to the objectives that are set.

Therefore, technology-enhanced learning provides the appropriate approaches and the conjunctive steps between education and practicing. Courses are designed to support a diversification of teaching methods in an enhanced form, reassessing strategies that foster active and collaborative learning by applying relevant technologies [13]. Hence, technology is used as a learning partner for all the involved parties, teachers and students. The rapid growth of information communication technology (ICT) over the last two decades, has brought increased learning possibilities to pedagogical purposes in higher education, which when used effectively provide a powerful learning experience to students [14,15]. The 2007 European Commission report on digital literacy recognized the need for a total change in education across Europe, with a specific need for the digital modernization of education systems to increase equality and personalization [16].

Nowadays, software-based presentations or communication via email are taken for granted in higher education courses, whether they relate to the academic procedure of the social sciences or engineering; technology is not innovative in teaching any more. However, it has to be mentioned that the term technology is not restricted to computer associated uses. The learning outcomes and the specific features of each subject are the ones that determine the supplementary use of additional technological tools involved in the overall procedure. First, the teachers set a hierarchy of goals, and

afterwards the appropriate tools, depending on the content of the course, are chosen on the basis that learning should be extended by their use. The selection of strategies and materials, which in higher education allows more freedom in designing the course, depends on goals, tasks, learners, objectives, and assessments, and equally important, the availability of resources, hardware, software, etc. [17].

The evolution of technology and the emergence of a new digital world have not only created new learning opportunities, but also students with different educational needs. Digital skills that have penetrated every aspect of modern life did not exist just a few years ago, and yet they are crucial for a person's ability to function at all levels. Digital literacy is not only about the acquisition of digital skills but also about the ability of the individual to understand and interpret digital technologies, and have the critical thinking to use them depending on the circumstances [18]. Digital literacy is a very useful resource for teachers and students as well; it helps them expand the use of technology for creativity and self-expression, as well as develop a deep understanding of the complex activities they already engage in [18].

Before examining the possible new ways of learning, a closer look at the new generation of students and their characteristics is needed. Young adults that study at a university in the year 2018 are born in the digital age and they are the new generation of students that emerged in the era of Web 2.0. They are growing up having taken the use of social networks for granted, and in the same aspect, permanent Internet connectivity and the ability to share and create content are also beyond doubt [19]. That generation which includes young people that were born from 1994 (or 2000) to 2010, is called the Google Generation, Generation Z or iGeneration [20]. They are referred to as digital natives, as Prensky [21] has defined them, but this generation is even more parameterised, having learned how to handle the Internet in its new form, from the emergence of Web 2.0 onwards [22]. "Digital natives" is a term used for young people born after 1982, which use the Internet and technology in every aspect of their everyday life since digital devices were at their disposal from their birth date [21]. Among other preferences, they "prefer active rather than passive learning, and rely heavily on communication technologies to access information" [23] (p. 109), and that is the reason why teachers have to adjust their pedagogical models to suit the new kind of learners. Students that belong to that generation are assumed to have a sophisticated knowledge and understanding of information and communication technologies [23]. The participants who are subjected to our study are members of that generation.

The aim of the research is to explore the attitudes of university students towards specialized technology used in education for audio-visual context courses on a media studies program. Specifically, the implementation of technology-based learning on the course of radio journalism taught in the School of Journalism at the Aristotle University of Thessaloniki is examined. It involves deeper comprehension of both the theoretical background and of the utilization of the equipment, allowing conceptual connections to be made between already existing knowledge in the field. Also, it concerns perceptions of meaning and goes beyond the simple understanding of running computer software. The objective is to provide a technical knowledge-based ability to solve problems resulting in adaptive expertise on the scientific foundations, which are created by the curriculum of the school as a whole, this course included. The challenge is to design an effective and pedagogically proper course, and to measure the impact it has on the students that attend it.

More specifically, the research questions that are investigated are as follows:

- RQ1: Is the usefulness of the incorporated technological tools in the procedures of teaching and examining in the course of radio journalism apprehended by the students?
- RQ2: Is there a connection between the perceived ease-of-use and the perceived usefulness of the involved technologies and the prior use of radio premises and equipment?
- RQ3: Is there a connection between the perceived ease-of-use and the perceived usefulness of the involved technologies among the students that select the course freely, and those that are obliged to attend it by the program of their chosen direction of studies?

Before presenting the results of the empirical study, the framework of the course is deployed, analyzing the necessity of technology incorporation in the process so as to result in technology-enhanced learning, to meet educational expectations and provide substantial learning outcomes.

2. Materials and Methods

The purpose of the radio journalism undergraduate course of the School of Journalism and Mass Communications at the Aristotle University of Thessaloniki, which is taught in the third year of study, is to provide students with the appropriate knowledge and skills in journalism and modern technology, and to engage them in the procedure of creating completely by themselves a small radio production at the end of the semester. The syllabus of the course is two-fold, it involves 13 week term lectures in the classroom where all the students participate and six individual laboratory exercises in the fully equipped radio studio of the electronic media lab of the school. The prerequisite theoretical background on radio language, news writing, structure and research, the news hierarchy, reporting and the interview precedes, and subsequently is transformed into, audio productions. Emphasis is given both to the development of journalistic skills for the creation and presentation of basic categories of the radio program (news, cultural, music broadcast, sports, etc.) as well as sound recording and processing techniques. The teaching staff is composed of a tenured senior instructor, an electrical and computer engineer who holds a PhD degree in new technologies in journalism, with 20 years of experience in teaching electronic media courses, and a Journalist who has worked for a series of years in a radio station, and holds an MSc in Sports Management and is currently a PhD candidate in Sports Media. Along with them, a PhD candidate in the field of "Media, Audiovisual Content and Education: Information and Communication Technology (ICT) in Adult Education" is involved in the procedure as a teaching assistant. Their scientific fields provide a sufficient combination of content, technological and pedagogical knowledge.

