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Dental students' perception of the use of instructional videos as an educational tool

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Abstract This study aimed to analyse dental students' perceptions of instructional videos as a didactic-pedagogical resource. A video on syphilis and its oral manifestations was created for this purpose and shown to first- to third-year dental students at a Federal University in Brazil, who then responded to a semi-structured questionnaire with closed-ended questions. The results indicated that 56 students (88.89%) agreed the video effectively facilitated content comprehension, while 60 students (95.24%) fully agreed that it enhanced their understanding of the professor's explanation. Furthermore, 50 students (79.37%) fully agreed that the video supported discussions during in-person activities. However, 28 students (44.45%) either partially or completely disagreed with the notion that the video could replace the professor's presence in the classroom. In conclusion, instructional videos are an effective educational tool in dental education, improving learning outcomes, though in-person instruction remains essential for certain learning aspects.
Descriptors: Audiovisual Aids. Instructional Film and Video. Education, Dental. Educational Technology.

Percepción de los estudiantes de odontología sobre el uso de videos instruccionales como herramienta didáctico-pedagógica
Resumen El presente estudio tuvo como objetivo analizar la percepción de los estudiantes de Odontología sobre el uso de videos instruccionales como recurso didáctico-pedagógico. Para ello, se elaboró un video sobre la sífilis y sus manifestaciones orales, que fue mostrado a los alumnos del primer al tercer semestre de una universidad federal brasileña. Después de la proyección, los estudiantes respondieron a un cuestionario semiestructurado con preguntas cerradas. De los participantes, el 88,9% estuvo de acuerdo en que el video facilitó la comprensión del contenido, y el 95,2% afirmó que mejoró la comprensión de las explicaciones del profesor. Además, el 79,4% consideró que el video apoyó las discusiones durante las actividades presenciales. Por otro lado, el 44,5% estuvo parcial o totalmente en desacuerdo con que el video pudiera sustituir la presencia del profesor en el aula. Se concluye que los videos instruccionales son una herramienta eficaz en la educación odontológica, favoreciendo una mejor asimilación y retención de los contenidos. Sin embargo, se resalta que la enseñanza presencial sigue siendo esencial para el desarrollo de habilidades y competencias clínicas.
Descriptores: Recursos Audiovisuales. Película y Video Educativos. Educación en Odontología. Tecnología Educacional.

Percepção de estudantes de odontologia sobre o uso de vídeos instrucionais como ferramenta didático-pedagógica
Resumo O presente estudo teve como objetivo analisar a percepção de estudantes de Odontologia sobre o uso de vídeos instrucionais como recurso didático-pedagógico. Para isso, foi elaborado um vídeo sobre sífilis e suas manifestações orais, exibido a alunos do primeiro ao terceiro período de um curso de Odontologia de uma universidade federal brasileira. Após a exibição, os estudantes responderam a um questionário semiestruturado com perguntas fechadas. Dos participantes, 88,9% concordaram que o vídeo facilitou a compreensão do conteúdo, e 95,2% afirmaram que ele melhorou o entendimento das explicações do professor. Além disso, 79,4% consideraram que o vídeo contribuiu para as discussões durante as atividades presenciais. Por outro lado, 44,5% discordaram parcial ou totalmente de que o vídeo pudesse substituir a presença do professor em sala de aula. Conclui-se que os vídeos instrucionais representam uma ferramenta eficaz no processo de ensino-aprendizagem em Odontologia, promovendo melhor assimilação e retenção de conteúdo. No entanto, ressalta-se que o ensino presencial continua essencial para o desenvolvimento de habilidades e competências clínicas.

Descritores: Recursos Audiovisuais. Filme e Vídeo Educativo. Educação em Odontologia. Tecnologia Educacional.

INTRODUCTION

The expansion of new information and communication technologies has been increasingly utilised due to the growing popularisation of the internet, which has implemented new teaching methodologies a reality, allowing for increased student autonomy and greater interaction between students and teachers[1]. In this context, university students exhibit various learning methods and preferences[2].

Numerous information and communication technologies can be successfully applied to the teaching process, including websites, blogs, images, chats, and videos[3]. Some studies have suggested that the integration and use of videos as a learning support tool can increase student motivation without replacing the existing pedagogical relationship[4]. Videos allow students to learn at their own pace and convenience, highlighting the flexibility of learning. One of the key advantages of using videos is that students can control them according to their assimilation pace[5].

