

Flipped classroom and the use of role-play in the COVID-19 pandemic: challenges and learning

Luiz Alexandre Chisini^{1,*} , Marcus Cristian Muniz Conde² , Alessandro Menna Alves² , Francine dos Santos Costa³ 

¹Federal University of Juiz de Fora, Governador Valadares - MG - Brazil

²University of Vale do Taquari, Lajeado - RS - Brazil

³Federal University of Pelotas, Pelotas - RS - Brazil

Corresponding author:

Luiz Alexandre Chisini
Institute of Health Sciences,
Department of Dentistry,
Federal University of Juiz de Fora,
1167 Moacir Paleta St., Governador
Valadares - MG - ZIP:35020-360,
Brazil
e-mail: alexandrechisini@gmail.com

Editor: Dr. Altair A. Del Bel Cury

Received: April 20, 2021

Accepted: February 12, 2021



Aim: In Brazil, COVID-19 remains one of the epicenters of the pandemic, thus, presentational educational activities are suspended. The study aimed to describe the approach of flipped classroom performed to provide social distancing and to maintain teaching activities during COVID-19-pandemic.

Methods: Flipped Classroom was chosen to be associated with the role-play technique as a central methodology. To bring students closer to activities performed in the non-pandemic period, some actions and assessments were also role-played by Professor simulating patients in virtual meetings. **Results:** Although the changes in the format of the lessons, our approaches stimulated the students maintained the high frequency of students in the activities (almost 100%) providing continuity activities. **Conclusions:** This report can reinforce that meaningful learning can be taught by using a virtual/remote approach. However, the potential positive results observed cannot be used as an excuse to maintain remote teaching activities with the objective of cost-cutting by the institutions.

Keywords: COVID-19. Coronavirus infections. Students, dental. Curriculum.

Introduction

Coronavirus Disease 2019 (COVID-19) starts in Wuhan – China - in December of 2019 and rapidly affects most of the countries worldwide^{1,2}. Recent data indicate that above 363 million individuals are infected and 5.6 million were dead due to COVID-19³. The first case of COVID-19 was confirmed in Brazil in February 2020 with significant growth in cases in the following months; therefore, Brazil became (and remains) one of the epicenters of the pandemic along with the United States of America^{1,4-7}.

The pandemic led to changes in dental education, especially in dentistry^{8,9}, considering the significant number of practical activities and the wide range of skills needing to be developed. In this way, following global recommendations, the theoretical classroom teaching activities have been suspended since then^{10,11}. This scenario has required the development of innovative learning approaches to minimize losses in the teaching and learning process as well as to continue the training of dental students in a new environment^{12,13}. Thus, the flipped classroom has been proposed as an active teaching strategy used in different academic environments¹⁴. The general guiding principle of the flipped classroom is that the traditional teaching process takes place outside of the classroom through videos performed by Professor, which is watched and studied before the classroom activity. So, the activities and projects related to upper-level cognitive field steps are carried out during classroom time.

Therefore, the study aimed to describe the approach of flipped classroom associated to role-play technique performed in our school to provide social distancing and maintain active learning as close as possible to the pre-COVID-19 period.

Material and Methods

Third-year dental students of the University of Vale do Taquari (located in the South region of Brazil) starts to study principles of occlusion being the activities mostly theoretical permeated by hands-on classes. It is important to highlight that the curriculum is not divided into disciplines, but is organized into integrated modules that aim to develop skills and competencies guided by the use of active teaching and learning methodologies. In this way, Professors should organize activities aiming to integrate the content covered by different areas. Thus, when classroom activities were suspended due to COVID-19, the curriculum was reorganized to promote students to meaningful learning and some hands-on activities. The Professor:Students ratio (1 professor to 10 students) has been maintained in the period. Activities that were not possible to be virtualized will be performed after the return of normal activities.

Flipped Classroom was chosen as a central methodology to carry out teaching activities. The theory of meaningful learning proposes that information is more easily learned when it makes connections with other previously known knowledge, helping to understand new knowledge based on prior knowledge¹⁵. Thus, the making of the videos by the professor who knows the students is fundamental,

