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The Role of VR-Haptic Trainers in Dental Education. Proceedings from the First International VR-Haptic Thinkers Meetup Held in Kuopio, Finland

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Abstract

Background: Implementation of VR-haptics-supported dental curriculums is stymied by a variety of economical, methodological, and institutional challenges. To mitigate these, it is important to share information related to the acquisition and use of this technology. Improved networking aids in the pooling and dissemination of collective expertise and can help improve sample sizes in educational research by bringing new ideas and techniques to the limelight.

Summary: The VR-Haptic Thinkers Meetup held in Kuopio, Finland, in November 2023, was the first of its kind on VR-haptics-supported dental education. The conference brought together over 200 students, dentists, and scientists interested in VR-haptics and dental education. The attendees had experience in research, publication, study, and teaching in the fields of dentistry. This summary reflects the proceedings from this recent scientific meeting to assess current preclinical and clinical challenges in dental education and propose future directions and possible solutions. The specific aims of the VR-Haptic Meetup were to (1) advance knowledge on the usability of VR-haptics in preclinical, clinical, and postgraduate dental training; (2) share experimental data, challenges, and solutions and reinforce collaborative capacity initiatives in education and research; (3) engage with universities' policy makers to address the benefits of VR-haptics in manual dexterity development; and (4) bring together those interested in dental education to strengthen the existing partnerships and extend networking.

Conclusion: The meetup provided a free and inclusive platform for in-person and online attendance with widespread attendees from across the globe. The goal of the meeting was to address challenges facing the preclinical, clinical, and postgraduate education regarding the development of new VR-haptics-supported training methods. Key opinion leaders from around the world provided their perspectives, with ample time for discussion with the participants.

Keywords: New techniques; Meeting report; VR-haptics

VR-Haptics: Importance, Advantages, and Considerations in Dental Education. Conference Process

Accurate dental processes require in-depth understanding of the patient-specific oral structures and planning of treatments.

Together with the traditional phantom head simulation, supplementary haptics-enhanced virtual reality (VR-haptic) training is increasingly becoming a part of dental clinical education [1-5]. Adaptation of three-dimensional (3D) patient-specific models within an educational VR environment in preclinical and clinical



care has demonstrated a reduction in early-operator learning curve in various medical specialties [6]. Haptic technology, though expensive, is especially interesting during early dental manual skill training, as several different modes and models can be run in one device [7-9]. VR-haptic dental training has the potential to improve the education of dental students with little to no experience in tooth preparation as it significantly increases the level of new students' basic technical skills and confidence [10]. More experienced personnel might also find it useful in maintaining their touch.

Although VR-haptic training will likely become more and more important for practicing different case-specific tooth preparations, phantom head simulation laboratory sessions and clinical training with patients should remain an integral part of dental education. As with any new teaching method, the infusion of VR-haptic training into dental curricula requires careful planning. Evaluation and discussion on its implementation can be enabled via research and conferences such as the VR-Haptic Thinkers Meetup. Sufficient time and resources must be invested. VR-haptic training could ultimately enable less expensive and more effective dental education by reducing the amount of direct contact hours required from the educators while offering a freer, less stressful training environment for the students.

We were pleased to find that the Institute of Dentistry, University of Eastern Finland (UEF), Kuopio, was an appealing host, as our one-day free to join meetup was able to attract over 200 registered attendees from around the world. There were seven highly recognized invited speakers, and their lectures included topics such as basic training with VR-haptics via patient-specific VR-haptic dental exercises and postgraduate training, efficiency, experience, and innovations (<https://middle-of-knowhere.com/#comp-18b898195d6>). They were all passionate about improving dental education with this new digital technology. In the same vein, the VR-haptics community gathered both at Kuopio as well as online to network, learn, collaborate, and socialize.

Educators and professionals with training and expertise in different fields of dentistry were called to join and our multidisciplinary meetup gave them opportunity for interaction and learning. It should be emphasized that the consideration of the potential benefits of VR-haptic training is important not only in dentistry, but in every branch of medicine, especially surgery, where great manual dexterity is required. Organizing this meetup helped identify potential curriculum plans for improved health education with the support of VR-haptics. We provided a safe space for educators to share their experiences on all aspects of the VR-haptics life cycle from specification of need, procurement, and everyday use.

Finally, we'll take the liberty to thank our leading sponsors (Dentsply; Kuraray Noritake; Planmeca; Simodont by Nissin;

Zirkonzahn) for their financial contributions, which were vital to our vision of organizing a free to join meetup. We would also like to thank all the meetup organizers at the Institute of Dentistry, UEF, for their help in ensuring the smooth running of the meeting. We also thank Arizona Wilson and the team from the Online Journal of Dentistry & Oral Health (OJDOH).

The lectures of the VR-Haptic Thinkers Meetup were recorded and can be provided upon request. Please email szabolcs.felszeghy@uef.fi for more information.

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Conflicts of Interest

No conflict of interest.

References

1. Leung AL, et al. (2021) Use of Computer Simulation in Dental Training with Special Reference to Simodont. *Dent J (Basel)* 9(11): 125.
2. Felszeghy S, et al. (2023) VR-haptic and phantom head dental training: Does the order matter? A comparative study from a preclinical fixed prosthodontics course. *Int J Comput Dent*.
3. Mirghani I, et al. (2018) Capturing differences in dental training using a virtual reality simulator. *Eur J Dent Educ* 22(1): 67-71.
4. Serrano CM, et al. (2020) First experiences with patient-centered training in virtual reality. *J Dent Educ* 84(5): 607-614.
5. San Diego JP, et al. (2022) Learning Clinical Skills Using Haptic vs. Phantom Head Dental Chair Simulators in Removal of Artificial Caries: Cluster-Randomized Trials with Two Cohorts' Cavity Preparation. *Dent J (Basel)* 10(11): 198.
6. Meyer-Szary J, et al. (2022) The Role of 3D Printing in Planning Complex Medical Procedures and Training of Medical Professionals-Cross-Sectional Multispecialty Review. *Int J Environ Res Public Health* 19(6): 3331.
7. Osnes C, et al. (2021) Investigating the construct validity of a haptic virtual caries simulation for dental education. *BMJ Simul Technol Enhanc Learn* 7(2): 81-85.
8. Anda S, et al. (2023) Patient-specific virtual simulation in the clinical training for prosthetic dentistry. *Eur J Dent Educ*.
9. Aliaga I, et al. (2020) Preclinical assessment methodology using a dental simulator during dental students' first and third years. *J Oral Sci* 62(1): 119-121.
10. Patil S, et al. (2023) Effectiveness of haptic feedback devices in preclinical training of dental students-a systematic review. *BMC Oral Health* 23(1): 739.