2023 UTD Grant Projects Snapshots

2022 Project Titles (Snapshots below)

- **Machine Translation Literacy for Language Learning**
- **Solving the Problem: Anchored instruction of mathematics using authentic problems**
- **Decolonising education: An Ōtākou approach**
- **The efficacy of an educational escape room (EER) to teach clinical handover: pre-registration health professional students' perspectives**
- **Targeted Online Writing Support for At-Risk University of Otago Students**
- **An enquiry into learning environments and their effects on medical student learning during lockdown for the COVID-19 pandemic**
- **Can you see us? Can you hear us? Fostering equity, diversity, and inclusion in our Bachelor of Pharmacy curriculum.**
- **Delivering effective interprofessional education for medical and midwifery students: an exploratory study of a collaborative model of educational delivery**
- **Moana Theology**
- **R code for training in data analysis using case study videos that motivate statistics learning**
- **Learning on clinical placements – understanding placement culture**

2022 UTD Grant Projects

2022 Project Titles (Report Extensions granted)

Exploring the impact of a Māori Strategic Framework implementation plan for Te Kaupeka Pūniho – The Faculty of Dentistry	Mr Samuel Carrington	Extension to 31 July 2023
Planning for a blended-learning approach for simulated clinical experience in the undergraduate curricula for Faculty of Dentistry dental and oral health students at Otago University, New Zealand	Mrs Hanna Olson	Extension to 30 June 2023
Whāriki – weaving life into a board game for Aotearoa	Dr Robin Quigg	Extension agreed to 30 June 2023.

2022 UTD Grant Projects

Title	**Machine Translation Literacy for Language Learning**
Project Team	Antonie Alm, Yuki Watanabe (RA)
Requested	$4,376
Awarded	$4,377
Snapshot	The grant facilitated the creation of several workshops aimed at helping language teachers become more familiar with machine translation tools, such as Google Translate and DeepL. These workshops aimed to equip language educators with a deeper understanding of the benefits and drawbacks of machine translation tools, while also guiding them in developing "educate-integrate" teaching models. Additional workshops were conducted at the national language teacher conference (in July), the Lessons Learned symposium in November, and a webinar for the Languages & Cultures department at the University of Limerick in Ireland (February 2023). The two later workshops also incorporated units on generative AI. Two resource sites were created on Wakelet, one on Machine Translation and one on ChatGPT for Language Learning. A curriculum model for the integration of machine translation was developed and trialled with an advanced-level German class, focusing on L2 reading. The model has been published in conference proceedings. The data analysis from interviews with teachers and students is ongoing.
Title	**Solving the Problem: Anchored instruction of mathematics using authentic problems**
Project Team	Dr Florian Beyer, Prof Boris Baeumer, Dr Fabien Montiel, A/Prof Sarah Wakes
Requested	$18,884
Awarded	$8,884
Snapshot	The goal was to develop and implement an authentic problem-based anchored instruction teaching method for both the in-person on-campus and distance summer school versions of MATH120 (Mathematics for Scientists). This approach aims to provide students with the opportunity to explore authentic and meaningful mathematical problems drawn from their disciplines. Through the anchored instruction approach, students can develop their confidence and proficiency in quantitative skills. Lab sessions are conducted in a group-learning environment, with the aim of creating a learning community in the mathematics classroom, which is especially beneficial to historically underserved populations, such as Māori and Pasifika students. Ample time is provided for exploring authentic problems, which can enhance student engagement and success in mathematics. Ultimately, the goal is to provide crucial quantitative skills to all students, including those who have previously felt excluded from quantitative science subjects

Title	**Decolonising education: An Ōtākou approach**
Project Team	Dr Kim Brown (Co-PI), Dr Rachel Martin (Co-PI), Dr Yasmin Abdul Aziz (ARF), Te Kura Ākau Taitoka, College of Education.
Requested	$ 20,000.00
Awarded	$ 20,000.00
Snapshot	Placing student voice at the heart of this project, we sought to learn more about the ways in which students encounter a higher education that is respectful of Te Tiriti o Waitangi (TOW), and mana whenua relationships and partnerships. Wānaka (tikaka-informed workshops) provided a particularly effective environment for a diverse group of 68 students to come together, kōrero, and share their experiences at the University. We applied Critical Tiriti Analysis to recordings of students' kōrero and learned that on whole students learn little about TOW and how it relates to the programmes they are studying. The exceptions are individual lecturers who champion TOW, and students see as advocates, teaching optional papers that often have small student numbers. Students are critical of what they see as tokenistic content in their courses, and instead aspire to greater opportunities for place-based, problem-based and future-focused education, which better prepares them for global citizenship.
Title	**The efficacy of an educational escape room (EER) to teach clinical handover: pre-registration health professional students' perspectives**
Project Team	Dr Allyson Calder, Dr Amanda Wilkinson, Dr Ewan Kennedy, Dr Chris Moir, Sheree Tikao-Harkess
Requested	$ 11,827.00
Awarded	$ 11,827.00
Snapshot	This study aimed to explore the experiences of pre-registration nursing and physiotherapy students about the efficacy of an educational escape room (EER) as a gamified learning environment for teaching clinical handover. Students acknowledged that the EER was clinically relevant and transferrable to a real-world clinical environment. They enjoyed the novelty of using gamification as an engaging, social learning experience. Team composition facilitated or created barriers for learning. The EER structure had unintended negative consequences for learning. The timed aspect of the EER facilitated competitiveness resulting in students prioritising winning over learning. While an EER is an innovative and engaging approach to teaching, we recommend proceeding with caution. Learning is likely to be enhanced if key concepts are taught prior to EER implementation. We suggest using an EER as novel approach to consolidate and evaluate learning. Allowing students to choose their team members provides a safe learning environment.
Title	**Targeted Online Writing Support for At-Risk University of Otago Students**
Project Team	Dr Michael Cop
Requested	$3,172.80
Awarded	$3,172.80
Snapshot	Each year at the University of Otago, Health Sciences First Year students sit the English Diagnostic Test. Around 25% of those students annually fail the initial sitting and need support before they write their second-chance test. One reason for failing is not knowing academic stylistic conventions (such as APA, Chicago, MLA, or Vancouver). This project aimed to create short videos (3-8 minutes each) teaching students how to avoid those common stylistic errors. The project also aimed to produce banks of multi-choice questions where students can practice the stylistic competencies

Title	**An enquiry into learning environments and their effects on medical student learning during lockdown for the COVID-19 pandemic**
Project Team	Linda Gulliver, Otago Medical School, Steve Gallagher, Jim Ross, Jasbir Singh (RA)
Requested	$ 17,379.80
Awarded	$ 17,379.80
Snapshot	This project aimed to establish if medical students' lockdown learning environments during the COVID-19 pandemic impacted student learning through effects on motivation, engagement and memory, and whether such effects were disproportionately experienced by students in environments where socio-economic, cultural or other influences potentially disadvantaged them. We conducted two online Qualtrics™ surveys across Otago Medical School's three campuses, asking students to reflect on their experiences of their learning and their learning environments during 2020 and 2021 periods of COVID-19 lockdown. Focus groups captured in-depth information. Results show that both the learning environment and the way learning is received have tangible effects on medical student learning during pandemics. A follow-up study targeting the experiences of students with disabilities, approximately half of whom reported their lockdown learning environment exacerbated their disability, is underway. Preliminary results were presented at AMEE [Lyon, France] and in the 'Lessons Learned' symposium at Otago University in 2022.
Title	**Can you see us? Can you hear us? Fostering equity, diversity, and inclusion in our Bachelor of Pharmacy curriculum.**
Project Team	Lisa Kremer, A/Prof. Alesha Smith
Requested	$19,972.00
Awarded	$16,972
Snapshot	In 2020 we performed a document analysis of the paper based clinical cases in the BPharm and identified that the cases were not representative of the community in an Aotearoa context. This provided an opportunity for reflection on how to ensure the curriculum is diverse and representative and decided that having the community voice expressing how they would like to be seen in clinical cases was worth exploring. To date, we have not directly engaged with underrepresented groups to ask how they would like to be seen in clinical cases. To ensure safety of both researchers and community members, we created a research group with members who have identities within underrepresented communities. We then used our connections to engage with underrepresented community members and carried out focus groups. The insight obtained within this research activity was hugely beneficial and the data collected very valuable. Many new ideas for curriculum development have occurred following the focus group activity, however we decided to halt clinical case development and the implementation and evaluation phase of the research while the Division of Health Sciences review is occurring. This is because it is not clear at present what student learning platforms are going to be available to staff in semester two and beyond (e.g., lectures, workshops, skills labs). Although the future is unclear at present, what is clear is our determination and commitment to seeing this project through to the classroom. Once the review is completed, this research group will continue this work.

Title	**Delivering effective interprofessional education for medical and midwifery students: an exploratory study of a collaborative model of educational delivery**
Project Team	Judy Ormandy, Christine Jackson, Lyndal Honeyman, Rose Spence, Eileen McKinlay, Sonya Morgan
Requested	$ 19,821.00
Awarded	$ 19,821.00
Snapshot	The aim of this project was to develop and refine an introductory interprofessional education (IPE) learning activity for 5th year medical students from University of Otago Wellington and 1st year midwifery students from Victoria University of Wellington. The project used a quality improvement framework and researcher-teacher partnership. Two teaching cycles of the IPE were delivered with separate student cohorts in 2022, with the second IPE delivery modified according to analysis of feedback (surveys/focus groups) from the first iteration. The evaluation showed the second refined IPE session was valued highly by students who reported increased understanding of each other's roles and of the importance of interprofessional collaboration in a maternity context. The findings demonstrate an evaluation which used a quality improvement cycle and researcher-teacher partnership led to a more effective IPE activity. Plans are underway to run this IPE three times in 2023, and to expand it to include sonography students.
Title	**Moana Theology**
Project Team	Prof, Murray Rae
Requested	$ 19,981.50
Awarded	$ 19,982
Snapshot	The aim of the project was to design and deliver an undergraduate paper in Pacific Theology, and to explore the ways in which Pacific pedagogies might enhance teaching and learning within the Theology Programme, especially, but not exclusively, for Pacific students. It was intended to undertake this project in close collaboration with Pasifika stakeholders of the Theology Programme. The aims were accomplished inasmuch as the paper was successfully delivered as a Pre-Christmas Summer School paper in 2022, (rather than a semester 1 paper in 2023 as orginially planned) and co-hosted by the Congregational Christian Church of Samoa, (CCCS), Mangere East, with whom the University has an MoU. The challenges associated with working with an external partner and negotiating the cultural protocols and expectations were considerable and a good deal was learned in the process. Both the Theology Programme and the Church are committed to repeating the project in future. Student evaluation of the paper indicated that it was well-received by students.
Title	**R code for training in data analysis using case study videos that motivate statistics learning**
Project Team	Assoc. Prof. Matthew Schofield, Assoc. Prof. John Harraway
Requested	$7,443.00
Awarded	$7,443.00
Snapshot	The purpose of the CALT Grant is develop R code for video case study exercises which are freely available on the Department of Mathematics and Statistics website. Lessons are currently provided for these videos in the Genstat statistical language. This project will look to convert the lessons to the R language. The R statistical package was founded at the University of Auckland in 1992 and is freely available online. R is extensively used both locally and globally, including the statistics teaching programme in the Department of Mathematics and Statistics.

Title	**Learning on clinical placements – understanding placement culture**
Project Team	Prof. Tim Wilkinson, Otago Medical School, Dr Sale Sheehan Otago Medical School, Dr John Thwaites Te Whatu Ora Waitaha Medical Education Unit
Requested	$ 24,421.00
Awarded	$12,000
Snapshot	The aim was to explore the varied ways in which culture in the workplace influences the learning environment and therefore impacts on the learning of medical students and newly graduated doctors. A critical partnership was established with the Medical Education Unit that supports newly graduated doctors for Te Whatu Ora in the Canterbury region to ensure that perspectives from the pre and immediate post graduate medical education curriculum were included in both the research team and the participants. We interviewed participants from the TI year and relief Registered Medical Officers (RMOs) giving us the observations from new eyes as well as from those who experience a range of clinical environments. We wished to make explicit the hitherto implicit aspects of workplace culture to assist both supervisors and learners to develop a shared mental model of the environment that learning will take place and recognise that each environment is situated within complex, unique and multifactorial cultures. The key findings to date are that we have identified key features of the placement environments that vary across placements and that together describe behavioural features that inform the culture. We have also identified four key themes that summaries what participants believed they need to do to "impress on this placement". We anticipate being able to integrate the findings from both these sets of results. The final phase is yet to be completed as one of the team has been on sick leave and only returned to work this month. We therefore request an extension to this project until June 30th to complete stages 4 and 5.

COMMITTEE FOR THE ADVANCEMENT OF LEARNING AND TEACHING

FINAL REPORT ON GRANT

31 March 2023

Snapshot of the Project

Title: Machine Translation Literacy for Language Learning
Names: Antonie Alm (PI) and Yuki Watanabe (RA)
Department: School of Arts, Languages & Cultures

Snapshot of the project.

The grant facilitated the creation of several workshops aimed at helping language teachers become more familiar with machine translation tools, such as Google Translate and DeepL. These workshops aimed to equip language educators with a deeper understanding of the benefits and drawbacks of machine translation tools, while also guiding them in developing "educate-integrate" teaching models.

Additional workshops were conducted at the national language teacher conference (in July), the Lessons Learned symposium in November, and a webinar for the Languages & Cultures department at the University of Limerick in Ireland (February 2023). The two later workshops also incorporated units on generative AI.

Two resource sites were created on Wakelet, one on Machine Translation and one on ChatGPT for Language Learning.

A curriculum model for the integration of machine translation was developed and trialled with an advanced-level German class, focusing on L2 reading. The model has been published in conference proceedings. The data analysis from interviews with teachers and students is ongoing.

Full Report

Title of Project: Machine Translation Literacy for Language Learning
Names: Antonie Alm and Yuki Watanabe

Introduction: The context and rationale for the project as well as the project objectives.

The purpose of the project was to develop workshops on machine translation tools for language teachers and to advance the research on machine translation literacy in language education.

Interventions: Workshops for teachers and students, resources and curriculum development.

The grant facilitated the creation of several workshops aimed at helping language teachers become more familiar with machine translation tools, such as Google Translate and DeepL. These workshops aimed to provide language teachers with a deeper understanding of the benefits and drawbacks of machine translation tools, while also guiding them in the development of 'educate-integrate' teaching models.

In addition to the workshops for language teachers at Otago, other workshops were held at the National Language Teachers' Conference (NZALT in July), the Lessons Learned Symposium in Otago in November 2022, and a webinar for academic staff in the Department of Languages and Cultures at the University of Limerick in Ireland (February 2023). The November and February workshops also included sections on generative AI, further broadening the scope of the training offered.

For additional support, two resource sites were created on Wakelet:

1) Machine Translation for Language Learning: A toolbox for Language Teachers
2) ChatGPT for Language Teachers: A collection of information, tools and ideas

In addition, a curriculum model for the integration of machine translation was developed and piloted with an advanced German class focusing on L2 reading.

Student interviews about their perceptions and use of machine translation tools were conducted in September 2022. However, the teacher interviews were delayed and took place in March 2023. Data analysis from these interviews is currently underway.

Discussion and implications:

1) Language educators
The teacher interviews

As I analyse the interview data, it is clear that the release of ChatGTP last year underscores the importance of adapting to technological advances in education. Both

generative AI and machine translation tools have the potential to have a significant impact on language teaching and higher education in general. This will require educators to re-evaluate and refine teaching strategies, assessment methods and academic integrity policies for effective integration and responsible use.

The rapid development of technology has left many teachers feeling overwhelmed and, as a result, there is a noticeable reluctance among some educators to adopt and integrate new tools into their teaching practices. This project sheds light on the concerns and hesitations that a significant number of teachers have about using technology in their classrooms. To address this resistance and apprehension, more training and support for teachers is needed.

2) Language students

A new curriculum model

An "educate-integrate" approach to Google Translate and DeepL was piloted in a 300-level German class, involving ten advanced students who engaged with self-selected reading materials and reflected on their use of machine translation tools. Initially, students mainly used these tools as dictionaries or for camera translation. During the course of the intervention, dictionary usage evolved to include saving words in phrasebooks and exporting Google Translate-generated spreadsheets to Quizlet for vocabulary review. Additionally, the previously unused webpage translation and glossing features (Chrome extension) were extensively utilised, offering tailored support to each learner. Some students used translated pages for an overview before delving into the original German text, while others switched between versions or relied on glosses to fill gaps. These individual approaches highlight the potential of these features, which resulted in unique learning affordances for each student. Ultimately, this support increased engagement with L2 texts that would have been too challenging without the assistance of online translators.

The student interviews

Building on the research findings of a previous study that highlighted the proficient use of MTTs by many advanced language learners, we conducted in-depth interviews with advanced students of French, German, Spanish, and Japanese to investigate the details of their MTT use. The interviews revealed that students utilise a variety of online language tools, such as Google Translate, SpanishDict, and Reverso, for both language learning and writing assessment. However, they noted a lack of guidance or established rules for MTT usage in language classes, leading to confusion and anxiety among language learners. To address this issue, participants suggested implementing clear expectations and guidelines to help them use MTT more effectively and prevent overdependence on these tools. Furthermore, the interviews identified a need for increased training and open discussions about MTT in language classes, enabling students to use these tools appropriately. Lastly, participants emphasised the importance of actively learning a language and engaging with its culture, considering the high prevalence of monolingualism in English-speaking countries and the inherent value of multilingualism.

Output:

1) *Digital resources (Wakelet):*

- Machine Translation for Language Learning: A toolbox for Language Teachers
- ChatGPT for Language Teachers: A collection of information, tools and ideas

2) *Workshops and Webinars*

Alm, A., & Clark, T. (2022). Machine translation literacy for language teachers. *Proceedings of the New Zealand Association of Language Teachers (NZALT) Conference.* (pp. 45).

Alm, A. (2022). Google translate for language learning – exploring new paradigms for formal language education. COVID-19's impact on teaching and learning at the University of Otago: Lessons learned. Otago University, 14 – 15 November, 2022

Alm, A. (2022) Google translate for language learning – exploring new paradigms for formal language education. COVID-19's impact on teaching and learning at the University of Otago: Lessons learned. Otago University, 14 – 15 November, 2022

Alm, A. & Watanabe, Y. (2022). Embracing machine translation in higher education. COVID-19's impact on teaching and learning at the University of Otago: Lessons learned. Otago University, 14 – 15 November, 2022

Alm, A. (2023). AI in language education: Google Translate and ChatGPT. Invited webinar University of Limerick (21 February 2023).

3) *Publications*

Alm, A. (2022). Actualizing the affordances of machine translation tools for language learning. In J. Colpaert, Y. Wang & G. Stockwell (Eds.), *Proceedings of the XXIst International CALL Research Conference.* (pp. 1-6). London, UK: Castledown.

Summary of Spending:
Please find attached the Life to Date Report. The additional amount spent on the RA's salary ($415) was covered by the HoP fund of the principal investigator.

CALT Grant Final Report

Full report

Solving the Problem: Anchored instruction of mathematics using authentic problems

Dr Florian Beyer	Project Leader, course developer, lecturer
Prof Boris Baeumer	Numeracy coordinator, course developer, lecturer
Dr Fabien Montiel	Course developer, lecturer
A/P Sarah Wakes	Distance teaching expert, course developer, lecturer

Snapshot

The goal was to develop and implement an authentic problem-based anchored instruction teaching method for both the in-person on-campus and distance summer school versions of MATH120 (Mathematics for Scientists). This approach aims to provide students with the opportunity to explore authentic and meaningful mathematical problems drawn from their disciplines. Through the anchored instruction approach, students can develop their confidence and proficiency in quantitative skills. Lab sessions are conducted in a group-learning environment, with the aim of creating a learning community in the mathematics classroom, which is especially beneficial to historically underserved populations, such as Māori and Pasifika students. Ample time is provided for exploring authentic problems, which can enhance student engagement and success in mathematics. Ultimately, the goal is to provide crucial quantitative skills to all students, including those who have previously felt excluded from quantitative science subjects.

Introduction

Starting in 2022, the university has been offering the paper MATH 120 (Mathematics for Scientists), a new course designed to teach mathematical thinking to students from various fields of study. This paper is available in both semesters 1 and 2 on campus, and beginning in 2023, it is also offered as a summer school paper by distance learning. The course is specifically designed to be inclusive of students who have not previously felt comfortable with traditional mathematics courses. MATH120 has now been offered two times on campus (S1 and S2 2022) and once by distance (SS 2023). It is currently running in S1 2023.

The traditional approach to teaching mathematics at university level emphasises theoretical concepts and relies on simplified, often artificial problems to illustrate abstract ideas. This approach's advantage is that it allows sufficient time to teach a broad range of mathematical techniques that form the foundation of quantitative science subjects. However, while this approach may address the profound lack of mathematical knowledge found among many incoming university students, a considerable proportion of them tend to disengage and miss out due to various reasons, including mathematics anxiety, gaps in basic numeracy

knowledge, but in particular also the lack of clear connections to relevant meaningful problems in their disciplines.

The research question for this CALT grant was: **How can an *authentic* problem anchored learning approach be carried out effectively to teach first-year mathematics in both on-campus and distance environments?**

Research shows that teaching mathematics within authentic contexts is more effective at conveying the critical thinking and problem-solving skills necessary for quantitative science subjects.

We have investigated and implemented an authentic learning approach that uses problems and applications from a range of quantitative subjects and has the following characteristics:

- foster peer learning in both on-campus and online environments,
- investigate the use of technology/software to enhance student learning,
- identify and develop online support resources,
- develop support and training material for teaching staff and tutors/demonstrators of both the on-campus and distance versions of MATH 120 (in the department plus the college/PASS/Maori/Pacific Centre), and,
- cooperate with the PAN programme to identify the most important knowledge gaps and to direct students to seek appropriate help.

Teaching MATH120 by distance in summer school has brought up additional issues:

- what level of interaction is needed during the laboratory sessions between the teaching staff, tutors/demonstrators, and the students,
- how to make these interactions as seamless as possible through an online environment,
- what software to use for the remote labs, and,
- how to ensure that the teaching staff and tutors are well trained in supporting remote students via this teaching/learning approach.

Approaches and methods

The main new idea that distinguishes MATH120 from all other mathematics papers at the university is that we allow ample time to explore authentic, meaningful problems drawn from the students' disciplines using the *anchored instruction approach*. Furthermore, invited guest lecturers from relevant disciplines emphasise the pivotal role of mathematics in their work. This approach generates confidence and provides crucial quantitative skills, particularly for those who have previously felt excluded from quantitative science subjects. Our weekly lab sessions are conducted in a group-learning environment, striving to create a learning community in the mathematics classroom, which is especially beneficial to historically underserved populations such as Māori and Pasifika, who have high failure rates in MATH 100 level papers. An especially important part of the learning process is to encourage students to try different approaches to problem-solving, to critically analyse their findings, and to effectively communicate their results through oral and written reports.

To support this new kind of learning, our research assistant Dr Joshua Ritchie has developed online worksheets using the highly interactive STACK Online Assessment platform and made resource videos to support the teaching of MATH120.

Our specific approaches to teaching the distance version in summer school is largely informed by CI Wakes' strong experience of teaching the distance paper MATS204 (see the CALT grant *I do: I understand – engaging distance and campus students in sustainability through active learning*). Here are the most important features of MATH120:

- *Asynchronous delivery of course material following a clear timeline* (see the MATH120 course book in Appendix 1): Pre-recorded lecture material is released in two tranches. This allows the students to study at their own speeds, but with clear goals and milestones.
- Resource videos: We provide videos on general topics like how to use zoom, gathertown etc., as well as more specific ones on how to use the course book, the timeline, how the modules are related to the assessment, how to use Stack etc. Further detail is provided in Appendix 2. Some of these videos were the same as for MATS204, but some other videos were created specifically for MATH120 by the CIs Montiel and Wakes.
- Guidance was provided for students on time management (upcoming assessments, timeline of watching material etc) through weekly emails and videos on echo360.
- For labs, we used the software gathertown to create a learning atmosphere which is as close as possible to a group learning environment. In order to give students the opportunity to learn according to their own schedules, the distance labs are however rather designed as drop-in sessions (one session during the day and one during the evening).
- Student presentations on the first project activity were recorded (either individually or in pairs). These were then peer marked.
- Assessed lab activities and project activities were adapted for the summer school version of the paper.
- First use of Stack for the online assessments.

