

Dental Education Research

Programme leader

Dr Lee Adam

Deputy Programme Leader: Dr Susan Moffat

Programme overview

Research in dental education focuses on enhancing theoretical and evidence-based policies and practices in teaching and learning. Researchers in the Dental Education Research Programme typically examine educational experiences in the Faculty and other dental education environments in order to foster a positive impact on education in both the clinical and traditional teaching and learning environments.

We seek to use research to identify strategies and practices that can improve experiences and support for students and educators, both within the University of Otago Faculty of Dentistry, and in other education environments.

KEY PERSONNEL

Dr Lee Adam	Dr Carolina Loch
Dr Susan Moffat	Prof Paul Brunton
Mrs Alison Meldrum	Mrs Hanna Olsen
Prof Alison Rich	Mrs Dorothy Boyd
Dr Lee Smith	Mrs Deanna Beckett
A/Prof Jonathan Broadbent	Dr Arthi Senthikumar
Dr Andrew Tawse-Smith	

Current research

The value of clinical placements in Australasian dental education

Investigators: Lee Adam, Alison Meldrum, Susan Moffat, Lee Smith

This research, funded by the Australasian Council of Dental Schools, is a mixed methods study undertaken in 2018, exploring the educational benefits and logistics of dental and oral health therapy students' clinical placements in Australasia. Academic and administrative staff from Australasian dental schools, as well as staff from clinical host providers, were surveyed and interviewed.

The research found that across Australasia there are a variety of placement models and locations. Clinical placements are deemed by all stakeholders to have a multitude of advantages for students, institutions, and host providers and the communities they serve. However, they involved substantive workloads for both institutions and



Dr Lee Adam presenting dental education research at the 96th IADR General Session in London, July 2018.

providers, and providers reported that hosting students can lead to a decrease in clinical productivity for their organisation.

The research highlighted the need for increased communication between institutions and providers regarding the expectations of students and host organisation clinical supervisors.

Stress and mood states of New Zealand dental students

Investigators: Paul Brunton, Jonathan Broadbent, Lee Adam, Alison Rich, Alison Meldrum

This longitudinal study investigates the perceived stressors and transient mood states of BDS students at the University of Otago Faculty of Dentistry. All BDS students are surveyed twice yearly using the Perceived Stress scale, the Brief Resilience Scale and the Profile of Mood States instruments. Data will be used to gain an understanding of the perceived stressors and psychological functioning (including coping) of undergraduate BDS students, and how stress and functioning varies within and between each class group, between each year of study, and over the course of each year.

Preliminary results suggest the BDS students' stress scores are significantly higher than those of other tertiary students, and their resilience scores are lower than those found in other populations. When the students' mood states are matched against performance, early indicators suggest that there is a positive relationship between students feeling 'on top of things' and higher academic grades.

Comparing the microbiology syllabi between University of Otago and the world's top dental schools

Investigators: Yee En Chen, Wei Theng Chen, Desmond Cheong, Richard Cannon, Geoff Tompkins, Lee Adam

Oral microbiology is a core component of dental education, however, what should be taught? There is a lack of studies comparing the oral microbiology syllabi of the general dental degree among dental schools.

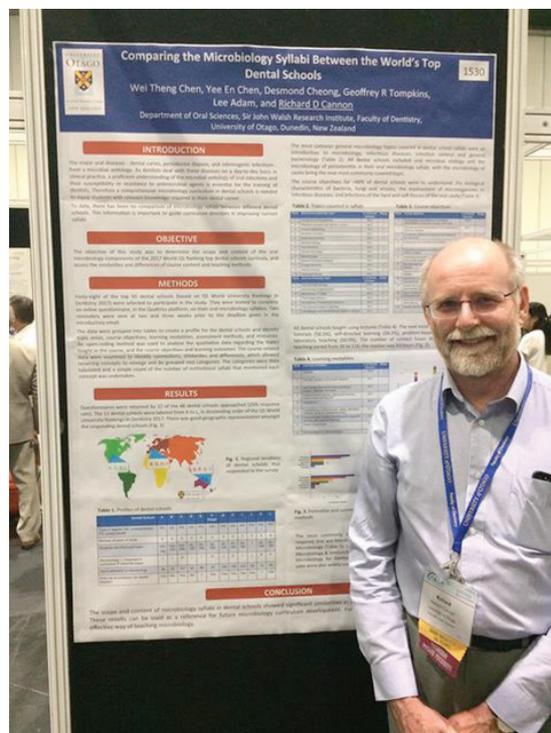
The objective of this study was to determine the scope and content of the oral microbiology components of the 2017 World QS Ranking top dental schools curricula, and assess the similarities and differences of course content and teaching methods.

