3rd International Conference on
TEACHING, LEARNING and EDUCATION
26-28 February, 2021 Amsterdam, Netherlands

Video technologies for professor-student interaction in online teaching

Carmen Álvarez-Álvarez[1*]

[1] *University of Cantabria*

Abstract

It is important to promote interaction in university teaching, both in face-to-face and online teaching, because it contributes to the acquisition of knowledge, promotes participation and encourages student involvement. In online synchronous classes the tutor plans video calls and can interact with students following similar guidelines to those used in face-to-face teaching, but can he do so in asynchronous teaching? There are technologies that allow it like Edpuzzle and H5P and in this contribution we will focus on its study. For this we have consulted 60 professors and teachers who have experienced it and we have asked them what advantages and disadvantages they find. The testimonies collected show a high satisfaction of the people who approach these technologies and their great potential to promote interaction in teaching. The results reveal that video interaction technologies are an innovative, enjoyable, dynamic, attractive and playful self-learning tool that favours the motivation and attention of students, promotes flipped classroom and is easy to use by professors, among others. The experiences developed in this regard allow us to conclude that technologies for interaction in asynchronous teaching via video allow professors to interact with students when they are learning alone, adding value to their own or others' graphic material to be used.

Keywords: asynchronous teaching; online learning; professor-student communication; teaching technologies; video interaction.

1. Introduction

Our university teaching context is gradually transforming in recent years developing changes that impact strongly on teaching, both in the face and distance processes: today we live connected, we no longer understand life without the Internet and we have many resources from web 2.0, all universities are developing and expanding their virtual platforms and learning technologies and knowledge are multiplying (TAC) so that regular classes increasingly combine classroom and digital elements (Alarcia & Bravo, 2012; Asri et al., 2020; Comer & Lenaghan, 2013; Ellis & Bliuc, 2019).

Previous research has shown that it is important to promote interaction in university teaching because it allows to promote teaching relationships based on dialogue, promote participation

info@ictle.com
www.ictle.com

and encourage the involvement of students, as well as promote more effective teaching-learning processes (Alarcia & Bravo, 2012; Alvarez-Alvarez et al., 2019; Álvarez Álvarez, 2017; Burns et al., 2020; Comer & Lenaghan, 2013; Hernández & Álvarez-Álvarez, 2018; Vercellotti, 2018).

In face-to-face teaching, interaction can take many forms, with more research than in online teaching. It is possible to mention a student-content interaction, a student-professor and student-professor and student-student interaction. This interaction allows us to share meanings, contribute experiences, clear up doubts, weigh up alternative answers, verify the acquisition of knowledge, etc. (Comer & Lenaghan, 2013; Hernández & Álvarez-Álvarez, 2018; Vercellotti, 2018).

Promoting interaction in online teaching is as necessary as it is in face-to-face teaching (Comer & Lenaghan, 2013). In this study we will focus on interaction in online teaching. Online activity can be synchronous (at the same time) and asynchronous (different time). In the synchronous activity the tutor makes video calls and can interact with students following similar guidelines to those used in classroom teaching, but how can you interact with students when you do not share the same time and space? A relevant practice in online universities are the discussion forums (Comer & Lenaghan, 2013), but in face-to-face universities that use Moodle as a training platform we have been observing that students prefer to write a personal email to the professor before doing it publicly in a discussion forum, unless the interventions in the forums are taken into consideration with a percentage for the final grade.

Increasingly, to facilitate student learning, it is necessary to diversify study materials. It is not enough to give them readings, make video calls, have platforms and use online forums. It is increasingly necessary to have videos and images that help explain and understand the contents (Roberts, 2019; Silverajah & Govindaraj, 2018). These can be both recorded classes and videos of other people linked to the explanation of the contents of the subjects. The video (the image) is a demanded resource and increasingly necessary (Arnone & Grabowski, 1992; Mischel, 2019; Roberts, 2019).