since the new knowledge and the examples presented will always be anchored in content that the students already know of. So, flipped classroom consists of the inversion of actions taking place in the classroom and outside it, the study materials must be made available in advance for students to access and understand the proposed contents¹⁶. It was created a virtual classroom (in Google Classroom; <https://classroom.google.com>) where study materials and videos recorded by professors were uploaded and activities were made available. Thus, students must attend classes previously recorded and take notes. The virtual meetings were carried out synchronously by Google Meet (<https://meet.google.com>); initially, the students presented their questions regarding the video content. Whenever possible, students were encouraged to address their colleagues' questions and thus, teachers complemented their answers. After this initial moment, students were frequently separated into smaller groups, containing up to 5 individuals, where they carried out - virtually - group activities. These activities ranged from directed studies, concept maps, case studies, depending on the instructional objectives. Some hands-on activities could be maintained. For example, an important skill to be developed is the anamnesis interview and clinical exams. In this way, in small groups, one of the students received a clinical case, which should be role-played. The student should represent, for colleagues, the patient described in the case reporting symptoms and characteristics related to temporomandibular dysfunctions while the other students should carry out the anamnesis interview and reach a consensus regarding the diagnosis. During all the activities, the teacher supervised the various virtual rooms. In general, assessments performed in the pre-COVID-19 period have been based on Objective Structured Clinical Examination (OSCE)^{17,18} with real patients. To bring students closer to activities that were carried out in the pre-pandemic period, assessments were also performed by the Professor's role-play. Thus, Professor role-played a patient condition, describing the clinical symptoms. Then, the student asked questions regarding the patient and TMD. The Professor observed the path by which the student investigated and gave the diagnosis of TMD following the OSCE.

Results

Although the changes in the format of the lessons, the present approaches stimulated the students maintained the high frequency in the activities (almost 100%) with a high level of academic performance (mean of 8.4, standard deviation \pm 0.5) considering all evaluations, providing continuity of theoretical and some possible hand-on activities. One of the main problems faced by us concerns the connection's instability of students residing in the. In this way, the flipped classroom proved to be an interesting tool because such students have been able to watch the videos which allowed students to master the content that would be discussed in class. This was one of the main advantages pointed out by the students. Video records show that all students watched at least once (mean of 2 times; Standard deviation of \pm 0.7) while some viewed multiple times. However, we have no record of the average time spent watching activities. It was conducted in all in-person virtual classrooms, frequently with small group settings.

Discussion

Presents results can reinforce that significant knowledge can be taught using a virtual/remote approach and could have a promising future perspective of pandemic prolongation.

Indeed, students were assessed according to three domains: cognitive, affective, and psychomotor¹⁹. In each of these domains, there is a hierarchical organization, classified based on the pedagogical learning objectives in increasing levels of complexity and specificity¹⁹. The first of them is the cognitive domain, which is mainly linked to the skills of different levels of knowledge acquisition and use. The affective domain concerns feelings and emotions, including how we face difficulties and the strategies developed to overcome them. The psychomotor domain, in turn, is linked to the student's ability to perform psychomotor activities. To assess the cognitive domain, the different works performed (i.e., conceptual map or case studies) over the period were used, where students presented high performances (>8.0). The affective assessment was carried out considering the criteria of responsibility, decision-making, leadership and communication developed throughout the module. In this evaluation, the students' perceptions were contrasted with the professors' perceptions until a consensus was reached. Finally, psychomotor assessments were performed using the use of role-play. Considering all domains, the class average was 8.4 and no student had a score lower than 6.0.

Although we use the flipped classroom combined with a role-play approach to minimize the pedagogical damage due to the Covid-19 pandemic, it needs to emphasize that will not be feasible to overcome the inherent limitations of remote/virtual approach, such as lack of patient contact and face-to-face professor-student, which stimulate a wide number of emotional skills essential for the professional development of future dentists. In this way, the potential positive results observed cannot be used as a loan for the maintenance of non-face-to-face activities with the objective of cost-cutting by the institutions.

In conclusion, although the changes in the format of the lessons, our approaches stimulated the students maintained the high frequency in the activities providing continuity activities. Flipped classroom and the use of role-play can be a pedagogical strategy to be used during the COVID-19 pandemic.

Disclosure statement

The authors have no conflicts of interest to declare.

Funding

No funding was obtained for this article.

Competing Interests

The authors have no conflicts of interest to declare.

Author Contribution

LAC Contributed to conception, design, literature review and wrote the manuscript. MCMC, AMA and FSC contributed to conception, design, literature review and critically revised the manuscript. All authors revised and approved the final version of the manuscript.

