

THE USE OF PODCASTING FOR A HYBRID FLIPPED CLASSROOM

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Abstract

We are currently assisting a social paradigm change motivated by the incorporation, more and more accelerated, of new information technologies (e.g., social networks or content platforms) in our day-to-day life. The increased availability of online resources in a universal, diverse, and permanent way is modifying how we consume online information and content. This is especially true when it comes to children and teenagers. New generations are increasingly adapting to immediacy and communication through information technologies. Therefore, it is necessary to evolve the educational paradigm to adapt it to this new social reality. Future learning strategies should consider the latest models of social communication, adapting them to achieve learning objectives from the perspective of constructive alignment and the acquisition or improvement of transversal competencies.

In this sense, there are currently several technologies that can be incorporated into the classroom. One of the emerging technologies is the podcast. Usually used for entertainment (e.g., stories, books, or radio talks), the podcast is becoming a tool for massive online content distribution. There exist many advantages to using podcasting for an educative purpose, as the production cost (in terms of time) is lower than recording a video. From a content consumer perspective, the main advantage is that an audio-only approach can be used/consumed everywhere and more easily than video media. Some educational podcasts are available online but generally tend to focus on learning languages or history. Outside these specific topics, their use in technology subjects is still residual and mainly focuses on interviews or long expositions. Moreover, in current proposals, the teacher is the one who produces the podcast, and therefore it is a one-way communication model (from the teacher to the students).

On the other hand, one of the teaching innovation models that is being increasingly used is the flipped classroom. In the flipped classroom, students are the main protagonists in their learning. They must prepare the theoretical parts on their own, and the teacher serves as a guide during this learning process.

In this paper, we propose using the podcast in the flipped classroom model, turning the podcast into a bidirectional tool in which students are both producers and receivers of learning. The proposal consists of dividing the class into small groups of students (2-4). Each group will record a podcast episode on a different conceptual part of the lesson. Group members will have to coordinate and share the activities of recording and searching for content for the podcast. This will encourage transversal skills related to communication and social skills. These podcasts will then be shared with the rest of the groups so that everyone can have direct and permanent access to the different sections of the lesson. Creativity will also be encouraged, allowing students to add the music or sound effects they consider necessary to enhance the explanation.

Keywords: Podcast, flipped teaching, transversal skills.

1 INTRODUCTION

Technology and self-paced learning have been gaining attention in recent years [1,2,3]. The use of digital content and digital delivery is normal nowadays. This new educational paradigm allows for greater flexibility and accessibility to educational content [4,5]. This way, students have the possibility to learn at their own pace and on their own schedule, making it possible, among other things, to better combine their studies with other activities such as work. The use of digital content also allows the creation of more engaging and interactive learning experiences, which can help to improve student involvement, information retention, or the acquisition of transversal competencies, especially in the field of technology and communication [6]. The COVID-19 pandemic has accelerated this trend, as many educational institutions have had to adapt quickly to distance learning. In this context, many innovations using different technologies, such as video broadcasting of lessons, have been proposed as alternatives to facilitate interaction between teachers and students [7,8].

Nowadays, one of the main problems in classrooms is students' lack of attention. In addition, the level of abstraction needed to understand some important concepts of the analysed subject can increase

demotivation. An alternative way to motivate students in their learning process commonly used in current innovative teaching is the flipped classroom [9]. The flipped classroom model consists of students reviewing and preparing the corresponding lesson previously with the teacher's assistance and practice in class. This method reverses the traditional model of classroom lectures, in which the student's complete homework and assignments outside of class time. Instead, students are expected to prepare content and perform self-study activities before attending a class [10]. During the course, the teacher is available to offer support and answer questions, allowing for a more interactive, hands-on learning experience. This approach has been increasing in popularity in recent years and has proven to be effective in engaging students and increasing their motivation to learn [11,12,13,14]. This is because they are allowed to take an active role in their own education, ask questions, and receive immediate feedback. In addition, this approach promotes a curious and inquiry-oriented attitude, encouraging students to explore and learn beyond the classroom.

In the flipped classroom model, it is common for students to prepare different parts of the lesson plan and then explain them to their classmates. The responsibility of explaining the subject to their peers motivates them in their learning process and helps them to acquire and understand the knowledge more easily. This is due in part to the fact that, by being forced to explain concepts to their peers, they are motivated to try to understand the logic behind these concepts. On the other hand, the explanations are usually through oral presentations in the classroom. This helps students to acquire communication skills. However, oral presentations are very similar to the traditional lecture model.

To overcome this problem and increase interest in the subject by encouraging student participation and creativity, we propose the use of podcasting as a self-learning approach. The main idea of our proposal is to combine challenge-based learning with flipped classrooms and incorporate gamification into the class, as it has been shown to be useful in enhancing student interest, facilitating their learning and increasing their motivation [9].