The entire teaching staff is present in all cases participating in the educational procedure. The students that attend this class belong to either a group who are obliged by the curriculum, following the Journalism direction of the study program, or another group who select it freely from the Communications direction. In both cases they do not have any previous course experience in radio production, either theoretical or practical. Technology-enhanced learning in the syllabus of the cross-disciplinary course, besides using the web-based platform (on elearning.auth.gr) which hosts the learning material and works as the communication channel, relates initially to defining the concept of sound propagation and consequently to the three necessary stages for creating a radio production: the proper use of a microphone, the correct function of digital recording using external portable devices, and finally the adequate employment of digital audio editing software. The degree of difficulty of the involved technologies is escalating, beginning with the assumption that no knowledge at all is considered the starting point. Audio, in the form of a radio production, as the topic under consideration was an intriguing endeavor for the students since they all had the experience of being an audience, but only few of them had been involved as actual producers. The aim of the course is to encourage them to connect to the medium, and to help them recognize their potential as creators, after realizing its capabilities and limitations by employing student-focused methods.

Though the main teaching method of the course is lecturing in the classroom, a more experiential process was chosen in order for the students to holistically understand what a radio production is about, and the fact that it cannot be achieved if the characteristics of sound are not fully perceived. Listening to real life examples, indoors and outdoors, places the information in a realistic context, and exposes students to real incidents that are helpful in clarifying sound propagation, reverberation, absorption, etc. The aforementioned instructional examples are created of different media types (solemnly audio, audiovisual or multimedia productions), which enrich the learning material and are carefully selected so as to stimulate their senses. Students' engagement in a critical review and analysis of prerecorded material, simulating different locations where an interview could take place

as well as actual broadcasted radio shows, create a vivid teaching atmosphere and result in a more comprehensive attitude towards the theory of the course.

The classroom in which the lectures are held is equipped with a PC with internet connection, an audio console, and a set of high performance speakers that can reproduce the entire audio frequency spectrum, allowing the students to recognize poor and problematic recordings and compare them to good ones.

The syllabus of the course is based on the following procedure. The theory is taught in a three hour class, and is enriched with many audio examples, after which the students can practice in the radio studio of the electronic media lab of the school. The first step is speech training, and for that purpose an actress who works as a teacher in the acting school of that domain is invited. She is involved in the educational process showing, in a very illustrative manner, breathing management techniques and the proper pronunciation of the vowels and consonants, such that students may learn the right ways in which words must be spoken. After that, the students are asked to vocalize a text in the studio so that they become acquainted with both the procedure and the premises.

The succeeding theory and practice involve the production of radio news bulletins. Many Greek radio stations' bulletins are listened to, and commented on, in the classroom. The analysis concerns not only the content, which is the dominant issue, but also the ways of speaking, highlighting specific words, and emphasis when necessary, as well as the time elapsed between the sentences and the different news categories (i.e., political news, financial, sports etc.). After the completion of the laboratorial exercise by the entire class, randomly as well as voluntarily selected recordings are played back in the classroom during the weekly lecture, generating respectful feedback and initiating compelling conversations with multiple perspectives. The students are constantly encouraged to share their opinions, take part in the overall discussion and make remarks on their own audio productions as listeners and not as creators. Peer evaluations help in the identification of strengths and weaknesses, and finally through that interaction, with the teachers' interventions, result in acquiring knowledge. The aim is to guide them in a holistic interpretation of a radio bulletin besides the text itself by defining all the constructive elements, and to foster a comprehension of the demands of the medium. Furthermore, each student receives the audio file of the conducted recording to listen to at his/her own convenience and self-evaluate. Afterwards, they are given the opportunity to receive personalized comments regarding journalistic evaluation and technical feedback by a member of the teaching staff. This exercise is performed twice in order for the students to acquire both content and procedural knowledge, resulting in a clearer understanding and better execution.

Producing radio reports with incorporated recorded sound bites from interviews is the third exercise, the first level of which involves a thorough understanding of the journalistic principles that must be followed to achieve it. The ways an event is pursued while collecting information and joining the data, leading to a final synthesis of the story, using the right vocabulary and syntax in a well-defined structure with an introduction, main part and closure, are of crucial importance and are taught in significant detail. Afterwards, the use of recording devices (different types of digital voice recorders, cell phones and laptops) are presented to the students, and the parameters of their proper utilization (operational information) along with the identification of the particularities of the locations where the interviews might take place (spatial information), are thoroughly explained with audio and video examples. The theory is supported by listening to integrated radio reports which complements the students' learning with explanation. The analysis of segments is very helpful while preparing and designing audiovisual mediated tutoring, and provides the appropriate data for critical thinking [24–26]. In the framework of bridging the gap between academic knowledge and workplace skills, which is scientifically proposed [1,27], a well-known journalist-radio producer of the city of Thessaloniki was invited as a guest speaker in order to provide an insight into the professional aspect of the course and resolve the students' questions regarding real-life radio shows by sharing personal experiences. After the completion of the exercise, the same procedure of discussion and commentary is followed in the classroom. Besides the comments on journalistic procedure, there is

also an evaluation of the technical part of the conducted interviews (sound levels, background noises, etc.). This exercise is also performed twice for the same reasons that are mentioned above.