In order to evaluate our success in summer school 2023, we have obtained ethics approval and sent out questionnaires to the students. This together with the statistical usage data available in echo360 will allow us to develop a comprehensive picture of how the students interacted with the paper. Of particular interest to us is how well students have engaged with each part of the paper, whether they followed the timeline, or made use of having early access to blackboard. The analysis is currently been carried out by Dr Linda Dunn.

Key findings and discussion

We believe that our attempts to implement an authentic anchored instruction approach to learning mathematics has been largely successful. But we have also learnt a few new lessons which will inform the further development of MATH120 and of this whole teaching approach in the future.

Positives

- We were able to successfully implement the authentic anchored instruction learning approach in both our lectures and labs. We believe that this approach has been well received by the students and that it has led to improvement learning outcomes.
- Our lab environment successfully fosters peer learning especially in the on-campus, but also in the distance version of the paper.
- Both teaching staff and tutors found it straightforward to adapt to our new kind of teaching mathematics and to engage with students in this more interactive engaging way.
- We have found that Stack is a tremendously useful interactive online mathematics learning and assessment platform (which is also free). Our experience will be valuable to other mathematics papers as well.
- We have made positive experiences on how to use blackboard and echo360 effectively to host and organise the course resources, especially resource videos and external resources.

Negatives/outstanding challenges

For many years, students have been coming into university with a huge variety of numeracy skills. Some students perform very well, they are well acquainted with all necessary mathematical skills, and they are therefore able to focus on the applications and new mathematical methods covered in MATH120. But there is also a large number of students who struggle even with the most basic mathematical tasks. How to deal with this discrepancy best is the topic of ongoing debate, not only within our department, but also the wider university. We have tried our best to engage especially with the weaker students, to offer them places in the PAN programme and to provide extra worksheets, resource videos and external resources. It turned out that the uptake of these opportunities by students was very low, and the reasons for this are not clear to us. Another struggle was a low student engagement/participation in lectures. Despite our extensive efforts, it is possible that we need to communicate even clearer how the content of the lectures fits together with the labs and the assessments.

Another problem for us was that for the first half of S1 2022 – the first time MATH120 had ever run -- the university operated online due to COVID. This significantly hampered our initial implementation especially of the labs which we had planned for being in person. Because of this we had less time to refine the in person labs in S2 2022.

Time management seems to be an issue for some students as well as prioritising assessments, whichever semester the paper is taken in. Even for the S2 version of the paper, when most students had already had a semester of study, students struggled to keep up with the regular assessment requirements. As with most mathematics papers assessment is weekly/fortnightly with lower percentage values to aid understanding of processes and skills. This can mean that students skip assessments when they have other priorities.

Distance teaching in summer school

Regarding the distance version of MATH120 in summer school, we made the following observations:

- The asynchronous delivery of course material is working well but also leads to certain challenges:
    - As a positive, it allows students to study the course material at their own pace. “Weaker” students can proceed slowly, while “better” students can jump ahead.
    - As a negative, students are required to have good time management and self-motivation skills, be more independent and be well acquainted with self-learning at university level. We are not sure how to best foster all these. In this respect, MATH120, as a 100-level university-entry paper, differs significantly from the 200-level paper MATS204, and, it is consequently likely that different strategies need to be adopted.
- Student engagement has been worse than we hoped. Our analysis of our engagement data is still ongoing (see below). We are certain that this will provide us with new insights about which parts of the paper students found hard to engage with and which parts were easy.
- Gathertown in the labs: Even though this software in principle emulates an in-person group discussion and work atmosphere as closely as possible, we found that it is difficult to help students with specific computer/software problems in their labs. We also found that group work is difficult to monitor; some students would be largely working on their own while others would be distracted and disengaged.
- Online student presentations are going well. There was no issue with most students recording their presentations and collaborating with their group members online.

The analysis of our evaluation data is still ongoing. We are therefore not yet able to present concrete results. We are particularly interested in comparing our findings to the ones previously obtained for MATS204 (Sarah J. Wakes and Linda A. Dunn (2023). I do, I understand: engaging distance and campus students in sustainability through active learning. Research in Learning Technology. 31. http://dx.doi.org/10.25304/rlt.v31.2823) especially regarding student engagement which we consider as critical. Our plan is to publish our results in an education journal. As part of our analysis, we also plan to interview the MATH120 teaching staff and tutors for the purpose of self-reflection in order to get a better picture of our successes, challenges and the future potential of our new approach to teaching mathematics.

Appendix 1: MATH120 Course Book

MATH 120 Mathematics for Scientists 2023

TABLE OF CONTENT

COURSE OVERVIEW

The modern world is built on science and technology. As such, the increasingly competitive job market requires new graduates to have confidence and fluency in quantitative problem solving. MATH 120 uses a problem-based learning approach to develop problem-solving and critical thinking skills by consistently working through applied examples from a range of scientific disciplines, while learning new techniques and tools. Students will be encouraged to try different approaches, critically analyse their findings and communicate them orally and/or as written reports. As a result, MATH 120 students will be ideally equipped to specialise in any discipline that includes a quantitative component.

Aim: The development of understanding, formulation and application of a variety of approaches to quantitative problem solving in scientific disciplines.

Learning Objectives:

The paper is structured around 5 modules:

1. Measuring the natural world

2. Empirical analysis
3. Modelling change in time
4. Computing with mathematical models
5. Higher-dimensional models

Course Coordinators:
Associate Professor Sarah Wakes (sarah.wakes@otago.ac.nz)
Dr Fabien Montiel (fabien.montiel@otago.ac.nz)

Timetable:
All material is pre-recorded and available on ECHO360 (click on the link on the Blackboard page). It is released in two batches, one at the start of summer school (9th January) and one at the beginning of week 3 (23rd January). To help you navigate the content over the 6 weeks of Summer School a seminar roadmap and suggested timeline are given in this document.
The **lecture and assignment roadmap** is an overview of course content and how it is associated with the assignments, lab assignments, presentation and project.
The **suggested timeline** is a proposed schedule of what to do in order to complete the course on time.

Laboratory and Project Sessions:
In **weeks 1, 2 and 4** there are two online drop in help labs (Thursdays: 12-2pm and 7-9pm).
In **weeks 3, 5 and 6** there are four online labs (Tuesdays and Thursdays 12-2pm and 7-9pm) of which you are required to **attend at least one**.

The laboratories are accessed through Gathertown.
https://app.gather.town/app/3ZFBN72SMOngbBuC/MATH120%20Teaching%20and%20Labs

The meeting link for MATH 120 (if needed) is:
https://otago.zoom.us/j/93336783111?pwd=ZTM4aTIycDRhczF4K2JMQVBhYlFxdz09
Meeting ID: 933 3678 3111
Password: Maths

Instructions for using Zoom and Gathertown are available via the Recorded content (ECHO 360) link on the course Blackboard page. Resource videos are filed under *Software Resources.*

Course Information is provided through Blackboard which is used in support of teaching in terms of course information, documents and return of marks. Full lecture notes and recordings are provided. **Staff Student Communication: The University requires that all communication between staff and students is via your University student email address.** Including your ID number in all communications is helpful.

Assessment and proposed due dates: Final grade compilation is 100% from internal assessment.

Assignment	%	Due date (11.59pm)	Format
A1	10	23rd January 2023	Online (STACK)
A2	10	30th January 2023	Online (STACK)
A3	10	6th February 2023	Online (STACK)
A4	10	13th February 2023	Online (STACK)
L1	10	18th January 2023	Online (BLACKBOARD)
L2	10	25th January 2023	Online (BLACKBOARD)
L3	10	8th February 2023	Online (BLACKBOARD)
Presentation	5 (group)	29th January 2023	Online (BLACKBOARD Discussion Board)
Peer marking	5	1st February 2023	Online (Qualtric Survey)
Report	20	19th February 2023	Online (BLACKBOARD)

Assignments submitted on the due date will be marked according to the University of Otago standard scale.

The University of Otago uses the following standard scale for converting numerical marks awarded into grades:

Pass			Fail
90–100 A+	75-79 B+	60-64 C+	40-49 D
85-89 A	70-74 B	55-59 C	< 40 E
80-84 A-	65-69 B-	50-54 C-	

Late submission of assignments:

- With the exception of the final assignment, late submissions will be accepted during the period of 1 week following the due date, but will incur a 10% penalty. After this date late assignments will not be marked unless an extension has been approved.
- No late submission is accepted for the final assignment without an approved extension.

Extensions need to be managed by the student through direct communication with one of the course coordinators. Early communication with one of the course coordinators about any issues affecting attendance or performance is encouraged.

Return of Assignments: Assignments will normally be returned 1 week after final submission date. Marks will normally be returned via Blackboard within 1 week of this date.

Academic integrity means being honest in your studying and assessments. It is the basis for ethical decision-making and behaviour in an academic context. Academic integrity is informed by the values of honesty, trust, responsibility, fairness, respect and courage. Students are expected to be aware of, and act in accordance with, the University's Academic Integrity Policy.

Academic Misconduct, such as plagiarism or cheating, is a breach of Academic Integrity and is taken very seriously by the University. Types of misconduct include plagiarism, copying, unauthorised collaboration, taking unauthorised material into a test or exam, impersonation, and assisting someone else's misconduct. A more extensive list of the types of academic misconduct and associated processes and penalties is available in the University's Student Academic Misconduct Procedures. It is your responsibility to be aware of and use acceptable academic practices when completing your assessments. To access the information in the Academic Integrity Policy and learn more, please visit the University's Academic Integrity website at www.otago.ac.nz/study/academicintegrity or ask at the Student Learning Centre or Library. If you have any questions, ask your lecturer.
Turnitin is used for all written work to confirm originality. Turnitin has been set up to allow students to submit one draft of an assignment for checking prior to submitting the final assignment for assessment.

Disability: The Department encourages students to seek support if they find they are having difficulty with their studies due to a disability, temporary or permanent impairment, injury, chronic illness or deafness. Contact Disability Information and Support, (Ph 479-8235, email disabilities@otago.ac.nz, website http://www.otago.ac.nz/disabilities).

Class Representative: A class representative will be nominated for the course. You are welcome to bring any issues you have to the attention of your class representative for discussion at these meetings.

TIMELINE

Monday	***Tuesday***	***Wednesday***	***Thursday***	***Friday***	***Saturday***	***Sunday***
December 2022						
			1 Blackboard opens	*2*	*3*	*4*
5	*6*	*7*	*8*	*9*	*10*	*11*

12	*13*	*14*	*15*	*16*	*17*	*18*
19	*20*	*21*	*22*	*23* University closed	*24* University closed	*25* University closed
26 University closed	*27* University closed	*28* University closed	*29* University closed	*30* University closed	*31* University closed	
January 2023						
						1 University closed
2 University closed	*3* University closed	*4*	*5*	*6*	*7*	*8*
9 Week 1	*10*	*11*	*12* **L1**	*13*	*14*	*15*
16 Week 2	*17*	*18* **L1 due**	*19* **L2**	*20*	*21*	*22*
23 Week 3 **A1 due**	*24* **P1**	*25* **L2 due**	*26* **P1**	*27*	*28*	*29* **Presentation due**
February 2023						
30 Week 4 **A2 due**	*31*	*1* **Peer marking due**	*2* **L3**	*3*	*4*	*5*
6 Week 5 Waitangi Day **A3 due**	*7* **P2**	*8* **L3 due**	*9* **P2**	*10*	*11*	*12*
13 Week 6 **A4 due**	*14* **P3**	*15*	*16* **P3**	*17*	*18*	*19* **Report due**

2022
THURSDAY 1ST DECEMBER: BLACKBOARD OPENS

The following content will be made available:

- Welcome video
- Software resource videos
- Assignment, Lab and project resource videos
- Mathematical techniques and tools resource videos

It is recommended that you become familiar with the course structure, take the numeracy test, check out Kahn Academy resources and download Excel and

MATLAB if you don't already have them. You could also do the MATLAB onramp course. Also get familiar with Zoom and GatherTown as we will be using these for the labs.

2023
Monday 9TH JANUARY: Week 1 - SUMMER SCHOOL STARTS

We suggest you start watching the lecture content from the beginning and accessing the additional content where you need it. Help is available in the lab sessions so please drop in. Lecture content will be made available for the first part of the paper.

Monday 9th JANUARY:
Assignment 1 opens

Thursday 12th JANUARY:
Laboratory 1 drop in sessions.

Monday 16TH JANUARY: Week 2

This week continue to watch the lecture content for the first part of the paper. Work on Assignment 1 and Lab 1.

Monday 16th JANUARY:
Assignment 2 opens

Wednesday 18th JANUARY:
Last day to submit Lab 1.

Thursday 19th JANUARY:
Laboratory 2 drop in sessions.

Monday 23RD JANUARY: Week 3

This week continue to watch the lecture content for modules 1-3. Lecture content will also be made available for the rest of the paper:

- Module 4: Computing with Mathematical Models
- Module 5: Higher-dimensional Models

Work on Assignment 1 and Lab 2.

You will be doing the first project activity this week so it is essential that you attend at least one of the laboratory sessions. You will be paired with another student and together you will produce a videoed presentation on project 1. We suggest you watch the resource videos on giving and recording a presentation ahead of the laboratory. Remember that you have to attend at least one project laboratory session this week.

Monday 23rd JANUARY:
Assignment 3 opens.
Last day to submit Assignment 1.

Tuesday 24th JANUARY:
Project 1 lab sessions.

Wednesday 25th JANUARY:
Last day to submit Lab 2.

Thursday 26th JANUARY:
Project 1 lab sessions.

Sunday 29th JANUARY:
Last day to submit the Project 1 presentation.

Monday 30TH JANUARY: Week 4

We suggest that you watch the lecture content from module 4 and 5 this week. You will also need to complete the presentation marking via the Qualtrics survey (link emailed to you via your university email address).

Monday 30th JANUARY:
Assignment 4 opens.
Last day to submit Assignment 2.

Wednesday 1st FEBRUARY:
Last day to submit the presentation peer marking.

Thursday 2nd FEBRUARY:
Laboratory 3 drop in sessions.

Monday 6TH FEBRUARY: Week 5

Waitangi Day: 6th February

Continue watching the lecture content and ask for help if needed. Remember to write notes and save data and figures on project 2 as you do it to make the report at the end easier to complete. Remember that you have to attend at least one project laboratory session this week.

Monday 6th FEBRUARY:
Last day to submit Assignment 3.

Tuesday 7th FEBRUARY:
Project 2 lab sessions.

Wednesday 8th FEBRUARY:
Last day to submit Lab 3.

Thursday 9th FEBRUARY:
Project 2 lab sessions.

Monday 13TH FEBRUARY: Week 6

This final week is about consolidation of everything you have learned. Have a template of your report and write up project 2 before the last project activity. Remember that you have to attend at least one project laboratory session this week.

Monday 13th FEBRUARY:
Last day to submit Assignment 4.

Tuesday 14th FEBRUARY:
Project 3 lab sessions.

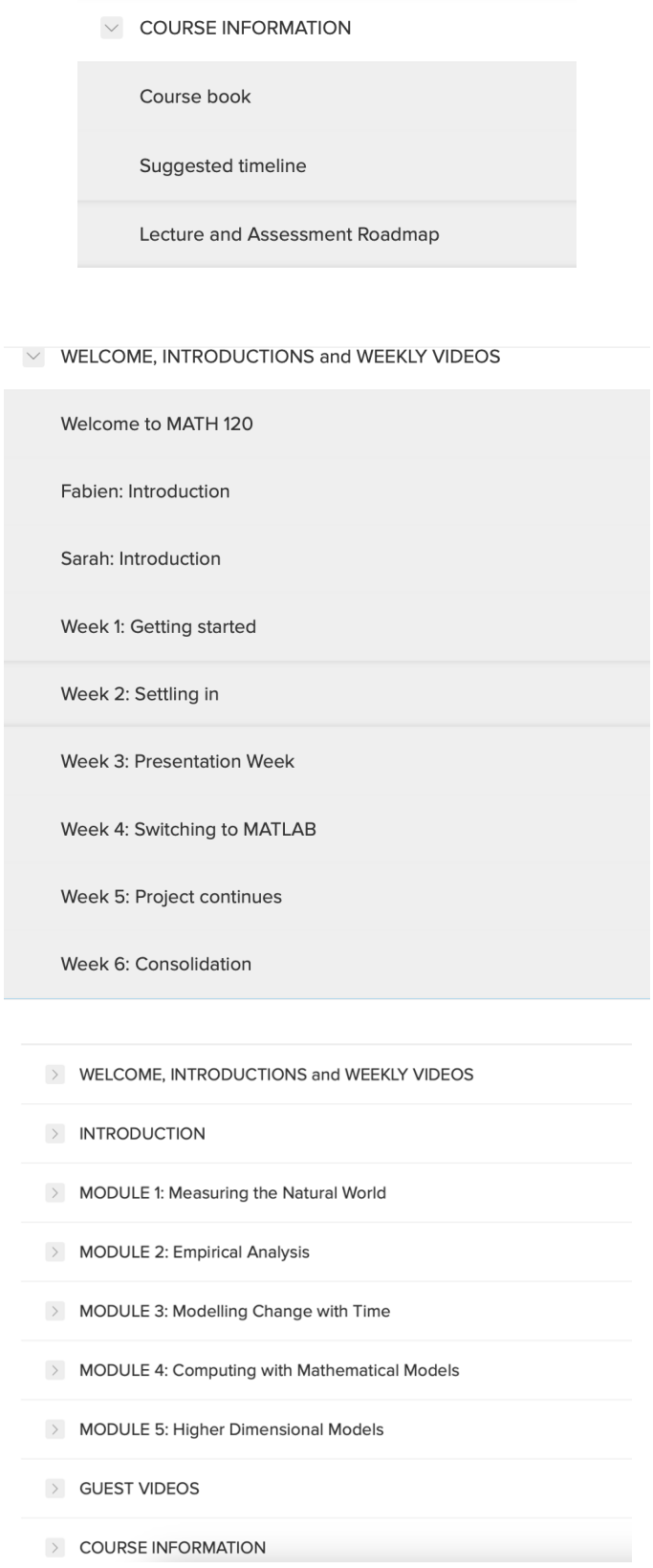
Thursday 16th FEBRUARY:
Project 3 lab sessions.

Sunday 19th FEBRUARY:
Last day to submit the project report.

LECTURE and ASSIGNMENT ROADMAP

The schematic below gives an indication of which assignment, lab or project part is associated with which module lecture material.

Appendix 2: MATH120 Resource material on echo360



ASSIGNMENT, LAB and PROJECT RESOURCES

- Assessment Overview
- Using Stack and Practice Questions
- PRESENTATION WORKSHOP
- Recording a presentation on Zoom
- Project 1: Presentation resource video
- LIBRARY SKILLS
- Moving average in Excel example
- Project report resource video
- Presentation marking resource video

SOFTWARE (EXCEL, MATLAB, ZOOM and GATHERTOWN) RESOURCES

- Zoom Intro
- Download and Install Zoom
- How To Join A Meeting
- Sign-in to Desktop Client
- Zoom on Mobile Devices
- Gathertown help
- Excel Help
- MATLAB help

MATHEMATICAL TECHNIQUES and TOOLS RESOURCES

- Fractions: example problem 1
- Fractions: example problem 2
- 3D Geometric shape function example part 1
- 3D Geometric shape function example part 2

CALT Grant final report

Other outputs

At this stage there are no other outputs. As discussed in the full report, the analysis of our evaluation data is currently ongoing and is planned to be published in an education journal.

CALT Grant final report

Project snapshot

Solving the Problem: Anchored instruction of mathematics using authentic problems

Dr Florian Beyer	Project Leader, course developer, lecturer
Prof Boris Baeumer	Numeracy coordinator, course developer, lecturer
Dr Fabien Montiel	Course developer, lecturer
A/P Sarah Wakes	Distance teaching expert, course developer, lecturer

Snapshot

The goal was to develop and implement an authentic problem-based anchored instruction teaching method for both the in-person on-campus and distance summer school versions of MATH120 (Mathematics for Scientists). This approach aims to provide students with the opportunity to explore authentic and meaningful mathematical problems drawn from their disciplines. Through the anchored instruction approach, students can develop their confidence and proficiency in quantitative skills. Lab sessions are conducted in a group-learning environment, with the aim of creating a learning community in the mathematics classroom, which is especially beneficial to historically underserved populations, such as Māori and Pasifika students. Ample time is provided for exploring authentic problems, which can enhance student engagement and success in mathematics. Ultimately, the goal is to provide crucial quantitative skills to all students, including those who have previously felt excluded from quantitative science subjects.

College of Education
Te Kura Ākau Taitoka

Committee for the Advancement of Learning and Teaching

Decolonising education: An Ōtākou approach

Project team: Dr Kim Brown (Co-PI), Dr Rachel Martin (Co-PI), Dr Yasmin Abdul Aziz (ARF)
Te Kura Ākau Taitoka, College of Education.

Snapshot

Placing student voice at the heart of this project, we sought to learn more about the ways in which students encounter a higher education that is respectful of Te Tiriti o Waitangi (TOW), and mana whenua relationships and partnerships. Wānaka (tikaka-informed workshops) provided a particularly effective environment for a diverse group of 68 students to come together, kōrero, and share their experiences at the University. We applied Critical Tiriti Analysis to recordings of students' kōrero and learned that on whole students learn little about TOW and how it relates to the programmes they are studying. The exceptions are individual lecturers who champion TOW, and students see as advocates, teaching optional papers that often have small student numbers. Students are critical of what they see as tokenistic content in their courses, and instead aspire to greater opportunities for place-based, problem-based and future-focused education, which better prepares them for global citizenship.

Introduction

Decolonising education is of mutual concern for Māori and Pākehā (Charters et al., 2019), and therefore is the responsibility of all educators and all students. Scholars of decolonising education speak with a voice that comes from the shared experiences of Indigenous people (Poitras Pratt et al., 2018), and asserts that decolonisation is a collective and ongoing journey (Dei, 2016). The existing research of Māori scholars and Indigenous scholars globally provides us with a framework to support students to reveal colonial impacts in their studies (Dei, 2016; Macfarlane, 2019; Mutu, 2019; Poitras Pratt et al., 2018), and aspects of their studies that already demonstrate decolonisation. In doing so, we will learn implications for our future teaching and learning practices, spaces and places.

Our objectives were to:

- Investigate the extent to which tauira/students at Te Whare Wānaka o Ōtākou understand, notice and/or experience decolonisation in their studies.
- Develop academic resources which are Aotearoa me Te Wai Pounamu-specific and Ōtākou-specific, which can be used to support teaching, increase students' knowledge of the effects of colonisation, and educator professional development.

Methods

The research design involved two research activities comprised of wānaka (workshops) and a photomapping activity (Instagram). Data was consitutive of four main formats: spoken, written, photographic and social media activity (likes and follows on Instagram). Demographic data was also collected, but was given anonymously and cannot clearly be attributed to data. Demographic data provides a description of the diversity among the participants other than age, for which we can report that participants ranged in age from 18 years to 48 years (majority < 22 years):

NZ European/ Pākehā	Māori	Pacific Peoples	Chinese	Other
28 – 41.2%	22 – 32.4%	4 – 5.9%	6 – 8.8%	8 – 11.8%
Female/Wahine	**Male/Tāne**	**Gender diverse/ Irahuhua**	**Non-gender/ Ira kore**	**Prefer not to say/ Kāhore e whakahoki**
39 – 57.4%	24 – 35.3%	3 – 4.4%	1 < 1%	1 < 1%
People with disabilities/ Tākata whaikaha	**People who are non-disabled**	**Neurodiversity/ Kanorau ā-roro**	**Prefer not to say/ Kāhore e whakahoki**	
8 – 11.8%	45 – 66.2%	3 – 4.4%	12 – 17.6%	
Commerce	**Health Sciences**	**Humanities**	**Science**	**Mixed**
1 < 1%	31 – 45.6%	23 – 33.8%	7 – 10.3%	6 – 8.8%

Wānaka

Wānaka as research methodology works as practices which are embedded in and shaped by local knowledge, place, people, language and tikaka (Mahuika & Mahuika, 2020). In our context, wānaka provided us with dynamic research practices that drew from our teaching and learning approaches in Education Studies, the language and knowledge of students as they evaluated their studies, and the setting of Te Whare Wānaka o Ōtākou. These practices were framed within Māori cultural protocols (Smith et al., 2019). Wānaka create "thought spaces" that encourage critical thinking, debate, and the co-creation of knowledge (Mahuika & Mahuika, 2020; Smith et al., 2019), and accordingly were fitting to this research on a number of levels.

