Generating audio-visual material for generic competences education

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Abstract. Generic competences are a set of skills common to any degree course that students should acquire. Some examples of problems we can find in the teaching/learning process of these competences are: frequently lecturers do not know how to teach these transversal skills, the contents to teach are repeated in different courses and lecturers dedicate an important amount of time to explain them. Teamwork is included among these generic competences. This paper describes an experience designing audio-visual material which includes guidelines to help lecturers and students achieve successful teamwork. In the future, this idea could be transferred to other generic competences.

Keywords: generic competences, teamwork

1 Introduction

A competence *is a dynamic combination of cognitive and metacognitive skills, knowledge and understanding, interpersonal, intellectual and practical skills, ethical values and attitudes. Competences are developed in all course units and assessed at different stages of a program. Some competences are subject-area related (specific to a field of study), others are generic (common to any degree course)* [1].

This work is the result of a project of Innovation and Improvement of the Education Quality carried out at the University of Balearic Islands. The motivation of this work arose during a regular education seminar hold in the Math and Computer Science Department. In this seminar we detected a general complaint: the amount of time devoted to teach students issues not directly related to the subject's contents but to transversal aspects like teamwork or making a presentation. Moreover, we detected that such issues were taught repeatedly in several courses.

A potential solution to this problem could be the use of CanalUIB which is the website of audio-visual contents in our university [2]. It can be used to broadcast live events or to watch uploaded videos. Users can also access most of the historical records of available audio-visual media. Most of the subjects in our university have web support; therefore, we envisioned the possibility to create a set of audio-visual resources to be used as a learning tool for generic competences. Resources should be

designed so as to be used globally in any course, independently of the career or academic year. Moreover, the audio-visual resources should be short and address very specific issues.

Students can access these resources to work several transversal skills autonomously and the lecturer can devote most of the time to the subject he or she is teaching. Lecturers could even use them during short breaks as tools to dynamize long lessons.

We propose as a pilot experience the teamwork competence teaching. Teamwork aims at combining the talent of team members, their knowledge and their ideas to produce projects or assignments of higher quality.

The present work describes an experience of the making of a video to show the advantages of teamwork and to give a set of guidelines to help students to understand the main concepts and to achieve skills for teamwork.

2 The importance of the teamwork competence and cooperative learning

The adaptation process of Spain's university system to the European Higher Education Area (EHEA) has aroused a renewed interest towards didactic methodologies that imply an active role of university students, mainly due to the change in the educational paradigm, which moves the focus from teacher's teaching to student's learning [3]. On the one hand, students need to be actively involved in their learning process and learning is best achieved interactively. Moreover, many researchers conclude that peer learning is an effective methodology [4, 5, 6]. On the other hand, the university system must guarantee that graduates develop the necessary skills to access to the labour market, which increasingly demands subject-area related and generic competences. For the first phase of the Tuning Project [1], base of the EHEA, a team of experts reached a consensus on which competences may be develop in university students. An interpersonal generic competence that appears in that project is *teamwork*. Teamwork is essential for the student's professional future and it can be easily transferred out of the boundaries of education.

Satisfying the previous two conditions, *cooperative learning* is an active learning methodology whose main characteristic is that students work in teams to face an educational task, taking an active part in their team-mates' learning. Cooperative learning involves more than traditional group work in which a task can be merely split in individually faced parts and then joined to give in the task. Interaction and interdependence between team-mates are necessary conditions for teamwork. Johnson et al. [7] analyze some more differences between traditional group work and cooperative work. Moreover, Johnson et al [8] remark that "*structuring cooperative learning involves more than seating a number of students close together and telling them to help each other. Many actions can hurt group efforts*". Teamwork is not an easy task [9, 10]: we find students that take advantage of their team-mates, team members that do not work or team conflicts appear. Therefore, the inclusion of teamwork requires some careful thought and guidelines should be given first to

teachers and then, they should transfer this knowledge to their students and help them to create and manage effective, efficient and satisfactory teams.