The last laboratorial exercise, which is held in pairs, involves recording a radio interview between the students that also follows the previously described process. This exercise is the least technology demanding of all. At all stages the students are free to provide feedback on the procedure, either in-person or by e-mail, and at the end of the semester they are asked to evaluate multiple sectors of the course, the one under discussion included. Previous evaluations ranked overall highly the course, however the teaching staff took into account all the comments while designing it.

In order to fulfill their obligations, the students must employ audio editing software such as Audacity (<https://www.audacityteam.org/>, free, open source, cross-platform audio software) which is presented during the lectures. After its operational presentation, along with explanatory slides which are uploaded on the web platform of the course, the students are asked to practice on their own and questions are resolved in classes, or by email correspondence for quicker solutions.

The final radio production, which is assessed at 60% of the degree course, is original in concept and execution, and must consist of a one-minute duration radio news bulletin, a two-minute duration report with incorporated pre-recorded sound bites, and a five-minute duration interview, along with conjunctive texts and the insertion of music at the right points. It is a synthesis of all the topics covered throughout the whole semester. From the beginning of the course, the students are informed regarding their obligations during the classes and they are given analytical instructions concerning the requirements of the final project. The achievement of that endeavor, besides clearly understanding the journalistic principles, lies in an understanding of sound propagation as well as the right use of technological tools, which are taught gradually both during their classes and the laboratory exercises. It is in the teachers' firm belief that the creation of the radio production is the way for students to get involved in the learning procedure as active and not passive members, thus answering the questions asked by Kirkwood and Price [28] regarding how enhancement will be achieved when technology is used, and how can enhancement be determined.

After the completion of the course and the fulfillment of all prerequisites by the students, they were asked to participate in a survey regarding their attitudes and perceptions towards the technologies involved in the entire spectrum of the procedure of teaching. The purpose was to provide feedback, retrieve the problems and evaluate possible solutions. The technology acceptance model (TAM), which was developed by Davis [29], was selected as the base-model in the investigation of the achievement of the aims of the course. According to the aforementioned model, the most important factors for adopting a technology are perceived ease-of-use and perceived usefulness. Perceived ease of use defines "the extent to which a person believes that using a particular system does not require effort" and as perceived utility is defined "the degree to which a person believes using a particular system will increase his/her performance at work" [29] (p. 320).

The conducted survey was based on the quantitative method employing a questionnaire, developed specifically for this study, with incorporated adapted questions from TAM tailored to be relevant to our scopes. It was composed of closed and semi-closed questions, and only at the end of it the students were asked to state their overall opinion of the course in relation to the involved technologies as well as to the educational procedure. This technique was used to provide an objective and quantitative description of content with respect to the issues under discussion. The questionnaire was comprised of five sets of questions, regarding: (a) general uses of the radio studio, (b) second laboratorial exercise (news bulletins), (c) a third laboratorial exercise (radio reporting with incorporated sound-bites), (d) the final production, and (e) demographics. There were not any general questions regarding computer use or availability of software since they were all aware that they could use the premises of the school where a fully equipped computer laboratory is located.

The course was attended by 76 students in the winter semester of the academic year 2018–2019, and the questionnaire, which was prepared in a Google form, was sent to all of them to be completed at their own convenience via the official mailing list of the web-based platform. At the beginning, there

was a preface regarding the framework of the survey stating the purposes, explaining the procedure, emphasizing anonymity and finally thanking the participants.

Before the final research was carried out, a pilot survey was conducted to ascertain the effectiveness of the questionnaire, and identify or correct any errors in order to make the necessary corrective interventions in time. The pilot survey was also carried out as a method of checking the validity of the main survey. In this case, five students who attended the course the previous academic year were selected as participants in the pilot survey. The following conclusions were drawn from the collection of the questionnaires distributed and the discussions that followed with the participants: (a) there were no ambiguities in the formalities of the questions, (b) the existence of examples in some cases was considered necessary, and (c) the size of the questionnaire did not cause fatigue or irritation as it did not take more than 10 min (on average) to complete it.

The questionnaire consisted of sets of questions with sections covering estimated ease-of-use prior to real usage of the involved technologies, perceived ease-of-use and usefulness after the employment of the technologies, reasoning of the answers and accompanying improvement proposals.

Out of the 76 students that attended the course, the questionnaire was completed by 63 of them (83%). Although the total number of participants was not large, the response rate was deemed acceptable. The statistical distribution of the variable of gender was 22% male and 78% female which is representative of the overall distribution of admitted students in the School. Regarding the percentage of those who freely selected the course, it was 16% while for the remaining 84% it was mandatory by the curriculum.

3. Results

After collecting the data, it was coded and inserted in IBM SPSS Statistics Version 25, which was the software selected for the statistical analysis. In this section of the paper, descriptive statistics of all items are presented and analyzed, and correlations between variables are researched and further explored as well. At this point, it has to be mentioned that digital competence in general was out of the scope of the investigation, since the program of the School of Journalism and Mass Communications in the first two academic years offer many ICT courses, some of which are mandatory.