We held two face-to-face wānaka and one online during the first three weeks of semester 2, a total of 68 students participated. Each wānaka lasted an hour. Wānaka followed tikaka that involved karakia, kai, whakawhanaukataka, kōrero and a closing karakia. Students' kōrero was guided by a decolonising Higher Education evaluation framework devised by Dei (2016). The framework was adapted to reflect the Aotearoa me Te Waipounamu and mana whenua contexts. Students formed their own groups to discuss the questions and one member acted as scribe to note key points on the evaluation framework. Students consented to their kōrero being recorded on a digital recorder and later transcribed. Students attending the online wānaka participated in breakout rooms and used Padlet prepared with the same evaluation questions. Of the three groups online, one recorded their conversations because they were in the same room together.

A fourth wānaka took place in October and served the purpose of sharing research findings with students for feedback. This wānaka was consistent with the same tikaka practices. David Murdoch and Vivienne Andreson attended as guests at the final wānaka, Richard Blaikie was invited but had to send apologies. At this wānaka, we also invited students to share how the project findings made them feel, which they could do by using a QR code to a simple Qualtrics form.

Photomapping

Photomapping offers the potential for a critical participatory research method, recognising that participatory research should enact more equitable collaboration between researcher and participants (Bagnoli & Clark, 2010). Following their participation in the wānaka, students were invited to participate in a photomapping activity by contributing photos that illustrated

decolonisation on campus. These photos were then uploaded to a project Instagram account. Some students shared photos of their eReserve reading lists, journal articles they were reading, assessment tasks, and University news items from social media. On reflection, we believe that students may have found this research activity difficult. Participation relied on students already being familiar with critical thinking and critical literacies, which they had indicated in the wānaka were not consistent aspects of their studies. Students were more active on Instagram when we shared content that supported critical thinking/literacies for decolonising education at Ōtākou, as indicated by likes and shares. The Instagram data was analysed alongside other data in ATLAS.ti using the Ōtākou CTA framework.

Data analysis

Data from all activities were entered into ATLAS.ti software and analysed using a Critical Tiriti Analysis - CTA (O'Sullivan et al., 2021). We developed explanations of each of the four articles using the CTA framework to specifically reflect the Ōtākou context:

Article 1 Kāwanataka - Honourable Governance (flexible structures, fair representation, Māori, Pākehā, and diverse frames).
Article 2 Rakatirataka – Agency (strong mana whenua voice and presence, Te Reo Māori, cultural narratives, clarity about Te Tiriti partnership roles).
Article 3 Ōritetaka – Equity (meaningful experiences of diversity, inclusion and participation, accessible/flexible assessment, dual heritage in curriculum).
Article 4 Wairuataka – Spirituality and Wellbeing (strong Indigenous and intersectional identities, validated and represented, global citizenship).

The data was intially coded in descriptive ways, generating 118 codes. The most frequents codes included: absence of opportunities to learn Te Reo; colonialism and physical space; critical thinking; diversifying education; mana whenua values not included; variety of assessments, and Western knowledge dominant.We then applied the Ōtākou CTA framework to futher analyse the data in terms of TOW.

Findings

A summary of the four themes identified through the Ōtākou CTA framework are presented below:

Theme 1- What students observe	Number of Codes	Synthesis
Kāwanataka and colonisation	39	• Colonisation is evident in the physical and structural environment. • Insufficient representation of Māori in governance structure. • Western forms of knowledge dominate. • Opportunities for critical thinking appears reliant on individual lecturers. • Absence of mana whenua information and knowledge of Te Reo Māori concepts (including *mana whenua).* • Students are not graduating with the University's graduate attributes.

Theme 2 – What students want to see	Number of Codes	Synthesis
Rakatirataka and colonisation	25	• Greater opportunities for student agency. • Strong mana whenua presence and cultural narratives. • Cultural competencies. • Non-avoidance of difficult conversations. • Academics modelling agency and cultural competencies.

Theme 3: What students want to experience	Number of Codes	Synthesis
Ōritetaka and colonisation	45	• Be supported in recognising their strengths. • Take up opportunities to do things differently. • University placing value on courses that teach decolonisation so that more students are willing to takes these courses. • Experiences that are less culturally tokenistic and more culturally meaningful. • Greater understanding of the articles of Te Tiriti o Waitangi and of partnership with Kāi Tahu. • To see Te Tiriti partnership less selectively enacted.

Theme 4: Effects on wellbeing	Number of Codes	Synthesis
Wairuataka and colonisation	15	• Identity, wellbeing, validation intersectionality, language. • Myths about the current generation and their 'open mindedness': some students reported peers who do not understand equity actions taken by the University for Māori and Pasifika students. • Students shared various beliefs that in some instances reflected social stereotypes and assumptions attributed to others, rather than themselves. • Concerns about the impact of Western knowledge having the greatest validation. • Broader perspectives are not always available.

Unfortunately, according to the partictipants in this study, the University of Otago is more likely to be experienced as a place and space of colonisation and White privilege. Students report that they have experienced learning and teaching that reflects racial, class and gender assumptions, and where diversity is presented in tokenistic ways. On campus, they see other students' discriminatory behaviours and perpetuation of offensive stereotypes. Students do experience decolonised education at the University, but this appears to be dependent on lecturers who are advocates for decolonisation, and on studying alongside students who share similar values for decolonisation and Te Tiriti partnership. Knowledge and understanding of mana whenuataka was strikingly absent.

The learning and teaching that students have found most affirming aligns with place-based, problem-based and future-focused educational approaches that are well-researched and, in small pockets, already existant in the University. Students aspire to graduate as more knowledgeable global citizens who understand their obligations as TOW partners. We find great hope and excitement in hearing their aspirations.

Discussion and Implications

We acknowledge the steps already undertaken by the University of Otago to address institutional racism and the efforts underway to establish honourable TOW partnership with mana whenua. University of Otago Vision 2040 aspires to provide an education "where every graduate has been empowered through their studies to understand and support Te Tiriti partnership" (p. 10). Students who participated in this research share the same aspiration now, which raises questions as to how the University supports teaching staff to integrate and progress honourable, active TOW partnership. There is an implication for mandatory staff training in TOW and cultural competencies and capabilities. As part of this journey towards reconciliation and transformation we urge consideration of how to build cultural competencies and capabilities among teaching staff while being mindful of a learning and working environment that is culturally safe for takata whenua and other minoritised groups.

There is concern among Indigenous scholars that efforts towards decolonisation can inadvertantly re-assert the needs of coloniser as the primary focus of the project, requiring further compromise and subjugation from Indigenous peoples. Indigenisation and 'Re-Maorification' (Jackson as cited in Cairns, 2020) of education places Te Tiriti o Waitangi at the heart of change, and we advocate the use of the Ōtākou CTA as a framework for departments to analyse and evaluate what and how they teach. Only through a process of evaluation will departments gain a better understanding of how takata whenua and students from other minoritised communities see themselves represented in their courses.

The process of decolonising education is recognised as invoking pedagogies of discomfort (Poitras Pratt et al., 2018), both for teachers and learners. Students in this study were united in their request for "difficult" conversations, and while we agree with this sentiment, we additionally acknowledge that pedagogies of discomfort can leave teachers vulnerable to criticism from some students and colleagues. Current teaching evaluation procedures can enable harsh criticism without qualification, and have implication for promotion and confirmation. There are implications here for decolonising current systems and establish new, inclusive and Indigenous frameworks for evaluation.

Creating networks of decolonising and indigenising practices acknowledges the efforts already underway at the University, and the teaching teams or indivduals already embarked on this journey. As students note, the University could be doing more to place value on these courses. Training for teaching staff on how to initiate and manage difficult conversations and topics with depth and honesty could help mitigate the sense of tokenism that many students report. Such training also offers support to teaching staff to reflect on how their own values and assumptions shape their own pedagogies, a necessary starting point for decolonising education. From a learning and teaching perspective there is clearly a long journey ahead, but it is a journey that many students and staff appear willing to travel.

Other Outputs

A paper is in a draft format for submission to a peer-reviewed journal.
Results have been disseminated in a departmental seminar (Nov 2022), and as a consequence, Rachel Martin and Kim Brown were invited to give a presentation for NZCER on Decolonising Assessment within NZCER's Strategic Priorities (Feb 2023).
Teaching and learning resources: Ōtākou CTA framework (p. 6 of this report)
Powerpoint file supporting critical reading

Ōtākou Critical Te Tiriti Analysis Framework (2023)

This framework is adapted from CTA (O'Sullivan et al., 2021). The indicators are context-specific to Ōtākou, informed by this research. We propose that the Ōtākou CTA framework can support analysis and evaluation of teaching practices on course and/or departmental basis.

	Indicators	Evidence				
		Silent	Poor	Fair	Good	Excellent
Article 1 Kāwanataka - Honourable Governance	Flexible structures, fair representation, Māori, Pākehā, and diverse frames.					
Article 2 Rakatirataka – Agency	Strong mana whenua voice and presence; Te Reo Māori; cultural narratives; clarity about Te Tiriti partnership roles.					
Article 3 Ōritetaka – Equity	Meaningful experiences of diversity, inclusion and participation; accessible/flexible assessment; dual heritage in curriculum.					
Article 4 Wairuataka – Spirituality and Wellbeing	Strong Indigenous and intersectional identities, validated and represented; global citizenship.					

References

Bagnoli, A., & Clark, A. (2010). Focus groups with young people: A participatory approach to research planning. *Journal of Youth Studies, 13*(1), 101-119.

Dei, G. (2016). Decolonizing the university: The challenges and possibilities of Inclusive Education. Socialist Studies, 11(1), 23-61. https://doi.org/10.18740/S4WW31

Cairns, P. (2020, February 10). Decolonise of indigenise: Moving towards sovereign spaces and the Māorification of New Zealand museology. https://blog.tepapa.govt.nz/2020/02/10/decolonise-or-indigenise-moving-towards-sovereign-spaces-and-the-maorification-of-new-zealand-museology/

Charters, C., Kingdon-Bebb, Olsen, T., Ormsby, W.,Owen, E., Pryor, J., Ruru, J., Solomon, N, & Williams, G. (2019). *Te Puapua: Report of the working group on a plan to realise the UN Declaration on the Rights of Indigenous Peoples in Aotearoa/New Zealand.* Retrieved from https://www.tpk.govt.nz/docs/undrip/tpk-undrip-he-puapua.pdf

O'Sullivan, D., Came, H., McCreanor, T., & Kidd, J. (2021). A critical review of the Cabinet Circular on Te Tiriti o Waitangi and the Treaty of Waitangi advice to ministers. *Ethnicities, 21*(6), 1093-1112. doi:10.1177/14687968211047902

Macfarlane, S. (2019). He raraunga o te ao—Global citizenship: A Māori perspective. *Curriculum Matters, 15*, 99-103. doi:10.18296/cm.0039

Mahuika, N., & Mahuika, R. (2020). Wānanga as a research methodology. *AlterNative: An International Journal of Indigenous Peoples, 16*(4), 369-377. doi:10.1177/1177180120968580

Mutu, M. (2019). 'To honour the treaty, we must first settle colonisation' (Moana Jackson 2015): The long road from colonial devastation to balance, peace and harmony. *Journal of the Royal Society of New Zealand, 49*(sup1), 4-18. doi:10.1080/03036758.2019.1669670

Poitras Pratt, Y., Louie, D. W., Hanson, A. J., & Ottmann, J. (2018). Indigenous education and decolonization. In *Oxford research encyclopedia of education* (pp. 1–31). https://doi.org/10.1093/acrefore/9780190264093.013.240

Smith, L., Pihama, L., Cameron, N., Mataki, T., Morgan, H., & Te Nana, R. (2019). Thought space wānanga—A Kaupapa Māori decolonizing approach to research translation. *Genealogy, 3*(4), 74. Retrieved from https://www.mdpi.com/2313-5778/3/4/74

University of Otago (2022). *Vision 2040: Approved as an interim final version by University Council, 29 November 2022*. Retrieved from https://www.otago.ac.nz/otago0241079.pdf


7
QUESTIONS
ABOUT YOUR READING LIST
DECOLONISE
EDUCATION @ OTAGO

1 WHOSE KNOWLEDGE?

Do your readings presume a particular perspective or give authority to particular types of knowledge?

DECOLONISE
EDUCATION @ OTAGO

2 DIVERSE AUTHORS?

Does your reading list reflect diversity in society? Are there authors who you can identify with?

DECOLONISE
EDUCATION @ OTAGO

3 TOKENISM?

How is equal status given to the work of all authors? How do you feel about this?

DECOLONISE
EDUCATION @ OTAGO

4 CRITICAL READING?

Are you encouraged to critically assess required readings? Or accept the content without question?

DECOLONISE
EDUCATION @ OTAGO

5 POWER & INTEREST?

How are Māori represented in comparison to the ways that Pākehā are represented?

DECOLONISE
EDUCATION @ OTAGO

Pureka ihomatua ki Ōtākou

Decolonising education @ Ōtākou

Dr Rachel Martin
Dr Kim Brown
Dr Yasmin Abdul Aziz

Karakia - tīmataka

Tukua te wairua kia rere ki kā taumata
Hai ārahi i ā tātou mahi
Me tā tātou whai i kā tikaka a rātou mā
Kia mau kia ita
 kore ai e karo
Kia pupuri
Kia whakamaua
Kia tina! TINA! Hui e! Tāiki e!

Allow one's spirit to exercise its potential to guide us in our work as well as our pursuit of our ancestral traditions. Take hold and preserve it, Ensure it is never lost Hold fast, Secure it Draw together! Affirm!

Methods

- Wānaka – Kaupapa is whakawhiti kōrero.
- Kanohi ki te kanohi, and huitopa.
- Kairakahau – Yasmin Abdul Aziz
- Recruitment diversified to include all tauira across Divisions.
- Written recording, audio recording and verbatim transcripts.
- Photomapping – participatory method for tauira to illustrate how they identify colonisation and decolonisation on campus - Instagram.

Tauira: n=68

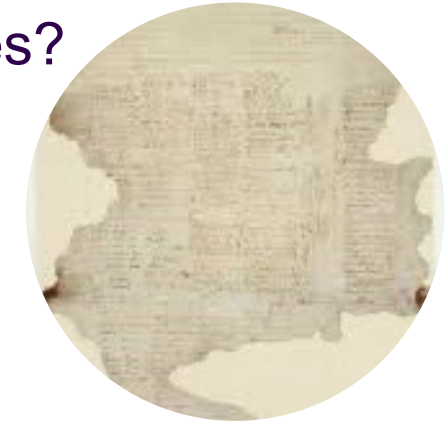
NZ European/ Pākehā	Māori	Pacific Peoples	Chinese	Other
28 – 41.2%	22 – 32.4%	4 – 5.9%	6 – 8.8%	8 – 11.8%
Female/Wahine	**Male/Tāne**	**Gender diverse/ Irahuhua**	**Non-gender/ Ira kore**	**Prefer not to say/ Kāhore e whakahoki**
39 – 57.4%	24 – 35.3%	3 – 4.4%	1 < 1%	1 < 1%
People with disabilities/ Tākata whaikaha	**People who are non-disabled**	**Neurodiversity/ Kanorau ā-roro**	**Prefer not to say/ Kāhore e whakahoki**	
8 – 11.8%	45 – 66.2%	3 – 4.4%	12 – 17.6%	
Commerce	**Health Sciences**	**Humanities**	**Science**	**Mixed**
1 < 1%	31 – 45.6%	23 – 33.8%	7 – 10.3%	6 – 8.8%

Age range: 18yrs – 48yrs; majority under 22yrs

Decolonising frame - questions

- In what ways can you see Aotearoa's colonial past at Otago?
- What forms of knowledge dominate your courses?
- Do your readings and course materials presume particular perspectives? Do you have a diverse range of authors?
- How central are issues of ethnicity, gender, equity, diversity and inclusion to the courses you study?
- Are you encouraged to think critically and develop awareness of different worldviews?
- Are you offered a variety of forms of assessment?
- How are **mana whenua values** and perspectives included in your courses?
- How are the articles of **Te Tiriti o Waitangi** represented at Otago?
- What sort of education should you be receiving?

(Charters et al., 2019; Dei, 2016)



not embedded in the courses, despite being important to many students

It should be compulsory to do cultural competency + language courses in your degree (especially professional programmes)

there's not enough!!

we get a few days a year dedicated it in a course... inadequate

these teachings should be incorporated into first year papers and made a part of the course from the get-go

Are you encouraged to think critically & develop awareness of different worldviews?

ahha no

limited teaching on tikanga and tapu (at least pre-clinical)

people are scared to say something offensive, which steers them away from critical thinking - we should be encouraged to try and learn from mistakes

Are you offered a variety of forms of assessment?

no - specials/make up exams are difficult

have to really go out of your way for different forms

neurodivergency - assuming you have an assessment (difficult in itslef) isn't always well accommodated

How are mana whenua values & perspectives included in your courses?

see previous - not included :(

some people don't even understand equitable entry pathway initiatives

How are the articles of Te Tiriti o Waitangi represented at Otago?

obscurely

there's a poster in the library somewhere?

frustrating - we expect tertiary education to include these basic things

What sort of education should you be receiving?

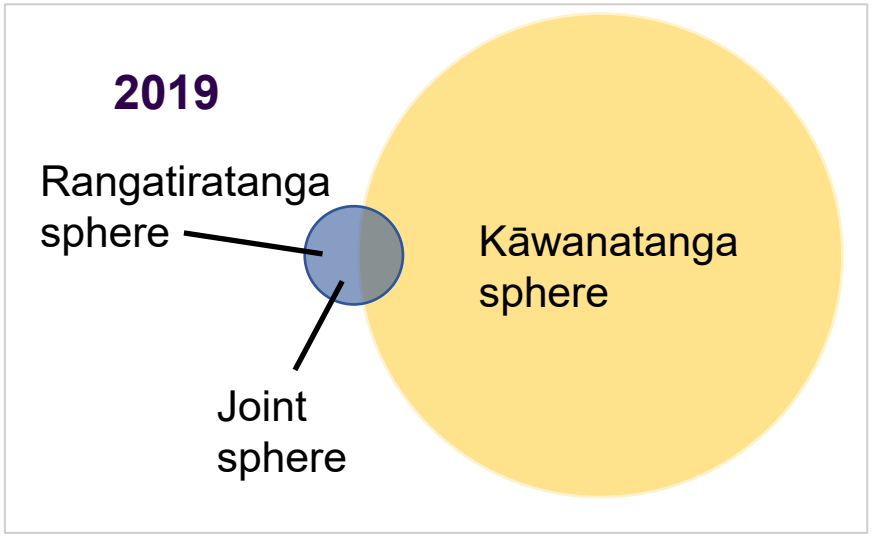
an accurate and not purely-Western perspective - stop toning down colonialism

non-biased and diverse

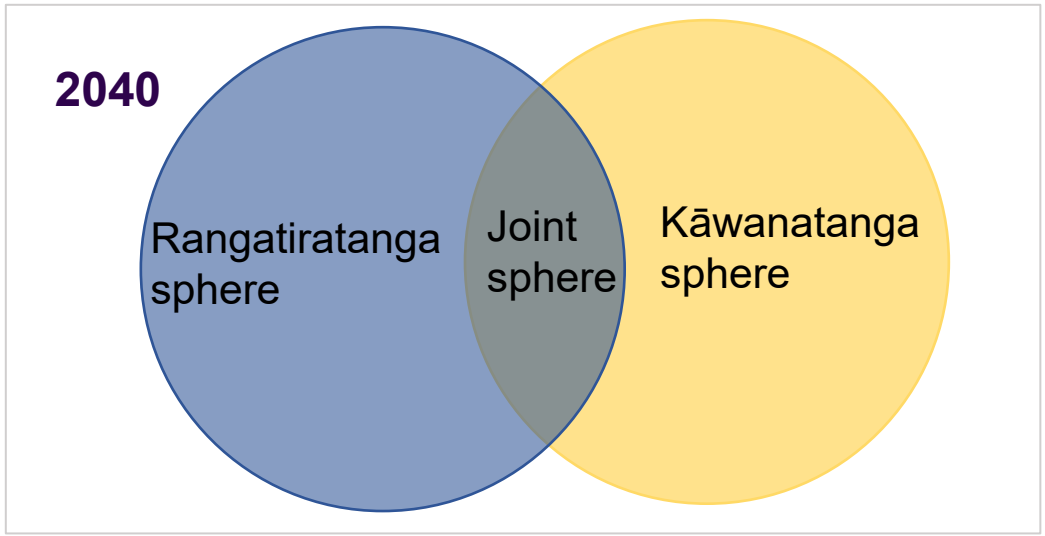
Analysis

- Data obtained from the wānaka was coded, identifying recurring patterns and themes.
- Te Tiriti o Waitangi framework.
- He Puapua – a break in the waves; embedded in TOW and UNDRIP.

The rakatirataka sphere reflects Māori governance over people and places.



The kāwanataka sphere represents Crown governance.



'Joint sphere' in which Māori and the Crown share governance over issues of mutual concern.

Te Tiriti o Waitangi

Article 1 Kāwanataka - Honourable Governance (flexible structures, fair representation, Māori, Pākehā, and diverse frames).

Article 2 Rakatirataka – Agency (strong mana whenua voice and presence, Te Reo, cultural narratives, clarity about Te Tiriti partnership roles).

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Article 4 Wairuataka – Spirituality and Wellbeing (strong Indigenous and and intersectional identities, validated and represented, global citizenship).

Te Tiriti o Waitangi

“You have the choice to learn but its not intwined in every paper that you take or every department, like you wouldn’t know that Te Tiriti o Waitangi is in place unless you were to go and ask."

"I think what would be cool is for every single department and paper and stuff, where they do actually have cultural competency courses that talk about Te Tiriti o Waitangi and Treaty of Waitangi their differences and what it actually meant for Māori, because a lot of people actually think that it was signed in peace."

Article 1. Kāwanataka
Honourable Governance

“Get rid of the Hauora Māori week, and just have real Māori 365 because still 90% of the course is non-Māori. It should be the whole thing.”

“Centres white perspectives as the default.”

“They do brush over it a lot and I was lucky that my teacher just chose to do the Treaty in my history classes in high school, but the level that they are teaching it at university is the same as what I got at high school, unless I am taking a Māori paper, its very washed over.”

Article 2. Rakatirataka
Agency

“You have the choice to learn but its not intwined in every paper that you take or every department, like you wouldn’t know that Te Tiriti o Waitangi is in place unless you were to go and ask."

“Mana whenua, I don’t know what that is?

“Honestly like everywhere, just looking at those old buildings and stuff, with the little museum things around Otago and that constant Eurocentric white male presence just in the beginnings of the University, just seeing that everywhere is a big one. ”

“Yeah, I think a big thing is like all of the roads and stuff were all built by Māori with no acknowledgment and things like that, like there is no acknowledgment of any of the work done by Māori to the city. ”

Article 3. Ōritetaka
Equity

“Lots of white men in teaching positions and in faculty, not a lot of representation.”

“Even just like lots of the courses on offer are very colonial, very old-fashioned and then like the few papers that are on offer are very small and not huge numbers of attendees and things.”

“And apparently there are some Māori and Pasifika people who purposely do not use that entitlement because they think that oh people might think I’m stupid or not meant to be a doctor even though they have every right to, you know.”

“There are diverse readings, but they are optional.”

“Last year for second year [course] we have this diversity part but that’s only a tiny part of the course but most of it is still so hetero.”

