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Assessing the effectiveness of a collaborative educational initiative engaging different learners

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1 | PROBLEM

Dental students and residents have limited opportunities for interactive learning when it comes to the vast array of new biomaterials available for mucogingival grafting. To facilitate a meaningful learning environment, best practices recommend highlighting the similarities and differences between the novel material substitutes and the traditional solutions using the autogenous graft, the "gold standard". The educational progress and person-centered care are reinforced by sharing knowledge between the academic institutions and corporations.[1,2] Such key collaborations may facilitate exposure to continuing education (CE) programs, foster life-long learning, and further support the increased interest of recent graduates in CE.

2 | SOLUTION

An interactive workshop aimed to increase awareness and facilitate knowledge development in the field of soft tissue alternatives used to correct mucogingival deformities,[3] was designed in collaboration with one corporation. The workshop was framed incorporating Miller's pyramid,[4] as highlighted in Figure 1 and defined below:

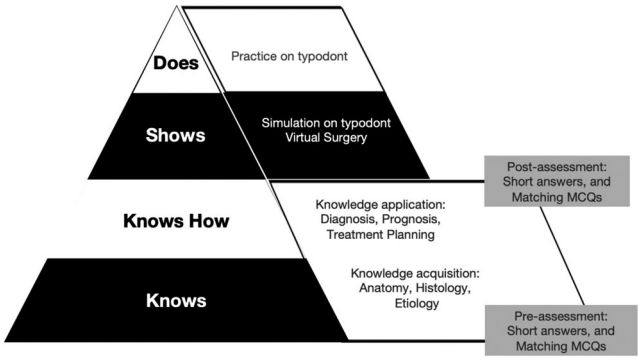

FIGURE 1 The framework of the designed workshop.

- A didactic lecture reviewing key concepts was presented by three clinicians in various stages of their careers: an early career clinician (less than 5 years' experience) reviewed the fundamentals; a mid-career clinician (5–10 years' experience) reviewed the direct comparison with the "gold standard"; advanced career clinician (more than 10 years' experience) reviewed more complex cases with long term follow-up.
- Pre- and post-course assessment of the didactic portion was conducted with multiple choices questions, assessing the knowledge acquisition using a web-based

TABLE 1 The feedback (quantitative and qualitative) from the participants recorded at the end of the session.

Survey question	Strongly disagree (*n*)	Disagree (*n*)	Neutral (*n*)	Agree (*n*)	Strongly agree (*n*)
Course objectives were clearly defined and presented.	0	0	0	1	14
The course material was relevant and current.	0	0	0	1	14
The course material was useful.	0	0	0	0	15
What aspect of this course do you find to be the most valuable? Please explain.	"I appreciated the in-depth and detailed discussion of the surgical procedures." "Having the experienced clinician share the knowledge to use soft tissue substitute in everyday practice is valuable." "I know more about the biologic material structure and the need for the band of keratinized gingiva." "Interactive nature of presentation keeps everyone engaged!" "I find the most valuable part of this course is the hands-on practice and demonstration of virtual surgery." "The hands-on activities and case studies helped me to better understand the concepts." "I really liked seeing the case study pictures to help me to identify the real-life application of these materials." "I learned from the lecturer about the tricks and nuances of material handling." "As a third-year dental student, this workshop was an exceptional opportunity to get hands-on experience prior to graduating from dental school. The information learned and didactic skills that I inherited will follow me well after matriculation and onto my periodontal residency." "My experience with the soft tissue workshop was very productive. Specifically, hands-on experience working properties of various biomaterials allowed me to efficiently use the product in a clinical setting."			

audience response system (Poll Everywhere). Integrating the assessment prior to the hands-on component, enabled the team to review the knowledge retention rate/ engagement before the hands-on component.

- bullet-Practical component:
  a. Virtual reality: step-by-step "gold-standard" procedure using the cognitive task analysis method provided by Touch Surgery.[5]
  b. Hands-on component: step-by-step soft tissue grafting using a typodont with defined mucogingival deformities and available biomaterial solutions.
- Reflection

At the end of the session, all participants had an opportunity to reflect on the educational experience and share lessons learned. A perception survey was distributed to obtain the overall feedback for both the didactic and the hands-on components.

3 | RESULTS

3.1 | What worked well

This collaborative learning experience was well received by all the participants: faculty ($n = 4$), students ($n = 5$), residents ($n = 6$), alumni ($n = 1$), and invited guest lecturers ($n = 2$), as presented in Table 1. The diverse clinical experience of the participants fostered a unique learning environment. The experienced clinicians were guiding the residents and students during the hands-on component; the residents and students were able to challenge the rest of the participants by asking questions comparing the "gold standard" techniques with the new biological solutions. Using the audience response system reported an increased average engagement of the participants, from 84% to 97%, and an improvement in knowledge acquisition, from a range of 42%–92% to 82%–100%, as highlighted in Figure 2.

3.2 | What did not go well

During the didactic session, as one of the invited clinicians joined via Zoom, the Q&A session required additional time, as some of the questions from the audience had to be repeated.[5]

3.3 | Lessons learned

The proposed educational format was able to increase awareness and facilitate knowledge development in the field of soft tissue alternatives used to correct mucogingival deformities.[3] Using the hybrid format design and

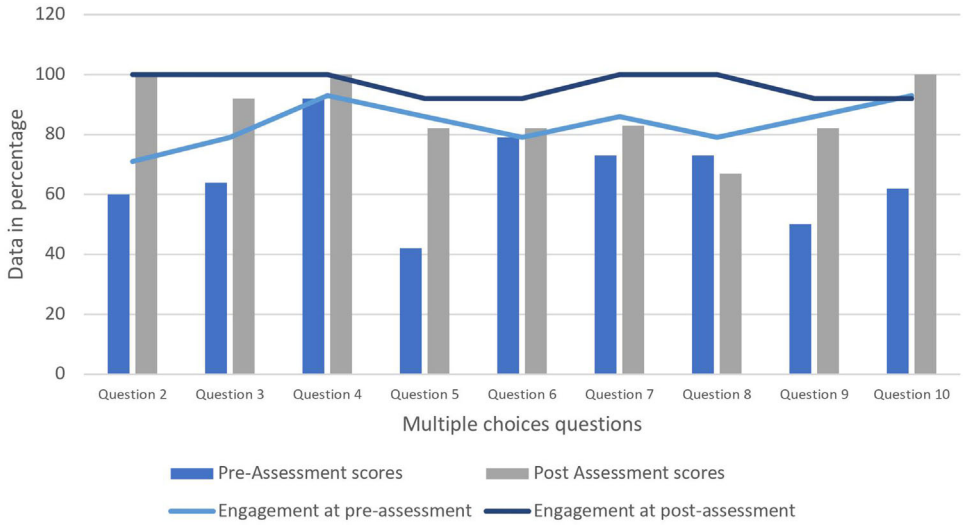

FIGURE 2 Direct comparison of Pre- and Post-assessment outcomes: knowledge acquisition with scores and activity engagement rate in percentage. (Note: The first question was a short answer format as the test entry and is not included in this figure for knowledge acquisition purposes.)

creative technology assistance greatly engaged the participants in the topic of interest. The integration of the pre- and post-course assessment enhanced the knowledge retention of the participants.

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