The study of cooperative work it's not a new topic (see for example [11] and [12]). Once the theory was specified in practical principles that were integrated in some of the most popular psychopedagogical trends, cooperative learning has experienced a great expansion, especially in pre-university educational levels. Researchers like David W. Johnson and Roger T. Johnson, with a great number of studies both theoretical and experimental, have considerably contributed to the development of cooperative learning. For example, the meta-analysis carried out by Johnson et al. [13] on more than 120 studies made in North America came to the conclusion "*that cooperation is considerably more effective than interpersonal competition and individualistic efforts*". Some of the benefits of teamwork are: it enhances students' learning and retaining capabilities [14], students improve their communication and teamwork skills [15, 16], it assists them in developing integrative perspectives and skills, it improves their self-confidence, and it gives them a greater appreciation and tolerance of their team-mates [17, 18].

2.1 Tips for including cooperative learning in the classroom

After discussing some documents about cooperative learning, we decided to compile several practical tips to help interested teachers to include cooperative learning strategies in their classrooms. These tips, selected from Gross Davis [14], are divided into groups, according to the following topics: general strategies, organizing teams, guiding teams and evaluating teamwork. These are the topics included in each group:

General strategies:

1. *Plan for each stage of teamwork*. Decide which topics, themes, or projects might be suitable to include teamwork skills.
2. *Explain to your class how the teams will operate and how students will be evaluated*. Explain the objectives of the team task and define any relevant concepts. Also explain how students will be evaluated.
3. *Give students the skills they need to succeed in teams*. Many students have never worked in cooperative teams and may need practice in such skills as active and tolerant listening, helping one another in mastering content, giving and receiving constructive criticism, and managing disagreements. Discuss these skills with your students and model and reinforce them during class.
4. *Consider written contracts*. In some occasions students are given written contracts that list members' obligations to their team and deadlines for tasks.

Organizing teams:

5. *Decide how teams will be formed*. Some faculty prefers randomly assign students to teams, others let students choose with whom they want to work and other instructors prefer to form the teams themselves.

6. *Be conscious of team size*. In general, teams of four or five members work best.
7. *Keep teams together*. When a team is not working well, avoid breaking it up, even if the group requests it because the bailed-out troubled team does not learn to cope with its unproductive interactions.

Guiding teams:

8. *Help teams plan how to proceed*. Ask each group to devise a plan of action: who will be doing what and when. Review the groups' written plans or meet with each group to discuss their plan.
9. *Regularly check in with the teams*. If the task spans several weeks, you will want to establish checkpoints with the teams. Ask teams to turn in outlines or drafts or to meet with you.
10. *Provide mechanisms for teams to deal with uncooperative members.* Some researchers recommend telling the class that after the team task is completed, each student will submit to the instructor an anonymous assessment of the participation of the other team members: who did extra work and who shirked work. If several people indicate that an individual did less than a fair share, that person could receive a lower grade than the rest of the team.

Evaluating teamwork:

11. *Ensure that individual student performance is assessed and that the teams know how their members are doing*. Ways to ensure that students are held accountable include giving spot quizzes to be completed individually and calling on individual students to present their team's progress.
12. *Give students an opportunity to evaluate the effectiveness of their team*. Once or twice during the teamwork task, ask team members to discuss two questions: What action has each member taken that has been helpful for the team? What action could each member take to make the team even better? At the end of the project, ask students to complete a brief evaluation form on the effectiveness of the team and its members.
13. *Decide how to evaluate members of the team*. Some faculty assign all students in the team the same grade on the team task, others grade the contribution of each student on the basis of individual test scores or the group's evaluation of each member's work.

On the other hand, we find interesting to add some tips addressed to students, extracted from Svinicki & McKeachie [5], about how to be an effective team:

1. *Be sure everyone contributes to discussion and to tasks.*
2. *Don't jump to conclusions too quickly. Be sure that minority ideas are considered.*
3. *Don't assume consensus because no one has opposed an idea or offered an alternative. Check agreement with each team member verbally, not just by a vote.*

4. *Set goals – immediate, intermediate and long-term – but don't be afraid to change them as you progress.*
5. *Allocate tasks to be done. Be sure that each person knows what he or she has to do and what the deadline is. Check this before adjourning.*
6. *Be sure there is agreement on the time and place for the next meeting and on what you hope to accomplish.*
7. *Before ending a meeting, evaluate your team progress. What might you try to do differently next time?*

To teach students and lecturers these guidelines, we decided to design audio-visual material which will be described in the following section.