Article 4. Wairuataka

Spirituality and wellbeing

“I think a lot of my Pākehā friends are scared, like they’re scared to think critically in case they say something offensive, which I get it but its not the right way to go about it, it is way better to have open discussions and then say something and learn why its offensive.”

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“Western partying, sailor-lifestyle”

“99% of the times they aren’t I reckon, especially Kāi Tahu. The one time that they are in the convocation ceremony, they have a mihi at the start and they are like yeah!... 99% they are not!”

What tauira see

Theme	Number of Codes	Synthesis
Kāwanataka and colonisation	39	• Physical and structural environment • Insufficient representation of Māori in governance structure • Western forms of knowledge • Opportunities for critical thinking appears reliant on individual lecturers • Absence of mana whenua information • Students are not graduating with the University's graduate attributes.

What tauira want to see

Theme	Number of Codes	Synthesis
Rakatirataka and colonisation	25	• Tauira agency • Strong mana whenua presence and cultural narratives • Cultural competencies • Avoidance of difficult conversations • Anonymity encouraged • Academics modelling agency

What tauira are willing to do

Theme	Number of Codes	Synthesis
Ōritetaka and colonisation	45	• Recognition of strengths • Taking up opportunities to do things differently • Placing value on course that teach decolonisation • Tokenistic experiences • Minimal understanding of the articles of Te Tiriti o Waitangi and of partnership with Kāi Tahu • Treaty partnership selectively enacted

How tauira see themselves

Theme	Number of Codes	Synthesis
Wairuataka and colonisation	15	• Identity, wellbeing, validation intersectionality, language • Myths about the current generation about their 'open mindedness' • Western knowledge has the greatest validation • Broader perspectives are not always available

Moving forward

What is your response to these findings?

What ways forward can you suggest?

How do you feel about the findings from this CALT-funded project?

https://otago.au1.qualtrics.com/jfe/form/SV_af0b1Na98AHiQCi

How tauira feel

Theme	Number of Codes	Synthesis
Emotions and decolonisation	11	• Hopeful • Uplifted • Appreciative • Discomfort • Disappointed • Frustration • Sadness • Happy • Validated and valued • Excited

It's good that we have this study - which shows strong presence of colonisation that affects and harms Māori, Pasifika, LGBTQ+ and other groups. Need to have other advocacy and structures which dismantles these discriminatory structures!

Dilemmas and Possibilities

How to enact cultural capabilities, cultural safety and cultural competency?

Should we have mandatory staff courses?

Decolonise or Indigenise?

Re-Māorification – “the promise of a created space where we, as the indigenous people, could determine the space, the content, the practice, according to our own autonomy and independence” (Cairns, 2020).

What have we learned?

- Tauira hope for place-based, problem-based, future-focused learning and global citizenship.
- Respond to tauira and staff perceptions as a starting point for developing cultural capabilities – have the difficult discussions.
- Racial assumptions, stereotypes, discrimination, bias, tokenism, class, sexuality, gender, white privilege.
- Diversify our understanding of who is an educator at Te Whare Wānaka o Ōtākou.

Ka nui kā mihi to…

Tauira o Te Whare Wānaka o Ōtākou

Committee for the Advancement of Learning and Teaching (CALT)

Karakia - closing

Kia mau i tō tātou hinekaro
kā whakaaro
kā wā katoa

Hold in our minds
positive thoughts
at all times

References

Cairns, P. (2020, February 10). Decolonise of indigenise: Moving towards sovereign spaces and the Māorification of New Zealand museology. https://blog.tepapa.govt.nz/2020/02/10/decolonise-or-indigenise-moving-towards-sovereign-spaces-and-the-maorification-of-new-zealand-museology/

Charters, C., Kingdon-Bebb, Olsen, T., Ormsby, W.,Owen, E., Pryor, J., Ruru, J., Solomon, N, & Williams, G. (2019). *Te Puapua: Report of the working group on a plan to realise the UN Declaration on the Rights of Indigenous Peoples in Aotearoa/New Zealand.* Retrieved from https://www.tpk.govt.nz/docs/undrip/tpk-undrip-he-puapua.pdf

Dei, G. (2016). Decolonizing the university: The challenges and possibilities of Inclusive Education. Socialist Studies, 11(1), 23-61. https://doi.org/10.18740/S4WW31

Conversations towards decolonising assessment within NZCER's Strategic Priorities

NZCER
Rangahau Mātauranga o Aotearoa

Dr Rachel Martin
Dr Kim Brown

Karakia - tīmataka

Tukua te wairua kia rere ki kā taumata
Hai ārahi i ā tātou mahi
Me tā tātou whai i kā tikaka a rātou mā
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Outline

Part 1 Kāwanataka - Te Tiriti o Waitangi

Part 2 UNDRIP

Part 3 Assessment

Part 4 Our research and examples

Te Tiriti o Waitangi

Article 1 Kāwanataka - Honourable Governance (flexible structures, fair representation, Māori, Pākehā, and diverse frames).

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Article 4 Wairuataka – Spirituality and Wellbeing (strong Indigenous and intersectional identities, validated and represented, global citizenship).

Critical Tiriti Analysis (CTA)

Critical review of Cabinet Office circular 2019.

Indicator 1 (preamble)	Elements showing that Te Tiriti is central and Māori are equal or lead parties in the policy.
Indicator 2 (A1)	Mechanisms to ensure equitable Māori participation and/or leadership in setting priorities, resourcing, implementing and evaluating the policy.
Indicator 3 (A2)	Evidence of Māori values influencing and holding authority in the policy processes.
Indicator 4 (A3)	Evidence of Māori exercising their citizenship as Māori in the policy.
Indicator 5 (A4)	Acknowledgement of the importance of wairua, rongoa and wellness in the policy.

O' Sullivan et al. (2021)

Critical Tiriti Analysis (CTA)

Indicator 1 (Māori are equal or lead parties in policy)	
Indicator 2 Kāwanataka/Honourable Governance	
Indicator 3 Rakatirataka/Agency	
Indicator 4 Ōritetaka/Equity	
Indicator 5 Wairuataka/Spirituality and Wellbeing	

What does commitment to and honouring TOW look, sound and feel like at NZCER?

Table 2. Critical Tiriti analysis (CTA) determination against indicators.

Indicators	Poor	Uncertain	Fair	Good	Excellent
1. Māori lead policy development	X				
2. Equitable Māori participation/leadership	X				
3. Evidence of inclusion of Māori epistemologies, approaches and authority	X				
4. Māori exercising their citizenship			X		
5. Acknowledgement of wairuatanga	X				

(Came et al., 2020, p. 447).

Critical Tiriti Analysis (CTA)

Indicator 1 (Māori are equal or lead parties in policy)	Silent – Poor – Fair – Good - Excellent
Indicator 2 Kāwanataka	Silent – Poor – Fair – Good - Excellent
Indicator 3 Rakatirataka	Silent – Poor – Fair – Good - Excellent
Indicator 4 Ōritetaka	Silent – Poor – Fair – Good - Excellent
Indicator 5 Wairuataka	Silent – Poor – Fair – Good - Excellent

What does commitment to and honouring TOW look, sound and feel like in your Strategic Plan?

https://otago.au1.qualtrics.com/jfe/form/SV_1RMf8P0TciimOYS

Te Tiriti o Waitangi – Te Mahere Rautaki a Rangahau Mātauranga o Aotearoa 2021-2025

- “Ongoing **power-sharing** relationships between tangata whenua and all others who would come in later years”.
- **Honourable** relationships.
- Best possible **care**.
- Address injustices caused by **colonisation**.
- Future **honours** TOW.
- Equitable outcomes for **Māori as Māori**.
- Value the importance of Māori **language**, **culture**, and **identity** in all practices.

United Nations Declaration on the Rights of Indigenous Peoples and TOW

13. Their languages, stories and names.
14. Education, including in their own language.
15. The dignity and diversity of their culture.
16. Their own media and equal access to all other media.
17. Protection in employment.
18. Participation in decisions that affect them.
19. Good faith consultation on laws and policies that affect them.
20. Their own political, social and economic institutions and activities.
21. Improvement of their economic and social conditions.
22. Particular attention to the needs of elders, women, youth, children and disabled people.
23. Development.
24. Health, and to their traditional medicinal resources and health practices.
25. Their spiritual relationship with their lands and resources.

https://www.tpk.govt.nz/en/a-matou-whakaarotau/te-ao-maori/un-declaration-on-the-rights-of-indigenous-peoples/resources-and-publications

UNDRIP and TOW

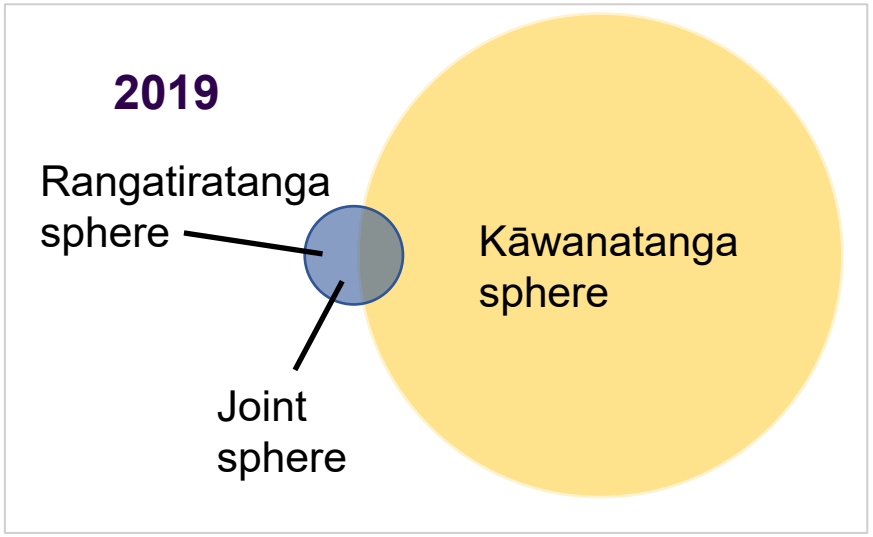
1. Rangatiratanga
2. Participation in kāwanatanga Karauna
3. Lands, Territories and Resources
4. Culture
5. Equity

https://www.tpk.govt.nz/en/mo-te-puni-kokiri/corporate-documents/cabinet-papers/all-cabinet-papers/develop-plan-on-nz-progress-un

Ongoing power-sharing relationships

- Te Tiriti o Waitangi framework.
- He Puapua – a break in the waves; embedded in TOW and UNDRIP.
- Charters et al 2019

The rakatirataka sphere reflects Māori governance over people and places.



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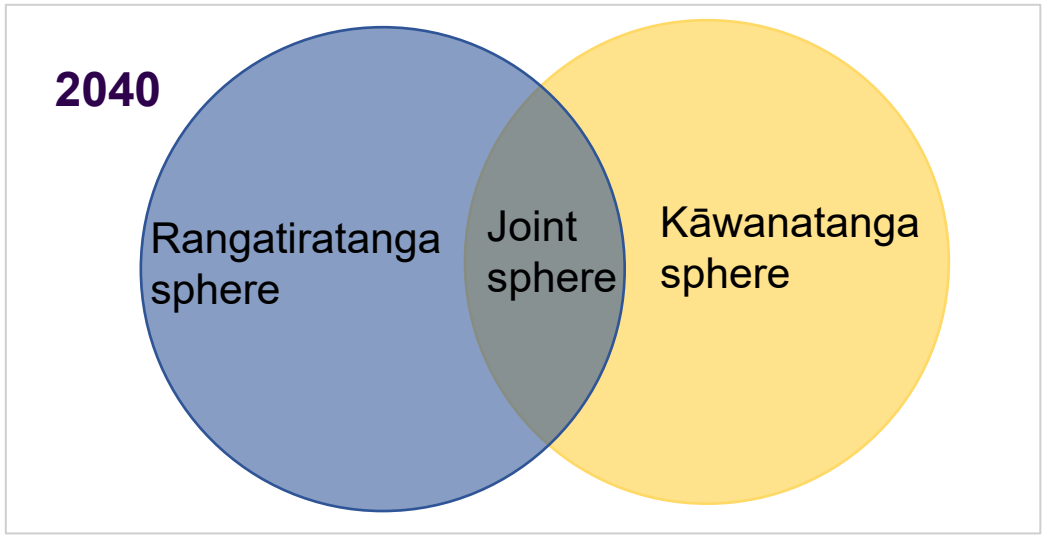

'Joint sphere' in which Māori and the Crown share governance over issues of mutual concern.

Strategic Priorities and assessment

- How do your strategic priorities lead your work on assessment?

Decolonising education	
Upholding mana Māori, whakamana Māori	
Improving equity for ākonga and equity in education	
Influencing the future of education	

Defining aromatawai/assessment

Aromatawai	Outcomes	Assessment	Outcomes
Mana ōrite- power sharing	Engage in teaching and learning pedagogy suitable for Māori	Guides Govt assessment and PD goals	Educational disparity
Underpinned by Māori values , beliefs and aspirations	Ako and Tairongo happens naturally and captures a wide range of evidence	Requires an understanding of educ assessment, knowledge, skills and dispositions	Predominantly reinforces Pākehā values
Contextualised, authentic, student-centred teaching and learning, captures potential and talent and informs planning	Values teachers' intuition. Legitimised if have strong kaiako/ākonga relationships captures targeted assistance	Teaching in cycles of improvement	Need assessment capability - examine own values, beliefs and thinking critically
Assessment is focused on teacher inclinations and dispositions,	Acute observation, listening and communication skills with, by and for ākonga	Needs to be responsive to local knowledge, tikanga, aspirations, draw from and sustain cultural identity	Eurocentric ways of understanding, knowing and doing
Holistic wellbeing is part of assessment practices tamaiti, whānau, hapū and community voice	How well is the school supporting community aspirations	Communicate Learning journeys	Need partnership with ākonga Māori and their whānau

Aromatawai

Dream, strive, achieve (Aromatawai, n.d, pp. 203-204).

Aromatawai and reporting guidance for kura and Māori-medium settings.
https://assessment.tki.org.nz/Assessment-tools-resources/Aromatawai

NZCER Strategy 2021-2025 (p. 6).

- Educational inequities
- Is it responsive to local knowledge, tikaka and aspirations
- Cultural identity of ākonga Māori
- Curriculum refresh goals

Assessment

What is the history of NZCER assessment?

NZCER strongly encourage teachers to critically engage with multiple sources of assessment data and provide all students with opportunities to build on their languages, cultures, and identities as strengths; and by doing so reach their full potential as learners of mathematics.

Transforming assessment is complex and requires a journey of change. Through embarking on its current equity-focused refresh, NZCER has made some important improvements to PAT: Mathematics. However, the journey is ongoing and NZCER are continuing to explore ways to transform standardised mathematics assessments.

This project has been generously supported by the Williams Family Trust, and we extend our heartfelt thanks to them for committing to such important mahi.

https://www.nzcer.org.nz/tests/pat-mathematics

Assessment

Decolonising education

What's different?

Each PAT assessment has been refreshed in one or more of the following ways:

- Contexts have been updated so that a wider range of learners see themselves and their cultural and social worlds reflected in the assessments.
- Home and community settings have been prioritised over school-based contexts.[4]
- Where possible, principles and values such as mahi tahi (working together), kaitiakitanga (guardianship) and manaakitanga (kindness, generosity) are represented within items.
- Graphics have been updated so that images are more realistic and relatable. For example, people from a range of cultures are depicted and people with different body sizes and physical abilities are represented.
- Wording has been simplified.

NZCER has also updated the look-and-feel of the online tests and refreshed the images used in the computer adaptive version of the test.

Decolonise, Indigenise or re-Māorification?

Is decolonisation of education enough?

How do we enact cultural capabilities, cultural safety and cultural competency?

Decolonise or Indigenise?

Re-Māorification – “the promise of a created space where we, as the indigenous people, could determine the space, the content, the practice, according to our own autonomy and independence” (Cairns, 2020).

Moana Jackson in conversation with Te Papa Tongarewa.

Practices for equity and wellbeing in assessment

Noticing practices and assessment for wellbeing

- Intentional noticing – set goals for what you want to notice; identify set times in routines to give attention.

Why noticing?

- We become habituated to the sameness of our classroom experiences as teachers, so tend to only notice those things that stand out from the background ‘hum’ of daily practice.
- Noticing is intentionally tuning into your emotional state, and internal response to a situation or interaction including your physical response.
- Mason (2001) suggests that to benefit from the reflection one must ‘mark’ the event, the feeling and the response.

Article 3. Ōritetaka
Equity

“Lots of white men in teaching positions and in faculty, not a lot of representation.”

“Even just like lots of the courses on offer are very colonial, very old-fashioned and then like the few papers that are on offer are very small and not huge numbers of attendees and things.”

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Ka nui kā mihi NZCER

What have you achieved?
Where to next?

References

Cairns, P. (2020, February 10). *Decolonise of indigenise: Moving towards sovereign spaces and the Māorification of New Zealand museology.* https://blog.tepapa.govt.nz/2020/02/10/decolonise-or-indigenise-moving-towards-sovereign-spaces-and-the-maorification-of-new-zealand-museology/

Came, H., O'Sullivan, D., & McCreanor, T. (2020). Introducing critical Treaty policy analysis through a retrospective review of the New Zealand Primary Health Care Strategy. *Ethnicities, 20*(3), 434-456. doi:10.1177/1468796819896466

Charters, C., Kingdon-bebb, K., Olsen, T., Ormsby, W., Owen, E., Pryor, J., Ruru, J., Solomon, N., & Williams, G. (2019). *He Puapua: Report of the working group on a plan to realise the Un Declaration on the Rights of Indigenous Peoples in Aotearoa/New Zealand.* Retrieved from https://www.tpk.govt.nz/docs/undrip/tpk-undrip-he-puapua.pdf

Kerr, B., & Averill, R. (2023). Arotakehia te rerenga - Assessment as a powerful instrument of navigation: Knowing how well we are doing. In P. Te Maro & R. Averill (Eds.) *Ki te hoe! Education for Aotearoa*. NZCER.

Mason, J. (2001). *Researching your own practice: The disciple of noticing*. Routlege.

Ministry of Education (n.d). Aromatawai and reporting guidance for Kura and Māori-medium settings. Retrieved from https://assessment.tki.org.nz/Assessment-tools-resources/Aromatawai

O'Sullivan, D., Came, H., McCreanor, T., & Kidd, J. (2021). A critical review of the Cabinet Circular on Te Tiriti o Waitangi and the Treaty of Waitangi advice to ministers. *Ethnicities, 21*(6), 1093-1112. doi:10.1177/1468796821104790 2

Karakia - closing

Kia mau i tō tātou hinekaro
kā whakaaro
kā wā katoa

Hold in our minds
positive thoughts
at all times

Final Report: University Teaching Development Grant

1. Snapshot of the project

This study aimed to explore the experiences of pre-registration nursing and physiotherapy students about the efficacy of an educational escape room (EER) as a gamified learning environment for teaching clinical handover. Students acknowledged that the EER was clinically relevant and transferrable to a real-world clinical environment. They enjoyed the novelty of using gamification as an engaging, social learning experience. Team composition facilitated or created barriers for learning. The EER structure had unintended negative consequences for learning. The timed aspect of the EER facilitated competitiveness resulting in students prioritising winning over learning. While an EER is an innovative and engaging approach to teaching, we recommend proceeding with caution. Learning is likely to be enhanced if key concepts are taught prior to EER implementation. We suggest using an EER as novel approach to consolidate and evaluate learning. Allowing students to choose their team members provides a safe learning environment.

2. Full Report

a. ***Title***

The efficacy of an educational escape room (EER) to teach clinical handover: pre-registration health professional students' perspectives.

Project Team

Dr Allyson Calder, Dr Amanda Wilkinson, Dr Ewan Kennedy, Dr Chris Moir, Sheree Tikao-Harkess

b. Snapshot of the project

This study aimed to explore the experiences of pre-registration nursing and physiotherapy students about the efficacy of an educational escape room (EER) as a gamified learning environment for teaching clinical handover. Students acknowledged that the EER was clinically relevant and transferrable to a real-world clinical environment. They enjoyed the novelty of using gamification as an engaging, social learning experience. Team composition facilitated or created barriers for learning. The EER structure had unintended negative consequences for learning. The timed aspect of the EER facilitated competitiveness resulting in students prioritising winning over learning. While an EER is an innovative and engaging approach to teaching, we recommend proceeding with caution. Learning is likely to be enhanced if key concepts are taught prior to EER implementation. We suggest using an EER as novel approach to consolidate and evaluate learning. Allowing students to choose their team members provides a safe learning environment.

c. Introduction

Health professionals in New Zealand (NZ) are bound by legislation making them accountable for patient safety.[1] A crucial aspect of patient safety is clinical handover, which is often poorly executed particularly in pre-registration health professional students.[2] Clinical handovers with missing information, irrelevancies, that are poorly sequenced can jeopardise patient safety.[2] Further, poor handovers can compromise trust, which is core to practicing clinicians and their patients.[3] Research suggests teaching clinical handover using a standardized, structured communication tool which is taught via simulation is more effective for building student confidence and knowledge translation into the clinical environment than didactic approaches.[4, 5]

Escape rooms are a novel and engaging simulation approach for teaching in health professional education.[6] Educational escape rooms (EER) are team-based games where players work collaboratively to solve a series of puzzles within a specified time limit to complete a mission and escape the room.[6-12] Learning is enhanced and strengthened through active participation, collaboration, communication, competition, and critical thinking.[6, 9-15]

The use of EER's is becoming more prevalent in higher education.[11] An EER is relevant to Māori students because Māori pedagogy by large, reflect cooperative, collaborative and inclusive approaches for learning and prioritises relationships that are built on trust, respect and reciprocity.[16, 17] While there is a growing body of EER research undertaken in pre-registration health professional groups, to the best of our knowledge, there is none in Aotearoa, NZ. Therefore, this study aimed to explore the experiences of pre-registration nursing and physiotherapy students about the efficacy of an EER as a gamified learning environment for teaching clinical handover. The objectives were to: 1) evaluate the student's experience of the EER and 2) explore students views about: a) the impact of the EER on their learning of clinical hand-over; b) how acquired learning experiences translate into clinical practice; c) the usability and the user experience of the EER game features and suggestions for improvement; and d) the cultural relevance of the EER specifically for Māori students.

d. Methods

The study used a pragmatic mixed method explanatory sequential methodological approach.[18]

Educational escape room intervention: We created an EER to teach a standardised universal communication framework for clinical handover (Identity/Introduction, Situation, Background, Assessment, Recommendations (ISBAR)), endorsed by the World Health Organisation,[2] and utilised in many NZ District Health Boards (DHBs). We used the "four room" framework described by Ferrer-Sargues et al to plan and implement the EER.[13]

1. Pre-game room: The Game Master (teacher) welcomes the students (players), introduces the EER, describes the goal, and explains the rules of engagement. Values of respect, trust and collaboration are emphasised to create a safe environment for learning.
2. Game room: The EER is a sequential design where each puzzle must be solved to unlock the next until "escape" is achieved. The puzzles increased in complexity, which scaffolds the players learning.[12] Our EER had six puzzles that must be completed in 90 minutes. The players were randomly allocated to a group of four players. All groups play simultaneously, thus creating friendly competition.
3. Monitoring room: Whilst in the Game Room, the role of the Game Master was to provide encouragement, verify answers, and scaffold the learning if requested by the players or if significant frustration was observed.[10, 12]
4. Debrief room: Once all teams had escaped, the Game Master facilitated players' reflections about their learning, skills, attitudes, and future actions for successful implementation in real-world contexts.

Participants and recruitment: We recruited physiotherapy and nursing students based at the Christchurch University of Otago campus. As part of the usual curriculum, the EER was delivered to all students. Each health professional programme implemented the EER independently due to logistical challenges with timetables. All students who completed the EER were eligible to participate in this study.

Data collection: Data were collected in two strands (quantitative followed by qualitative). Following participation in the EER, the consented participants engaged in the quantitative strand, where they completed an anonymous e-survey administered via Qualtrics. The e-survey included demographic information and the GAMEFULQUEST questionnaire to evaluate their satisfaction across seven domains (guidance, challenge, social experiences, accomplishment, competition, immersion, and playfulness) of the game experience.[14] Participants who completed the EER and had experienced at least one subsequent clinical placement were then invited to participate in a focus group (the qualitative strand). The focus group discussions centred around the EER learning, translation into practice, game features, suggestions for improvement, and cultural relevance. Focus groups were audio-recorded and transcribed verbatim by a paid transcriber.