A questionnaire was sent to 48 of the top 50 dental schools requesting course syllabi for the microbiology component of their dental degree. The syllabi were analysed using an open-coding method to produce a profile of topic areas and course objectives. The similarities and differences between microbiology teaching at the dental schools, including topics taught and course objectives, were determined. Questionnaires were returned by 12 of the dental schools (25%) and 11 provided their microbiology syllabi.

The most common topics taught were: an introduction to microbiology; oral microbial ecology; and the microbiology of periodontitis. The top course objectives were to: demonstrate understanding of the biological characteristics of bacteria, viruses and fungi; describe the involvement of microorganisms in infectious disease; and understand infection of hard and soft tissues of the oral cavity.

Lectures were the most commonly used teaching modality, employed by all of the participating dental schools, while the most commonly used assessment method was multiple-choice questions. One textbook was required or recommended reading for 73% of dental schools.

The scope and content of microbiology syllabi in dental schools showed significant similarities in a wide range of topic areas and course objectives. These results can be used as a reference for future microbiology curriculum development.



Prof Richard Cannon presenting research at the 96th IADR General Session in London, July 2018.

Clinical tutors and their teaching practice

Investigators: Lee Smith, Lee Adam, Alison Meldrum

Although many clinical educators (Dental Clinical Tutors and Professional Practice Fellows) have vast experience in clinical dental practice, many come into tertiary education with no formal teacher training. Clinical expertise is assumed as marking a dental professional as a good clinical educator, but this is not necessarily the case.

Students have reported that self-identifying dental 'experts' are frequently unable to disseminate their knowledge; instead, students rate good clinical educators as those who can define complex concepts, motivate students, maintain rapport, show enthusiasm, and are organised and caring.

Previous research with clinical tutors at the Faculty of Dentistry identified a number of barriers to the retention of tutors, including perceived lack of opportunities for career and pay progression, little support for teaching, few opportunities for undertaking research, and lower pay-rates than if they were employed as a practitioner outside of the University. Approximately two thirds of participants (n=47) said that they thought a formal teaching qualification should be mandatory for this role.

In 2018 we began researching the value that a cohort of clinical educators' placed on formal teaching training,



how they rated their own teaching ability, and how they thought the Faculty of Dentistry could support them with their teaching. Our overarching objective was to investigate challenges the clinical educators experienced in their teaching. The results of this research will inform professional development opportunities provided by the Faculty of Dentistry going forward.

Perceptions of stressors of Bachelor of Oral Health students

Investigators: Hanna Olson, Susan Moffat, Deanna Beckett, Lee Adam, Andrew Tawse-Smith

Despite a recent trend to investigate students' stressors in dentistry learning environments, there is little research on students' stressors in the oral health learning environments. This study aimed to identify self-perceived stressors of Bachelor of Oral Health students to determine if the learning support provided at the Faculty of Dentistry is meeting students' needs.

All Bachelor of Oral Health students (n=135) were invited to complete an online modified version of the Dental Environmental Stress Survey. The survey consisted of 39 questions: 7 collecting demographic information, 1 free comment box, and 31 items related to various potential sources of stress which students were asked to rate on a 5-point Likert-type scale ranging from 'not at all stressful' to 'extremely stressful'. Additionally, the student learning support system was examined. Around half of the group of respondents were first-year students, with participants from second and third years equally distributed. The items 'fear of being unable to catch up if behind' and 'examinations and assessments' scored the highest, indicating that the students perceived these to be their greatest stressors.

Overall, academic requirements were the highest scoring self-perceived stressors for students from all year groups. Stressors related to the clinical environment were highest for second-year students, which is when students start seeing patients. Although there is an existing network of support for students, the study identified several self-perceived stressors over 3 years of Bachelor of Oral Health study that have implications for student support.

Sustainable staff recruitment and retention in Dentistry

Investigators: Paul Brunton, Arthi Senthilkumar, Carolina Loch, Lee Adam

This study was conducted to identify factors that affect retention and recruitment of dental clinical teaching staff at the Faculty of Dentistry. The study has explored issues that influence the clinicians to take up teaching roles and

possible barriers to continue in their current role.

