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Touliou, Eftychia; Liokou, Effrosyni; Genitzes, Anagnostis; Triantafyllou, Evangelia

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Using web radio as a pedagogical tool: skills development and collaborative learning
Eftychia Touliou1, Effrosyni Liokou2, Anagnostis Genitzes1, Evangelia Triantafyllou2
1Scientific Society European School Radio, Thessaloniki, Greece
2Department of Architecture Design and Media Technology, Aalborg University, Copenhagen, Denmark
efs.touliou@gmail.com
ef@create.aau.dk
ef.s.touliou@gmail.com
evt@create.aau.dk

Abstract: Radio has been used in education since the beginning of last century. With the rise of the internet, web radio came into life and provided new possibilities for web radio content (e.g. video apart from voice and music), asynchronous broadcast, and cooperation between students from different schools. In this paper, we present our experiences with the NEStOR (Networked European School Web Radio) project, which promotes web radio as an educational tool. The NEStOR project employs the European School Radio, a collaborative web radio station, where schools participate with both entertaining and educational radio shows produced exclusively by students (http://www.europeanschoolradio.eu). This paper presents the skills and the dexterities that students can develop, when web radio process is used as a pedagogical tool within this framework. As part of an introduction to digital tools, creating a web-radio production allows students to get involved in group projects, where they can discuss and reflect on various subjects (intra- and extra-curricular), and collaborate in order to produce a radio show. Moreover, while students search information online for their radio production, they gain information literacy skills and develop critical thinking, as they have to filter the information that is available on the internet. The process of finding information and music for a radio show and the process of recording the final production help students to develop also media literacy skills. We conclude there, that web-radio activities may be employed in classrooms to promote the aforementioned skills.

Keywords: educational web radio, learning scenarios, media literacy, information literacy, collaborative learning

1. Introduction
The use of radio as an educational tool is not new. In the United States, for example, educational radio has been used since the 1920s (Lamb, 2012). In those days, students were mainly listeners of educational radio programs. The rise of technology and the World Wide Web made producing and broadcasting radio programs easier, since recording can now be done on a personal computer without the use of special equipment, while radio programs can be transmitted via the internet, without employing a radio station. The radio broadcasted on the internet is called web radio, and offers new possibilities for learning activities, since students can easily produce and broadcast their own radio programs (Coccoli, 2014). Moreover, the appearance of Web 2.0 tools allowed the collaboration and the interaction between users as content creators in a virtual community. This development has also influenced learning activities in the context of web radio (Güney, Rizvanoglu, & Öztürk, 2013).

In this paper, we discuss skills’ development and the potential for collaborative learning when learners produce their own radio programs. Such online radio programs are no longer linear broadcasted, but may also be associated with metadata, synchronized slideshows and even short video clips. The production of such digital audio objects involves various phases, such as choosing a theme, gaining knowledge on this theme, authoring a script based on this knowledge, probably choosing a soundtrack, and then recording, and mixing the audio (and possibly visual) parts of such an object. Finally, these digital objects are uploaded on the internet. Since these phases require time and effort, such productions are ideal for group work, where students in groups address different phases of the production. The whole process thus encourages the development of various skills, such as media literacy, information literacy, and collaborative skills (Boling, Castek, Zawilinski, Barton, & Nierlich, 2008).

2. Research context
In this paper, we present research carried out in the NEStOR (Networked European School Web Radio) project, which aims at developing the necessary tools and skills in order to successfully incorporate web-radio activities into educational settings. The project provides an online platform, called “European School Radio (ESR)” (http://www.europeanschoolradio.eu), which operates since 2009, and attracts more than 400 primary and
secondary schools all around Europe each year (mainly from Greece and Cyprus). The ESR station broadcasts a continuous streaming audio (music), which includes radio shows from the participating schools. These schools produce entertaining or educational radio shows, which are broadcasted in the ESR platform. Such productions are either pre-recorded (students record and edit an audio file, which is then uploaded on the platform to be broadcasted later), or live broadcast (students prepare their radio show and perform live from a studio). Furthermore, the ESR platform provides a framework for supporting the educational aspects of web radio productions (e.g., guides, learning scenarios, and good practices).