3 Audio-visual material design

Considering the material to design we took into account the following factors: innovation from the technological point of view, simplicity from the standpoint of production and the aesthetic appeal.

Regarding the challenge of the technological innovation we decided to develop an interactive video [19], hypervideo type, which includes an interface with buttons that pop-up depending on the context and allows the user to repeat parts or view them in the desired order. Interactive videos have been present since quite a long time [20], but only in recent years, these methods have been applied to the e-learning field [21]. In this sense, considering the reviewed training material found to teach generic competences, we believe that our system can have a distinguishing factor that we certainly think it can be more attractive for the audience intended.

The issue of simplicity of production is critical because the cost of an audio-visual product can easily increase if it is not taken into account from the beginning. This means that the goals to be achieved have to be adapted accordingly with the budget: for example, reducing the number of characters, locations, props and effects will have an immediate effect on the final cost of the product.

The aesthetic issue is crucial for any visual product, especially when the video is for the network and focused towards a particular community such as the students. We have to take into account social and aesthetic aspects of popular culture already defined by channels such as YouTube [22, 23]. Our proposal will have a modern and casual style, but it will also have a rigorous aspect to achieve two different goals: to reach the target population and to provide the desired information.

3.1 Preproduction

The documentation has been written using standard and free tools like Celtx [24]. The application includes tools for writing the screenplay, and sections to define characters, locations and digital effects.

The script is designed to take approximately 10 minutes in total without considering the interaction time and the possible repetitions that the user can demand. It is structured in 20 scenes with two alternated locations. In total there are four

characters that do not change location, the narrator is a character in the location that we call *space of the narrator* and the other 3 characters are students at the location that we call *space of students* (see Fig. 1). We have a total of 19 digital special effects that will be used to solve two aspects: on the one hand all the interaction of the video that will be introduced by the narrator and on the other hand, they will highlight dialogues, thoughts and students' actions. This design is thought to limit the complexity and the budget of the production.

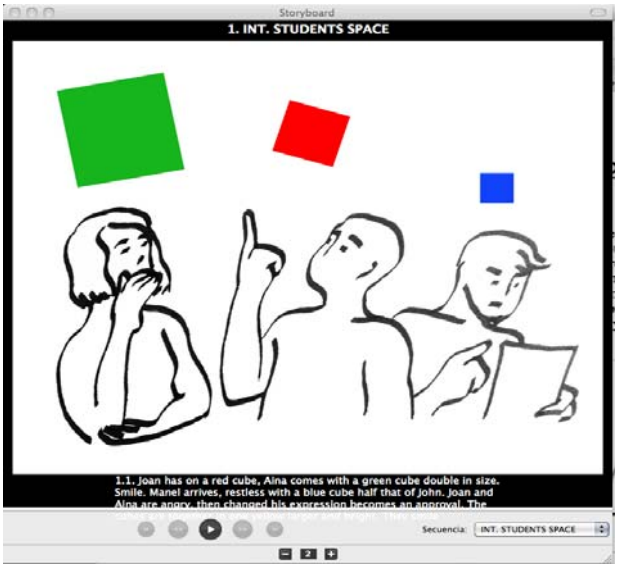

Fig. 1. An example of the storyboard in the CeltX environment.

3.2 Locations

Both locations are virtual white spaces without any object or with only those that are absolutely essential for the action. These objects are generated in digital 3D, so they must be integrated with the actors recorded in a chroma set. This design decision was taken considering the possibility of using a set with these characteristics at the University.

3.3 Characters

- *Narrator*: The narrator or presenter exposes and manages the audio-visual interactivity. She is the responsible for providing the knowledge, so she will be older than the characters that act as the students. This does not mean that the character portrays the archetype of the wise teacher with white hair and white coat,

as we seek to come closer to the students with a narrator that presents a young, dynamic and decisive professional. She wears a suit-jacket and her image looks like a mixture of an executive and a television newsreader.

