



Utilising virtual reality in undergraduate paediatric dentistry education: a mixed-methods study



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Background

- Dental students experience significant stress during the transition from pre-clinical to clinical practice.
- This stress is especially pronounced in mastering technical and patient management skills.
- Innovative educational approaches are essential to support students during this transition.

Objectives

- To explore the efficacy of a non-immersive desktop virtual reality (VR) platform with a mixed-method analysis involving questionnaire and focus group interviews.

Methodology

- Ten VR scenes depicted a typical paediatric clinical workflow, including history taking, patient examination, treatment planning, and operative procedures (local anaesthesia, rubber dam placement, pulpotomy) were produced on an online platform
- Interactive multiple-choice questions on clinical decision-making were embedded within the platform.
- Participants were 4th-year Bachelor of Dental Surgery students who had completed only a pre-clinical didactic course and had not yet begun clinical paediatric training.
- Qualitative themes were analysed using an inductive-deductive approach.

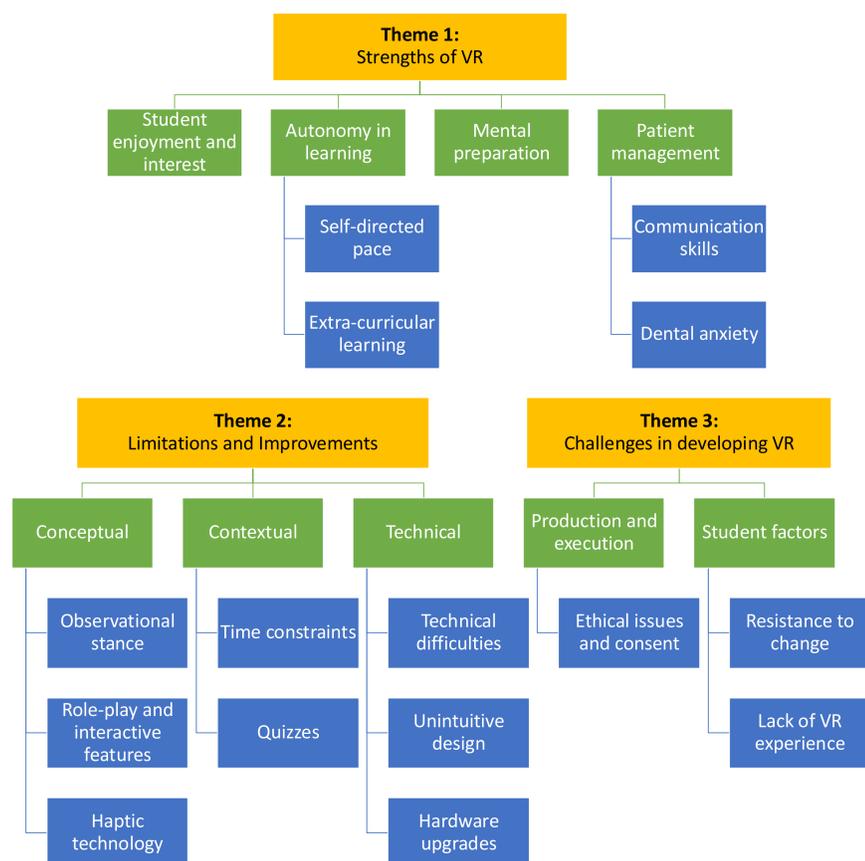
Results

Questionnaire survey (Response rate: 87.2%; N=68/78)

	Strongly agree	Agree	Somewhat agree	Somewhat disagree	Disagree	Strong disagree	N/A
1.General impression							
1.I enjoy using the VR to learn	14.7 (10)	30.9 (21)	32.4 (22)	4.4 (3)	11.8 (8)	0 (0)	5.9 (4)
2.I find these simulations are useful to my learning	10.3 (7)	27.9 (19)	33.8 (23)	10.3 (7)	13.2 (9)	4.4 (3)	0 (0)
3.These simulations motivate me to acquire further knowledge	10.3 (7)	30.9 (21)	35.3 (24)	5.9 (4)	10.3 (7)	7.4 (5)	0 (0)
2.Functionality							
4.I can learn at my own pace with these simulations	5.9 (4)	48.5 (33)	30.9 (21)	5.9 (4)	7.4 (5)	0 (0)	1.5 (1)
5.The length of each simulation was too long	7.4 (5)	25 (17)	27.9 (19)	17.6 (12)	19.1 (13)	2.9 (2)	0 (0)
6.I find the simulation helpful, because I am able to pause and replay the key features of the lecture	7.4 (5)	39.7 (27)	35.3 (24)	5.9 (4)	10.3 (7)	0 (0)	1.5 (1)
3.Application to learning							
7.I find the VR resources help prepare me for paediatric clinics after the simulation course.	8.8 (6)	42.6 (29)	29.4 (20)	5.9 (4)	8.8 (6)	0 (0)	4.4 (3)
8.The VR resources provide a better view of the procedure to be practice in dental clinic	8.8 (6)	45.6 (31)	32.4 (22)	5.9 (4)	1.5 (1)	5.9 (4)	0 (0)
9.The VR resources helped me remember key features of the clinical procedures.	8.8 (6)	39.7 (27)	30.9 (21)	11.8 (8)	5.9 (4)	2.9 (2)	0 (0)

Results

Thematic analysis (Response rate: 32.1%, N=25/78)



Strengths:

- “Know more about the flow of how things really work in the clinic”
- “I think the biggest fear everyone has for a clinic is uncooperative patients...so if VR can give us different scenarios...then we can have more realistic, insight before we see an actual patient.”
- “In VR, the patient can also have some non-verbal gesture...you can pick up and then you know how to respond... it's better than maybe lecture on how to get some soft skills”



Limitations:

- “Flat screen, looking at a video”
- “We're just in the third person”
- “Don't feel like I'm really engaging with the patient”.
- “Quite a rush”

Challenges:

- “We need time to get used to this new, new method”
- “Most of the students are used to reading books in a text or even just images, people can absorb information quite quickly, through those medium than VR itself”

Conclusion

- The study underscores the potential of VR in dental education and the importance of integrating student perspectives in its development.
- Future research should explore the long-term impact of VR training and the integration of haptic technology to further improve the learning experience.

References

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