Educational instructional videos are considered one of the pillars of higher education and are viewed as the primary mechanism for delivering information in remote courses. In this context, their effective use as an active tool in knowledge construction depends on three elements: how to manage the cognitive load of the video, how to maximise student engagement with the video, and how to promote active learning through the video[6]. Thus, instructional videos are regarded as important tools in supporting education, but on their own, they may not be sufficient as a standalone teaching method. Consequently, they should be part of a broader context of interaction between students and tutors, and among students themselves, as interaction is recognised as key to meaningful learning[7].

Despite the numerous beneficial effects of using instructional videos in learning environments, they can also have negative impacts, such as the excessive use of multimedia devices, a lack of objectivity and accuracy in content, and an influence on individual cognitive behaviour, potentially leading to outcomes contrary to those intended. Therefore, these resources must be employed judiciously to ensure their beneficial effects prevail[8]. To innovate their teaching methods, some American universities, such as Harvard University and the Massachusetts Institute of Technology, have adopted the flipped classroom model. In this approach, technological tools are used to provide students with content before in-person classes, which are then focused on discussion and addressing individual challenges. This method aims to reduce student failure and dropout rates[9].

Based on these principles, it is evident that there are fundamental criteria to be considered when analysing the use of instructional videos as educational tools. These criteria take into account several points of critical importance, such as the types of content presented, the technical and aesthetic aspects of the video, the defined pedagogical proposal, the accompanying materials, and, most importantly, the target audience for whom the video is intended. However, it is observed that all the criteria considered in the analysis of an educational video are directly influenced by the target audience. Therefore, it is essential to evaluate whether the pedagogical proposal, the language used, and the format are appropriate based on the prior knowledge of the target audience[10,11].

Thus, it is evident that, although the use of videos in dentistry is not new, there is currently limited evidence measuring the effectiveness of these videos in contributing to and improving the clinical performance of students[12]. Therefore, it would be valuable to investigate the perception of dental students regarding the use of these instructional videos throughout their undergraduate studies. Consequently, the objective of this study was to assess the opinions and perceptions of dental students about the relevance of instructional videos as educational tools.

METHODS

Cross-sectional, descriptive study that analysed the relevance of instructional videos as an educational learning tool in the field of dentistry. This study followed the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines. The sample universe of the study consisted of all students enrolled from the first to the third semester of the Dentistry course at the Federal University of Espírito Santo. The research was approved by the Ethics Committee for Research Involving Human Beings at the Health Sciences Centre of the Federal University of Espírito Santo (CAAE: 89560418.6.0000.5060). All participants signed the Informed Consent Form (ICF).

Initially, the students underwent training through an instructional video about syphilis. Following this, data were collected using a self-administered questionnaire containing closed-ended questions, designed by the research team itself. The questionnaire included items related to demographic identification, the student's current semester, and aspects concerning their opinions and perceptions regarding the relevance and applicability of instructional videos as educational tools for knowledge acquisition. Participants were selected based on two criteria: their agreement to participate in the study and their presence in the classroom on the day the study was conducted. Consequently, the questionnaire was administered collectively in the classroom at a time deemed suitable and convenient for the students, ensuring the privacy and confidentiality of the shared information. This structured approach not only facilitated an organised data collection process but also fostered an environment where students felt comfortable providing their feedback.

The synthesis of the database was conducted using a spreadsheet based on the variable information contained in the completed research forms, which were entered into SPSS software, version 17.0 (IBM, Armonk, NY, EUA). The statistical data were analysed using simple descriptive statistics (percentual and numerical frequency) in Epi Info™ software (Centers for Disease Control and Prevention, Atlanta, GA, EUA).

RESULTS

According to the research conducted, the sample consisted of 63 students enrolled from the first to the third semester of the Dentistry programme. Table 1 presents data regarding the identification of the participating students, including age range, gender, and academic semester in which they are enrolled at the university. It is noteworthy that the majority of the sample was represented by first-semester students, female, and under the age of twenty-five.

