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Comparing the efficacy of video-based learning with real patient interactions versus traditional teaching on dental students' education

Submission date 29/12/2024	**Recruitment status** Not yet recruiting	[X] Prospectively registered [_] Protocol [_] Statistical analysis plan [_] Results [_] Individual participant data [X] Record updated in last year
Registration date 27/01/2025	**Overall study status** Ongoing	
Last Edited 24/01/2025	**Condition category** Oral Health	

Plain English summary of protocol

Background and study aims

Dental education is of critical importance in the development of the skills and knowledge necessary to provide high-quality care. Nevertheless, conventional teaching methods, which depend predominantly on lectures and textbook learning, may not consistently adequately prepare students for the real-world, hands-on patient interactions they will encounter in their future careers. The objective of this study is to make a comparison between two methods of learning for dental students: video-based learning with real patient-clinician interactions and traditional teaching methods. The hypothesis tested in this study is that students who learn with video-based cases will improve their knowledge, skills, and attitudes towards patient interactions more than students who learn through conventional classroom methods.

Who can participate?

This study is open to dental students who are currently enrolled in an accredited dental programme and who have completed at least one semester of training. Participants should be between the ages of 18 and 65 years and must be willing to engage with video-based learning. Participants will also be required to have access to a computer and a stable internet connection in order to participate in the study.

What does the study involve?

Participants will be randomly assigned to one of two groups: one group will participate in the video-based case learning program, while the other group will receive traditional in-person lectures and textbook-based learning, which is the standard teaching method in dental programs.

The video-based learning program will consist of pre-recorded real-life patient-clinician interactions. These videos will portray clinical scenarios, allowing students to learn about common dental issues and practice their patient interaction skills in a safe, controlled environment. The intervention will be meticulously structured into three progressive training levels: basic, intermediate, and advanced. At each level, students will engage in case discussions, guided reflections, and feedback sessions to reinforce learning objectives and improve clinical competence. The control group will follow the traditional curriculum, which includes standard

lectures and textbook-based learning.
Assessments will be conducted at several key points during the study to measure the success of the two teaching methods. These assessments will measure knowledge acquisition, skill development, and attitude changes. The overarching objective of the study is to evaluate the disparities between the two groups with respect to the domains of knowledge acquisition, skill development, and professional attitudes.

What are the possible benefits and risks of participating?
The integration of video-based learning with real patient-clinician interactions and traditional teaching methods has been demonstrated to be advantageous for participants. Video-based learning enables students to observe authentic clinical scenarios, thereby enhancing their communication, clinical reasoning and patient interaction skills. Conversely, traditional teaching methods are designed to reinforce fundamental knowledge and essential skills. The overarching objective of this study is to enhance the competence and confidence of dental practitioners, thereby providing valuable insights into the efficacy of integrating these diverse educational methodologies. On the other hand, the study necessitates a considerable time investment, and some students may encounter difficulties in balancing video-based and traditional learning methods. Those participating in the video-based group may encounter challenges related to technology or adapting to self-paced learning. Furthermore, while video scenarios simulate clinical interactions, they may not fully replicate real-life patient care. Nevertheless, participants will be provided with support to facilitate effective navigation of the study.

Where is the study run from?
The study will be conducted at the Egas Moniz Center for Interdisciplinary Research, located in Almada, Portugal. which is located in Almada, Portugal. The institution is responsible for the management of the study, including the recruitment of participants, the collection of data, and the administration of the interventions.

When is the study starting and how long is it expected to run for?
December 2024 to December 2027

Who is funding the study?
Egas Moniz Center for Interdisciplinary Research (Portugal)

Who is the main contact?
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Contact information

Type(s)
Public, Scientific, Principal Investigator

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Additional identifiers

EudraCT/CTIS number
Nil known

IRAS number

ClinicalTrials.gov number
Nil known

Secondary identifying numbers
ViCaD-1

Study information

Scientific Title
Comparative efficacy of video-based case learning with patient-clinician interactions versus traditional teaching methods on educational outcomes among dental students: a multi-level randomized controlled trial

Study objectives
Dental students who receive video-based case learning with patient-clinician interactions will show significantly greater improvements in knowledge acquisition, skills development, and attitude change in patient interactions compared to students taught using traditional teaching methods, across multiple training levels (basic, intermediate, and advanced).