If we add to this demand the need to enhance interaction, it becomes essential to have technologies that allow it. There are at least two: Edpuzzle and H5P. Edpuzzle is a free online tool that allows you to insert comments, voice notes, open and closed questions, etc. to videos, both those available on the web and others that we believe. Each user can access with his account as a teacher (being able to create materials) or as a student (being able to consume them). H5P is a free and open interactive content creation platform for free software in education. Its great advantage is that it can be integrated into Moodle or WordPress and allows the creation, sharing and reuse of interactive videos, as well as other interactive work proposals (Santos et al., 2019). Both are complete and easy to use tools that promote student learning outside the classroom, in a motivating way, as well as monitoring and evaluation (Mischel, 2019). In addition, they can contribute to the development of a flipped classroom methodology at any educational level, which is giving good results in the evaluations carried out so far (Awidi & Paynter, 2019; Foldnes, 2016; Låg & Sæle, 2019; Lai & Hwang, 2016).

The scarce previous research regarding these two technologies has allowed the identification of some results. However, more research is needed. H5P has been only recently researched. It was evaluated by a sample of 30 students from a computer training cycle in Spain, revealing a very high level of satisfaction (Santos et al., 2019). As for Edpuzzle there is more research. For example, a study was made with 18 chemistry students in Malaysia that has concluded that

Edpuzzle helps to self-regulate learning, contributes to the improvement of learning, with special interest in those who have a greater risk of abandonment or have difficulties, since it motivates, they can reflect as long as they need, share their doubts with their peers by being proactive in their academic improvement, watch the video several times and review autonomously everything that is most difficult for them to assimilate (Silverajah & Govindaraj, 2018). Another study developed in the United States in biochemistry emphasizes the potential for learning this subject and other related subjects such as thermodynamics, kinetics and enzyme (Pulukuri & Abrams, 2020).

Among its advantages is that Edpuzzle ensures that the student sees the video, allowing for its revision, as well as incorporating the voice of the professor, to emphasize content, and to personalize it. In addition, its advantages are its use in virtual teaching contexts, revisualization, self-regulation of learning, monitoring of learning by the teacher (to reinforce failures or highlight successes) and the creation of teaching material that can be shared in the virtual community with all users (Mischel, 2019). In addition, it allows reflection by leaving time between visualization and response, something that in the classroom has limitations (Comer & Lenaghan, 2013). Among its disadvantages we can highlight that the student has no possibility to communicate with his professor (having to do it through another tool or email), the limitations he has in video editing itself (not being possible to join two different videos, for example) and it is not possible to integrate it into LMS (Mischel, 2019).

However, both Edpuzzle and H5P can also be used as a complement to classroom teaching. In this study we will examine how some users value these technologies to determine their possible potentialities and limitations through the analysis of other different cases related to their use.

2. Methodology

The general objective of this study is to show the possibilities and limitations of the implementation of a technology for interaction in asynchronous teaching by video, from the evaluation of the same both practicing professors and teachers in training. We have the hypothesis that these technologies are still very unknown and therefore little used, but very interesting and with enormous potential for teaching and learning in asynchronous teaching contexts.

After the experience of employing Edpuzzle with a group of 60 students of the Degree in Primary Education during the confinement period in Spain (March-May 2020) and that it was very positively valued, it seemed appropriate to me to sound out the valuation it receives from more people. For this purpose, 60 more people were contacted: 23 university professors in practice (7 who have used it on some occasions and 16 who have tried it, but have not yet used it in their classes) and 37 future Secondary Education teachers who were unaware of the technologies for interaction in asynchronous video teaching and were asked to express their impressions on the subject, thus moving from the single case to the multi-case study (Álvarez Álvarez & San Fabián Maroto, 2012).

After the first good experience with it, it seemed necessary to proceed to verify its liking with a second group of teachers in training and I considered it appropriate to do so on this occasion with teachers in training for the exercise in Secondary Education. Given that on this

occasion the professors were only asked to watch a video edited with Edpuzzle and openly comment on what usefulness or potential they saw in it. This was also done with the practicing teachers.