The NEStOR project aims also at evaluating the pedagogical value of web radio, when it is incorporated into educational settings. The project employs a two-stage evaluation process. In the first stage, the learning design approach for introducing web-radio activities in classrooms, and the pedagogical value of such activities were evaluated based on feedback given by teachers (Triantafyllou, Liokou, & Economou, 2018). The results of this evaluation indicated that the introduction of web radio in schools may enable various literacies (such as media and information), and various skills (such as critical thinking, collaboration, creativity, etc.). In the second stage of the evaluation, feedback from a larger number of teachers, students, and the school community has been gathered in order to further evaluate the pedagogical potential of web radio. The preliminary analysis of the data gathered during this evaluation stage confirms the results of the first evaluation, but it has not been finalized yet. Moreover, our observations and experiences with web radio productions as intra- and extra-curricular activities since the establishment of the ESR platform agree with the evaluation results, which indicate that educational web-radio activities may improve students’ media and information literacy, and provide context for collaborative learning. Based on these indications, this paper analyses the process of implementing a radio production in order to identify which aspects may improve students’ media and information literacy, and how this process can be applied for collaborative learning.

In the following section, we provide the definition of media literacy, information literacy, and collaborative learning, and we present the potential of web radio productions for promoting such skills, as discussed in the literature.

3. Literature review
Web radio has been used for enhancing and motivating learning in different curriculum areas and at different educational levels. In the following, we are focusing on approaches where web radio was used for enhancing collaborative learning, as well as media and information literacy. Before reviewing such approaches, we discuss how these skills are defined in the literature.

3.1 Media literacy and information literacy
The plethora of media available in our modern world makes the need to educate media literate citizens increasingly urgent. The European Commission has underlined this fact already in 2007, and defined media literacy as: “…the ability to access the media, to understand and to critically evaluate different aspects of the media and media contents and to create communications in a variety of contexts.” (European Commission, 2007). Moreover, it defined the following levels of media literacy:

“ - feeling comfortable with all existing media from newspapers to virtual communities;
- actively using media, through, inter alia, interactive television, use of Internet search engines or participation in virtual communities, and better exploiting the potential of media for entertainment, access to culture, intercultural dialogue, learning and daily-life applications (for instance, through libraries, podcasts);
- having a critical approach to media as regards both quality and accuracy of content (for example, being able to assess information, dealing with advertising on various media, using search engines intelligently);
- using media creatively, as the evolution of media technologies and the increasing presence of the Internet as a distribution channel allow an ever growing number of Europeans to create and disseminate images, information and content;
- understanding the economy of media and the difference between pluralism and media ownership;
- being aware of copyright issues which are essential for a “culture of legality”, especially for the younger generation in its double capacity of consumers and producers of content.” (European Commission, 2007)

In the literature, media literacy is often discussed together with information literacy and digital literacy. According to Hobbs (2006), information literacy “...emphasizes the need for careful selection, retrieval and
choice-making in response to the abundant information available in the workplace, at school, and in all aspects of personal decision-making, especially in the areas of citizenship and health.” Therefore, she continues mentioning that information literacy education “...emphasizes the critical thinking, meta-cognitive, and procedural knowledge used to locate information in specific domains, fields, and contexts. A prime emphasis is placed on recognizing message quality, authenticity and credibility.” In order to emphasize the connection between the notion of information literacy and newer forms of online communication, Gilster (1997) introduced the term “digital literacy” as the ability to understand, evaluate, and integrate information in multiple formats. Other has used the term digital literacy in a restrictive way referring exclusively to newer forms of online communication, Gilster (1997). Since there are inconsistencies with the use of this term, we will use in the following the term “information literacy” to also encompass the notion of ability to understand, and to use information available in a variety of digital sources.

Bundy (2004) defined three main elements of information literacy: generic skills, information skills and values and beliefs. Generic skills relate to problem solving, collaboration, teamwork, communication, and critical thinking. Information skills concern information seeking, information use and information technology fluency. Finally, values and beliefs focus on the aspects of using information wisely and ethically, on social responsibility, and on community participation. He proposed therefore that information literacy education should provide opportunities for students to experience, reflect, and apply learning to novel contexts.

The production of (web) radio programs has been used to promote both media and information literacy in education, since it involves retrieval, filtering and dissemination of information through a communication medium. For instance, Todorova proposed the use of radio for teaching critical media literacy in a large urban Canadian university (Todorova, 2015). In this project, university students produced short radio programs narrating how they view and experience the concept of multiculturalism. She concluded that radio production in the classroom “...is soundscaping that politicizes intimacy, disrupts hegemonic discourses, and allows for teaching and learning to transgress; yet it also illuminates the ways in which self-positionality poses limitations to media literacy education that seeks to link local classrooms to a global world.”

Gautam et al. (2015) employed radio for conducting an oral history project with university students. The project was based on a partnership between the university’s social studies department and its public radio station. Gautam et al. found that students’ information literacy skills were enforced after getting involved in the process of conducting interviews, since they had to think critically in order to decide whose perspectives to include in each project. Moreover, the process of picking up key details in an interviewee’s answer, and relating them to the broader historical patterns forced students to think critically on the reasons behind specific social changes. Gautam et al. concluded that what really strengthened students’ information literacy skills was that they should construct a broad historical narrative from diverse primary and secondary sources.