Podcasting has become very popular as a complement to education, offering flexibility to students, especially those with busy schedules or who cannot attend classes [15,16,17]. The possibility of listening to lesson podcasts can be beneficial for the students to engage with the subject and retain information easier. The podcast format allows the student to learn in a more conversational style of teaching and makes the student more connected with the class and the professor. Moreover, the podcast format permits the inclusion of a wide variety of content and the latest advancements in the subject, ensuring up-to-date learning. One of the main advantages of the podcasting approach is that the information can be easily shared and is available to everyone.

Since podcasting is widely used as an entertainment media platform, we think it can be useful to involve students in the development of the class [18,19,20,21]. Usually, it is used in a one-way direction, where the main actor recording the podcast is the teacher, that transmits the knowledge to the listener. We think that there is an opportunity to mix the concepts of a flipped classroom and podcasting, making the students the creators of the podcasts. This way, it becomes a bidirectional model in which students are active participants in the learning process.

2 METHODOLOGY

This paper aims to innovate in the field of teaching by providing a new methodology that combines two pedagogical tools: the podcast and the flipped classroom model. The main idea is to provide students with a more accessible, flexible, and motivating learning experience. On the hand, the use of podcasts allows students to have a preview of the topic to be covered in class. This gives them the opportunity to come prepared with questions and comments. On the other hand, in our proposed flipped classroom model, the students will be in charge of generating the content of the podcast, making them active participants in their learning process.

Specifically, our proposal consists in dividing and classifying the subject content by importance and difficulty and then proposing to the students which contents are available for them so that they make a podcast episode to explain the concept to the other students. This way, students will be at the centre of the learning process, with their understanding of the concepts being the basis for the creation of their podcasts. The goal is for students to not only understand the material but also to be able to communicate that knowledge to their peers effectively. By placing students at the starting point and emphasising the importance of their understanding and communication of the concepts, we aim to provide a more dynamic and engaging learning experience. This will bring multiple advantages. First, the responsibility of having to prepare the podcast results in students being motivated to go beyond the basic understanding of the

material and to do additional research to deepen their knowledge. Secondly, it motivates them to structure the information in a clear and easy-to-understand way, thus improving their ability to synthesise the content. Finally, they should be able to convey the information in the podcast, effectively communicating their knowledge to others and improving their cross-cutting communication skills.

To facilitate the process of preparation and creation of the podcast, students will form groups of 2 to 4 people and choose one of the concepts to be explained. All the concepts should be tackled, and there should be at least two podcasts for each concept. To obtain an episode for each concept, we propose that every file should not have a duration of more than 10 minutes so that at the end of the subject lessons, a complete podcast with all the main contents will be available for students to review.

The experiment will be conducted with students in the third year of the computer sciences degree in the database course. This course is structured in two different parts: a theoretical part, in which the fundamental concepts of databases are introduced, and a practical part, in which students learn how to program a database using a database programming language. We have focused only on the theoretical part. We have selected five different didactic blocks:

- Introduction to database management systems.
- The most used database techniques.
- Relational database model.
- Non-relational database model.
- Integrity constraints.

Students will be divided into two groups: experimental and control. The experimental group will use the methodology proposed in this paper for the acquisition of the theoretical knowledge of the course. On the other hand, the control group will follow the usual model of the course through class lectures.

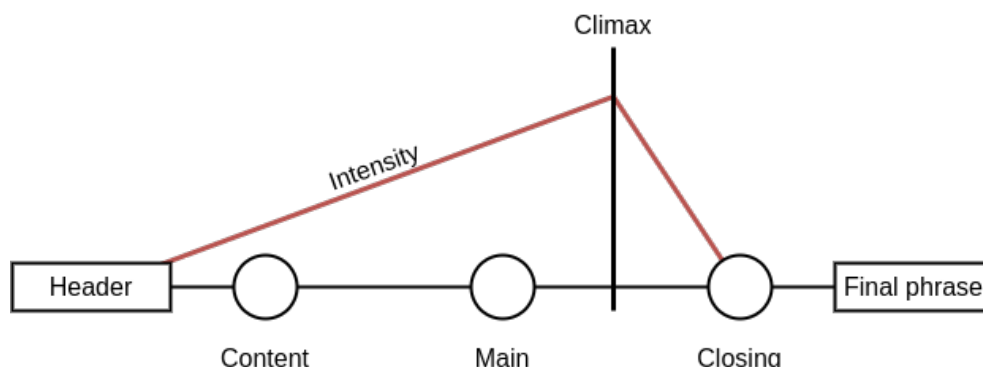


Figure 1. Main parts of a podcast episode with the intensity change during the recording.

Students in the experimental group will be divided into groups of between 2 and 4 participants. Each group will be assigned one random topic. Students will then be assigned the task of creating the podcast. All students in the experimental group will be informed of the following instructions for creating the podcast:

- It should have a duration of between 5 to 10 minutes.
- It must cover all the fundamental concepts of the didactic block.
- It can include both music and sound effects.
- It must have four clearly differentiated sections (Figure 1): header section (with an approximate duration of about 30 seconds) that will open the podcast and introduce the topic that the podcast will deal with; content section, which should summarise the content of the podcast; main section, in which the key concepts of the didactic block will be explained; closing section (with an approximate duration of about 30 seconds) in which the audience will be thanked for having listened to the podcast, giving it diffusion and saying goodbye until the next episode.