Data analysis: Quantitative data were analysed descriptively, and qualitative data were analysed using the General Inductive Approach.[19] Trustworthiness of the qualitative strand was enhanced through researcher reflexivity and methodological triangulation. We analysed each programmes data separately which reflected the notion that the study was not an interprofessional EER. Inferences were drawn from each strand from both programmes to create meta-inferences (i.e., mixing of the methods).

e. *Key findings, outputs, or outcomes*

The e-survey was completed by 38 students (21-46 years; median 22 years) which represented 54% of the total number of students who participated in the EER. These students identified ethnoculturally as NZ European (n=30), Māori (n=4), Chinese (n=3), Indian (n=1), and other (n=5). The majority indicated they enjoyed playing games (79%), 42% had prior experience of completing an escape room, however only one student had participated in an EER previously.

A total of 48 students aged between 20-50 years (median 22 years) participated in the focus groups (n=8) representing 68% of the total number of students who completed the EER and at least one subsequent clinical placement. Most of the students identified as NZ European (n=24), followed by Māori (n=7), Chinese (n=3), Indian (n=3) and other (n=12). The majority of students agreed or strongly agreed to enjoying playing games (73%).

The students reported several factors of the EER which impacted on their learning. Overall, our data did not show differences in learning between Māori and non-Māori students. Many of students acknowledged that the EER content was clinically relevant. The loud, busy, and sometimes chaotic nature of the EER represented a real-world clinical environment. They enjoyed the novelty of using gamification for learning and they found most of the puzzle's fun and engaging. The quantitative data supported this finding where 60% of the students indicated that the EER grabbed their attention and gave them a feeling of time passing quickly. The EER appealed to two thirds of the student's curiosity and were keen to "know what came next".

Team relationships had positive and negative impacts for learning. E-survey findings reported that 75% of students felt the EER provided a positive social experience where they gained a sense of social support by learning alongside their peers. However, some students reported that the randomisation of students to make up the groups created a barrier to learning. The students would have preferred to choose who they wanted to work with because they felt it created a safe space for learning. However, a few students acknowledged that being in a group where you did not know the team members, more

accurately reflected the nature of healthcare teams in the real-world. Learning preferences also influenced team relationships and learning. For example, students who were quiet reflectors were challenged and pushed out of their comfort zone by the timed aspect of the EER, leaving them feeling lost and unable to contribute equitably. Groups without leaders or defined roles became disorganised and unstructured in their approach to problem solving which impacted on student learning.

The EER structure had unintended outcomes which created "lost learning". The students appeared unsure if they had accomplished learning about ISBAR where the e-survey illustrated that half of the students neither agreed nor disagreed with all statements within the "accomplishment" domain. The primary reason for this ambivalence towards learning was revealed in the focus group discussions. The timed aspect of the EER created competitiveness and cheating. The high value placed on the competition resulted in the students prioritising winning, meaning learning was potentially lost. The competitive nature of the EER culminated in frustration for some students because the puzzles at the end became increasingly difficult and they lost interest, further compromising learning.

f. Discussion and implications

An EER is an innovative and engaging approach for teaching clinical handover skills. While students acknowledged the EER simulated a real-world clinical environment, we recommend proceeding with caution. Learning is likely to be enhanced if key concepts are taught prior to EER implementation. We suggest using an EER as a novel approach to consolidate and evaluate learning. In addition, we recommend that educators consider how the EER teams are established. Students in our study preferred to choose their own team members (over random allocation) which created a safe learning environment.

3. Other outputs

Modification of the EER is planned according to the participants recommendations. The modified EER will be trialled in teaching practice and re-evaluated in 2024. We have a publication underway which is planned for submission to a peer reviewed journal in the coming months.

4. Summary of Spending

See attached report.

5. References

1. Health Practitioners Competence Assurance Act 2003, (2020).
2. Burgess A, van Diggele C, Roberts C, Mellis C. Teaching clinical handover with ISBAR. BMC Medical Education. 2020;20(459). doi:10.1186/s12909-020-02285-0
3. Lundh P, Palmgren P, Stenfors T. Perceptions about trust: a phenomenologic study of clinical supervisors in occupational therapy. BMC Medical Education. 2019;19(404). doi:10.1186/s12909-019-1850-1
4. Desmedt M, Ulenaers D, Grosemans J, Hellings J, Bergs J. Clinical handover and handoff in healthcare: a systematic review of systematic reviews. International Journal for Quality in Health Care. 2021;33(1). doi:10.1093/intqhc/mzaa170
5. Malone L, Anderson J, Manning J. Student participation in clinical handover - an integrative review. Journal of Clinical Nursing. 2016;25:575-82. doi:10.1111/jocn.13081
6. Guckian J, Eveson L, May H. The great escape? The rise of the escape room in medical education. Future Healthcare Journal. 2020;7(2):112-5. doi:10.7861/fhj.2020-0032
7. Anderson M, Lioce L, Robertson J, Lopreiato J, Diaz D. Toward defining healthcare simulation escape rooms. Simulation & Gaming. 2021;52(1):7-17. doi:10.1177/1046878120958745
8. Dittman J, Amendola M, Ramraj R, Haynes S, Lange P. The COMET framework: a novel approach to design an escape room workshop for interprofessional objectives. Journal of Interprofessional Care. 2021. doi:10.1080/13561820.2020.1870442
9. Makri A, Vlachopoulos D, Martina R. Digital escape rooms as innovative pedagogical tools in education: a systematic literature review. Sustainability. 2021;13(4587). doi:10.3390/su13084587
10. Moore L, Campbell N. Effectiveness of an escape room for undergraduate interprofessional learning: a mixed methods single group pre-post evaluation. BMC Medical Education. 2021;21(220). doi:10.1186/s12909-021-02666-z
11. Morrell B, Eukel H, Santurri L. Soft skills and implications for future professional practice: qualitative findings of a nursing escape room. Nurse Education Today. 2020;93. doi:10.1016/j.nedt.2020.104462
12. Veldkamp A, van de Grint L, Knippels M, van Joolingen W. Escape education: a systematic review on escape rooms in education. Educational Research Review. 2020;31(100364). doi:10.1016/j.edurev.2020.100364
13. Ferrer-Sargues F, Kot Baixauli P, Carmenate-Fernández M, Rodríguez-Salvador G, González Domínguez J, Martínez-Olmos F, et al. Escape-cardio: gamification in cardiovascular physiotherapy. An observational study. Nurse Education Today. 2021;106. doi:10.1016/j.nedt.2021.105062
14. Hogberg J, Hamari J, Wastlund E. Gameful experience questionnaire (GAMEFULQUEST): an instrument for measuring the perceived gamfulness of system use. User Modeling and User-Adapted Interaction. 2019;29:619-60. doi:10.1007/s11257-019-09223-w
15. Molina-Torres G, Rodriguez-Arrastia M, Alarcon R, Sanchez-Labraca N, Sanchez-Joya M, Roman P, et al. Game-based learning outcomes among physiotherapy students: comparative study. JMIR Serious Games. 2021;9(1). doi:10.2196/26007
16. Stucki P. A Māori pedagogy: weaving the strands together. Kairaranga. 2012;13(1):7-15.
17. Waiari D, Lim W, Thomson-Baker A, Freestone M, Thompson S, Manuela S, et al. Stoking the fires for Māori and Pacific student success in psychology. Higher Education Research & Development. 2021;40(1):117-31. doi:10.1080/07294360.2020.1852186
18. Creswell J, Plano-Clark V. Designing and conducting mixed methods research. 3rd ed. Thousand Oaks: SAGE; 2018.
19. Thomas D. A general inductive approach for analyzing qualitative evaluation data. American Journal of Evaluation. 2006;27(2):237-46. doi:10.1177/1098214005283748

CALT 2022 Final Report

1. Snapshot of the Project

Title of the project: Targeted Online Writing Support for At-Risk University of Otago Students

Project team: Dr Michael Cop

Departmental affiliation: English and Linguistics

Snapshot of the project: Each year at the University of Otago, Health Sciences First Year students sit the English Diagnostic Test. Around 25% of those students annually fail the initial sitting and need support before they write their second-chance test. One reason for failing is not knowing academic stylistic conventions (such as APA, Chicago, MLA, or Vancouver). This project aimed to create short videos (3-8 minutes each) teaching students how to avoid those common stylistic errors. The project also aimed to produce banks of multi-choice questions where students can practice the stylistic competencies.

2. Report

Title of the project: Targeted Online Writing Support for At-Risk University of Otago Students

Introduction

Around 1400 Health Sciences First Year (HSFY) University of Otago students sit an English Diagnostic Test (EDT). Of these students, 25% usually fail the initial sitting (T1) and need support before they write their second-chance test (T2; see Table 1). While students fail the EDT for a variety of reasons, our research shows mechanical errors to be one of the main culprits. For example, for the Reading Comprehension section of the EDT, 56% of all responses (and responses are largely single sentences) have a mechanical error; 19% of all sentences are sentence fragments (Cop and Hatfield 2016 and 2017). These error rates reflect the work of students who are aware that their *language* is being tested. That is, our students seem to be demonstrating genuine linguistic deficiencies.

Table 1: HSFY Students Who Sit and Who Fail the EDT

Year	Total Students Sat T1	Total Students Failed T1
2016	1509	337
2017	1413	311
2018	1495	378
2019	1477	377
2020	1298	368
2021	1377	383
Average	**1428**	**359**

Our data tell us that students commonly commit 24 types of mechanical errors that academic style guides (such as APA, Chicago, MLA, or Vancouver) frown upon: one main type of subject-verb agreement error (subjects followed by a prepositional phrase); pronoun and antecedent matching; colon errors for introducing lists; two types of capital letter errors (proper nouns and initial capitals); two types of apostrophe errors (possession and contraction); three commonly confused homonyms (its/it's; affect/effect; their/they're/there); five types of errors with commas (commas with coordinating conjunctions, comma splices, commas with appositives, commas with subordinate clauses, and commas with interjections or direct speech); and nine types of sentence construction errors (fused sentences, infinitive phrases only, subordinate clauses only, participles only, dangling participles, prepositional phrases only, bare noun phrases, missing subjects, and list parallelism) (Cop and Hatfield 2016).

The students who fail T1 need support to meet the demands of the academic discourse community—not only for T2, but for an overall positive student experience. Our most recent data show that 20% of students who failed T1 in 2020 were either on conditional enrolment or had an academic warning in 2021. Our research also shows that students who make mechanical errors of any type tend achieve more poorly across their HSFY papers than do student who do not commit such errors; they also tend to have a significantly lower admittance rate into the health professional programmes (Cop and Hatfield 2016 and 2017). While we cannot say with certainty that language is preventing these students from succeeding, plenty of research suggests that students can be marked or viewed less favorably when their writing or speaking deviates from expected usage though colloquialisms, second language patterns, or ungrammatical usage (for examples, see Connors and Lunsford 1988, Santos 1988, Lunsford and Lunsford 2008, Roberts and Cimasko 2008, Lippi-Green 2012, Johnson and VanBrackle 2012). Moreover, 81% (n=260) of the students who failed T1 in 2020 identified English as their first language. That is, this problem is not limited to our second language students.

This project builds laterally off our 2021 CALT grant that looked at how medium (in-person on paper testing versus remote on computer testing) affects our students' performance. While our foci there were volume and novelty of production, that project also showed that the general trend of mechanical errors persists. The resources that this project created aimed to be targeted at Otago students specifically, to be hosted locally, and to be browser agnostic.

Methods

As we were already aware of the types of errors that University of Otago students make, this project largely entailed making the mini lecture videos for each of the 24 different types of errors and gathering sufficiently different examples of those errors from past EDTs to use in the online practice quizzes. Some of the errors were grouped together for ease of teaching and presentation.

Using PowerPoint videos and recordings, Dr Cop made the series of videos, converting them to MP4s. The videos were then uploaded to xOtago on the HEDC webpage by RAs with the assistance of Dr Russell Butson at HEDC.

So that our practice quizzes reflected real student production errors, this project frequently took examples from extant tests (2014-2021). Because so many students are writing on the same topics and often using the same phrasing, these examples were in no way be identifiable as any one student's work. This paradigm also meant that some examples needed to be created to have sufficient diversity in the quizzes. The RAs collected and digitized the examples for the 24 different types of errors, organizing them into multi-choice and fill-in-the-blank quizzes.

Key Outcomes

In total, 21 videos were created and are now hosted on xOtago, ready for the 2023 HSFY cohort. This year, 25.1% of students failed T1; they have been automatically added to xOtago, allowing them to access the support videos and quizzes. At the time of writing this report, the students have not yet received their results. When they do, we will be able to see through the analytics on xOtago if the students use this support and on which exercises or videos they spend their time. Moreover, we added a student feedback section where students can input freely their experience using the videos and quizzes, and we can modify appropriately moving forward.

Implications

While the implications of this project cannot be fully known until we see the student uptake in the analytics, the project aimed to respond to six Guideline Statements from the 2020 Cycle 6 Academic Audit and two imperatives from the Strategic Direction 2020:

Guideline Statements

GS 1 Planning and reporting: The university gathers and uses appropriate and valid data and information to establish objectives, plan, assess progress and make improvements in its teaching and learning activities.

- As the video modules are based on errors that *Otago* students make, this project took a data-driven approach to helping Otago students.

GS 3 Teaching and learning environments: Teaching and learning activities are supported by appropriate learning environments (infrastructure, spaces, media, facilities and resources).

- As HSFY students are often on demanding schedules, this project allows students to access materials in their own time.

GS 5 Academic risk management: Potential disruption to the quality and continuity of learning and teaching at the university, including risks to infrastructure, is mitigated through effective risk management processes.

- As COVID disruptions are likely here to stay, this project allows for short and targeted support for our students, provides students access to help in their own time, and does not require students to be on campus.
- Further, as budget cuts continue, this project should lessen the effects of dwindling in-person support.

GS 6 Progress on the Enhancement Theme (Māori students): The university has achieved the objectives in its enhancement theme plan with respect to Māori students and successful practice has been embedded and is sustainable.

- Our data show that Māori students in the HSFY cohort represent a similar percentage to that of the overall University community and therefore will be supported through this initiative.

GS 7 Progress on the Enhancement Theme (Pasifika students): The university has achieved the objectives in its enhancement theme plan with respect to Pasifika students and successful practice has been embedded and is sustainable.

- Similarly, our data show that Pasifika students in the HSFY cohort represent a similar percentage to that of the overall University community and therefore will also be supported through this initiative.

GS 12 Learning support: Students have timely and equitable access to appropriate learning support services.

- As this project is online, students can access the resources at any time, and all students have equal access.

Strategic Direction Imperatives

Imperative of "Excellence in Teaching": "We have focused on raising the calibre of our commencing student cohort, increasing expectations in respect of student academic performance, and recruiting a higher proportion of postgraduate students" (6).

- This project aims to support Otago's largest annual first-year cohort (HSFY) at their point-of-entry and therefore setting them a much firmer foundation in language ability to enable their success during their time at Otago.

Imperative of "Sustaining Capability": "In order to sustain capability universities must, therefore, maintain a long-term view even when challenged by short- or medium-term instability" (11).

- This project has a long-term view for both the University and for its students: it allows the University to have a resource in place during times of instability.

COMMITTEE FOR THE ADVANCEMENT OF LEARNING AND TEACHING

FINAL REPORT ON GRANT

As at 31 March 2023

Name: Linda Gulliver

Department: Otago Medical School

Date: 31/3/23

1. Snapshot of the Project

Title of Project: An enquiry into learning environments during lockdown for the COVID-19 pandemic and their effects on medical student learning.

Project Team Lead: Linda Gulliver, Otago Medical School.

Snapshot

This project aimed to establish if medical students' lockdown learning environments during the COVID-19 pandemic impacted student learning through effects on motivation, engagement and memory, and whether such effects were disproportionately experienced by students in environments where socio-economic, cultural or other influences potentially disadvantaged them. We conducted two online Qualtrics™ surveys across Otago Medical School's three campuses, asking students to reflect on their experiences of their learning and their learning environments during 2020 and 2021 periods of COVID-19 lockdown. Focus groups captured in-depth information. Results show that both the learning environment and the way learning is received have tangible effects on medical student learning during pandemics. A follow-up study targeting the experiences of students with disabilities, approximately half of whom reported their lockdown learning environment exacerbated their disability, is underway. Preliminary results were presented at AMEE [Lyon, France] and in the 'Lessons Learned' symposium at Otago University in 2022.

Project Title: An enquiry into learning environments during lockdown for the COVID-19 pandemic and their effects on medical student learning.

Project Team

Linda Gulliver [PI], Steve Gallagher, Jim Ross, Jasbir Singh [Research Assistant]

Full Report

Snapshot of the project

This project aimed to establish if medical students' lockdown learning environments during the COVID-19 pandemic impacted student learning through effects on motivation, engagement and memory, and whether such effects were disproportionately experienced by students in environments where socio-economic, cultural or other influences potentially disadvantaged them. We conducted two online Qualtrics™ surveys across Otago Medical School's three campuses, asking students to reflect on their experiences of their learning and their learning environments during 2020 and 2021 periods of COVID-19 lockdown. Focus groups captured in-depth information. Results show that both the learning environment and the way learning is received have tangible effects on medical student learning during pandemics. A follow-up study targeting the experiences of students with disabilities, approximately half of whom reported their lockdown learning environment exacerbated their disability, is underway. Preliminary results were presented at AMEE [Lyon, France] and in the 'Lessons Learned' symposium at Otago University in 2022.

Introduction

During the COVID-19 nationwide lockdown in New Zealand beginning midnight March 25 2020, Otago medical students found themselves thrust into a variety of different learning environments that were not fundamentally supportive to good learning. As with other medical schools worldwide, the Otago Medical School had to make very quick decisions while trying to consider the best interests of faculty, staff, students and the public. This meant much student learning and assessment rapidly transitioned to online and students were removed from clinical placements. Although continually informed and updated, students did not really have a role to play in the decision-making processes, something also reported for other medical schools [1]

Students remained in their lockdown learning environments until alert levels in New Zealand progressively allowed them to return to face-to-face learning with their tutors or the clinical environment. Students in years 2 and 3 of the MB ChB [Early Learning in Medicine] spent 10 weeks learning exclusively online in their lockdown learning environments, while Advanced Learning in Medicine [ALM] students in years 4 and 5 of the degree were largely unable to access the clinical environment, their learning and assessment also adapted for online delivery where possible. Trainee Interns [ALM year 6] were in the final year of their degree and as such were prioritised to have on-going clinical exposure as safety permitted.

World-wide, students rapidly transitioning to online learning have encountered cognitive, psychological, emotional, social, economic and digital-associated challenges, all having the potential to impact their ability to engage productively with their learning [1,2]. Practical challenges have included shared and/or inappropriate physical spaces to learn, problems sharing internet devices/connectivity, competing demands of parenting and educating children at home, students being expected to 'work' in some capacity for the family or care for family members when at home, inequality of access to digital technology/internet connectivity due to learning location or comparative poverty, and online learning saturation [2,3,4,5]. Online learning can benefit physically challenged students, however, giving them more freedom to participate in a virtual environment requiring limited movement [6]. Anecdotally, medical students in Early Learning in Medicine [ELM] reported difficulty retaining information during lockdown and feeling less motivated to engage. This appeared to have exacerbated feelings of inadequacy and anxiety, further impacting their learning. ALM students held similar concerns, possibly compounded by fears of not having the same degree of clinical exposure as their peers in previous years.

We hypothesised that lockdown learning environments had the potential to impact learning through effects on motivation, engagement and memory, and that these effects may have been disproportionately experienced by students in environments where socio-economic, cultural or other influences potentially placed the student at a disadvantage. We considered the 'lockdown environment' to not only include the physical environment, but also the social, emotional, psychological and cultural environs students found themselves in. Obtaining information relating to students' experiences of their lockdown environments could give students a voice in future medical school and wider university decisions around interventions to optimise online learning environments, especially for those disproportionately affected in what could be a 'pandemic era' [4,7].

The aims of the project were to:

1. Identify types of learning environments medical students reported themselves to be in during the COVID-19 pandemic lockdown of 2020.
2. Determine the impact of the different types of lockdown learning environments on the students' experience of learning; specifically on students' perceived motivation and ability to engage, and on their perceived ability to retain new information delivered online.
3. Determine the extent to which any perceived alteration to students' levels of motivation, ability to engage and retention of information, impacted their academic performance.
4. Determine the extent to which pre-existing socio-economic, cultural or other circumstances may potentiate academic inequalities during prolonged periods of off-campus online learning.
5. Compare students' choice of their 2020 to their 2021 lockdown learning environments to see if repeated and/or alternative lockdown environments led to different learning experiences for the same student cohorts.
6. Use the information gained about lockdown learning environments to engage students to better plan for online learning in the event of future pandemic [or similar] restriction.

Methods

To initiate this research, we conducted an online Qualtrics™ survey of all ELM and ALM students whom we could contact across Otago Medical School's three campuses in February 2021 [n=846]. We asked them to reflect on their 2020 experiences of their learning and learning environments during COVID-19 lockdown. Following the emergence of the COVID-19 Delta variant in 2021,

there was a second period of lockdown for these students announced at very short notice. We therefore undertook to re-survey the same cohorts to assess for the effects of repeated and alternative lockdown environments. Thematic analysis of survey results using NVivo™ informed selection of student focus groups to gather more in-depth information on the students' learning environments' impacts on learning. In order to satisfy Aim 3 [above] selected in-course assessment conducted inside and outside periods of COVID-19-induced periods of lockdown and learning environments is being compared.

Key findings, outputs and outcomes as of March 31 2023

The vast majority of students surveyed localised to the Dunedin campus in 2020 and 2021 [96.8 and 96.4% respectively], so we used purposeful sampling in the make-up of the focus groups [and one individual interview] to obtain representation across ELM and ALM and the three campuses serving the Otago Medical School. During 2020, less than half the students [47%] remained at or near their respective campus, compared to 86% choosing to stay at or near their campus in 2021. Most students leaving campuses to 'bed in' for the 2020 lockdowns went home [53%], either to their own home or to be with their family of origin, but only 14% chose to repeat that choice in 2021. Instead, they elected to remain in their flats or stay in their residential colleges. Two thirds of students surveyed reported their lockdown learning environments did not motivate them well to engage in learning delivered to them online, regardless of their locations during lockdowns [63% in 2020 and 60.3% in 2021]. Approximately a third contended that their lockdown learning environments did not well enable them to acquire and retain new information delivered online [33% in 2020 and 29% in 2021]. Despite students having a much greater familiarity with online and distance learning in 2021, and having moved or remained in environments they thought would offer a better learning experience, greater numbers of students reported IT and internet issues than in 2020 [22% in 2021 versus 17% in 2020].This related to a variety of factors, with financial hardship a notable one in 2021.

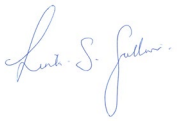
Quantitative analysis was able to begin to shed light on sub-portions of the student population. Notably, of those students considering themselves to have some form of disability prior to any periods of lockdown, nearly half reported that their lockdown learning environments made their disability worse [47% of those surveyed in 2021 and 43% of those surveyed in 2022]. This is the subject of on-going enquiry for our research team in 2023. When ethnicity was cross-tabulated with learning environment effects on motivation, engagement and memory, we found that no ethnic group was disproportionately affected by their lockdown learning environments in 2020, however analysis of the 2021 data is yet to be completed due to on-going COVID-19 disruption. The expectation is to have 2021 data analysis completed in the very near future with view to two publications in peer-reviewed Medical Education journals in 2023.

Preliminary results have already been presented at the Association for Medical Education in Europe's 50 year celebration conference [AMEE] in Lyon, France in August 2022 and in the 'Lessons Learned' symposium at the University of Otago in November, 2022. Our ultimate goal is to inform improvements and innovations in the delivery of medical education during pandemics and other similar challenges to delivering education.