3.2 Collaborative learning

Collaboration (or cooperation) is working together to accomplish shared goals, while collaborative learning is the instructional use of small groups so that learners work together to maximize their own and each other’s learning. Collaborative learning has its origins in Dewey’s and Vygotsky’s educational theories (Dewey, 2013; Doolittle, 1997). Members of such groups are responsible for learning the assigned material while making sure that all members of their group do likewise. They do this by discussing the material to be learned with each other, assisting each other to understand it, and encouraging each other to work hard (Johnson & Johnson, 2008).

Johnson et al. (1998) listed five elements essential for successful collaborative learning groups. First, there must be positive interdependence in that members of the group understand that they should learn together to accomplish their goal. Second, there must be promotive interaction in that students interact face-to-face in the group. Third, there must be individual and group accountability in that members are held responsible for their own contribution to the group’s success. Fourth, there must be group processing in that members reflect on their collaborative efforts and decide on ways to improve effectiveness. Finally, there must be the development of small-group interpersonal skills such as giving constructive feedback, involving each member, and reaching a consensus.

There are studies that investigated the interaction between radio and collaborative learning. McGroathy identified benefits of planning and implementing cooperative learning activities in acquiring English as a
second language by employing a radio show (McGroarty, 1989). Similarly, Lemos Tello found that there is a positive correlation between the participation of students in an online radio show with the aim to foster speaking confidence, and the use of a cooperative learning strategy (Lemos Tello, 2012). Piñero-Otero and Ramos investigated the potential of web radio for the sense of belonging creation and cohesion in higher education communities as perceived by students and professors at Aveiro University, Portugal (Piñero-Otero & Ramos, 2012). They concluded that both students and professors believe that web radio can foster development of a sense of belonging, unity, and communication in the university community (a new channel of communication internal or external) by allowing participation in and dissemination of content production.

In this paper, we discuss both skills development and collaborative learning opportunities, when web radio is used as an educational tool. In order to provide a framework for this discussion, the following section describes the different roles, which members of a radio team undertake during a radio program production, as well as the various phases of such a production.

4. The radio team and the process of a (web) radio program production

There are several people involved in a radio show production. These people undertake different roles during the preparation and the actual broadcasting of the radio show. First, there is the role of producer (or broadcaster) and the role of presenter. The producer group leads, organizes and often makes the radio broadcast. In some cases, there are people dedicated to make the broadcast (read the script, discuss, etc). These people are called presenters. The “program flow modulator” group decides when the radio show/advertisement spots will be played and makes sure to keep the arranged schedule, while the internet and multimedia group is mainly engaged with the online presence of the radio show team (web page, social media, etc.), and the communication among the members of the radio show team. Another group of people involved is the journalists or reporters, which work on finding the information that will become the texts/script of the show. They usually are also the ones to write and edit the script/texts of the show. The public relations team is responsible for promoting the show, and communicating with the audience. Finally, a radio show production requires a technical support team, which takes care of setting up and using the required equipment (computers, microphones, mixing panels, recording, etc.). In the following, we call this group of people “the radio team”.

The radio team has to follow several steps for the production of a radio program. Aspinall (1973) identified four phases in a radio program production: assignment, preparation, rehearsal, and performance. The assignment refers to the program that the producer is assigned to make. Whatever the assignment, Aspinall suggests that the producer carefully considers the goal of such an assignment (i.e. is it supposed to entertain, to inform or to educate?), and its target audience (e.g. general listening or a particular section of the audience?). Another important consideration is to find the most suitable way of handling the assignment (i.e. is it going to be a talk, an interview, a documentary or something else?).

For the preparation phase, Aspinall proposes that all people involved in the assignment are engaged into a brainstorming session in order to discuss the subject and generate ideas for the radio program. He calls this session “briefing”. During this session, Aspinall suggests that major deadlines are set (e.g. first draft of the script) and necessary bookings are made (e.g. studio/equipment booking). At this stage, both the preparation of the publicity material and the editing of the script take place. Finally, the preparation phase contains casting, i.e. deciding the roles among the radio program team (presenters, journalists, script editors, etc.), and the selection of music for the show.

During the rehearsal phase, all people who participate in the show as presenters read the script, either in front of the microphone or not. Aspinall provides recommendations on how to support presenters during the rehearsal, what to prepare before the rehearsal, and what is the most appropriate pace for various types of shows. Finally, the performance is where the actual show recording/live show takes place. There are several considerations to be made during this phase, and they regard both the attitude of the producers during the recording, and the organization of the recording.