A short questionnaire survey was distributed to current dental clinical teaching staff to understand the retention strategies and barriers. The response rate was almost 96% with equal distribution of female and male clinicians. The majority of participants were European New Zealanders, followed by Asians. Themes identified to improve the retention strategies were the necessity of formal teaching skills, clinical teaching as a career pathway, pay progression, lack of support, and workload.

The study results suggested that the respondents were motivated to give back to their profession through engaging in dental clinical teaching. Clinical teaching staff can be retained by assigning a clear career pathway and encouraging career progression.

Feedback processes in the clinical dental learning environment

Investigators: Lee Adam, Alison Meldrum, Alison Rich

Creating an optimal clinical learning environment poses a challenge to health professions educators. To evaluate and improve the clinical learning environment, it is necessary to understand students' experiences of their environment and the factors they perceive as having an impact on their learning.

The aim of this explorative qualitative study was to examine Faculty of Dentistry students' perceptions of their clinical learning environment to gain insights into how learning outcomes could be enhanced. In 2015, all approximately 600 students at all levels of the Bachelor of Oral Health and Bachelor of Dental Surgery degrees were invited to participate in focus groups. Focus groups facilitated by the faculty education research fellow and another researcher employed for the project were conducted during the second half of the academic year.

Twenty-one students from all levels of the two programs attended one of six confidential focus groups. Three broad themes were evident in the results from all groups: feedback processes, assessments and grading, and tutor interactions. In the focus groups, students expressed dissatisfaction regarding current feedback practices, types of feedback to benefit learning, consistency in the grading system, and impact of different educators' teaching styles on learning.

These results indicated a need for further research and curricular efforts to promote good student-teacher relationships in the clinical learning environment, which are paramount for creating an optimal teaching and learning environment and enhancing student outcomes.

Practicing destination of past Bachelor of Dental Surgery graduates

Investigators: Paul Brunton, Arthi Senthilkumar, Carolina Loch, Lee Adam

In New Zealand (NZ), 11% of university students are international, generating 9.9% of the university sector's income. However, there is little research regarding international students' work intentions beyond graduation. This study investigated whether undergraduate students at the University of Otago Faculty of Dentistry intend to practice in NZ after graduation, and whether international dental students (Bachelor of Dental Surgery, Bachelor of Oral Health and Bachelor of Dental Technology) who graduated between 2001 and 2016 are currently practicing in NZ or overseas.

Almost 64% of current international students indicated their intention to stay in NZ after graduation. Only 22% of graduates since 2001 are currently practising in New Zealand, however this trend is increasing. The number of international graduates registered in NZ increased between 2001 and 2016. More than 70% of current students from Malaysia and China indicated their intention to practice in NZ. All students from Brunei and Oman intended to return to their home country. These findings can be used to prepare current and future graduates for a globalised society and multicultural workforce in NZ.

Funding highlights

2018: ACODS (Australasian Council of Dental Schools) grant: \$50,000. Assessment of the value of clinical placements in Australasian Dental Schools. Lee Adam (principal investigator), Alison Meldrum, Susan Moffat, Claire Gallop

2017: MBIE \$13,700. Otago Participatory Science Platform, Sugar in your diet: kino te pai! Carolina Loch, Richard Cannon, Lyndie Foster Page, Deanna Beckett, Lisa Te Morenga, and Tiahuia Kawe-Small (Te Kura Kaupapa Maori Otepoti).

2017, University of Otago Teaching Development Grant, \$19,982. Counteracting the CSI Effect: Enhancing and Developing Forensic Biology Curriculum Content and Delivery. Angela Clark, Elaine Webster, and Richard Cannon.

