

Flipped classroom or master class: innovate or die

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ABSTRACT

The strategies to communicate information have undergone many changes, which have been evidenced in the pandemic. The idea is to be able to connect with the student and to get information across in a clear, timely and relevant manner so that the student has prior knowledge to integrate information from theory and practice to successfully face the simulated activity like when he or she interacts with the patient. In this context, the flipped classroom is a didactic strategy that provides videos, podcasts, among others, to be reviewed in advance, so that when the student participates in a face-to-face or virtual activity, the most important concepts are deepened and clarified, using active participation methodologies to achieve the following objective: Flipped learning seeks a change in the dynamics of learning that points to the student as its axis. The objective of this teaching contribution is to share the benefits of this strategy used with students of the Dentistry degree program within the framework of the Adult Stomatology Clinic I course taught in 2023 and which belongs to the fifth semester of the Stomatology degree program at the Universidad Peruana Cayetano Heredia.

Keywords: didactic strategies, flipped classroom, dental education.

INTRODUCTION

The teaching of the physical and mechanical qualities of dental biomaterials is a fundamental subject in the training of dentists. These materials are essential for dental restoration, rehabilitation and surgery; and their correct use is very important to ensure the health, esthetics and function of patients.

Dental education today faces a number of challenges, including increased academic load, student diversity, and the need to develop active learning skills. In this context, the flipped classroom (FC) strategy has become a promising alternative to enhance learning in dental education.

FC is a teaching methodology in which students learn the content independently, outside the classroom, and then deepen and apply their knowledge in the classroom. This strategy has proven to be effective in enhancing the learning of several topics, and in the case of the physical-mechanical qualities of dental biomaterials it can offer several advantages, such as:

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- Improve motivation: By learning the content independently, students can choose the resources and pace of learning that best suit their needs. This can help increase their motivation and reduce the feeling of academic overload.
- Encourage active learning: In a flipped classroom (FC), students are the protagonists of the learning process. Having to learn the content independently, they must reflect on the concepts and apply them in a practical way. This helps them develop critical thinking and problem-solving skills.
- Increase class participation: In the in-person classroom, after FC, students can explore the concepts and resolve their doubts. This allows them to participate more actively in the learning process.

This didactic strategy aims to improve the way of teaching and to generate significant learning, as well as to transform the teaching method. One of its strengths is that it is related to the strong links and interaction with the teacher, who generates activities that promote collaborative learning by peers and in a personalized way between students and teachers (1-3).

EXPERIENCE DEVELOPMENT

The use of information and communication technologies (ICTs) and new methodologies in the teaching process force the migration to more efficient and effective ways of learning, and one of them is the FC strategy. It was proposed as a change to traditional master classes, so the contribution of this experience was to encourage student participation and training in the personalization of autonomous learning.

The purpose was to generate a different, playful and innovative teaching experience to transmit information and achieve significant learning, as well as to promote the strengthening of the bond between teachers and students. Videos were made of two classes corresponding to the physical-mechanical qualities of dental biomaterials in the unit on dental caries and other types of dental deterioration in the Integral Adult Clinic I course given in 2023. Students received the links of the videos seven days before the learning session. They had to review the content of the videos as their personalized learning. A participatory activity was prepared in the class session, where participatory work between pairs was encouraged using social networks to achieve integration and appreciations regarding the content of the videos. Finally, a playful digital tool WordWall® (free version) was used to consolidate and provide feedback on

the most important concepts. A FC survey was designed and validated by the teachers in charge. To determine the perception of the strategy, the survey was applied among students, in which they participated voluntarily and anonymously using Google Forms. Subsequently, a descriptive statistical analysis was performed.

RESULTS

65% of students participated ($n = 60$). Of those who participated, 71.7% were female and 28.3% were male. 85.2% were between 19 and 21 years old; 8.2% were over 22; and 6.6% were under 18. When asked if it was useful to have the class recorded before the face-to-face meeting, 60% felt it was useful; 36.7% felt it was very useful; and 3.3% mentioned it was not very useful. Regarding whether the face-to-face sessions with students and teachers were useful for learning about the topic, 52.5% considered that they were useful; 45.9% said they were very useful; and 1.6% disagreed that they were useful. When asked about the usefulness of the face-to-face activities, whether they were useful for learning the concepts provided in the videos, 50.8% agreed that they were useful; 42.6% strongly agreed that they were useful; 3.3% disagreed; and 3.3% strongly disagreed that the classes were useful in the face-to-face sessions. When asked whether the videos of the recorded classes were useful for learning the concepts provided, 54.1% considered that they were useful; 39.3% thought they were very useful; and 6.6% mentioned that they were a little useful.