In the following section, we discuss how each of these roles and phases may support the development of media and information literacy skills, and collaborative learning among students, who prepare their own radio show.
5. Skills development during a web radio program production

In the following, we discuss how a radio program production can be used as a learning activity in education. Our assumption is that students create their own programs and they learn through this process. The radio programs can be either entertaining or educational. In the latter case, the radio team (consisting of the teacher and the students involved) aims at educating the audience on a chosen topic (and thereby the students involved in the production). However, there are still learning opportunities for students, even when the goal of a radio program is simply to entertain.

Regarding collaborative learning, the different roles of people involved in a radio program production make this process ideal for group work. Learning opportunities arise already during group forming, whether students are allowed to form their own groups or not. In the first case, the social relationships between students will affect the group forming process (Hogg & Turner, 1985), i.e. students tend to select to work with friends. However, students will eventually realize that to work effectively with “friends,” they must transition from social relationships to task-oriented ones. Moreover, they may reflect on the composition of the group (different abilities, collaboration, communication etc.) and select differently next time.

Once the groups are formed and assigned different roles in the radio team, the students belonging to the same group should collaborate in order to fulfil the tasks assigned to their role. Therefore, students will have to learn how to efficiently allocate the different tasks among the members of their group in order to be successful. Since there are deadlines to meet during a radio program production, students will also need project management skills in order to accomplish the tasks assigned to them on time. Since several groups work towards the same goal (the radio program production), students will be exposed both on intra-group and inter-group collaboration and communication. There are thus several opportunities for students to develop their collaboration and communication skills, and to experience collaborative learning.

Regarding media and information literacy, we will examine skills development in each of the four phases of a radio program production that were described in the previous section. During assignment, the students have to consider the goal, the target audience, and the type of their radio program. In order to make these considerations, students need both to investigate different types of radio programs (educational, music, news, sports, etc.) and also different ways to handle the topic of their program. There are thus many opportunities for students to get familiar with the characteristics of different radio formats (length, pace, type of music, length of text, etc.), and with activities (interview, debate, discussion, talk, etc.), that take place in radio but also in other media (TV, social media, etc.). At this phase, students (possibly with the help of their teacher) should decide on the target audience, and contemplate as to which features of their program will have the greatest audience appeal. Similarly, the kind of approach the students decide upon must be dictated by a knowledge of their audience. Unless students familiarize themselves thoroughly with the assignment, they cannot easily set about the next stage of preparation. Therefore, they get plenty of opportunities to familiarize and reflect on how media work, and the way they approach their audience, improving thereby their media literacy skills.

During the preparation phase, the students should develop ideas for their assignment and start writing the script. For doing so, they should gather and assimilate knowledge on the chosen topic. The students may seek knowledge both online and offline, developing information retrieval strategies. During this process, students are exposed to different sources of information, and they have to relate to these sources. Moreover, they should decide which information is relevant, trustworthy, and valuable for their goal. After gathering all the necessary information, the students should write and edit the text for their radio program. This is also a learning process, since they should try to present all relevant information in a way that will appeal to the audience. Another important consideration is the selection of the music for the radio program, where the teacher gets the opportunity to discuss copyright issues and fair use of internet music with the students. Finally, the students should prepare the publicity material, and therefore decide on how to best promote their program on different media (e.g. web radio platform, social media etc.). There are therefore opportunities for developing both information and media literacy skills during preparation.

At the rehearsal and performance phase, the radio program is finalized and broadcasted. During this process, the students should use technical equipment for recording the radio program and editing the recorded file. Moreover, they should decide on the right pace for the performance. During rehearsal and editing, they have therefore a last chance to critically evaluate and adjust aspects of their radio program in order to achieve the
best possible result. The final step after the performance is to upload the edited recording to the web radio platform, and schedule it according to the decisions taken during preparation. Moreover, the public relations group should contemplate on how to best promote and advertise the show on different communication channels. This offers also ways for the students to reflect on the power of the media to influence people’s preferences and choices. The same observations appear in the preparation of live productions, where the only difference is the manner of broadcast. In this case, it is required a connection to the ESR server in order to broadcast live the radio show. Moreover, the students participating in the show (i.e. technicians, producers) can interact live with their listeners via an online chat offered in the ESR platform.

6. Conclusion
In this paper, we aimed at discussing the opportunities for skills development when a web radio production is employed as a learning activity in education. During such activities, students with the help of teachers produce their own radio programs. Our discussion is based on the experiences from the NEStOR project, where an online web radio platform (ESR) can be used by schools to broadcast their radio programs. We focused on media literacy, information literacy, and collaborative skills, since these are the most prominent based on the evaluation conducted during the project and our own observations. We believe that the web radio constitutes an attractive tool for cultivating such skills among the educational community. It is of paramount importance however that its introduction in the classroom follows a pedagogical approach.

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