To assist participants in the development of the podcasts, each group will be provided with teaching material along with relevant research papers related to their didactic block. Participants will be encouraged to search for more information on their own to complement the provided material.

To motivate participation, the best podcasts will be rewarded with an incentive that will affect the final grade of the course. The evaluation of the effectiveness of podcasting will be based on two questionnaires: a multiple-choice test and a satisfaction survey. The multiple-choice test will assess the knowledge acquisition of the students, while the satisfaction survey will measure their perceived quality of the learning process. Both questionnaires will be completed by both the control group and the experimental group, and the results will be compared to identify whether there is a significant positive effect on the learning and comprehension of students who listened to the podcasts.

The incentive of the presented approach will be a significant boost to the students' final grades, making it a strong motivator for participation and engagement. The students will be given a clear understanding of the importance of the podcasts and the impact they will have on their grades, making them more likely to listen to each episode with focus and attention. This will provide a positive learning experience, where students can learn at their own pace and revisit content if necessary, allowing for a more effective and efficient learning process.

In order to ensure a fair evaluation, the questionnaires will be standardized and administered in a controlled environment, with clear instructions and guidelines provided to the students. The multiple-choice test will consist of a set of questions that are related to the content covered in the podcasts, and the satisfaction survey will include questions on the quality of the audio and video, the level of engagement and interaction, and the overall learning experience. This data will be analysed and compared between the control group and the experimental group to identify any statistically significant differences in their learning outcomes. The results of this study will provide valuable insights into the effectiveness of podcasting as a learning tool and inform future educational practices.

3 RESULTS

The proposal explained in this work is currently being developed during the second semester of the course 2022-2023. Hence, we still need the results of the proposed experiment to demonstrate our hypothesis empirically. However, previous experiences of the authors in similar works using videos instead of podcasting makes us suppose that this approach would significantly benefit the students' learning process, thus improving their performance in the subject.

We believe podcasting can be a great tool to motivate students as the process of creating a podcast is well-defined and structured, usually following a script. This structure will force students to plan their content and follow the necessary time frames for each part, which can help to enhance their learning experience. We think podcasting will provide students with a platform to express their knowledge creatively and confidently. This format will also allow students to participate in a hands-on and active learning process, leading to a deeper understanding of the subject. The way the methodology has been designed, we expect that the podcast production process will also have a positive impact on their collaboration, teamwork, and problem-solving skills. Furthermore, the combination of podcasting and student-directed learning will create a unique opportunity for students to understand the material and develop important skills such as research, communication, and critical thinking. Moreover, we think that the use of podcasts will increase students' ability to present information about the subject creatively and engagingly, bringing an opportunity to develop their communication skills while improving the subject understanding.

Therefore, the expected results of applying this new educational methodology to students in the university include a potential improvement in their final grades, the development of transversal skills, and the students' engagement in the subject. All of this will help the students perform better during the learning process, especially for the students of this generation that have grown up with lots of technology around them and get quickly bored with more traditional educational methodologies.

4 CONCLUSIONS

In this paper, we propose a new educational methodology that combines the use of podcasting and the flipped classroom model in higher education. The proposed method involves both teachers and students, giving significant importance to the role of the learner. The proposed flipped classroom is based on a multimedia audio platform that consists of creating audio content of significant concepts of the subject so that a collection of content is built by the students for the students. The fundamental idea of this methodology is that students can listen to podcast episodes as part of their preparation before class, allowing them to learn in a more accessible, flexible way. In addition, the podcast provides them with a preview of the topic to be covered in class and allows them to come prepared with questions and

comments. In this way, class time can be reused to review the topic in more detail, resolve doubts, and/or focus on the development of practical skills.

The combination of the podcast and flipped classroom model aims to improve students' understanding and interest in the subject, encourage a more participatory attitude, and motivate autonomous learning. This personalized and flexible learning experience can lead to more focused and productive class discussions and activities. The multimedia audio platform also allows for the creation of a collaborative and community-driven learning environment.

The use of podcasting in education has the potential to enhance students' engagement with the subject matter, increase their motivation to learn, and foster critical thinking skills. Additionally, it provides a cost-effective and technologically accessible solution for both students and teachers.

In this work, we have directed the focus of our methodology towards the database course that is studied in computing sciences. To do that, we have proposed to divide the theoretical concepts of the subject into five different topics from which five podcasts will emerge. Then, we will divide the class into groups of 2 to 4 participants to prepare the podcasts.

In future work, we intend to apply this new learning approach and test our proposal in a real environment, using a series of tests and questionnaires before and after the podcast production to analyse the impact on the students' learning process. It would also be interesting to replicate this experiment in other subjects to evaluate the effectiveness of podcasting.

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