Ethics approval required
Ethics approval required

Ethics approval(s)
Not yet submitted, Egas Moniz Ethics Committee (Campus Universitário, Quinta da Granja s/n, Almada, 2829 - 511, Portugal; Telephone number not provided; iuem@egasmoniz.edu.pt), ref: Reference number not provided

Study design
Single-centre interventional parallel-group single-blinded double-arm randomized controlled trial

Primary study design
Interventional

Secondary study design
Randomised controlled trial

Study setting(s)

University/medical school/dental school

Study type(s)
Treatment, Efficacy

Participant information sheet
See study outputs table

Health condition(s) or problem(s) studied
Knowledge acquisition, skill development, and attitude change among dental students

Interventions
This parallel-group randomised controlled trial will have two arms: an intervention group and a control group. The intervention group will engage in video-based case learning using pre-recorded patient-clinician interactions in dental settings. The intervention will be delivered via an online platform (Moodle®) and structured into three progressive levels of training: basic, intermediate and advanced. Each level will include case discussions, guided reflection, and feedback sessions designed to improve knowledge acquisition, practical skills, and professional attitudes. The control group will follow traditional teaching methods, including face-to-face lectures and textbook-based materials, in line with standard dental curriculum practice.

The study will include dental students at different levels of training (basic, intermediate, advanced). Participants will be randomised to the intervention or control arms using stratified randomisation to ensure balanced representation across training levels. A computer-generated randomisation sequence will be generated separately for each stratum using specialised randomisation software. The outcome assessors will be unaware of group allocation to reduce potential bias in the assessment of outcomes.
Regular check-ins will assess participants' engagement with the video-based learning materials at predetermined intervals throughout the study. Participants will complete questionnaires after each module to report any challenges or concerns related to the content or platform. The online platform (Moodle®) will track participant activity. Support resources will be made available to address potential issues. In addition, intervention fidelity checks will ensure that the intervention is delivered as planned.
Baseline assessments will evaluate participants' initial knowledge, skills and attitudes related to dental practice. Post-intervention assessments will measure changes in these areas, with follow-up assessments at 6 months and 1 year to assess the long-term impact of the intervention.

Regular reminders will be sent via email or Moodle® to encourage timely completion of these assessments. Alternative data collection methods, such as mobile device-enabled assessments or extended deadlines, will be offered to accommodate participants who have difficulty completing the assessments.

Statistical methods, such as multiple imputation or intention-to-treat analysis, will be used to account for missing data and minimise bias.

The trial will follow CONSORT (Consolidated Standards of Reporting Trials) guidelines to ensure comprehensive and consistent reporting.

Intervention Type
Behavioural

Primary outcome measure
1. Knowledge acquisition is measured using an assessment questionnaire at baseline, immediately post-intervention, 6 months, and 1 year post-intervention
2. Skill development is measured using the Global Rating Scale (GRS), administered at baseline, immediately post-intervention, 6 months, and 1 year post-intervention
3. Attitude change is measured using the Professional Assessment Scale (PAS) at baseline, immediately post-intervention, 6 months, and 1 year post-intervention

These outcomes will be assessed at each specified time point to evaluate both the immediate and long-term impact of the intervention.

Secondary outcome measures
1. Anxiety is measured using the Depression, Anxiety, and Stress Scale (DASS-21) at baseline, immediately post-intervention, 6 months, and 1 year post-intervention.
2. Stress is measured using the Depression, Anxiety, and Stress Scale (DASS-21) at baseline, immediately post-intervention, 6 months, and 1 year post-intervention.
3. Student engagement is measured using a self-reported engagement survey, with Likert-scale items, at baseline, immediately post-intervention, 6 months, and 1 year post-intervention.
4. Perceived confidence in clinical skills is measured using a self-assessment questionnaire at baseline, immediately post-intervention, 6 months, and 1 year post-intervention.
5. Satisfaction with the e-learning platform is measured using a Technology Acceptance Model (TAM) Likert-scale survey at baseline and immediately post-intervention.
6. Perceived ease of use is measured using a Technology Acceptance Model (TAM) Likert-scale survey at baseline, midpoint, and immediately post-intervention.
7. Perceived usefulness of the e-learning platform is measured using a Technology Acceptance Model (TAM) Likert-scale survey at baseline and immediately post-intervention.
8. Usefulness is measured using a Technology Acceptance Model (TAM) Likert-scale survey at baseline and immediately post-intervention.
9. Digital skills are measured using the DigComp framework (v 2.2), with assessments at baseline, immediately post-intervention, 6 months and 1 year post-intervention.