References

1. Kachra R, Brown A. The new normal: Medical education during and beyond the COVID-19 pandemic. Canadian Medical Ed J. 2020;11(5):e168-e169
2. Pokhrel S, Chhetri R. A literature review on impact of COVID-19 pandemic on teaching and learning. Higher Education for the Future. 2021; 8 (1):133-141
3. Arowoshola L. Medical Education Engagement during the COVID-19 era – A student parent's perspective. Medical Ed online. 2020;25(1788799) https:doi.org/10.1080/10872981.2020.1788799
4. Goudeau S, Sanrey C, Stanczak A, Manstead A, Darnon C. Why lockdown and distance learning during the COVID-19 pandemic are likely to increase the social class achievement gap. Nature Human Behav. 2021. https://doi.org/10.1038/s41562-021-01212-7
5. Montacute R, Holte-White E. COVID-19 and Social Mobility Impact Brief #2: University Access and Student Finance. 2021 Available at https://www.suttontrust.com/wp-content/uploads/2020/05/COVID-19-and-Social-Mobility-Impact-Brief-2.pdf. Accessed Oct 4, 2021.
6. Basilaia G, Kvavadze D. Transition to online education in schools during a SARS-CoV-2 coronavirus (COVID-19) pandemic in Georgia. Pedagogical Research. 2020;5(4):10 https://doi.org/10.29333/pr/7937
7. Lim ECH, Oh VMS, Koh D-R, Seet RCS. The challenges of continuing medical education in a pandemic era. Ann Academy Med Singapore. 2009;38(8):724-726

Linda Gulliver



Date: 4 April 2023

COMMITTEE FOR THE ADVANCEMENT OF LEARNING AND TEACHING

FINAL REPORT ON GRANT

12 April 2023

Snapshot of the Project

Title of Project: Can you see us? Can you hear us? Fostering Equity, Diversity, and Inclusion in our Bachelor of Pharmacy curriculum.

Project Team: Lisa Kremer and Associate Professor Alesha Smith

Department: He Rau Kawakawa (School of Pharmacy)

Snapshot of the Project: In 2020 we performed a document analysis of the paper based clinical cases in the BPharm and identified that the cases were not representative of the community in an Aotearoa context. This provided an opportunity for reflection on how to ensure the curriculum is diverse and representative and decided that having the community voice expressing how they would like to be seen in clinical cases was worth exploring. To date, we have not directly engaged with underrepresented groups to ask how they would like to be seen in clinical cases. To ensure safety of both researchers and community members, we created a research group with members who have identities within underrepresented communities. We then used our connections to engage with underrepresented community members and carried out focus groups. The insight obtained within this research activity was hugely beneficial and the data collected very valuable. Many new ideas for curriculum development have occurred following the focus group activity, however we decided to halt clinical case development and the implementation and evaluation phase of the research while the Division of Health Sciences review is occurring. This is because it is not clear at present what student learning platforms are going to be available to staff in semester two and beyond (e.g., lectures, workshops, skills labs). Although the future is

unclear at present, what is clear is our determination and commitment to seeing this project through to the classroom. Once the review is completed, this research group will continue this work.

Aims: to achieve equity, diversity, and inclusion in people (and their whānau) presented in clinical cases in the BPharm curriculum

Methods: Literature review, and focus groups.

Key findings:

Literature review:

- The review identified poorly designed learning materials, institutional culture and student/faculty diversity as being key potential sources of racism within the hidden curriculum.

Focus Groups:

- Participants in all focus groups had a desire to be seen in pharmacy cases, however this was conditional on the learning being delivered in a way that upholds their beliefs, values, and voices.
- Cultural factors (beliefs, ethnicity, language), environmental factors (first impressions, pharmacy design, privacy weather), personal factors (disability status, gender identity, sexual identity) and social factors (family) were all identified as important characteristics and factors that may be appropriate for inclusion in pharmacy case-based learning materials.

Outcomes:

- Pharmacy Clinic collaboration with Dunedin Pride
- Two manuscripts submitted
- One international presentation
- Curriculum development initiated but on hold while the Division of Health Sciences review is underway

Amount Awarded: $16,972

Full Report

Title of Project: Can you see us? Can you hear us? Fostering Equity, Diversity, and Inclusion in our Bachelor of Pharmacy curriculum.

Project Team: Lisa Kremer and Associate Professor Alesha Smith

Department: He Rau Kawakawa (School of Pharmacy)

Snapshot of the Project: In 2020 we performed a document analysis of the paper based clinical cases in the BPharm and identified that the cases were not representative of the community in an Aotearoa context. This provided an opportunity for reflection on how to ensure the curriculum is diverse and representative and decided that having the community voice expressing how they would like to be seen in clinical cases was worth exploring. To date, we have not directly engaged with underrepresented groups to ask how they would like to be seen in clinical cases. To ensure safety of both researchers and community members, we created a research group with members who have identities within underrepresented communities. We then used our connections to engage with underrepresented community members and carried out focus groups. The insight obtained within this research activity was hugely beneficial and the data collected very valuable. Many new ideas for curriculum development have occurred following the focus group activity, however we decided to halt clinical case development and the implementation and evaluation phase of the research while the Division of Health Sciences review is occurring. This is because it is not clear at present what student learning platforms are going to be available to staff in semester two and beyond (e.g., lectures, workshops, skills labs). Although the future is unclear at present, what is clear is our determination and commitment to seeing this project through to the classroom. Once the review is completed, this research group will continue this work.

Introduction: In 2022 we completed a critical review, where we carried out a document analysis of patient cases extracted from small group learning sessions that occurred in 2020 across the Bachelor of Pharmacy curriculum. Results from this study indicated that most cases were well described for clinical characteristics (e.g., medical condition, medications), but were poorly described for demographic and social characteristics. This means we may be training students to assume ‘mainstream’ unless otherwise specified. For example, if a case written as, ‘a 78-year-old married male presents to the clinic with a productive cough’, it may be interpreted as a white, cis-gender, heterosexual male (e.g., aligned with mainstream ‘dominant’ populations). A lack of

clarity provided within case material could result in dominant student populations associating case material with mainstream populations and only considering minority population health when specifically referred to. Our findings support the notion that our teaching material, like other pharmacy curricular, may have a contributory role towards systemic racism, prejudice, and implicit bias.

Therefore, we wanted to find out if we could achieve equity, diversity, and inclusive representation of people and their whānau, in clinical cases in the Bachelor of Pharmacy curriculum, by developing both a blueprint and a repository for clinical cases. The intention for this was to help address access and equity barriers for underrepresented groups and to create learning opportunities for pharmacy students to see how they can contribute to meeting health needs of underrepresented groups.

Additionally, the institutional system in which the educators work needs to be enabling, for the educators to make the necessary changes from a Eurocentric lens, to one of equity, diversity, and inclusion. We are trying to recreate a new system, and a new approach, that all staff can safely contribute to.

Methods:

Literature review: A critical review of the literature was performed to identify the effects of the hidden curriculum on implicit bias in health professional students.

Focus Groups: Focus group research was carried out to investigate gow underrepresented groups (Māori, Pacific Peoples, Asian, LGBTAQI+, Refugee, Disability) would like to be seen in pharmacy cases.

Curriculum Development: started, but now on hold.

Results:

Literature review: The review identified poorly designed learning materials, institutional culture and student/faculty diversity as being key potential sources of racism within the hidden curriculum.

Focus Groups: Participants in all focus groups had a desire to be seen in pharmacy cases, however this was conditional on the learning being delivered in a way that upholds their beliefs, values, and voices. Cultural factors (beliefs, ethnicity, language), environmental factors (first

impressions, pharmacy design, privacy weather), personal factors (disability status, gender identity, sexual identity) and social factors (family) were all identified as important characteristics and factors that may be appropriate for inclusion in pharmacy case-based learning materials.

Key outputs and outcomes:

1. We established a representative research group consisting of members within He Rau Kawakawa (School of Pharmacy) and across campus.
2. We hired a fixed term research assistant.
3. We performed a literature review (manuscript submitted and in peer-review). This is data is likely to be useful for all health science division departments / schools.
4. We carried out focus groups with Māori, Pacific Peoples, Asian, Refugee, LGBTAQI+, and disability consumers (manuscript submitted and in peer-review). This data is likely to be useful for all health science division departments / schools.
5. Started but now ON HOLD (due to Division of Health Sciences review): based on focus group data, new clinical cases and teaching approaches that facilitates diversity, equity and inclusion pharmacist practices are to be created. This will be suitable for online or in person teaching.
6. Started but no ON HOLD (due to Division of Health Sciences review): blueprint to guide the ongoing development and review of clinical cases. This is to ensure the clinical cases better reflect society and population diversity, with a particular focus on Māori and Pacific Peoples.
7. ON HOLD (due to Division on Health Sciences review): creation of a clinical case repository for staff to engage with for ongoing clinical case stocktake and review of equity, diversity, and inclusion.
8. ON HOLD (due to Division of Health Sciences review): working on a method for sustainable schedule review of student learning material.
9. ON HOLD (due to Division of Health Sciences review): staff engagement, training, and evaluation to facilitate safe teaching and student experiences.

Discussion and Implications

Pharmacy Clinic and Dunedin Pride collaboration: An unintended outcome that occurred following the focus group activity was the Dunedin Pride takeover day at the Pharmacy Clinic. Research members were looking for an opportunity to give back to the LGBTAQI+ community following their generous focus group discussions, and the result was a collaboration between Dunedin Pride and He Rau Kawakawa (School of Pharmacy), and several media articles (e.g., https://www.pharmacytoday.co.nz/article/news/clinic-rainbow-community-big-hit-pharmacy-school-otago, https://dunedinpride.org.nz/pages/rainbow-pharmacy-clinic, https://www.odt.co.nz/the-star/clinic-assess-needs-rainbow-community, https://www.otago.ac.nz/news/news/otago0241235.html)

It is anticipated that there will be regular collaboration days at the Pharmacy clinic between Dunedin Pride, and this will also provide learning opportunities for pharmacy students.

The success of the pharmacy clinic has provided a model for us to carry out take over days for other underrepresented groups in the community and we are engaging with whānau Māori to offer paediatric clinics.

We have decided to halt progress with the written clinical cases in the BPharm curriculum while the Division of Health Sciences review is underway. This is because we are unsure at present what future methods of teaching will be occurring and will pivot once this has been decided. We are a dedicated and committed research group who will continue this work following the completion of the Division of Health Sciences review.

Publications: Manuscripts for the literature review and focus group data have both been submitted to journals and are in peer review.

Presentation: Lisa Kremer was invited to present to staff at Duquesne University School of Pharmacy, Pittsburgh, USA to share research and vision for equity, diversity, and inclusion work in curriculum development.

Appendix 1: Progress on Project

Phase	Activity	Led by	Proposed Dates	Actual Dates
Approvals	We will obtain appropriate ethical approvals before commencing the project	Lisa and Alesha	Feb 2022	April 2022 Completed
Engagement	We will establish engagement groups to help lead and inform the research 1) one that has members of minority communities, e.g., Pacific Peoples, LGBTAQI+. This group will help us ensure we appropriately include diverse patients in our curriculum 2) SoP staff and student representatives willing to be involved in and test the newly developed resources. We will engage with these groups at multiple times to develop, implement and provide ongoing support for the project, therefore this group will need sufficient remuneration for their expertise in this area.	Alesha and Lisa	Feb 2022	May – August 2022 Completed Jan 2023 Manuscript submitted
Literature review	We will complete a rapid literature review of the design and implementation of equity, diversity, and inclusion curricula in health sciences. The findings from this will be used alongside our previous case base analysis and focus groups to help develop the blueprint.	Final year pharmacy student (PHCY410 Elective A) - Lisa and Alesha supervisors	Mar 2022	November 2022 Manuscript submitted
Blueprint development (Objective 1)	Develop a blueprint for creating and revising clinical cases for diversity, equity, and inclusion. The blueprint will ensure that all clinical cases are captured and will form part of the documentation required for case development and audit. The blueprint will be able to be mapped to the clinical case repository, with the potential to map assessments in the future.	Research assistant	Apr-June 2022	On hold due to Health Sciences review
Develop repository (Objective 2, 3	Develop a clinical case repository for staff to access on a shared platform (e.g., sharepoint) and utilise for case revision and new case development.	Research assistant	Apr-June 2022	On hold due to Health Sciences review

Phase	Activity	Led by	Proposed Dates	Actual Dates
and 4)	This will help to ensure that the clinical cases are reflective of society and free from consistent stereotyping of minority groups. Within this phase we will also develop 3 to 4 exemplars of demographic information that would be suitable for medical condition(s) within a BPharm module. This interactive repository will also help with ongoing review and evaluation phase, to determine the level of equity, diversity, and inclusion in our curriculum.			
Making the change	We will work collaboratively with our staff to create and/or update clinical cases across our curriculum using the new blueprint and repository. This will provide guidance, ideas, and a record for including equitable, diverse, and inclusive cases.	Lisa	July-Sep	On hold due to Health Sciences review
Evaluation	We will undertake evaluation with staff and students. STAFF Following blueprinting and case repository development, staff will be asked to provide feedback on the following questions; 1. Did staff find the blueprint usable and useful to inform their teaching? 2. Does the repository template help staff consider aspects of demographic and social characteristics for paper based clinical cases? 3. Has this process helped staff create a strategy for viewing their teaching with a diversity, and equity, and inclusion lens? 4. Has this process helped staff avoid negative stereotypes in cases for minority groups? 5. How has staff been able to use this information when creating clinical cases (e.g. patient goals, pharmacist goals, patient education)? 6. What further support would staff like in the area of equity, diversity, and inclusion?	Alesha	Oct	On hold due to Health Sciences review

Phase	Activity	Led by	Proposed Dates	Actual Dates
	STUDENTS Following student learning experiences from the newly developed cases, students will be asked to provide feedback on the following questions; 1. How does inclusion of distinctive characteristics modify the way students approach the case? 2. Do students instinctively avoid assuming population-level assumptions and stereotypes if the information is not presented? 3. Does repetitive exposure to cases representing the full spectrum of diverse populations work to change assumptions and the way that students approach these cases? 4. What else would support students' learning experience in the area of equity, diversity, and inclusion?			
Dissemination	During this phase we will complete the project report, draft a manuscript and/or conference abstract. We will also organise a multidisciplinary seminar to present our project and findings to other schools and departments within the Division of Health Sciences.	Lisa and Alesha	Nov 2022 - Jan 2023	On hold due to Health Sciences review

SNAPSHOT OF THE PROJECT

Title: Delivering effective interprofessional education for medical and midwifery students: an exploratory study of a collaborative model of educational delivery

Project Team: Judy Ormandy,[a] Christine Jackson, [b] Lyndal Honeyman, [b] Rose Spence,[c] Eileen McKinlay,[a] Sonya Morgan[a]

Snapshot:

The aim of this project was to develop and refine an introductory interprofessional education (IPE) learning activity for 5th year medical students from University of Otago Wellington and 1st year midwifery students from Victoria University of Wellington. The project used a quality improvement framework and researcher-teacher partnership. Two teaching cycles of the IPE were delivered with separate student cohorts in 2022, with the second IPE delivery modified according to analysis of feedback (surveys/focus groups) from the first iteration. The evaluation showed the second refined IPE session was valued highly by students who reported increased understanding of each other's roles and of the importance of interprofessional collaboration in a maternity context. The findings demonstrate an evaluation which used a quality improvement cycle and researcher-teacher partnership led to a more effective IPE activity. Plans are underway to run this IPE three times in 2023, and to expand it to include sonography students.

Centre for Interprofessional Education
Division of Health Sciences

CALT FINAL REPORT:

Delivering effective interprofessional education for medical and midwifery students: an exploratory study of a collaborative model of educational delivery using a quality improvement framework augmented by a researcher-teacher partnership.

March 2023

Research team: Judy Ormandy,[a] Christine Jackson, [b] Lyndal Honeyman, [b] Rose Spence,[c] Eileen McKinlay,[a] Sonya Morgan[a]

[a] University of Otago
[b] Victoria University of Wellington
[c] Te Whatu Ora Capital, Coast and Hutt Valley

1. Introduction

This report presents the findings of a University of Otago CALT funded study to develop an effective Interprofessional Education (IPE) opportunity for 5th year medical students from the University of Otago Wellington (UOW) and 1st year midwifery students from Victoria University of Wellington (VUW), and to evaluate the feasibility, acceptability and learning outcomes of the IPE initiative.

The collaborative IPE initiative was developed by teaching and research staff from the UOW and VUW. The study was conducted in 2022; two IPE sessions with separate cohorts of students were delivered in April and August 2022. Ethics approval was granted by the University of Otago Human Ethics Committee ref: D22/057.

1.1 Background to the study

1.1.1 Effective interprofessional collaboration is essential for quality maternity care

The provision of safe, quality maternity care requires effective collaboration and communication between midwives and obstetricians. In New Zealand (NZ), midwives and obstetricians work autonomously but also interdependently alongside various medical specialties and disciplines to optimise health outcomes for pregnant people and their whānau.[1,2] Midwives and obstetricians support each other in uncomplicated physiological birth; jointly work in high-risk, time-constrained obstetric emergencies; and, midwives also consult with, and/or transfer responsibility of care to obstetricians in complicated or high-risk pregnancies.[3] However, communication failures between the different health professionals in maternity settings have been identified as contributing to adverse maternal outcomes,[4] highlighting the need to improve relationships/collaboration between the two professions.

1.1.2 The role of Interprofessional education (IPE) in preparing medical and midwifery students for interprofessional collaboration in the workplace

Despite the requirement to work collaboratively with each other as graduate clinicians,[5] in NZ medical and midwifery students have traditionally had very little exposure to each other during their respective pre-registration training programmes. International research suggests they have little knowledge of each other's roles and contributions to maternity care. [6] To prepare medical and midwifery students for future collaborative relationships there has been a call for the two professions to be exposed to communicating and collaborating with each other through the establishment of IPE training opportunities.[7,8] Through interacting with students of other disciplines IPE supports students to develop IP skills/competencies to be *collaborative practice-ready*[9-11] and is defined as *"occasions when two or more professions learn with, from, about each other to improve collaboration and the quality of care.*[12] International IPE research in undergraduate maternity settings demonstrates that engaging medical and midwifery students in IPE in early stages of their learning: dispels inaccurate stereotypes of disciplines,[7] improves students' understanding and respect for each other's roles, [7,13-18] and increases their attitudes to and confidence in working in interprofessional IP teams in the future.[7,14-17,19-26]

1.1.3 Opportunities for medical-midwifery IPE in New Zealand

In NZ, there have been few attempts to provide Interprofessional learning opportunities for pre-registration medical and midwifery students,[27,28] and no published evaluations.

The UOW for many years has taught medical students about obstetrics and gynaecology within their 5th and 6th year programmes of study and VUW has more recently begun to offer an undergraduate midwifery degree programme. Both universities offer contemporary, dynamic and innovative training programmes to medicine and midwifery students respectively but neither institution has offered IPE to medicine and midwifery students.

In 2021 a group of teaching and research staff from both institutions committed to developing IPE to better prepare students for collaboration in maternity care, formed a community of clinical practice in respect to IPE, and sought CALT funding to develop an introductory IP learning activity for medical students from UOW and midwifery students from VUW.

1.1.4 Developing an effective IP learning activity for medical and midwifery students

There is limited guidance from the international literature about how to develop and implement successful IPE initiatives for medical and midwifery students, but in general multiple barriers exist in implementing high-quality IPE.[29] Challenges reported implementing IPE in maternity settings have included logistical difficulties of timetabling,[7,17,30,31] selecting appropriately matched training levels of medical and midwifery students,[7,30] unequal professional group composition in learning activities,[7,14,31] 'power play' dynamics[7,14] and selecting learning content for activities appropriate for both professions.[31]

Quality improvement approaches, such as Plan-Do-Study-Act cycle, widely used in quality improvement programs may provide useful frameworks for developing successful IPE activities, through the incorporation of feedback-improvement cycles. However, studies using structured quality improvement approaches for improving educational design are rare. [29,32,33] Few have reported on using a quality improvement process together with a researcher-teacher research partnership. [34,35]

1.2 The study aims:

To address the need to provide medical and midwifery students with an effective introductory level IP learning opportunity, the study team developed a collaborative early exposure IPE activity for 5th year medical students from UOW and 1st year midwifery students from VUW using a quality improvement framework and researcher-teacher partnership approach.

The aims of the study were:

- to develop and refine an introductory IPE activity for 5th year medical students and 1st year midwifery students; and
- in the course of a two-cycle delivery; use a quality improvement framework augmented by a researcher-teacher partnership to improve the design and delivery of the IPE.

2.0 Methods

2.1 Study design

This mixed methods study utilised a quality improvement framework augmented by a researcher-teacher partnership approach to design, evaluate and improve the IPE learning activity developed for pre-registration midwifery and medical students (for a description of the IPE learning activity developed see Appendix A.

2.1.1 The DIAM quality improvement framework

The quality improvement framework used to guide the development and refinement of the IPE learning session, was the DIAM (Design-Implement-Assess-Modify) model. [29] The DIAM framework was selected as the model has been designed specifically for the development and ongoing improvement of IPE activities. In this study, two iterations of the IPE were developed and delivered with separate cohorts of students in April 2022 and August 2022; refined through two DIAM quality improvement cycles. Assessment of the first IPE iteration informed modifications to the second IPE iteration.

2.1.2 The researcher-teacher partnership approach

The collaborative researcher-teacher partnership approach employed was another key feature of the methodological approach. The interdisciplinary study team consisted of four teaching staff (two medical professionals, two midwifery professionals) and two researchers. The interdisciplinary teams' researcher-teacher partnership was established at the outset and included considerable shared 'common ground' between researcher and facilitator/teacher team members even though they were from different professional cultures.[35] Although the researchers were not doctors or midwives, they had topic-specific knowledge as IPE researchers and one as a previous IPE facilitator/teacher had relevant cross-institutional knowledge and experience. Both researchers also had a personal understanding of the importance of maternity care having birthed babies. At the outset, all members of the team were passionate about the topic and committed to developing a high-quality IPE learning activity that would meet the needs of both midwifery and medicine students.

Cognisant of the importance of establishing a successful partnership with teachers, and also between both sets of teaching staff who had not met previously, researchers established a series of conditions and activities to facilitate successful working relationships and to affirm the 'common ground' they shared. This included setting up several meetings with both sets of teachers before commencing the IPE learning activity to not only plan but allow time to get to know each other; running an introductory IPE facilitation training session with all teachers to facilitate shared understanding of the IPE objectives as well as to provide facilitation support; providing some input into the design of the learning activity and designing and seeking feedback from the teachers on the initial drafts of the survey tools and question frameworks.

Over the course of the study, whilst acknowledging that some aspects would be undertaken separately (e.g. preserving the anonymity of student survey and focus group responses- *researchers*; delivery of the actual IPE- *teachers*), the researchers and teachers continued to collaborate closely to improve the IPE activity. Figure 1 summaries the collaboration between researchers and teachers throughout the two DIAM cycles of IPE development and quality improvement.