Before performing the analysis, the reliability of the research was tested. Cronbach's alpha was carried out on overall the questions resulting $\alpha = 0.65$. Subsequently, it was carried out on the groups of variables that were further tested with non-parametric tests (perceived ease-of-use and perceived usefulness) showing the questionnaire to reach acceptable reliability $\alpha = 0.71$. Consequently, the analysis commenced with descriptive statistics.

The answers to the question "have you engaged in radio studio before the Radio Journalism course?" indicated that 65.1% of the students had never before engaged in radio studio. Out of the 34.9% who stated that they had previously studied radio, 12 students answered that it was in job situations, and seven more declared that they had visited the studio for other courses' objectives. Finally, three students stated that they had been engaged in radio studio for: (a) project of a previous degree, (b) high school project, and (c) artistic reasons. They were asked to rank, on a five-point Likert scale (very difficult to very easy), their opinion concerning the ease-of-use of the premises and equipment of the radio studio prior to, and after the completion of the 1st laboratorial exercise (text vocalization). The results showed that prior to the use only 4.8% thought that it would be very easy (17.5% easy) and 20.6% thought that it would be difficult (4.8% very difficult; mean value: 2.97 and SD: 0.879). Almost half of them, 52.4%, stated that it would be neither difficult/nor easy. After the fulfillment of the objective, the percentages changed a lot. This time, 39.7% stated that it was easy (15.9% very easy) and only two students answered that it was very difficult. A further eight answered that it was difficult (mean value: 3.52 and SD: 1.014). Those answers show initially their fears for the "unknown" which are afterwards reduced, which as a fact is interpreted by the technology enhanced learning (TEL) approach since the educational innovations of TELs, support and enhance the learning practices of individuals [30].

In an effort to decode the problems that caused the difficulties to the students while they were in the radio studio, five questions regarding the vocalization circumstances were asked. They involved: (a) speech training (breathing management and punctuation), (b) body posture, (c) keeping the right distance from the microphone, and (d) the form of the text (radio text vs. written text). They had to mention the importance of those factors by choosing between the five levels of a Likert-scale (absolutely not important to absolutely important). The results, in percentages, are presented in Figure 1 “Vocalization circumstances”. The findings provide evidence that all of the factors were considered either important or very important. Breathing management was measured as the most important factor for the participants and it was very frequently mentioned during the laboratorial exercises. The students were constantly encouraged to perform at home the breathing exercises that were presented by the actress as to become acquainted with the procedure. As the course evolved, great progress was observed in that domain. Another important factor, which is connected to the aforementioned, was the form of the texts. As journalism students, they were trained in writing long sentences with many details; when they had to vocalize those sentences they realized the difficulty and tried to change their writing style—as they were told by the teachers—into writing “for the ear style”.

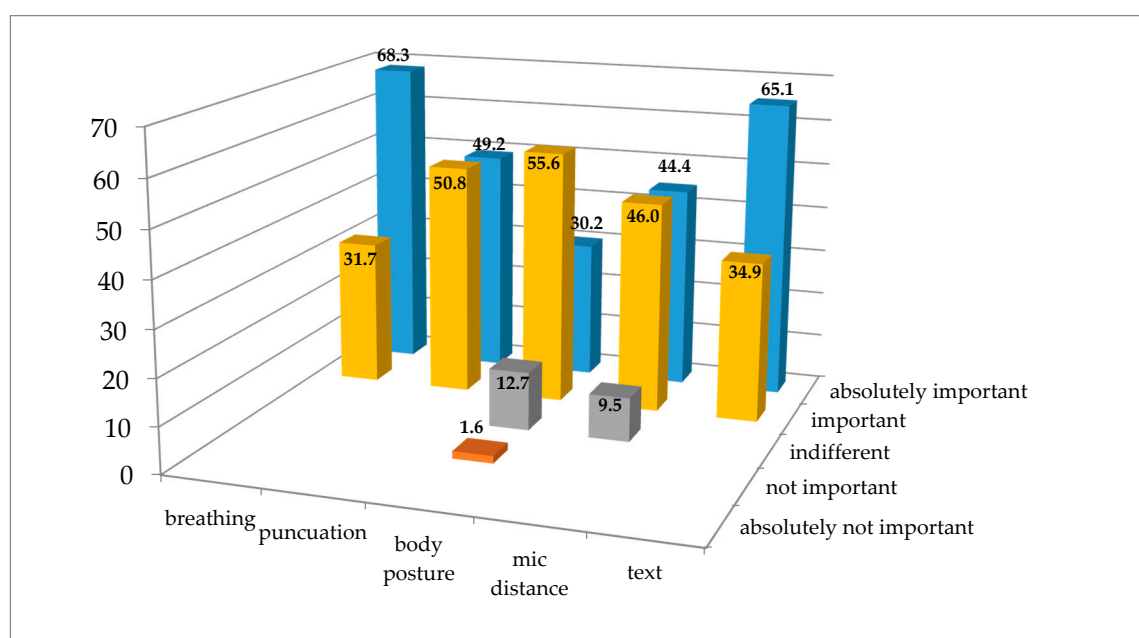


Figure 1. Vocalization circumstances.

On the question regarding the usefulness of that exercise, ranging from absolutely useless to absolutely useful on a five-point Likert scale, the results presented a large accumulation on the positive answers (mean value: 4.38 and SD: 0.633), in fact there was none answer in the first two levels.

