Additional file 1

Study questionnaire (English translation)

Manuscript: Dental Students' Perceptions of a 3D-Printed Intraoral Model Compared with Commercial and Porcine Jaw Models

This questionnaire was developed specifically for the present study and was not based on a previously validated instrument. It was administered to participants in German; the English translation below is provided for reference. Unless stated otherwise, items in Sections 3 to 6 were rated on a 5-point Likert scale from 1 = "strongly disagree" to 5 = "strongly agree".

Section 1 – Information and consent

Dear dental student, thank you for taking the time to participate in our study evaluating different training models in dental education. Completing the questionnaire will take approximately ten minutes. This study focuses on your learning process and learning outcome in performing incisions and sutures, and on how the different models (porcine jaw, commercial [Kavo] model, 3D-printed model) support your manual skills. Providing your matriculation number allows us to link your assessments across all three models. Data are collected in strict accordance with the General Data Protection Regulation (GDPR); responses are treated confidentially, stored pseudonymously, and analysed as an anonymised dataset for quality-assurance and scientific purposes only.

Consent: By completing and submitting this questionnaire, I confirm that I have been informed about the study and voluntarily consent to participate.

Section 2 – Demographic information

- 2.1 Gender: Female / Male / Diverse
- 2.2 Age: _____ years
- 2.3 Previous vocational or academic training in a dental-technical or dental/medical field: Yes / No
- 2.4 Matriculation number (used only to link your assessments across the three models): _____
- 2.5 Which training model are you evaluating? Porcine jaw model / Commercial (Kavo) model / 3D-printed model

Section 3 – Learning process and learning outcome

- 3.1 The exercises were appropriate to my level of training.
- 3.2 I greatly improved my handling of instruments and suture material.
- 3.3 I learned to handle the tissue gently.
- 3.4 After the exercise, I can confidently perform the incision.
- 3.5 After the exercise, I can confidently perform the suturing technique.
- 3.6 I was able to practise under conditions that closely resemble real situations with patients.
- 3.7 Overall, I am satisfied with my practical performance.

Section 4 – Effectiveness of the exercises and transferability to real patients

- 4.1 The exercises effectively prepared me for the challenges of working with real patients.
- 4.2 I developed a deep understanding of the complexity of the techniques.
- 4.3 I became aware of possible sources of error and risks.
- 4.4 I now feel confident to apply what I have learned with real patients.
- 4.5 The practice conditions on the model reflected realistic clinical scenarios.

Section 5 – Sense of immersion

- 5.1 I felt able to immerse myself fully in the surgical scenario.
- 5.2 The exercise was so realistic that I forgot everything around me.
- 5.3 It felt as if I were genuinely interacting with a patient.
- 5.4 The exercise captured my full attention.
- 5.5 Time seemed to fly by during the exercise.

Section 6 – Didactic quality of the course

- 6.1 The course was well organised.
- 6.2 The instructors demonstrated excellent competence in performing and teaching the techniques.
- 6.3 I received valuable guidance from the instructors.
- 6.4 I had sufficient opportunities to practise.
- 6.5 Practical training with models is essential in dental education.
- 6.6 Overall, I was satisfied with the course.

Section 7 – Free-text comments

Please share any further comments, suggestions, or feedback regarding the training models or the course:

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