Other Dental Education Research projects

- Assessing improvements in academic writing in first year Bachelor of Oral Health students
Investigators: D Beckett, J Oranje, L Adam, S Moffat
- Professionalism for the undergraduate oral health professional
Investigators: R Ahmadi, L Smith, L Adam, A Meldrum, S Moffat.
- Evaluate to improve: Using student evaluations to inform teaching improvements
Investigators: L Adam, C Golding
- Inter-professional collaborative practice initiatives in oral health therapy education across Australasia
Investigators: H Olsen, A Senthilkumar

Student projects

- Learning experiences of 4th year Bachelor of Dental Surgery students in relation to perceived clinical tutor teaching approach
Investigators: P Choo, S Zhang, L Adam, C Loch
- Students' experiences of a compulsory undergraduate research paper
Investigators: R Heran, HW Yeang, D Boyd, L Adam, A Meldrum
- Dental students' perspectives of the long case examination
Investigators: T Paul, L Adam, S Moffat
- Perceptions of special needs dentistry
Investigators: A Ramasamy, L Adam, G Ting, A Rich
- The teaching of posterior composites: a survey of dental schools in Oceania
Investigators: Y Liaw, P Metussin, C Loch, P Brunton
- I am a lefty in a right-handed world: qualitative analysis of clinical learning experiences of left handed undergraduate dental students
Investigators: E Al Lawati, H Al Maskari, S Ma



Prof John Broughton presenting dental education research at the 95th IADR General Session in San Francisco, March 2017.

Key publications

Ebbeling, S., Adam, L., Meldrum, A., Rich, A., McLean, A., & Aitken, W. (2018). Oral health and dental students' perceptions of their clinical learning environment: A focus group study. *Journal of Dental Education*, 82(10), 1036-1042. doi: 10.21815/JDE.018.102

Smith, L., Adam, L., Moffat, S., Meldrum, A., & Ahmadi, R. (2018). How do educators in one New Zealand undergraduate Bachelor of Oral Health course teach and nurture professionalism? *European Journal of Dental Education*, 22(2), e212-e220. doi: 10.1111/eje.12274

The, A. J. M., Adam, L., Meldrum, A., & Brunton, P. (2018). Dental students' and staff perceptions of the impact of learning environment disruption on their learning and teaching experiences. *European Journal of Dental Education*, 22(3), 151-159. doi: 10.1111/eje.12293

Veerasamy, A., Loch, C., Adam, L., Howe, B. J., & Brunton, P. A. (2018). Challenges in clinical teaching investigated: Towards sustainable staff recruitment and retention in dentistry. *European Journal of Dental Education*, 22(4), 234-242. doi: 10.1111/eje.12336

Adam, L., Anderson, V., & Spronken-Smith, R. (2017). 'It's not fair': Policy discourses and students' understandings of plagiarism in a New Zealand university. *Higher Education*, 74(1), 17-32. doi: 10.1007/s10734-016-0025-9

Brunton, P. A., Ghazali, A., Tarif, Z. H., Loch, C., Lynch, C., Wilson, N., Blum, I. R. 2017. Repair vs replacement of direct composite restorations: A survey of teaching and operative techniques in Oceania. *Journal of Dentistry*. Advance online publication. doi: 10.1016/j.jdent.2017.02.010

Smith, L., Adam, L., Moffat, S., Meldrum, A., & Ahmadi, R. (2017). Undergraduate Bachelor of Oral Health student and educators' understandings of professionalism. *New Zealand Dental Journal*, 113(1), 4-10.

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Lai, K.-W., & Smith, L. (2018). University educators' perceptions of informal learning and the ways in which they foster it. *Innovative Higher Education*. Advance online publication. doi: 10.1007/s10755-018-9434-2

Lai, K.-W., & Smith, L. A. (2017). Tertiary students' understandings and practices of informal learning: A New Zealand case study. *Australasian Journal of Educational Technology*, 33(2), 115-128. doi: 10.14742/ajet.2937

Raphael, S. L., Foster Page, L. A., Hopcraft, M. S., Dennison, P. J., Widmer, R. P., & Wendell Evans, R. (2018). A survey of cariology teaching in Australia and New Zealand. *BMC Medical Education*, 18, 75. doi: 10.1186/s12909-018-1176-4

Olson, H., Beckett, D., Moffat, S., Adam, L., & Tawse-Smith, A. (2018). Self-perceived stressors of Bachelor of Oral Health students and level of support in the oral health learning environment. *Journal of Dental & Craniofacial Research*, 3, (pp. 40). doi: 10.21767/2576-392X-C1-001

Senthilkumar, A., Adam, L., Loch, C., Howe, B. J., & Brunton, P. (2018). Challenges in clinical teaching investigated: Towards sustainable staff recruitment and retention in dentistry. *New Zealand Dental Journal*, 114(4), (pp. 185).