All the information collected is qualitative and was analyzed through a system of content analysis, organizing it around three main categories: possibilities, limitations and doubts. The ethical considerations that mark the research have been taken into account at all times: not revealing the identity of the subjects (using pseudonyms), maintaining confidentiality, independence, etc.

3. Results

In order to present the results achieved, we have divided them into three main categories: possibilities, limitations and doubts. The possibilities are ideas that highlight the value of these technologies for interaction in asynchronous video teaching. Likewise, the participants have pointed out the limitations they see in them.

Posibilities

The possibilities listed by the participants have been very numerous, revealing a remarkable interest on the part of all the people consulted on this subject. To account for them, they have been grouped around three subcategories and listed below.

Outstanding possibilities by teachers and students:

a) Self-learning tool. Students and teachers consulted have indicated that these technologies have great potential as a self-learning tool. "I thought to make some videos with the resolution of exercises in excel and, as they progress, I will embed questions. Those questions will be answered in later sections of the video, then the student will be able to self-evaluate. I see a lot of potential in it as a tool for self-learning and self-evaluation" (Female Professor 16).

b) A pleasant and dynamic tool. Likewise, students and teachers agree that it is a dynamic tool, which favours learning in a more enjoyable way. "Since you can edit the videos and add questions, it makes the viewing process more enjoyable and dynamic. For example, the insertion of specific voice notes from the teacher throughout the video is similar to the comments a teacher would make in a face-to-face class and helps draw attention to the issues that the teacher wants to emphasize" (Female Student 15).

c) Motivation. These technologies capture the students and motivate them in their learning. "I think the incorporation of different tasks with H5P is interesting. I think that these can promote the motivation of the group" (Female Professor 4).

d) Attractive and playful tool. It is an attractive tool and there are those who value it as playful. "My daughter is using it in high school and she likes it a lot, she lives it almost like a video game. The first time she used it, she showed it to me so that I could see it and she told me that it was very attractive to her. She was watching a history video and

stressed that when she asked the questions after watching the video clip she didn't forget what she was seeing. She was hooked" (Female Professor 2).

e) Innovative tool. For many, it has also been considered a tool of interest for its novelty for all, students and teachers, as it allows to develop in asynchronous a usual synchronous activity in the classroom: raising questions and providing answers. "I think it's interesting, I think it can be a new way to transmit information, maintain a feedback, reflect a learning ..." (Female Student 11).

f) Immediate feedback. These technologies, by allowing for easy and agile feedback, facilitate teacher evaluation and this has been assessed by one of the experienced teachers. "What I like most is that it facilitates immediate feedback, but come on, I've been using it for a long time for many reasons. I consider it an indispensable tool, so I am already convinced of the cause" (Male Professor 6).

g) Students work. Many teachers emphasize that thanks to the students' motivation, they work more and better on the content of the subject. "I put several videos and several readings to my students every week. They always make the videos, even the ones for future classes. They like it a lot and are learning a lot too" (Female Professor 2).

h) All the students participate. When you ask a question in class, it is not possible to recover the answer of all the students, but these tools allow it. "I think it's a good idea because it's a way for all the students to participate without the class being chaotic" (Male Student 5).

Outstanding possibilities for teachers:

i) Focus. These tools, by requiring the participation of the student to respond to the questions posed, favour attention and active listening, as many teachers have emphasized. "What I like best is that it helps to focus attention and not to be distracted. It's not about being a spectator, but an active learner" (Male Professor 2).

j) Easy for teachers. Teachers appreciate that it is easy to learn and use. "For me the biggest advantage is that it is very easy to use. If I learned, anyone can, because it is intuitive" (Female Professor 10).

k) It promotes reverse learning. Another advantage that has been observed by teachers who have used it is that it facilitates innovation through the successful implementation of reverse learning practices. "I like it very much because first the students work autonomously and then in the video calls they solve their concrete doubts, in such a way that it facilitates the learning and new forms of interaction" (Female Professor 1).

l) Versatile for synchronous and asynchronous teaching. A teacher likes that it works for both asynchronous and synchronous teaching. "I used it in confinement, when everything was online, but it is also suitable as a complementary activity to classroom teaching and so I will use it in other courses" (Female Professor 3).

m) Plurality of questions. These technologies allow to ask different types of questions. "I like that I can formulate multiple choice questions that correct themselves, although it is not convenient to abuse them because the students can pass the answers; open questions of a reproductive type (what the video says) and of a productive type (a

reflection, an example, etc.) Overall, a lot of information can be extracted from the students' understanding of the videos" (Male Professor 1).