After the completion of the second laboratory exercise (production of both news bulletins) the attitude of the students regarding the ease-of-use of the premises, and equipment of the radio studio was further improved. The results indicated that none of the students considered it very difficult only 4.8% as difficult and 57.1% stated that it was easy (mean value: 3.87 and SD: 0.751).

However, the difficulties regarding this exercise were explored. The students were asked to rate on a five-point Likert scale (totally disagree to totally agree) their opinion concerning the importance of four factors: (a) their available time on the radio studio for the execution of the exercise, (b) their level of knowledge on the way to syntax a news bulletin, (c) their level of knowledge on the way a news bulletin should be vocalized, and finally (d) their level of knowledge on writing a text with radio speech. In Figure 2 “Difficulties encountered in exercise News Bulletin Production” the findings are presented in percentages. Analysis of the data revealed that although writing a news bulletin was not difficult for the participants, nevertheless the factor of radio speech that was indicated previously was

still intense. The students were constantly encouraged after writing the bulletin, to vocalize and record it at their own premises and afterwards to critically listen to it, in an effort to correct their writing style.

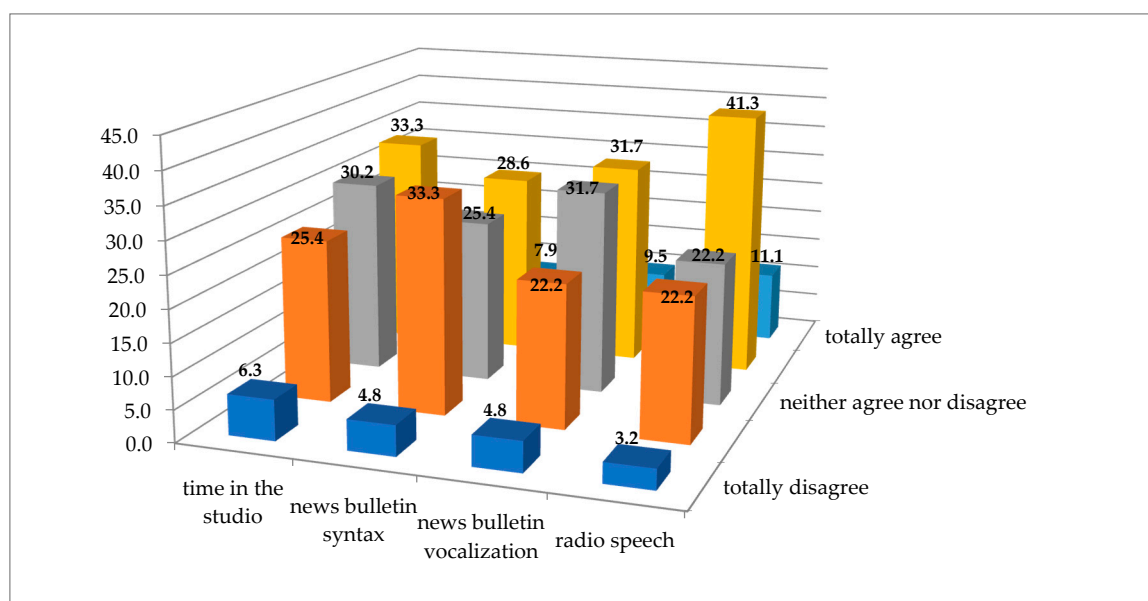


Figure 2. Difficulties encountered in exercise “News Bulletin Production”.

On the question regarding the recording devices that were used for the short interviews that would comprise the sound bites of the reporting, the answers were almost unanimous; 96.8% replied that the smartphone was the device they employed (only two students gave different answers, one of them used a digital voice recorder and the other an external audio card with a microphone). This fact indicates the degree of ease in modern radio productions since dedicated recording equipment is no longer needed. It is remarkable though, that despite the fact that the students are in the third academic year, 39.7% have never used their cell phone for recording before and only 12.7% had used it over 20 times for that purpose. On the question regarding their level of knowledge of three factors that determine the quality of an outdoors recording which are: (a) level of knowledge on the recording device handling, (b) level of knowledge on the right distance of the interviewee from the recording device, and (c) level of knowledge on the environmental noise, the results are shown in Figure 3 in percentages. The participants although they had not performed many recordings in the past, nevertheless they presented a high level of confidence regarding their ability to handle both the device and the situations. As modern students belonging to the digital natives’ generation they seem to have an inherent “adaptive response” to technology. Furthermore, contemporary technologies seem to have the potential to fulfill the requirements from a professional perspective with an easy way [31].

To realize what the participants think would be more functional in the learning procedure and what could operate supplementary to lectures on the recording techniques, students were asked to state their opinion regarding the significance of three additional teaching tools: (a) performing more recordings in the classroom, (b) listening to more personal students’ recordings, and (c) more video presentations on how to perform audio recordings. In Figure 4 the findings are presented in percentages. As it is revealed by the results, the students need even more feedback for their own productions. It seems that it is in their belief that better outcomes would come from more focused and personalized remarks. It is encouraging that they ask this process to take place in the classroom, which can be interpreted as a chance to start a broad conversation where everyone could participate. Collaborative learning has also been proven pivotal in the educational process when the learner/student is at the center [30]. Therefore, the authors conclude that for the procedure of learning the engagement of the students as reviewers and analysts is a necessity. Furthermore, the results

revealed that the participants are eager to watch more video presentations—a form of displaying information that is familiar to them—on how to perform audio recordings, despite their answers on the previous question regarding their level of confidence in the ability to handle both the device and the situations.