- *Student 1*: Joan is a student. He represents an enthusiastic, active and leader student. His physical appearance is of a young in his twenties. He dresses a t-shirt and jeans and he is the archetype of a young and positive person. He represents an individual of the target population of our audio-visual. He wants to learn and he counts with leadership skills. He needs the support of someone more cautious and sensible. Ana's personality is the counterbalance of his behaviour.
- *Student 2*: Ana is a student. She represents a student with non-University experience and with doubts. She has a great common sense and she is able to explain things clearly. Her maturity is the counterbalance of Joan. She represents an individual of the target population of our audio-visual. She wants to learn, she is aware of her limits due to her University inexperience.
- *Student 3*: Manuel is a student. He represents the individualistic, skeptical and quiet student. He is more relaxed than his classmates in his dressing. He is the archetype of the young rebel or disenchanted youngster. He always disagrees with his classmates at the beginning, he questions everything and he always offers the most bizarre solutions. He is nice and funny and occasionally he is brilliant. He is stubborn and persevering. He is hard to convince but finally he normally agrees.

All the dialogue is done by the narrator, the students actually do not speak and all their ideas and actions are understood due to the digital effects. The lack of dialogues for the characters of students will facilitate the selection of actors, because the role is easier to perform. The speech is in initially done in Catalan language as it is the language of the area where the project is implemented, but subtitles can be included.

3.4 Digital effects

The interaction elements are buttons that the user can click to know their meaning, their design is standard, and they appear like a "flying window" triggered by the narrator's explanation. These elements support the story and all the students' actions. They appear as 3D geometric primitives or simple polygonal structures with basic colours without texture, for example a red cube floating above the head of the character symbolizes an idea or project. The animations of these objects are shown with a simple animation and they follow the character.

3.5 Interaction

Buttons appear depending on the narrator's dialogue. When the system is waiting for a user's action, the narrator will stop until the user chooses an option. This action causes a location change where we find the students who will describe and solve the situation. When a particular display shows more than a button the user is free to define the order in which items will be displayed, but all have to be watched in order to advance the story.

The interaction is defined by three menus: the first one with a single button will show the main objective, the second has three options and explains issues related with forming working groups and the last menu will show seven problems that can appear within the group and their solutions. See Fig. 2.

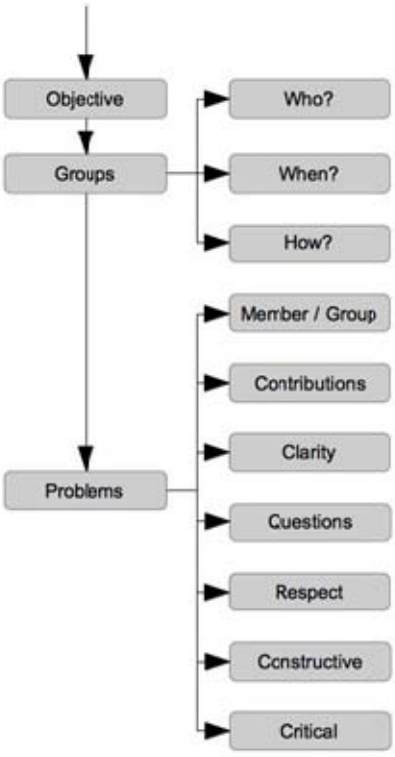

Fig. 2. The interaction scheme.

4 Conclusions

In this paper we presented a dynamic, easy, innovative and aesthetic system to help lecturers and students to teach and learn generic competences. We focused on one of these competences, teamwork, and designed an interactive audio-visual material to be used autonomously or in the classroom.

The interactive audio-visual material offers guidelines to face the obstacles encountered when creating groups, how to confront the problems arisen among the members of the team and how to evaluate students when working in a team.

Currently, the design and script is all written and we have to film in high quality the audio-visual material to upload it to the web of CanalUIB providing access to all the University members. Then, we will be able to assess the video contents and analyze its use by the University community.

In the future, all generic competences can be analyzed to compile a set of guidelines and to present them in this format.

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