Outstanding possibilities by students:

n) It is a visual material. The students value very positively that it is a visual, graphic material, beyond the use also necessary of texts and written material. "It can allow students to learn from a much more visual plane, which is very important, since our brain works through images. I think it is a useful tool to create content different from the usual ones and that can motivate students" (Female Student 9).

o) Revision of the video. For some students it is also positive to be able to review the video if you do not know the answer. "It is very good that as the video advances it suddenly stops to ask a question, where if you have not been attentive you have the option to watch that part of the video again" (Female Student 4).

p) Reference material. The student identifies that, after a while, the video can still be reviewed as many times as required, constituting a material for review and consultation. "In a moment of doubt, having a reference to consult is always satisfactory" (Male Student 1).

q) Immediacy. Students value that questions emerge from the video when appropriate, achieving an immediacy in the response and not a delay in it. "I find it very useful because it allows to ask questions in time that the contents are coming out in the video, to highlight some point that we think is relevant. In addition, the visualization of videos seems to me to be something quite enjoyable for the students" (Female Student 3).

r) The video stops if you change the screen. Students who have tried Edpuzzle have tried to change screens while watching their video and realized that it is not possible. They have made a positive reading on this aspect. "I find it an excellent tool for online teaching. It should be noted that when you open another page or minimize the page on which Edpuzzle is playing, the video stops, so you have to see the teacher with his explanation, which I think is very positive to avoid distractions. Besides, asking questions or explaining the video is very useful and effective" (Male Student 15).

s) Versatility in the treatment of the contents. Students have appreciated that these technologies can be used at the beginning, middle and end of a topic. "These types of activities serve as a support to present a topic and know what your students know; to conclude a topic and discover how much they have learned; to work on listening comprehension; to work on any class content by adapting the video to that content; etc." (Female Student 17).

t) Training complement in specific cases. One student has considered that these technologies can be used when the student's circumstances do not facilitate their evaluation with the group's standards. She gives an example. "I am from Physical Education and I find it very interesting to be able to show contents or explanations of the subject in videos to my future students. For example, in my classes there are often students who are injured or have a disease that prevents them from taking certain classes or all of them, so I think that this platform can be useful to evaluate them. I also think it will be useful for all the other students, because, for example, there are techniques of

some individual or collective sport that are difficult to explain and through this platform I could teach those contents of the subject" (Female Student 18).

Limitations

Just as participants have shown the possibilities of these technologies for interaction in asynchronous video teaching, a few have appreciated some specific limitations that we will list below.

Outstanding limitation by teachers and students:

a) Technical difficulties. One professor and one student have expressed slight technical difficulties in their use. "I have had technical problems because some students could not see the grades I was giving them. I don't know why this happened" (Female Professor 2).

Outstanding limitations by teachers:

a) Edpuzzle does not belong to Moodle. For two professors the main limitation they see in Edpuzzle, because "The main thing I put in Edpuzzle is that it is a platform of its own and that it is outside of Moodle, which is the tool we use at the university. Students have to register outside. H5P is integrated in Moodle and offers practically the same functionalities" (Female Professor 3).

b) H5P does not offer as many features as Edpuzzle. For two professors H5P can be improved. "I have tried something with H5P but I like Edpuzzle better because it has more features, or so I thought when I started with it" (Male Professor 1).