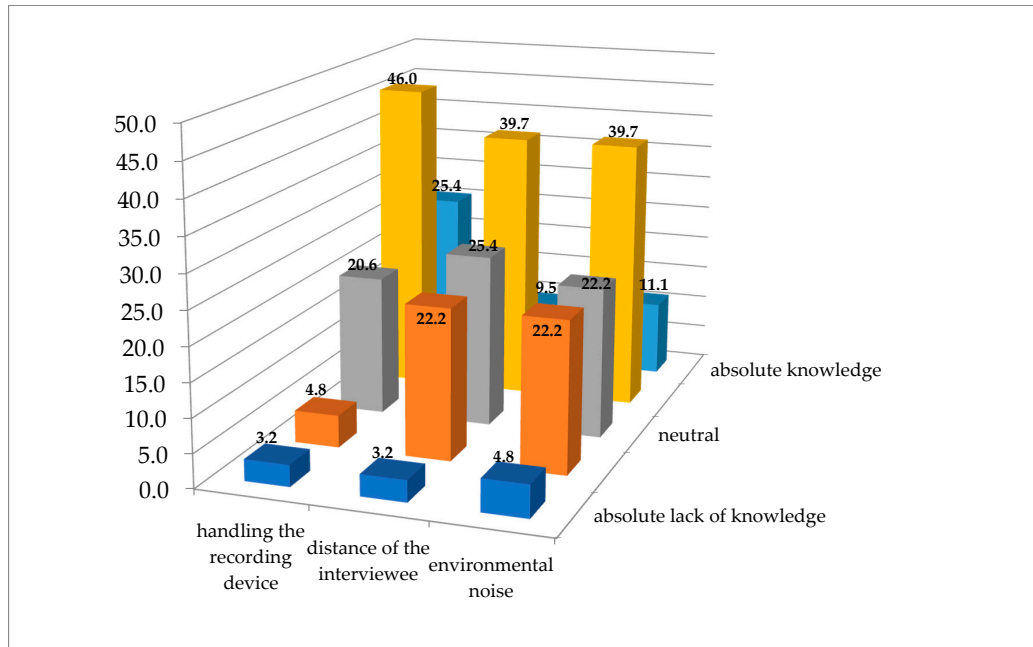


Figure 3. Outdoors recording factors.

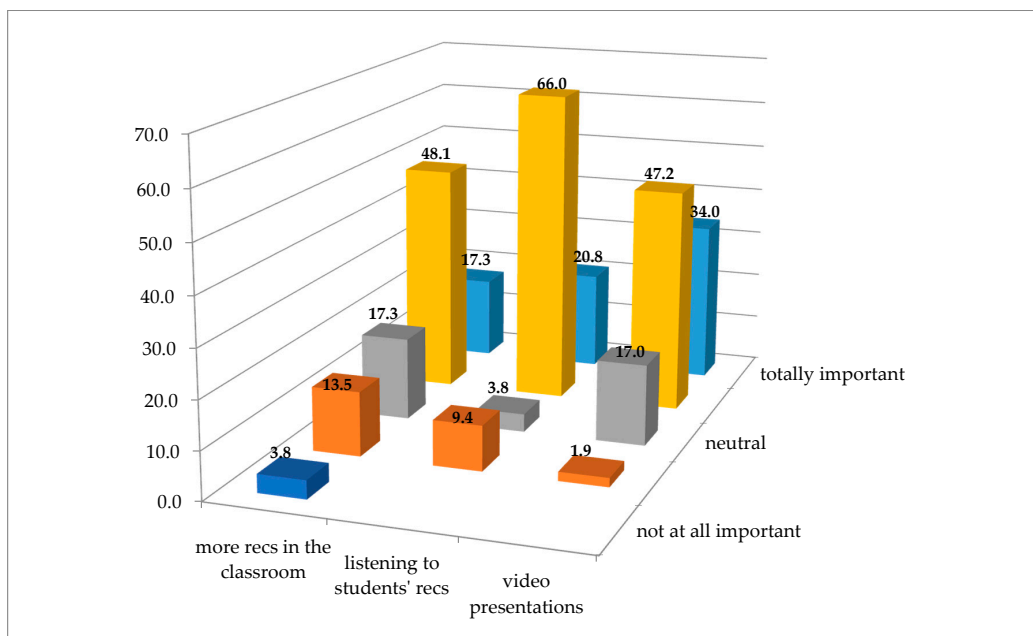


Figure 4. Supplementary tools on recordings.

The level of difficulty for the 3rd exercise, as stated by the students, was slightly higher than the previous exercise (mean value: 3.10 and SD: 0.756). This was probably caused by the insertion of another parameter, namely the addition of pre-recorded sound bites. Nevertheless, the perceived usefulness was still significantly evaluated (mean value: 4.44 and SD: 0.799).

Before attending the course of Radio Journalism, 74.6% of the students had never employed audio editing software. Although the software was not considered difficult by many students (in five-point Likert scale, 3.2%: very difficult, 20.6%: difficult, 42.9%: neither difficult nor easy, 30.2%: easy and 3.2%: very easy), nevertheless they seem to have faced difficulties in the development of the final production.