Regarding the use of video as a teaching material that facilitates understanding of syphilis and its oral manifestations, the analyses demonstrated that the vast majority of students who responded to the questionnaire fully agreed that this resource was valid as a tool to facilitate content comprehension. Conversely, a minority of students agreed that the resource was valid as a facilitator of content comprehension to a lesser extent, indicating the significant acceptability and validity of this didactic-pedagogical method (Table 2).

Out of the total participants, 53 (84.13%) reported total agreement that the dynamic presentation in the instructional video improved the learning process, while 10 (15.87%) mentioned partial agreement regarding the same parameter, demonstrating that the video positively contributed to the construction and assimilation of the knowledge presented. Furthermore, the majority of participants fully agreed that the video facilitated their understanding of the teacher/narrator's speech.

Table 1. Data on the identification and profile of participating students.

Study Variables	N	%
Gender		
Male	18	28.57
Female	45	71.43
Age		
Less than 25 years	55	90.16
Between 25 and 29 years	3	4.92
Between 30 and 34 years	1	1.64
Between 35 and 39 years	1	1.64
50 years or older	1	1.64
Period		
First	24	38.10
Second	23	36.51
Third	16	25.40

Table 2. Students' perception of the instructional video on syphilis as a teaching tool.

Study variables	Categories	N	%
Was the video a valid resource for facilitating understanding of syphilis and its oral manifestations?	1 Totally disagree	0	-
	2 Partially disagree	0	-
	3 I don't know	0	-
	4 Partially agree	7	11.11
	5 Totally agree	56	88.89
Did the animated visuals in the video enhance the learning process?	1 Totally disagree	0	-
	2 Partially disagree	0	-
	3 I don't know	0	-
	4 Partially agree	10	15.87
	5 Totally agree	53	84.13
Did the video make it easier to understand the teacher/narrator's speech?	1 Totally disagree	0	-
	2 Partially disagree	0	-
	3 I don't know	0	-
	4 Partially agree	3	4.76
	5 Totally agree	60	95.24
Would the video facilitate face-to-face discussion?	1 Totally disagree	0	-
	2 Partially disagree	1	1,59
	3 I don't know	1	1.59
	4 Partially agree	11	17.46
	5 Totally agree	50	79.37
Does the video adequately replace a face-to-face presentation?	1 Totally disagree	5	7.94
	2 Partially disagree	23	36.51
	3 I don't know	16	25.40
	4 Partially agree	16	25.40
	5 Totally agree	3	4.76
Was the video content useful or beneficial to you?	1 Totally disagree	0	-
	2 Partially disagree	0	-
	3 I don't know	0	-
	4 Partially agree	5	7.94
	5 Totally agree	58	92.06
Is the content sequence appropriate?	1 Totally disagree	0	-
	2 Partially disagree	0	-
	3 I don't know	4	6.35
	4 Partially agree	4	6.35
	5 Totally agree	55	87.30
Did the illustrations complement the text and the teacher/narrator's speech?	1 Totally disagree	0	-
	2 Partially disagree	1	1.59%
	3 I don't know	0	-
	4 Partially agree	3	4.76
	5 Totally agree	59	93.65
Is the language used in the video clear and objective?	1 Totally disagree	0	-
	2 Partially disagree	0	-
	3 I don't know	0	-
	4 Partially agree	2	3.17
	5 Totally agree	61	96.83
Would you recommend the video to someone you know?	1 Totally disagree	0	-
	2 Partially disagree	0	-
	3 I don't know	3	4.76
	4 Partially agree	3	4.76
	5 Totally agree	57	90.48

Regarding the association between the video as a pedagogical-didactic tool and in-person teaching, it was observed that a significant portion of students inferred that the video would entirely facilitate the discussion of the content during in-person sessions, while a minority considered that this tool would only partially facilitate the discussion. Others indicated that they did not know the answer to this question or partially disagreed with this assertion. When it came to the appropriate replacement of an in-person presentation by the video, a considerable portion of students partially disagreed (36.51%), while others in the sample stated they did not know how to respond to this question (25.40%), partially agreed that the video would adequately replace the in-person presentation (25.40%), or fully agreed with the aforementioned statement (7.94%).