Outstanding limitation by a student:

a) Problems with the use of a smatphone. A student has highlighted problems using Edpuzzle from her cell phone. "I, who have used the application for the cell phone, have had some problems. With the audio, for example, when the teacher intervened with the recording, the sound was bad. Sometimes it got stuck, other times, it stopped, but when I went back to the minute, I could hear what she was saying..." (Female Student 1).

4. Conclusion

The previous results allow us to draw some conclusions. First, the positive reception of these technologies by professors and students preparing to become teachers, as already glimpsed in previous studies, is noteworthy (Awidi & Paynter, 2019; Comer & Lenaghan, 2013; Foldnes, 2016; Låg & Sæle, 2019; Lai & Hwang, 2016; Mischel, 2019; Pulukuri & Abrams, 2020; Santos

et al., 2019; Silverajah & Govindaraj, 2018). Testimonies have been collected that show twenty possibilities they offer. From the point of view of professors and students, they constitute a new, enjoyable, dynamic, attractive and playful self-learning tool that favors motivation, immediate feedback and the participation and work of all students. From the point of view of the professors: they are intuitive and easy to use tools, they focus the student's attention, promote reverse learning and allow a plurality of questions to be asked. From the point of view of the students: they offer a visual work material, they allow the revision, they generate a consultation material, the answers are given in the immediacy, it is not allowed to change the screen, it allows a versatile treatment of the topics and they can be used as a formative complement.

Also, the limitations noted are few: only four have been highlighted. Some students and professors have had some technical difficulties and one student has alleged difficulties using a Smartphone. Professors have highlighted as negative that Edpuzzle does not integrate into Moodle and that H5P does not offer as many options as Edpuzzle.

Based on this evaluation made by 60 different people, it can be concluded that technologies for interaction in asynchronous teaching via video allow teachers to interact with students when they are learning alone, adding value to their own or others' graphic material to be used. Therefore, taking into account the current health crisis and the remarkable technological development, it is necessary to consider the need for greater dissemination of these technologies among professors to increase their use and thus make blended learning, online, synchronous or asynchronous and distance learning more attractive, motivating and interactive (Alarcia & Bravo, 2012; Asri et al., 2020; Comer & Lenaghan, 2013; Ellis & Bliuc, 2019).

The testimonies collected show a high satisfaction of the people who approach these technologies and their great potential to promote interaction in teaching, especially in the asynchronous one, which is the most inaccessible, since it is developed in different times and spaces for professors and students (Alarcia & Bravo, 2012; Alvarez-Alvarez et al., 2019; Alvarez-Alvarez, 2017; Burns et al., 2020; Comer & Lenaghan, 2013; Hernández & Álvarez-Álvarez, 2018; Vercellotti, 2018). The testimonies collected also reveal an idea pointed out in the state of the art: the preference for graphic and visual material that helps to understand the contents (Arnone & Grabowski, 1992; Roberts, 2019; Silverajah & Govindaraj, 2018).

1.1.1 References

Alarcia, Ò. F., & Bravo, I. de A. (2012). La influencia de las TIC en la interacción docente y discente en los procesos formativos universitarios. *RUSC Universities and Knowledge Society Journal*, *9*(2), 213–228. https://doi.org/10.7238/rusc.v9i2.1243

Alvarez-Alvarez, C., Sanchez-Ruiz, L., Ruthven, A., & Montoya, J. (2019). Innovating in University Teaching Through Classroom Interaction. *Journal of Education, Innovation, and Communication*, *1*(1), 8–18. https://doi.org/10.34097/jeicom_1_1_1

Álvarez Álvarez, C. (2017). ¿Es interactiva la enseñanza en la Educación Superior? La perspectiva del alumnado. *REDU. Revista de Docencia Universitaria*, *15*(2), 97. https://doi.org/10.4995/redu.2017.6075

Álvarez Álvarez, C., & San Fabián Maroto, J. L. (2012). La elección del estudio de caso en investigación educativa The selection of case studies in education research. *Nº Artículo*, *281*(14). http://hdl.handle.net/10481/20644