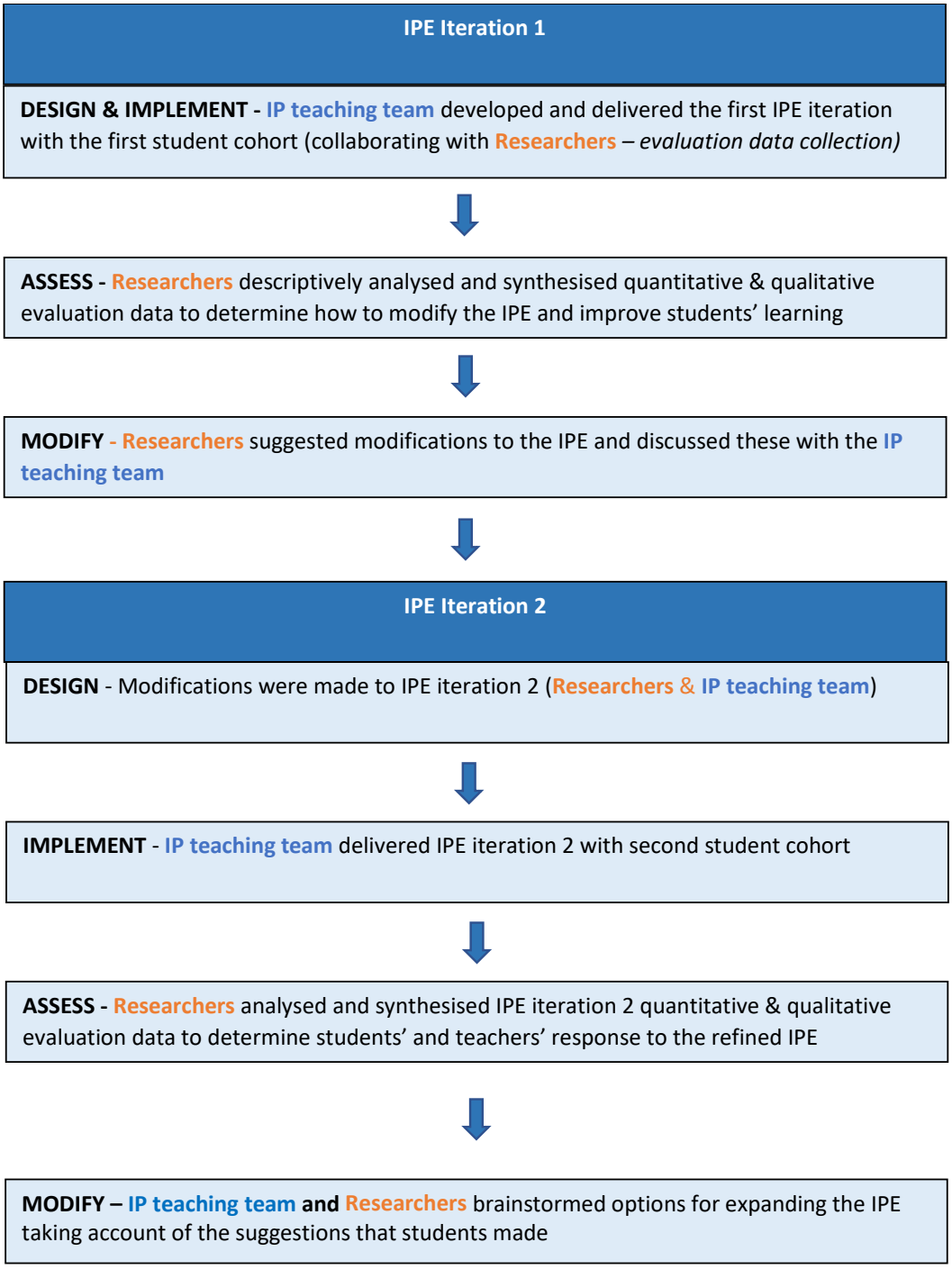


Figure 1 research-teacher collaboration over the course of the DIAM quality improvement stages

2.2 The study setting

The first IPE session was delivered over Zoom due to Covid-19 disruptions at the time. The Zoom 'breakout room' feature was used for undertaking small group activities. The second IPE session was delivered in-person in midwifery teaching spaces at VUW.

2.3 Student participants in each IPE session

Participants selected for participation in each cohort were 5th year UOW medical students scheduled to be on their Obstetrics and Gynaecology run at the time of the IPE and 1st year VUW midwifery students. These training levels were selected because both student groups were in early stages of their training and at similar levels of learning in relation to maternity care despite the medical students being in their 5th year. VUW midwifery students in their 1st year had undertaken some initial experience on clinical placement. UOW medical students in their 5th year had experienced clinical placements in other specialty areas but were at the start of a 5-week block in Obstetrics and Gynaecology and had not been exposed as students to maternity care.

2.4 Recruitment and data collection

The study recruitment and data collection process are summarised in Figure 2.

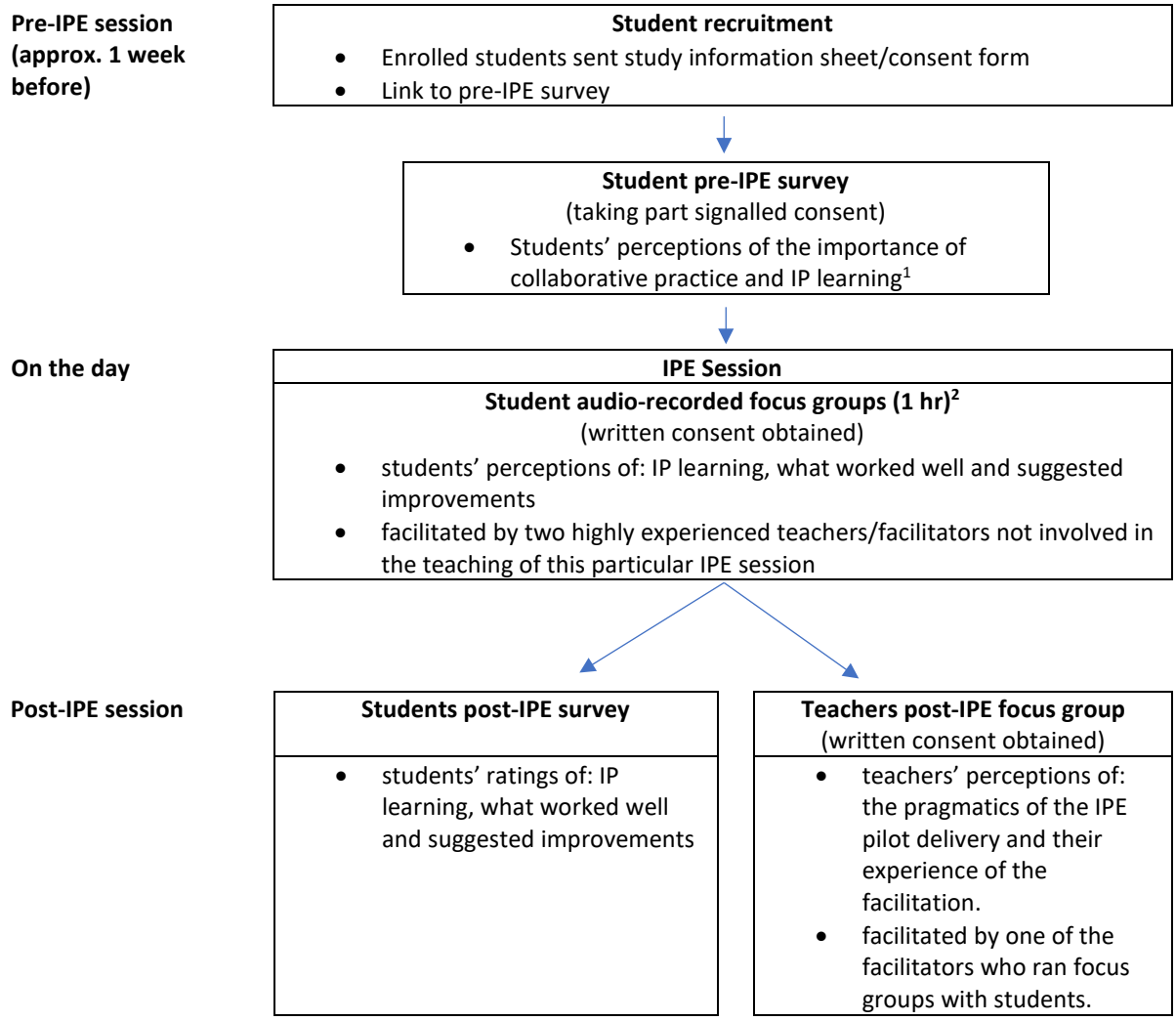
2.4.1 Students:

Both student groups were recruited to participate in the pilot IPE by educators as a course requirement for their respective programs. Student participation in the evaluation component of the pilot was voluntary. Before each IPE session, enrolled students were sent a study information sheet inviting them to participate in the evaluation data collection, consisting of pre- and post-IPE online surveys and a mixed discipline focus group immediately following the IPE session (conducted online for the first cohort). Taking part in surveys signalled consent. For the focus groups, students were required to provide written consent to take part, and the groups were audio-recorded and transcribed for analysis.

The pre-IPE survey included questions about students' programme of study, what they were expecting to learn and their perceptions of the importance of collaboration and IP learning in a maternity context. The post-IPE survey and focus groups included questions about students' perceptions of: the IPE experience (including what went well and what they perceived could be improved); their learning about the roles of midwives and obstetricians and their perceptions of the importance of collaboration and IP learning in a maternity context. Research recommends that the size of focus groups be between 4-12 participants,[36-40] and therefore the student cohorts were divided into two interprofessional groups. Each focus group included approximately 10-11 students per group. Focus groups (approx. 1 hour) were semi-structured, audio-recorded and facilitated by two highly experienced teachers/facilitators not involved in the teaching of this particular IPE activity.

2.4.2 IPE educators:

After each of the two IPE iterations the four educators involved were invited to take part in an audio-recorded focus group, designed to gather their feedback on: the pragmatics of the IPE pilot delivery and their experience of the facilitation. All facilitators signed written consent forms. The focus groups were facilitated by one of the facilitators who ran focus groups with students.



Notes

1: The pre-IPE survey included questions about students' programme of study, what they were expecting to learn and their perceptions of the importance of collaboration and IP learning in a maternity context

2: Students were split into two groups for focus groups (the same groups used within the IPE session).

Figure 2: study recruitment and data collection sequence for each IPE iteration

2.5 Data analysis

Data analysis was iterative, with the analysis of feedback data (survey and students and teacher focus groups) from the first IPE iteration informing modifications to the second IPE iteration delivered. After each IPE session, student surveys and focus group data (from students and teachers) were first analysed independently. Survey data was exported from Qualtrics to excel and analysed descriptively.

Focus group data was transcribed and coded by one of the researchers using content analysis. Data from each IPE session was then synthesised by one researcher and the interpretation reviewed and discussed with the other member of the research team.

3.0 Key findings from the surveys and focus groups

3.1 Students participating in the IPE sessions and evaluations

A total of 45 students attended the two IPE sessions: 25 students (11 medical, 14 midwifery) attended the first IPE session, and 20 students (11 medical, 9 midwifery) attended the second iteration. Twenty-two students (88%) attending the first IPE session participated in the focus groups immediately following the IPE session, and 21 (84%) completed the post-IPE online survey. For the second IPE session, all 20 students attending the second IPE session stayed on for the focus group (100%) and 15 students (75%) completed the online post-IPE survey. Student participation in the evaluation is summarised in table 1.

Table 1: Student participation in study surveys and focus groups

	IPE iteration 1			**IPE iteration 2**		
	Medical	Midwifery	Total	Medical	Midwifery	Total
Completed pre-IPE survey	12	14	26[1] (104%)	6	9	15 (75%)
Completed post-IPE survey	11	10	21 (84%)	7	8	15 (75%)
Completed focus group	11	11	22 (88%)	11	9	20 (100%)
Total number of students attending IPE	11	14	25	11	9	20

1: one medical student completed the survey twice

3.1.1 Midwifery and medical students' pre-IPE attitudes towards collaborative practice and learning interprofessionally

Prior to taking part in each IPE session, both medicine and midwifery student cohorts rated IP collaborative practice and IP learning as important (Table 2). Overall, there was little difference in pre-IPE attitudes towards collaborative practice and learning interprofessionally between the two student cohorts. Slightly more students in the second cohort (attending IPE iteration 2) strongly agreed with the importance of IP learning than students in the first cohort attending IPE session 1 (rating as 'extremely important'), however there was little difference when the 'very important' and 'extremely important' categories were combined.

Table 2: Students' pre-IPE perceptions (for each IPE student cohort)

Students' attitudes towards collaborative practice and IP learning (pre-IPE learning activity survey questions)	**Cohort**[1]	**Not at all important**	**Somewhat important**	**Important**	**Very important**	**Extremely important**	**Number of responding students**[2]
How important is collaborative practice in a maternity context?	IPE 1	0 (0%)	0 (0%)	2 (8%)	4 (16%)	19 (76%)	25 (92%)
	IPE 2	0 (0%)	0 (0%)	0 (0%)	2 (13%)	12 (80%)	15 (93%)
How important do you think learning with students from other health professions is to future working professional relationships?	IPE 1	0 (0%)	1 (4%)	2 (8%)	12 (48%)	10 (40%)	25 (88%)
	IPE 2	0 (0%)	0 (0%)	2 (13%)	3 (20%)	9 (60%)	15 (80%)

1: Two different cohort of students participated in iterations 1 and 2
2: The data in this table is from 25 responding students out of 25 students who attended IPE session 1; and 15 responding students out of 20 students who attended IPE session 2.

3.2 Findings IPE iteration 1: Aspects of the IPE identified for improvement to achieve learning outcomes

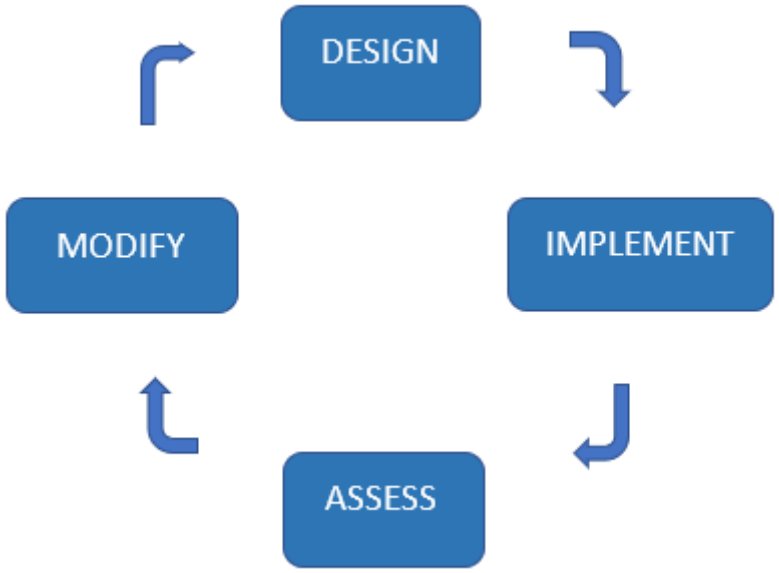


Figure 1: The DIAM (Design-Implement-Assess-Modify) methodological framework[29] guided the development and refinement of the IPE initiative (adapted from Smith et al 2021)

After the *Design* and *Implement* phases of the first cycle of the DIAM quality improvement method the *Assess* phase involved analysis of the post-IPE survey feedback. This revealed participating midwifery and medical students enjoyed the IPE experience and found the opportunity to meet each other beneficial, with 76% of students rating the IPE session as valuable overall (see Appendix B Table

1). However, further analysis of other questions revealed the primary learning outcome of role clarification was **not achieved**, with many students reporting in the post-IPE survey that they had learnt little about how their own or the other participating profession contributed to maternity care. For example, in the post-IPE survey 48% disagreed the IPE class increased their knowledge about what the other profession could contribute to the care of pregnant people and their whānau, and a further 14% were neutral. Further, 24% disagreed the IPE class increased their knowledge about what their own profession could contribute (a further 33% were neutral) (see Appendix B Table 1). Focus group comments supported this finding.

> *I would **want to know a little bit more about how we interconnect with each other, and how we can better each other in our professions**. So maybe I don't know part two but I'm not sure. (Midwifery student, focus group)*
>
> ***we didn't really learn at all about what midwifes really do** (Medical Student, focus group)*

Seven aspects of the first IPE iteration were identified for quality improvement. Most areas for improvement (five) were identified by students themselves, many (but not all) were also identified by the teaching team (four), and one was identified by researchers. The aspects of the first IPE iteration identified for improvement are shown in Box 1.

Box 1: aspects of the first IPE session identified for improvement

Aspects of IPE iteration 1 identified for improvement:	Identified by:
1. the size of the IP subgroups (too large) and insufficient time allocated for whakawhanaungatanga	students, teachers and researchers
2. misaligned learning levels (the midwifery students had less clinical experience)	students, teachers and researchers, (students more strongly than teachers)
3. the online delivery format	teachers
4. the human factors focus of case scenarios used for group work	students and teachers
5. the limited input from facilitators when discussing the roles of midwives and doctors	students
6. the mix of male students allocated to subgroups	researchers
7. the human factors topic for the IPE	students and researchers

3.3 Findings IPE Session 2: the modified IPE was well received, and IP learning outcomes achieved

On the basis of the seven identified areas for improvement researchers designed a 'pick-list' of possible modifications for consideration for the second IPE iteration. After discussion, the teachers selected changes that they felt best addressed each of the seven issues and these were adopted in the *Modify* stage and implemented in the second IPE iteration (*Design*). Students' and teacher's response to the refined IPE synthesised in the final *Assessment* phase of the DIAM quality improvement cycle revealed the refined IPE session was well received. All modified aspects of the second IPE session were reported favourably by students and/or teachers (see Appendix B Table 2).

All students (100%) responding to the post-IPE online survey agreed their participation in the modified IPE session had been valuable, with 87% indicating strong agreement (Appendix B Table 1). Moreover, the primary learning outcome of role clarification had been achieved. All students agreed the IPE had increased their knowledge of how either the other profession (or their own profession) contributed to maternity care. For example, 100% agreed the IPE class increased their knowledge about what the other profession could contribute to the care of pregnant people and their whānau (67% strongly agreed); and 100% agreed the IPE class increased their knowledge about what their own profession could contribute (67% strongly agreed). Examples of students' learning are summarised in Appendix B Table 3.

All students (100%) responding to the post-IPE online survey agreed non-technical skills (or human factors) in the clinical environment was a useful topic for the medical-midwifery IPE, with 60% indicating strong agreement (Appendix B Table 1). Students' comments during focus groups indicated the non-technical skills/human factors focus of the IPE had increased their understanding the importance of effective collaboration in a maternity setting.

> *I think yeah **(I learnt) breaking those boundaries is really important to you know so that the Swiss cheese model doesn't happen in that you pick up on those mistakes and you feel more comfortable talking to your colleagues** about things that they may have done wrong (Midwifery student, focus group 2).*

3.4 Findings IPE Session 2: students described an enhanced understanding of the importance of IP Collaboration and IPE in maternity context

Student focus group and survey comments elaborated on their enhanced understanding of the importance of IP collaboration in maternity care

> *learning about LMCs and kind of the continuity of care model ….(and) **the importance (of) communication between the two professions and (if) miscommunication happens that can have bad outcomes** on the maternal care or on the person who is having the baby (Medical student, focus group 2).*
>
> *there tends to be a bit of a hierarchy with doctors. And then midwives who come and they're like 'I know everything', but just knowing that ….if we do have any complications in a*

pregnancy then you can go to like the obstetrician (and) be able ***to work together to share the knowledge that we all have, to help that person*** *(Midwifery student, focus group 1).*

Collaboration is of very great importance! ***Midwives and doctors would not be able to function without each other. Both practices and scopes are necessary for the best care*** *(Medical student, post-IPE survey).*

The students also expressed an enhanced understanding of the importance of IPE for medical and midwifery students and a desire for more IPE opportunities as they advanced in their training.

I found that when I ***went on my midwifery placement, I had a lot more insight*** *to what the midwife was doing …****I am sure that this IPE class helped me feel more at ease and allowed for this interaction to happen*** *(Medical student, post IPE survey).*

From what I've seen so far on placement there is quite a bit of disconnect between the midwifery staff and like the medical staff, ***so it's good to have these (IPE) sessions where we can start that foundation and then take it through into our practice*** *(Midwifery student, post-IPE focus group).*

Do it (IPE) ***more often and have it throughout the years of our study*** *and get to meet other students (Midwifery student, post-IPE focus group).*

4.0 Discussion and implications

This study aimed to design, implement, assess, and modify an early exposure IP learning activity for undergraduate medical and midwifery students. Using a quality improvement framework (DIAM)[29] augmented by a researcher-teacher partnership[34,35] two teaching cycles of the IPE developed were implemented with separate cohorts of students in 2022, with the second IPE iteration modified according to assessment of the first IPE iteration. Evaluation of the second refined IPE iteration showed changes made were well received by the second student cohort who reported an enhanced understanding of each other's roles and of the importance of IP learning and interpersonal collaboration in a maternity context.

This initiative is one of the first IPE opportunities for midwifery and medical students in New Zealand. The results of the study confirm that this introductory level medical-midwifery IPE developed and refined to meet the needs of students is a feasible initiative, acceptable to and highly valued by students, supporting them to develop enhanced IP role clarification skills for future collaboration in maternity settings. The study also demonstrates the value of the DIAM model of quality improvement combined with the researcher- teacher partnership. While more has been written about quality improvement models in education less is known about researcher-teacher partnerships. This joint approach facilitated by collaborative activities started before the project was implemented built a solid trusting relationship which led to common ground where the skills of everyone could be used in two iterations. This led to students achieving the desired learning outcomes and enjoying taking part in the learning activity, as well as cementing the teachers' desire to deliver further iterations of this IPE and to explore new IPE learning activities.

In mid-late 2023 the IP teaching team will increase the number of times this IPE is offered and also expand the IPE to include sonography students. The IPE will be run in the second semester to enable midwifery students to have gained more clinical experience.

Planning is also underway for a pilot IPE simulation activity to take place later in 2023 for senior midwifery & medical students ('IP engagement level' IPE).[41]

5.0 Research outputs

McKinlay, E., Morgan, S., Ormandy, J., Jackson, C., Honeyman, L., Spence, R. (in progress). *Using a quality-improvement model and researcher-teacher partnership methodology to improve an IPE learning activity for medicine and midwifery students*. Paper in preparation for submission to an International Journal.

Jackson, C., Honeyman, L., Spence, R., Morgan, S., McKinlay, E. (in progress). *Planned abstract submission for the New Zealand College of Midwives Biennial National Conference*. 2-4 November 2023. Christchurch.

Ormandy, J., Jackson, C., Honeyman, L., Spence, R., Morgan, S., McKinlay, E. (2023). *Tailoring Interprofessional Education to Meet the Needs of Midwifery and Medical Students*. Poster presented at: The Perinatal Society of Australia and New Zealand Annual Congress. Melbourne. 5-8 March 2023.

McKinlay, E., Morgan, S., Ormandy, J., Jackson, C., Honeyman, L., Spence, R. (2022). *Using a quality improvement model and educator-researcher partnership methodology to improve pilot IPE for medicine and midwifery students.* Proceedings of the Auckland University of Technology & University of Auckland's Combined Interprofessional Education and Practice Showcase: Creative Approaches in Interprofessional Education and Collaborative Practice in 2022 and Beyond. Friday 18 November 2022.

6.0 Appendices

Appendix A: Description of the IPE activity

The learning pedagogy and intended learning outcomes:

The learning pedagogy informing the IP activity design was social constructivist learning theory; learning is contextual and occurs through group interaction.[42] The primary learning objective for the IPE sessions were for medical and midwifery students to learn about each profession's roles and skillsets, as well as their unique contributions to maternity care - i.e. to develop IP role clarification skills. Role clarification is one of the key competencies areas which leads to IP collaboration.[43]

The clinical topic focus for the IPE sessions was managing human factors or non-technical skills in the maternity clinical environment, therefore a secondary learning objective was for students to gain knowledge of human factors in an IP work environment and their relationship to patient safety[44] (Box 1).

Box 1: IPE learning outcomes

The IPE's intended learning outcomes:

1. **Role clarification:** describe the different roles and skillsets of each profession
2. **Human factors**: define human factors and their relationship to patient safety. Apply human factors thinking to an IP work environment

Design of each IPE learning activity

Informed by an earlier trial undertaken by the lead investigator in 2021,[45] the IPE sessions were designed as an informal, interactive sessions of short duration (1.5-2hours). The IPE was planned as initial exposure level activities involving case-based interprofessional group work.[41]

Four IP teachers (2 medical health professionals and 2 midwives) one of each in two classrooms facilitated the sessions.

