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Time Efficient and Cost-Effective Online Teaching Tool: iConcepts in Orthodontics for DDS students @ UoM

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Abstract

Background

Traditional teaching methods in orthodontics with models and static images for 3-Dimensional (3D) changes in tooth positions have posed immense challenges as the learner is unable to clear concepts on the different planes that affect the final tooth positions not to mention the protracted treatment time ranges from 12 months (simple cases) to 36 months (complex cases). Furthermore, orthodontic movements can pose difficulty in understanding the changes particularly in growing children adding to the fourth dimension. At the University of Queensland (UQ) (Naser-ud-Din, 2015) and internationally (Bridges, 2015) over a decade of experience with creating online teaching modules in orthodontics education highlight its strengths of flexibility, ease of access on demand and global presence. UQ had SBLi -Scenario Based Learning interactive for Postgraduate Orthodontic students who found it highly engaging, with self-reflective and self-assessment elements (Khoo et al., 2023; Naser-ud-Din, 2016). Generally simulations can be expensive (Kröger et al., 2017) and it's essential to explore cost effective simulation teaching tools.

Aims

There is a gap in the dental education sector to enhance the learning of core concepts in biomechanics with the aid of 3D simulated online learning for the student in undergraduate courses to feel confident and clinically ready on graduation as Dentist. Over the past 5 years, in particular, there has been an exponential drive by the industry providing 3D simulations for treatment planning and patient communication. The aim of this presentation is to highlight the time efficiency and cost effectiveness of the learning tool.

Material and Methods

Currently the CAD CAM industry is providing 3D simulations as open access that can be utilized for teaching and clearing core concepts related to biomechanics foundations for student learning, engagement and assessment. This project envisages to create a new forum encompassing education revolution with robust online presence of an interactive textbook (iConcepts) under the banner of the University of Melbourne (UoM) to assist students in Doctor of Dental Surgery (DDS) years 2-4.

Results

The purpose of iConcepts is to create lifelong learning opportunities in non-judgmental space by visual and kinesthetic interactive learning of concepts that directly translates into clinical applications. In the past decade CAD CAM has become clinically relevant particularly with Clear Aligner Therapy adding to higher precision and patient satisfaction. Moreover, it is imperative to have Long Term Retention (LTR) (Irvine, 2020) of learning new tasks. It is essential that students in dentistry are aware of the digital workflows and have clinical preparedness on graduation as it's the future and here to stay. Both qualitative and quantitative data on student experience shall be collected and analyzed to seek out the best practice and processes for instruction of delivery in Orthodontics for DDS cohort encompassing time efficiency and cost effectiveness.

Conclusion

The current iConcepts is developed with Apple Education and prototype is being assessed with MSc Data Science cohort at the UoM.

Future Recommendations

It can be marketed to developing universities internationally assisting the dissemination of information a flagship for UoM and revenue generation for department of Education at UoM. As we progress there will be more and more demand towards interactive concepts clarification (Poblete et al., 2020) hence iConcepts.

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