Arnone, M. P., & Grabowski, B. L. (1992). Effects on children's achievement and curiosity of variations in learner control over an interactive video lesson. *Educational Technology Research and Development*, *40*(1), 15–27. https://doi.org/10.1007/BF02296702

Asri, T. M., Kurnia Irmawati, D., & Novita Dewi, D. (2020). Investigating the Use of Internet Applications for Teaching at Higher Educational Level in the Indonesian Context. *Arab World English Journal*, *11*(2), 37–48. https://doi.org/10.24093/awej/vol11no2.3

Awidi, I. T., & Paynter, M. (2019). The impact of a flipped classroom approach on student learning experience. *Computers and Education*, *128*, 269–283. https://doi.org/10.1016/j.compedu.2018.09.013

Burns, A., Holford, P., & Andronicos, N. (2020). Enhancing understanding of foundation concepts in first year university STEM: evaluation of an asynchronous online interactive lesson. *Interactive Learning Environments*, *0*(0), 1–13. https://doi.org/10.1080/10494820.2020.1712426

Comer, D. R., & Lenaghan, J. A. (2013). Enhancing Discussions in the Asynchronous Online Classroom: The Lack of Face-to-Face Interaction Does Not Lessen the Lesson. *Journal of Management Education*, *37*(2), 261–294. https://doi.org/10.1177/1052562912442384

Ellis, R. A., & Bliuc, A. M. (2019). Exploring new elements of the student approaches to learning framework: The role of online learning technologies in student learning. *Active Learning in Higher Education*, *20*(1), 11–24. https://doi.org/10.1177/1469787417721384

Foldnes, N. (2016). The flipped classroom and cooperative learning: Evidence from a randomised experiment. *Active Learning in Higher Education*, *17*(1), 39–49. https://doi.org/10.1177/1469787415616726

Hernández, G., & Álvarez-Álvarez, C. (2018). Improving interaction in the classroom through collaborative action research. *Bordon, Revista de Pedagogia*, *70*(4), 73–87. https://doi.org/10.13042/Bordon.2018.60079

Låg, T., & Sæle, R. G. (2019). Does the Flipped Classroom Improve Student Learning and Satisfaction? A Systematic Review and Meta-Analysis. *AERA Open*, *5*(3), 233285841987048. https://doi.org/10.1177/2332858419870489

Lai, C. L., & Hwang, G. J. (2016). A self-regulated flipped classroom approach to improving students' learning performance in a mathematics course. *Computers and Education*, *100*, 126–140. https://doi.org/10.1016/j.compedu.2016.05.006

Mischel, L. J. (2019). Watch and Learn? Using EDpuzzle to Enhance the Use of Online Videos. *Management Teaching Review*, *4*(3), 283–289. https://doi.org/10.1177/2379298118773418

Pulukuri, S., & Abrams, B. (2020). Step back, translate, extend: Addressing misconceptions relating to energy and free energy in cellular reactions via active-learning videos. *Biochemistry and Molecular Biology Education*, *August*, 1–3. https://doi.org/10.1002/bmb.21461

Roberts, D. (2019). Higher education lectures: From passive to active learning via imagery? *Active Learning in Higher Education*, *20*(1), 63–77. https://doi.org/10.1177/1469787417731198

Santos, D. R., Cordon, C. R., & Palomo-Duarte, M. (2019). Extending H5P Branching Scenario with 360° scenes and xAPI capabilities: A case study in a local networks course. *2019 International Symposium on Computers in Education, SIIE 2019*. https://doi.org/10.1109/SIIE48397.2019.8970117

Silverajah, V. S. G., & Govindaraj, A. (2018). The use of Edpuzzle to support low-achiever's development of self-regulated learning and their learning of chemistry. *ACM International Conference Proceeding Series*, 259–263. https://doi.org/10.1145/3290511.3290582

Vercellotti, M. Lou. (2018). Do interactive learning spaces increase student achievement? A comparison of classroom context. *Active Learning in Higher Education*, *19*(3), 197–210. https://doi.org/10.1177/1469787417735606