When asked about their experience with this classroom modality, students expressed their impressions openly:

What is your opinion about your experience with these classes?

- *"I found it very different from the other classes I have in the course."*
- *"The dynamics of working in pairs and playing seem interesting to me."*
- *"I loved them because they are dynamic and catch your attention."*
- *"I find them interesting, and I feel it is easier to learn by watching a video before going to class and especially to learn by playing."*
- *"It's a class that activates me. I really enjoy participating even when the doctor asks for it, which compared to other theory classes of 2 hours, it seems as if they were 4 hours. The class with Dr. Saravia is very dynamic, he asks us to give our opinion and we also learn by playing, which is the best way to learn a topic in a faster way. Thank you, doctor!"*

- *"Didactics, adapted to the digital age".*
- *"Classes are a lot of fun with games that push you to pay attention."*
- *"They are really good because they are didactic. It is a technique for the student to interact and learn more than in a traditional class".*
- *"I find these classes interesting and important, but the environment in which they are conducted is sometimes not pleasant, not only for me, but for many of my classmates."*
- *"The experience in the proposed way was very fruitful; interaction is greater with students, something that allows the massive concentration of participants."*
- *"They were very dynamic and fun, they really caught my attention, apart from being very interesting."*
- *"These classes are very didactic, entertaining and above all, they give you the possibility to learn in different ways, such as with audio, video and quiz games".*
- *"Learning was very dynamic and interactive with images, questions and examples given in class."*
- *"Podcasts and videos are helpful in a complementary way to recall concepts, and I really like the fact that we can use technology to develop this information."*
- *"I really like the class because it's different from what we're usually used to."*
- *"They were very interesting."*
- *"I found it didactic, I liked the teaching method."*
- *"I like it a lot because it is didactic; when I play certain learning games I learn better."*
- *"I really like the way the doctor explains, it's very interactive and understandable."*

DISCUSSION

The results of this experience showed that the FC didactic strategy was efficient in generating significant learning in students, who showed a higher level of understanding of the concepts and were more motivated and participative in class. This is related to what has been found in the literature, where, in order to foster critical thinking, problem-solving skills and commitment to new ways of teaching and learning are promoted (1, 4, 5).

Motivation in learning

Motivation is an indispensable variable for learning. When students are motivated, they are more likely to connect with the content of the class and remember the information provided. In the case of the physical-mechanical qualities of dental biomaterials, motivation can be a challenge. These concepts can be complex and abstract, and it is important that students understand their relevance to clinical practice (6).

FC can help improve motivation for learning this topic. By allowing students to learn the content autonomously, they can choose the resources and pace of learning that best suit their needs. This helps them feel more independent and in control of their own learning. Apart from that, FC helps students realize the relevance of the concepts they are learning. When relating concepts to clinical practice, they can better understand their importance and their application in the real world (1).

Creativity in learning

Creativity is an essential skill for success in education in general, but particularly with dental education as well as in professional life. Physicians need to be creative to solve problems and offer innovative solutions to their patients. FC can help foster creativity in learning. By allowing students to learn independently, they can explore different ways of learning and applying knowledge. This helps them develop their critical thinking and find original solutions to problems (1, 7).

In the case of the physical-mechanical qualities of dental biomaterials, creativity can help students to better understand concepts; for example, students can create models or simulations to represent concepts.

Learning transformation

Learning should be transformative. Students should have the ability to put knowledge into practice to learn with simulated or real situations. FC can help transform learning. By allowing students to learn independently, they can delve deeper into concepts and apply them in a practical way. This helps them develop transferable skills that they can apply in different contexts (1, 8).

In the case of the physical-mechanical qualities of dental biomaterials, FC can contribute with students to develop diagnostic and treatment skills; for example, students can use the acquired knowledge to assess the condition of a tooth and recommend the appropriate dental material (1, 9-12).

CONCLUSIONS

FC is a promising methodology for teaching the physical-mechanical qualities of dental biomaterials. This strategy can help improve motivation, creativity, connectivity and learning transformation. Undoubtedly, this didactic strategy provides the opportunity to consider a new way of connecting with students, one that is closer to the new disruptive

methodologies that promote active and collaborative learning between students and teachers, generating the possibility of autonomy in learning.

The way we learn has changed and the way we teach has also changed. Along with these initiatives, new opportunities and challenges arise to analyze the relevance or not of continuing with the master class as a strategic model for transmitting information or migrating to a new way of teaching, as is the case of FC. Undoubtedly, innovating with FC or dying with the classic ways of transmitting information are the new challenges posed by the art of teaching. Now that their benefits are known, and considering even more the different learning styles, there is no doubt that we can achieve unique success using FC.

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