Overall study start date
19/12/2024

Completion date
31/12/2027

Eligibility

Key inclusion criteria
1. Currently enrolled in a recognized dental program (Bachelor’s or Master's level)
2. Have completed at least one semester of dental training
3. Willing to engage with video-based case learning and participate in both the intervention and assessment phases of the study
4. Able to understand and complete assessments in English or Portuguese
5. Have access to a computer and stable internet connection to engage with the online learning platform and complete digital assessments
6. No history of significant cognitive or neurological conditions that might affect learning ability
7. Provide written informed consent to participate in the study

Participant type(s)

Learner/student

Age group
Adult

Lower age limit
18 Years

Upper age limit
65 Years

Sex
Both

Target number of participants
300

Key exclusion criteria
1. Participants who are not currently enrolled in a recognized dental program
2. Participants who have not completed at least one year of dental training
3. Participants who are under 18 or over 65 years old
4. Participants who have a history of significant cognitive or neurological conditions that may affect learning ability
5. Participants who are unable to understand and complete assessments in English (or the relevant language of the study)
6. Participants without access to a computer or stable internet connection for engaging with the online learning platform
7. Participants who have not provided written informed consent to participate in the study
8. Participants with any significant visual or hearing impairments that may affect their ability to engage with video-based learning
9. Participants who have previously participated in similar interventions or studies that may create bias in the outcomes
10. Participants who are not willing to engage with video-based case learning or participate in the assessment phases of the study

Date of first enrolment
01/04/2026

Date of final enrolment
25/04/2027

Locations

Countries of recruitment
Portugal

Study participating centre
Egas Moniz Center for Interdisciplinary Research
Campus Universitário, Quinta da Granja. Monte de Caparica

Almada
Portugal
2829 - 511

Sponsor information

Organisation
Egas Moniz School of Health and Science

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Sponsor type
University/education

Website
https://www.egasmoniz.com.pt/

Funder(s)

Funder type
University/education

Funder Name
Egas Moniz School of Health and Science

Results and Publications

Publication and dissemination plan
Planned publication in a peer-reviewed journal.
Additionally, findings may be presented at relevant conferences and shared with stakeholders in dental education to ensure broad visibility and impact within the academic and professional communities. Further details regarding specific journals or conferences will be determined as the study progresses.

Intention to publish date
31/12/2028

Individual participant data (IPD) sharing plan

The datasets generated and/or analysed during the course of this study will be stored in a publicly accessible repository, specifically the Open Science Framework (OSF). This repository will serve as a platform for sharing the raw data collected throughout the study. All data will be made available in accordance with the guidelines of the OSF, which ensures transparency and promotes reproducibility in research. The shared data will include individual participant responses from various assessments conducted during the study, such as knowledge acquisition tests, skills assessments, student engagement surveys, perceived confidence in clinical skills, and digital skills assessments. This will include all relevant data points collected from the intervention and control groups. The data will be made publicly available 6 months after the final results of the study are published to allow sufficient time for analysis, peer review and dissemination of the results. The data will remain accessible for a period of 5 years from the date of publication. After this period, access may be reassessed and the data archived or removed in accordance with the repository's policies. Access to the data will be granted to qualified researchers and institutions for secondary analysis. The data will be available through the Open Science Framework repository and users wishing to access the data will be required to submit a formal request. This process will include agreeing to terms and conditions of use, which will emphasise the need to protect the privacy of participants and to ensure that the data are used strictly for legitimate research purposes. Informed consent for data sharing will be obtained from all participants as part of the ethical approval process for the study. Participants will be explicitly informed that their anonymised data may be shared for future research, with the option to opt out if they wish. Consent will be obtained before data collection begins. All participant data will be anonymised before being shared. Personal identifiers will be removed and data will be coded to ensure that individual identities cannot be traced back through the dataset. This anonymisation process will comply with ethical standards and legal requirements, including those set out in the General Data Protection Regulation (GDPR) for participants based in the European Union. Data sharing will be conducted in full compliance with ethical guidelines and applicable data protection laws. Any legal restrictions on data sharing, such as specific consent clauses or national data protection regulations, will be strictly adhered to.

IPD sharing plan summary

Stored in publicly available repository

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Participant information sheet			24/01/2025	No	Yes