Analysing the students' opinions regarding the content of the video, it was found that the majority fully agreed that the material was useful and beneficial for building knowledge about syphilis, while a small portion of students considered the same statement but to a lesser extent. When the question addressed whether the sequence of the video was correctly structured, a considerable number of students completely agreed that it was appropriate, while some students did not know how to respond to this question, and others considered the same statement partially.

In relation to the perception of the illustrations, a significant portion of the students indicated that they served to complement the text and the narration of the professor/narrator entirely. However, some students partially agreed with this statement, while others partially disagreed. This demonstrates that there are still divergences regarding whether visual content contributes to effective learning in health-related subjects. When the topic turned to the language used in the video, a considerable number of students fully agreed that it was clear and objective (96.83%), while a small portion assessed it in the same way but to a lesser extent (3.17%). Finally, when asked if they would recommend the video to someone they knew, the majority of students responded positively, fully agreeing with the statement (90.48%). However, some students expressed doubt about this answer (4.76%) or partially agreed (4.76%), indicating that the method was effective in terms of learning for the majority of respondents.

DISCUSSION

In recent decades, the use of instructional videos has been increasingly incorporated as an important tool in dental education[1,6].[A1] Supporting these findings, Wong et al. (2019)[12] inferred that when instructional videos are used in addition to traditional classroom teaching, students' cognitive and psychomotor skills are enhanced, with an improvement in knowledge retention. In our study, the vast majority of students who responded to the questionnaire agreed that the instructional video was a constructive tool that fully facilitated content comprehension, suggesting that this didactic-pedagogical method is satisfactory and highly accepted by dental students.

It is, therefore, of utmost importance to always adopt educational methods aimed at enhancing students' skills and competencies[13]. In this regard, using instructional videos can be a means of faculty calibration and standardisation of teaching content. The adoption of this type of content is particularly relevant considering the current situation with the COVID-19 pandemic and the fundamental need to maintain social distancing[14]. Within this context, this study supports using instructional videos as a learning method; however, some limitations should be considered.

In line with this research, Rayyan et al. (2016)[15] observed that most students preferred instructional videos over traditional face-to-face demonstrative teaching, considering the option of watching them even before the content was covered in class. Based on this finding, it is inferred that the flexibility provided by this learning method allows students to watch the video in segmented parts as needed, allowing them to achieve better assimilation of the content and enabling a much deeper learning experience.

On the other hand, Wong et al. (2018)[11], who evaluated the effectiveness of instructional videos in teaching dental local anaesthesia in an oral health programme course, inferred that instructional videos were effective in complementing the teaching of psychomotor skills in anaesthetic administration by students. The videos with the highest student engagement were short, with quick and enthusiastic pronunciation, colloquial language, colours, and highlights for the most relevant information, and the addition of subtitles to enable viewing in different environments. Additionally, the use of quizzes as a form of assessment was shown to increase students' attention and improve content retention[6,16].

Thus, the development of theoretical-practical knowledge through the inclusion of audiovisual educational materials in daily theoretical and clinical practices can serve as fundamental tools that significantly contribute to current learning in higher education[9]. Within this context, some studies have questioned the application of instructional videos for educational purposes in the dental field. Patel et al. (2009)[17], who assessed students' opinions on the effectiveness of videos in improving understanding of the topic "Amalgam Restoration Technique" as well as facilitating the execution of laboratory procedures, concluded that video presentations served as a valid and approved supplementary teaching resource. However, according to students' feedback, it did not replace the student/teacher interaction provided during practical demonstrations.

There remain numerous gaps regarding the use of instructional videos for pedagogical-didactic purposes in dental education. Consequently, given the limited knowledge about the use of videos as a supplementary instructional tool in Brazilian health courses, the need for further studies on this subject is evident—not only to deepen understanding but also to expand findings by investigating additional higher education institutions. This could provide more comprehensive insights into dental students' opinions and perceptions regarding the relevance of instructional videos as educational tools, whether as primary or supplementary aids in promoting theoretical-practical learning, while also considering the benefits and limitations already established in the literature.

CONCLUSION

There is a positive perception among students regarding the use of instructional videos as pedagogical tools in dental education, with evidence suggesting that aspects such as content presentation style and video length significantly influence how these resources are accessed and utilized by students.

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