The last findings of the research concern the creation of the final production, which in the authors' belief is the most important and most challenging exercise of all because it includes all the stages that were analyzed above. At this last stage, the students should have clarified and critically examined the theoretical framework and also should have evolved the technical skills to accomplish the objective. In the students' opinion, according to results of the survey, the final audio production was rather difficult (mean value: 2.92 and SD: 0.867). Nevertheless, despite the encountered difficulty, their estimated self-efficacy was rated highly in a 5-point Likert scale (not at all satisfied to totally satisfied) on the question regarding the satisfaction obtained from the fulfillment of the goal. Satisfied was the answer holding the larger percentage (60.3%) and 12.7% of the students declared that they were very satisfied (mean value: 3.78 and SD: 0.792). An interpretation of that could be that they evolved problem-solving skills and put a lot of effort into being creative and productive so as to overcome the obstacles, since they thought that this endeavor was really essential in terms of usefulness. The authors conclude that as students come to realize the usefulness of a designed course for specific educational purposes, they will be able to develop or improve appropriate skills that will be useful to their future work environment. This is especially succeeded when their TEL environment, also function in real learning and working situations [31]. The results, regarding the perceived usefulness of the final production, measured in a five-point Likert scale, indicate that it is very highly evaluated (mean value: 4.51 and SD: 0.644).

Finally, the non-parametric independent samples t-test was conducted to search for the existence (or not) of variables that would impact on the ease-of-use factor. The independent variables that were chosen were: (a) the prior use of a radio studio (indicating former knowledge concerning the premises and equipment), and (b) the free selection of the course (indicating positive prepossession on the syllabus of the course). Between them, and the all questions regarding the perceived ease-of-use, statistically correlations were sought. The results are presented in Tables 1 and 2 below.

Table 1. T-Test on perceived use-of-use and prior use of radio studio.

Independent Samples T-Test.		
	W	p
Perceived ease-of-use prior 1st exercise	518.0	0.296
Perceived ease-of-use after 1st exercise	455.5	0.952
Perceived ease-of-use after 2nd exercise	446.0	0.942
Perceived ease-of-use after 3rd exercise	417.0	0.833
Perceived ease-of-use after final production	374.5	0.247

Note. Mann-Whitney U test.

Table 2. T-Test on perceived use-of-use and selection of the course.

Independent Samples T-Test		
	W	p
Perceived ease-of-use prior 1st exercise	205.0	0.223
Perceived ease-of-use after 1st exercise	222.0	0.402
Perceived ease-of-use after 2nd exercise	193.0	0.133
Perceived ease-of-use after 3rd exercise	300.5	0.403
Perceived ease-of-use after final production	320.0	0.279

Note. Mann-Whitney U test.

The conclusions that are revealed from the above Tables, on both cases, are that none of the variables (prior use of the studio and selection of the course) present statistical significant results. Regarding the first variable, the prior knowledge of the participants was not proven to be an important factor. This could lead to the assumption that the teaching approach of escalating the difficulty level, and which begun with the hypothesis that no knowledge at all was considered the starting point, diminished this “advantage”. According to Manouselis et al. [30] (p. 392), “learners achieve different levels of competences that have various levels in different domains, what is important is identifying the relevant learning goals and supporting learners in achieving them”. With this mind, it must be noticed and considered that the participants that stated having prior experience in a radio studio were relatively fewer than those who had not. Therefore, this result should be further examined, at least with more targeted questions concerning the detailed information on the specific areas the students were engaged in, specifically a radio production prior to the course, in order to identify the particular requirements that need to be taken into consideration. Regarding the second variable, the selection of the course, was not proven to be an important factor. As it was aforementioned in the description of the course, the students that attend this class belong either to those who are obliged by the curriculum, following the journalism direction of the study program and those who select it freely from the communications direction. The supposition in which the authors were led by the outcome of the non-parametric test, besides the fact that in this case, as well the participants from the communication direction were remarkably fewer, was that since course selection is totally free to the students, it proves the assumption that the students attitude towards the syllabus is positive. Even though it might seem rather outside their general fields of interest, actually it is not and they developed the skills required to effectively use the support material and finally the technological expectations and the educational climate were obviously right for them. By all means, this result should also be subjected to further analysis, perhaps with a qualitative survey where the reasons that led to that selection would be more thoroughly explained.

The same independent variables were chosen to be tested on the factor of the perceived usefulness. The results are presented in Tables 3 and 4 below.

Table 3. T-Test on perceived usefulness and prior use of radio studio.

Independent Samples T-Test		
	W	p
Perceived Usefulness 1st exercise	477.0	0.682
Perceived Usefulness 2nd exercise	464.5	0.818
Perceived Usefulness 3rd exercise	510.5	0.329
Perceived Usefulness final production	450.0	0.993

Note. Mann-Whitney U test.

Table 4. T-Test on perceived usefulness and choice of the course.

Independent Samples T-Test		
	W	p
Perceived Usefulness 1st exercise	240.0	0.607
Perceived Usefulness 2nd exercise	312.5	0.279
Perceived Usefulness 3rd exercise	316.5	0.271
Perceived Usefulness final production	293.0	0.553

Note. Mann-Whitney U test.

In both cases there were not presented statistical significant results. This was somehow expected since the overall level of perceived usefulness in all questions asked was extremely high, which suggests that there were very few different responses among the participants and therefore there could be no significant statistical variations.