References

1. WHO. World Health Organization. WHO Coronavirus Disease (COVID-19) Dashboard. [real time] [cited 2020 Sep 7]. Available from: <https://covid19.who.int>.
2. Chisini LA, Costa FDS, Salvi LC, demarco FF. Endodontic treatments in the Brazilian Public Health System: influence of COVID-19 pandemic. *Health Pol Technol*. 2021 Jun;10(2):100514. doi: 10.1016/j.hlpt.2021.100514.
3. WHO. World Health Organization. Coronavirus disease (COVID-19) Situation Report – 195. 2020 Aug 2 [cited 2020 Aug 3]. Available from: https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200802-covid-19-sitrep-195.pdf?sfvrsn=5e5da0c5_2.
4. Chisini L, Sartori L, Costa F, Salvi L, Demarco F. COVID-19 pandemic impact on prosthodontics treatments in the Brazilian Public Health System. *Oral Dis*. 2022;28(Suppl. 1):994-6.
5. Chisini LA, Costa FDS, Demarco GT, da Silveira ER, Demarco FF. COVID-19 pandemic impact on paediatric dentistry treatments in the Brazilian Public Health System. *Int J Paediatr Dent*. 2021 Jan;31(1):31-4. doi: 10.1111/ipd.12741.
6. Chisini LA, Castilhos ED, Costa FDS, D'Avila OP. Impact of the COVID-19 pandemic on prenatal, diabetes and medical appointments in the Brazilian National Health System. *Rev Bras Epidemiol*. 2021 May 28;24:e210013. doi: 10.1590/1980-549720210013.
7. Chisini LA, Costa FDS, Sartori LRM, Corrêa MB, D'Avila OP, Demarco FF. COVID-19 Pandemic impact on Brazil's Public Dental System. *Braz Oral Res*. 2021 Jul 16;35:e082. doi: 10.1590/1807-3107bor-2021.vol35.0082.
8. Aquilanti L, Gallegati S, Temperini V, Ferrante L, Skrami E, Procaccini M, et al. Italian Response to Coronavirus Pandemic in Dental Care Access: The DeCADE Study. *Int J Environ Res Public Health*. 2020 Sep 24;17(19):6977. doi: 10.3390/ijerph17196977.
9. Liu X, Zhou J, Chen L, Yang Y, Tan J. Impact of COVID-19 epidemic on live online dental continuing education. *Eur J Dent Educ*. 2020 Nov;24(4):786-9. doi: 10.1111/eje.12569.
10. Sukumar S, Dracopoulos SA, Martin FE. Dental education in the time of SARS-CoV-2. *Eur J Dent Educ*. 2021 May;25(2):325-31. doi: 10.1111/eje.12608.
11. Gurgel BCV, Borges SB, Borges REA, Calderon PDS. COVID-19: Perspectives for the management of dental care and education. *J Appl Oral Sci*. 2020 Sep 28;28:e20200358. doi: 10.1590/1678-7757-2020-0358.
12. Parsegian K, Ayilavarapu S, Gardner AL, Angelov N. Predoctoral periodontal education and COVID-19: Challenges, actions, and learned lessons. *J Dent Educ*. 2020 Oct 4;10.1002/jdd.12451. doi: 10.1002/jdd.12451.
13. Quinn B, Field J, Gorter R, Akota I, Manzanares MC, Paganelli C, et al. COVID-19: The immediate response of european academic dental institutions and future implications for dental education. *Eur J Dent Educ*. 2020 Nov;24(4):811-4. doi: 10.1111/eje.12542.

14. Halasa S, Abusalim N, Rayyan M, Constantino RE, Nassar O, Amre H, Set al. Comparing student achievement in traditional learning with a combination of blended and flipped learning. *Nurs Open*. 2020 Mar 31;7(4):1129-38. doi: 10.1002/nop2.492.
15. Ausubel DP. *The acquisition and retention of knowledge: a cognitive view*. Kluwer Academic Publishers; 2000.
16. Vanka A, Vanka S, Wali O. Flipped classroom in dental education: A scoping review. *Eur J Dent Educ*. 2020 May;24(2):213-26. doi: 10.1111/eje.12487.
17. Zayyan M. Objective structured clinical examination: the assessment of choice. *Oman Med J*. 2011 Jul;26(4):219-22. doi: 10.5001/omj.2011.55.
18. Donn J, Scott JA, Binnie V, Bell A. A pilot of a Virtual Objective Structured Clinical Examination in dental education. A response to COVID-19. *Eur J Dent Educ*. 2021 Aug;25(3):488-94. doi: 10.1111/eje.12624.
19. Ferraz APCM, Belhot RV. Bloom's taxonomy and its adequacy to define instructional objective in order to obtain excellence in teaching. *Gest Prod*. 2010;17(2):421-31. doi: 10.1590/S0104-530X2010000200015