4. Discussion

This study was conducted in an attempt to extract useful information concerning learning attitudes, difficulties, needs and remarks on specialized technology that is used in the course of radio journalism, which can then be applied to improve the educational process. As TEL research defines, technologies nowadays can support learning from a different angle than a decade before the millennium [32]. The purpose of this specific cross-disciplinary course is to combine a theoretical science, in this case journalism, with the technological character required by the medium in which it should be applied, this case radio. This two-fold intent was pursued through lectures and laboratorial exercises. The aim of the survey, that followed the completion of the course's obligations, was to determine the degree, as stated by the students, of the perceived ease-of-use and of the perceived usefulness of the involved technologies, and the aid that was provided by the tools in the fulfillment of the course's objectives.

The findings of this study present that the students find, to some extent, difficult the use of employed tools. However, the students evaluate highly the usefulness of the technical aspects of the course. Therefore, the authors conclude that the survey confirmed the hypothesis that was set by the RQ1 regarding the students' apprehension of the usefulness of the incorporated technological tools in the procedures of teaching and examining the course.

The results on the RQ2 showed that there was no apparent evidence concerning the connection between the perceived ease-of-use and the perceived usefulness of the involved technologies and the prior use of radio premises and equipment.

Likewise, there was no significant correlation of the factors of the RQ3 regarding the aforementioned approach by students that select the course freely, and by those that are obliged to attend it by the program of their chosen direction of studies.

Since "usefulness is more strongly linked to usage than ease-of-use, this suggests that users will put up with some difficulty in the utilization, if the system provides some critical function" [33] (p. 74). Moreover, students might be positively motivated towards technologies that are essential in their future work environment [33]. By realizing the demands of the medium through thorough theoretical analysis and explanatory examples they create a real world aspect regarding their potential employment requirements and therefore knowledge that is both relevant and applicable to the students' future practice was obtained. In this respect, these findings conclude that evidence of enhancement is profound.

The authors agree with [34] (p. 11) that "a technological learning environment is not effective by itself; it has to be adopted by learners in line with their ability, self-management and perspectives on technological learning environments", and they consider that through the self-evaluation of the students for the course, this is achieved. After harvesting and analyzing the responses, the obvious result is that the utilization of specialized tools for the acquisition of new skills is highly appreciated. Also, it provided a significant level of satisfaction to the students which led to the estimation that they enjoyed being creators rather than simply receivers, a conclusion which is in compliance with the findings of McGarr [35].

The results are in accordance with Triantafyllou, Liokou, and Economou [36] (p. 228) who evaluated a visual learning design (VLD) approach for developing educational scenarios in web radio. They pointed out that "the impact of such implementations could be to engage students in learning scenarios aligned with their interests, providing them the space and time to develop their skills (digital, transversal media and information literacy skills) and reach 'substantial learning outcomes'".

Due to the small number of the participants of the study, which was restricted to 63, certain limitations are imposed in the generalization of the results. However, the authors feel that there are sufficient numbers to reflect how students feel about technology use in their learning process. Another factor that deprives us from holistic conclusions is the small number of the male students and that was the reason that gender was not tested as an independent variable. Also, since the sample was drawn from School of Journalism and Mass Communications, for a specific course, the adoption of

technology may differ in other courses in the same or another school. The purpose is for the research to be continued in the following academic years, enriched with qualitative data, in order to monitor the evolvement of the students' attitudes towards the use of technology, and clarify all the factors that determine the initial adoption of the tools employed in the teaching procedure, which will lead to the achievement of the learning objectives. At this point, the indicators that have been received could be applied in a second step, with a larger group of participants that would deliver overall results. To further validate the study, more research is recommended to determine the journalism students' overall attitude towards contemporary technologies that are encountered in their profession such as Web-Radio, Web-TV, social media networking, etc. along with their perceptions on the general use of ICT.

5. Conclusions

The teachers' aim was not to employ a static teaching method but rather to link the students with the technology under study, through the simultaneous accumulation of knowledge in the field of media studies, and of skills in the employed tools. The purpose of the course was the acquisition of the learning objectives by the students to escalate at each step of the procedure and to reach the final outcome, which was the conjunction of all the previous stages. This paper is completed after the grading of the students' final productions and it is no exaggeration to point out that excellent work has been done regarding their learning outcomes in knowledge and skills, none of which worked against the other. Highly creative, concise and technically correct assignments were delivered. Therefore, the authors could not agree more with Anderson and Dron [11] (p. 2) that "together, technology and pedagogy reveal and develop our human creativity and responsiveness and allow us to learn effectively and enjoyably".

Furthermore, the teachers attempted to "heighten the students' awareness of the benefits of developing skills that enhance their effectiveness in work contexts" as Edmunds, Thorpe, and Conole [33] (p. 83) explicitly state.

The authors believe that knowledge on new technologies and the monitoring of their evolution can make journalists actively involved in the ever-changing landscape of modern information distribution, as Reese [37] (p. 585) states: "technology is a consistent presence in our lives, which is constantly changing and evolving". As new needs or tools may evolve, the teachers must always be on alert to implement changes that would offer enhanced learning to their students. While it is generally accepted that developments in technology are rapid, and that it is very difficult to predict the tools to be used—even in the near future—educational institutions must constantly strive to offer the most appropriate knowledge.

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