Overview of the lesson plans

The lesson plan used for both IPE iterations shared common overall elements. The IPE sessions commenced with a ***1. Karakia and facilitator introductions.*** The students were then divided up into small IP subgroups to undertake ***2. whakawhanaungatanga*** (introductions and getting to know each other). Students were encouraged to talk informally, share background information about themselves, and then ask questions of students from the other profession. After the

whakawhanaungatanga, students came back together for a ***3. class talk on human factors*** in the clinical environment. Finally, students again divided into small IP groups (the same groups used for the whakawhanaungatanga) to ***4. discuss how to manage two clinical case studies*** involving applying human factors thinking to two different scenarios in maternity settings (see Box 2). After discussing the scenarios, students returned together as a group to ***5. Sum up and a close with a Karakia.***

Box 2: Scenarios used for small group case-based work

IPE iteration 1	IPE iteration 2
Scenario 1 – Hand hygiene You are a medical / midwifery student working in a postnatal ward. You observe the senior doctor go into a woman's room, immediately after exciting another room. As you enter the room you notice the doctor about to check the woman's fundus without first using hand hygiene (washing or gel). • What do you know about the impact of hand hygiene? • What is your initial thoughts / feelings towards this situation? • How would you respond? Rationale? • Would you respond differently if it was a senior midwife? • How are you feeling about the suggestions of others in your group? Feedback your answers to the wider group	**Scenario 1 – Administration of vitamin K** In your current role, you have just assisted in a vaginal delivery, and notice a midwife getting vitamin K ready to give to the baby. You recall, while reading the patient file earlier, you saw the parents did not give consent to vitamin K being given to their child. • What is your initial thoughts / feelings towards this situation?? • How would you respond? Rationale for this? • What would you do if this was a paediatrician? Feedback your answers to the wider group.
Scenario 2 – Racism As a student you observe a midwife / doctor being dismissive of a person's concerns relating to abdominal pain during handover. They make assumptions that the pain is exaggerated due to stereotypes about their ethnicity. • What is your initial thoughts / feelings towards this situation? • What assumptions did you make as you read this scenario? • How would you respond? Rationale? • How are you feeling about the suggestions of others in your group? Feedback your answers to the wider group	**Scenario 2 - Racism** As a student you observe a midwife / doctor being dismissive of a person's concerns relating to abdominal pain during handover. They make assumptions that the pain is exaggerated due to stereotypes about their ethnicity. • What is your initial thoughts / feelings towards this situation? • What assumptions did you make as you read this scenario? • How would you respond? Rationale? • How are you feeling about the suggestions of others in your group? Feedback your answers to the wider group.

Appendix B: Detailed results tables

Table 1: Students' post-IPE perceptions (for each IPE student cohort)

Student's perceptions of their participation in the IPE learning activity (post-IPE learning activity survey questions)		**Strongly disagree**	**Disagree**	**Neither**	**Agree**	**Strongly agree**	**Number of responding students**
Overall participation: Overall, my participation in the IPE learning activity has been valuable	IPE 1	0 (0%)	2 (10%)	3 (14%)	11 (52%)	5 (24%)	21
	IPE 2	0 (0%)	0 (0%)	0 (0%)	2 (13%)	13 (87%)	15
Learning about the other profession: Participation in the IPE class has increased my knowledge about what the other profession in the IPE class can contribute to the care of pregnant people and their whanau.	IPE 1	2 (10%)	8 (38%)	3 (14%)	5 (24%)	3 (14%)	21
	IPE 2	0 (0%)	0 (0%)	0 (0%)	5 (33%)	10 (67%)	15
Learning about own profession: Participation in the IPE class has increased my knowledge about what my own profession can contribute to the care of pregnant people and their whanau	IPE 1	2 (10%)	3 (14%)	7 (33%)	7 (33%)	2 (10%)	21
	IPE 2	0 (0%)	0 (0%)	0 (0%)	5 (33%)	10 (67%)	15
Learning about human factors topic: Human factors/Non-technical skills[3] in the clinical environment was a useful topic for medical-midwifery student IPE	IPE 1	1 (5%)	0 (0%)	3 (14%)	8 (38%)	9 (43%)	21
	IPE 2	0 (0%)	0 (0%)	0 (0%)	6 (38%)	9 (60%)	15

Notes:

[1] Two different cohort of students participated in iterations 1 and 2

[2] 1 medical student completed the pre-survey twice

[3] The Human factors topic was renamed "non-technical skills" in the second IPE session.

Table 2: Summary of aspects of the first IPE iteration identified for improvement, modifications made and student and teacher views of the final refined IPE

Description of IPE iteration 1:	**Changes made to IPE iteration 2**	**Students' and/or teachers' response to the modified IPE iteration 2** (Focus group and survey data)
Aspect 1 of IPE iteration 1 identified for improvement: Whakawhanaungatanga and getting to 'know each other' – both students and teachers perceived there was limited engagement between the two student groups and not enough opportunity for students to learn about each other during small group activities (subgroups were too large and not enough time allocated).		
Students in the first IPE session (n=25) divided into two **subgroups of 12-13 students per group** for the whakawhanaungatanga. **25 mins** was allocated for this component. The Whakawhanaungatanga component consisted of brief student introductions and informal Q&A (students typed questions into a shared online whiteboard).	Change 1) The size of subgroups for both learning activities was reduced to **4-5 students per subgroup,**[1] and more time was allocated for the whakawhanaungatanga component (**45-50 mins).**[2] Change 2) The Whakawhanaungatanga component was modified to be more structured to ensure students asked questions for each other were answered.[3] Teachers were provided with a list of 'back-up' questions to use if students ran out of questions or if questions did not generate in-depth discussion.	Both students and teachers perceived the small group size and time allocation for whakawhanaungatanga worked well and facilitated students' rapport building and role learning about each other. *I liked that it was small groups able to get to chat with everyone and actually get to know them rather than it being like 30 of us in here. (Midwifery student, focus group 1)* *Whakawhanaungatanga was so awesome! Learned a lot about them as people but also their course/profession (Medical student, post-IPE survey)* *I liked the more time for Whakawhanaungatanga. I thought that (students) asked, (had) more opportunity to meet that learning of the first learning objective (role clarification)…. I really liked the small group size…. I think that was key within all of my sessions…I found it just so much easier for conversation to flow (with a smaller group) (Medical teacher 2).* During the post-IPE survey when asked "what aspect of the IPE worked well" 12/15 students responding to the question commented on this aspect When asked "did you have enough time to find out about the other profession" 12/14 students responding to this question commented they had enough time to find out about the other profession.

Aspect 2 of IPE iteration 1 identified for improvement: The learning level alignment between medical and midwifery students – students strongly felt the midwifery students did not have as much clinical experience; teachers acknowledged this, but to a lesser extent.

Participating students in the first IPE session: *Medical students* (5th year) on their O & G run – all had experienced clinical placements, but no placements in maternity settings. *Midwifery students* (1st year) in the first few months of their training - most had not yet experienced any clinical placements.	Change 3) Participating medical and midwifery students in the second IPE session were closer aligned in terms of their clinical experience. *Medical students* (5th year) on their O & G run -– all had experienced clinical placements, but no placements in maternity settings. *Midwifery students* (1st year) - the second cohort of midwifery students had more clinical experience than those in the first cohort because by this later stage in the year the midwifery students had had 6 months of clinical experience.[4]	Students participating in the second IPE session did not raise any issues or concerns about the experience level of midwifery (or medical) students. Teachers described the second cohort of midwifery students as slightly more experienced than the first cohort, however they perceived both groups overall had similar levels of limited experience - which they felt on balance worked well for the purposes of the IPE. *The medical students had just started their (O & G) run and the midwifery students had been on the post-natal wards and in a way, that seemed to work out just fine…….both groups had very little clinical experience, but I didn't really feel that it mattered (Medical Teacher 1)*

Aspect 3 of IPE iteration 1 identified for improvement: The online delivery format – teachers found the session challenging to deliver online and felt this contributed to a perceived lack of engagement between medical and midwifery students. Students had mixed views about the online delivery method.

The first IPE session was delivered online over Zoom (due to Covid-19 restrictions). Students were pre-allocated to mixed profession subgroups and placed into 'breakout' rooms for subgroup activities.	Change 4). The second IPE session was delivered in-person. Students were pre-allocated to mixed profession subgroups and directed to sit at tables where their name badge was placed.	Teachers preferred facilitating the IPE session in-person and reported students responded to the session overall better as a result. They perceived the in-person method facilitated students to mingle and start forming connections at their tables before the IPE session had formally begun. *I really loved it being in person. I felt it was much more personable. I like being able to see and eyeball people and you can kind of really gauge their engagement and try and match the energy... Which I felt compared to last time, it was a bit harder to do online cos some of them would mute their cameras or you just don't have a good overview of who's in the room (Midwifery teacher 2, focus group).*

		A few students commented they perceived the in-person delivery worked well in the second IPE session. *"I think everyone talked more because we're in person" (student, unknown discipline, focus group 2)*

Aspect 4 of IPE iteration 1 identified for improvement: The human factors focus of the case scenarios used for small group work – both students and teachers perceived the scenarios could be improved to facilitate more IP discussion and learning. Students perceived the scenarios should have more of a maternity focus (See also aspect 7 which relates to the naming of the topic area).

Two different scenarios involving human factors in maternity settings were used for the case-based learning component: 1)*Hand hygiene scenario* -a student observing a senior doctor failing to use hand hygiene between patients in a postnatal ward 2)*Racism scenario* – a student observing a doctor/midwife being dismissive of a patient's concerns related to abdominal pain (making assumptions the pain is exaggerated due to ethnicity).	Change 5): The focus of the case scenarios in the second IPE session[5] on human factors in a maternity context was maintained,[6] however the first scenario *(hand hygiene)* was replaced with a new scenario that had more of a maternity focus *(administration of Vitamin K to a newborn)*. The new scenario involved a student observing a midwife preparing to administer Vitamin K to a new-born, when the student knew the parents had not given their consent.[7]	Both students and teachers reported the case-based scenarios in the second IPE session facilitated both learning objectives (i.e. learning about different points of view as well as learning different strategies to address human factors), and generated beneficial IP discussion and learning between the midwifery and medical students. *we had an interesting discussion about like midwife versus if it was paediatric consultant and that was quite interesting to hear the different views about like how you feel towards those different situations (Midwifery student, focus group 2).* *it was good to hear what the others had to say about it (the scenarios) because they obviously have different points of view and they had like different things to say and I was like oh yeah that's, that's really true like really good advice about what to do if you're in a situation where it's like you don't really feel comfortable with what someone said and stuff like that... (Medical student, focus group 1*) *there was quite a bit of discussion on the whys and the why nots and what would you do…..a lot of discussion on it. In fact, I had to stop them thinking we would go onto the second one but we ran out of time (Midwifery teacher 1, focus group).*

Aspect 5 of IPE iteration 1 identified for improvement: Facilitator input in relation to the different roles of doctors and midwives – students found they floundered when answering questions about their own discipline through lack of experience. They wanted more input/information from teachers when their own knowledge was limited.

For the first IPE iteration the teachers' role was defined as facilitators – predominantly allowing students to teach and learn with, from and about each other.	Change 6) The 'facilitator' role was maintained; however teachers were asked to more actively contribute information about doctors and midwives roles, and fill in any gaps in student knowledge during Whakawhanaungatanga & the small group case scenario work. Teachers were also provided with a 'backup' list of questions about the roles of doctors and midwives to use with students during Whakawhanaungatanga if necessary.	Students did not make any comments about wanting facilitators to provide more information. Students attending the second IPE iteration perceived facilitators created a welcoming and enjoyable learning environment. *I think the facilitators were great, I think they created a supportive environment that we all felt comfortable enough to share in. (Medical student focus group 2)* *it was good that they had one person (facilitator) from medicine, one person from midwifery…..so it didn't feel like skewed towards one direction. (Midwifery student, focus group 2).*

Aspect 6 of IPE iteration 1 identified for improvement: The mix students allocated to subgroups - researchers identified male medical students dominated discussions in some of the subgroups[2], contributing to the limited IP engagement between the medical and midwifery students (as noted by students and teachers).

In the first IPE session students were allocated to mixed IP subgroups to provide a balance of professions in each subgroup, however by chance all the males in the class ended up in one subgroup	Change 7). In addition to allocating students to subgroups based on profession, male medical students in the second cohort were distributed evenly between the subgroups. Teachers were instructed to be prepared to re-allocate students if absentees on the day meant the groups were not balanced in terms of profession or gender.	Both students and teachers described a positive dynamic and rapport and open conversation between medical and midwifery students in the subgroups. Researchers also noted the positive interaction and engagement in the subsequent focus groups. *I really appreciated how you guys were just hearing our experiences and what's expected of us (Midwifery student, focus group 2)* *I think everyone was open and willing to share (Medical student, focus group 2)* *It did feel very relaxed and at times, it felt more like a conversation relaxed gathering as opposed to an education session (Medical teacher 1, focus group)*

Aspect 7 of IPE iteration 1 identified for improvement: The human factors topic – medical students reported they already knew about Human Factors and had been in classes about this.

In the first IPE session the topic of "Human Factors in the clinical environment" was used as the context for IP learning.	Change 8). The topic of human factors was maintained; however, it was re-named to "Non-Technical Skills" with the aim of presenting something perceived as new to the medical students (Non-Technical Skills was an unfamiliar term for medical students).	Students responded well to the topic renamed as "Non-Technical Skills" and described appreciating learning about non-technical skills and their relevance to the maternity care setting. *I like(d) the comment of that not everyone, oh like …being a good follower is actually just as good as being a leader cause they think like especially when you get into senior roles you're kind of expected to be a leader, but like sometimes it can be quite daunting working up through the ranks (Medical student, focus group 1)* *I think yeah breaking those boundaries is really important to you know so that the Swiss cheese model doesn't happen in that you pick up on those mistakes and you feel more comfortable talking to your colleagues about things that they may have done wrong. (Midwifery, focus group 2)* All students responding to the post-IPE survey agreed Non-Technical Skills was a useful topic for medical-midwifery student IPE (See Table 2).

Table footnotes

1: The second cohort of students (n=20) separated into two separate classes right from the start of the session (the full group were never together), which were then each divided in two for the learning activities.
2: The student IP subgroups used within the IPE sessions were the same groups used for post-IPE focus groups.
3: In IPE iteration 2 the whakawhanaungatanga had two distinct components: a-Making connections (purely introductions); b-Learning with, from and about each other (students were asked to stick post-it notes with questions for each other onto A1 sheets, and teachers went through the questions with students as a group).
4: It was suggested that year 1 midwifery students were an appropriate match. In 2023 the IPE will be held in the second semester with first year midwifery students who at this pint will have had more clinical experience.
5: To allow more time for Whakawhanaungatanga, the time allocation for case scenario work was reduced from 30 mins in IPE iteration 1 to 15 mins in IPE iteration 2. Some of the teachers perceived student discussion during case scenario work was limited by the reduced time allocated to this component and identified this as a possible area for further improvement of the IPE.

6: The use of case dilemmas involving human factors (rather than exclusive focus on a maternity dilemma) was maintained because the teaching team felt: 1) the generic nature of the scenarios would be more suited to the students early experience level and 2) the students' suggestion for scenarios to include a dilemma more specific to maternity care dilemma to facilitate greater discussion around roles, would be met by the changes made to the first learning activity.
7: For the second IPE session, it was left up to teachers to gauge whether to use one scenario or two

Table 3: Key themes medical and midwifery students commented learning about each other's roles in the post-IPE survey (data source = free text comments)

Medical students	**Midwifery students**
The important contribution and value of midwifery to maternity care *their contribution to the continued/long-term care of patients is so vital*	The important contribution and value of midwifery to maternity care *that there is so much knowledge in midwifery, and it needs to be shared. Because so many people don't know about it*
How the medical profession relates to and interacts with midwives is important *Our attitude towards midwives makes a difference to the overall team dynamic*	Medical students had knowledge gaps about midwives' role *their conceptions of midwifery …they initially viewed us as having less importance than they may have thought*
The different roles/responsibilities/training requirements/constraints of midwives and doctors and the how they can work together *I learnt more about the relationship between midwives and obstetricians, and how they work together to provide care for their patients*	The different roles/responsibilities/training requirements/constraints of midwives and doctors and the how they can work together *that we are lucky with our CLEs and get the one-on-one chance to ask, talk and interact with all professionals (unlike the medical training programme)*
The important contribution of our medical role *although we are very reliant on midwives for primary care of mothers, obstetricians are very important in maternal healthcare*	Our knowledge gaps about doctors *just how little we know about doctors*

NB: two questions combined. Based on those who responded to brief free text.

7.0 References

1. Downe S, Finlayson K, Fleming A. Creating a collaborative culture in maternity care. Journal of midwifery & women's health 2010;55:250-4.
2. Skinner JP, Foureur M. Consultation, referral, and collaboration between midwives and obstetricians: lessons from New Zealand. Journal of midwifery & women's health 2010;55:28-37.
3. Ministry of Health. Guidelines for Consultation with Obstetric and Related Medical Services (Referral Guidelines). Wellington: Ministry of Health; 2012.
4. Perinatal and Maternal Mortality Review Committee. Twelfth annual report of the Perinatal and Maternal Mortality Review Committee. https://www.hqsc.govt.nz/assets/Our-work/Mortality-review-committee/PMMRC/Publications-resources/12th-PMMRC-report-final.pdf2018.
5. Gorantla SB, U. Singh, J. V. Dwivedi, A. D. Malhotra, A. Kumar, A. Introduction of an undergraduate interprofessional simulation based skills training program in obstetrics and gynaecology in India. Advances in Simulation 2019;4:6.
6. Quinlivan JA, Thompson CM, Black KI, Kornman LH, McDonald SJ. Medical and midwifery students: how do they view their respective roles on the labour ward? Australian and New Zealand journal of obstetrics and gynaecology 2002;42:403-8.
7. Murray-Davis BS, Elizabeth Kerley, Brian Knight, Sandy. A Pilot Project of Collaborative Maternity Education: Understanding Perspectives from Family Medicine and Midwifery. Canadian Journal of Midwifery Research & Practice 2013;12:22-9.
8. Patterson J, Miller S, Kerkin B, Mącznik A, Baddock S. Preparing midwifery students to consult confidently. Women and Birth 2021;34:105-10.
9. World Health Organization. Framework for Action on Interprofessional Education and Collaborative Practice. Retrieved from http://www.who.int/hrh/nursing_midwifery/en2010.
10. Frenk J, Chen L, Bhutta ZA, et al. Health professionals for a new century: transforming education to strengthen health systems in an interdependent world. Lancet 2010;376:1923-58.
11. Institute of Medicine. Measuring the Impact of Interprofessional Education on Collaborative Practice and Patient Outcomes. . https://www.nap.edu/catalog/21726/measuring-the-impact-of-interprofessional-education-on-collaborative-practice-and-patient-outcomes2015.
12. What is CAIPE? Retrieved from https://www.caipe.org/about-us. 2017.
13. Andersn G, Hughes C, Patterson D, Costa J. Enhancing inter-professional education through low-fidelity simulation. British Journal of Midwifery 2017;25:52-8.
14. Burns ESD, M. Leggett, J. Schmied, V. Emergency scenarios in maternity: An exploratory study of a midwifery and medical student simulation-based learning collaboration. Women and Birth 2020.
15. Kumar A, Wallace EM, East C, et al. Interprofessional simulation-based education for medical and midwifery students: a qualitative study. Clinical simulation in nursing 2017;13:217-27.
16. Lestari ES, R. E. Widyandana, D. Scherpbier, A. Does PBL deliver constructive collaboration for students in interprofessional tutorial groups? BMC Medical Education 2019;19:360.
17. Symonds IC, L. Fraser, D. Evaluation of a formative interprofessional team objective structured clinical examination (ITOSCE): a method of shared learning in maternity education. Medical Teacher 2003;25:38-41.
18. McLelland GM, L. French, J. Crossing professional barriers with peer-assisted learning: Undergraduate midwifery students teaching undergraduate paramedic students. Nurse Education Today 2013;33:724-8.
19. Anderson GH, C. Patterson, D. Costa, J. Enhancing inter-professional education through low-fidelity simulation. British Journal of Midwifery 2017;25:52-8.

20. Furber CH, J. Lee, K. McLoughlin, A. Boggis, C. Sutton, A. Cooke, S. Wakefield, A. Interprofessional education in a midwifery curriculum: The learning through the exploration of the professional task project (LEAPT). Midwifery 2004;20:358-66.
21. Kumar AG, C. Nestel, D. Aldridge, R. McLelland, G. Wallace, E. Can we teach core clinical obstetrics and gynaecology skills using low fidelity simulation in an interprofessional setting? Australian & New Zealand Journal of Obstetrics & Gynaecology 2014;54:589-92.
22. Meffe FCM, C. Espin, S. An interprofessional education pilot program in maternity care: findings from an exploratory case study of undergraduate students. Journal of Interprofessional Care 2012;26:183-8.
23. Edwards SEP, S. Lenguerrand, E. Winter, C. Mears, J. Davis, S. Lucas, G. Hotton, E. Fox, R. Draycott, T. Siassakos, D. Effective interprofessional simulation training for medical and midwifery students. BMJ Simulation and Technology Enhanced Learning 2015;1:87-93.
24. Lefebvre KW, J. Stoll, K. Vedam, S. Through the resident lens: examining knowledge and attitudes about midwifery among physician trainees. Journal of Interprofessional Care 2018.
25. Murray-Davis BM, M. Gordon, F. Becoming an interprofessional practitioner: Factors promoting the application of pre-qualification learning to professional practice in maternity care. Journal of Interprofessional Care 2014;28:8-14.
26. McLelland GP, C. Morphet, J. McKenna, L. Hall, H. Williams, B. Cant, R. Stow, J. Interprofessional simulation of birth in a non-maternity setting for pre-professional students. Nurse Education Today 2017;58:25-31.
27. Daellenbach R, Davies L, Meeks M, Ormandy J, Welfare M. Prebrief or debrief? Using simulation in collaborative midwifery and medical education. New Zealand College of Midwives 16th Biennial national conference 5-6 November, 2021; 2021; Christchurch.
28. Daellenbach R, Davies L, Meeks M, Welfare M, Ormandy J, eds. Obstetric Violence and Systemic Disparities. Can Obstetrics Be Humanized and Decolonized? Volume 3.: Berghahn Books; 2023.
29. Smith L, Keiser M, Yorke A, Turkelson C. Use of a Structured Approach to Develop Best Practices in Interprofessional Education. Journal of Nursing Education 2021;60:309-16.
30. Avery MD, Jennings JC, Germano E, et al. Interprofessional education between midwifery students and obstetrics and gynecology residents: an American College of Nurse-Midwives and American College of Obstetricians and Gynecologists collaboration. Journal of Midwifery & Women's Health 2020;65:257-64.
31. Fraser DM, Symonds I, Cullen L. Multiprofessional or interprofessional education in obstetrics and gynaecology. The Obstetrician & Gynaecologist 2005;7:271-5.
32. Rose S, Hamill R, Caruso A, Appelbaum NP. Applying the Plan-Do-Study-Act cycle in medical education to refine an antibiotics therapy active learning session. BMC Medical Education 2021;21:1-7.
33. Wallett L, Chen W, Thomas L, et al. Developing a simulation-based learning model for acute medical education during COVID-19 pandemic with Simulation via Instant Messaging–Birmingham Advance (SIMBA). BMJ open quality 2022;11:e001565.
34. Hartle R, T. A collection of research reporting, theoretical analysis, and practical applications in science education: Examining qualitative research methods, action research, educator-researcher partnerships, and constructivist learning theory. Submitted in partial fulfillment of the requirements for the degree of Doctor of Arts in the Department of Biological Sciences 2007.
35. Tanner KD, Chatman L, Allen D. Approaches to biology teaching and learning: Science teaching and learning across the school–university divide—cultivating conversations through scientist–teacher partnerships. Cell Biology Education 2003;2:195-201.
36. Barbour RS. Focus groups. Qualitative methods in health research London: Sage 2010:327-52.

37. Guest G, Namey E, Taylor J, Eley N, McKenna K. Comparing focus groups and individual interviews: findings from a randomized study. International Journal of Social Research Methodology 2017;20:693-708.
38. Nyumba T, O, Wilson K, Derrick CJ, Mukherjee N. The use of focus group discussion methodology: Insights from two decades of application in conservation. Methods in Ecology and evolution 2018;9:20-32.
39. Stalmeijer RE, McNaughton N, Van Mook WN. Using focus groups in medical education research: AMEE Guide No. 91. Medical teacher 2014;36:923-39.
40. Webb C, Doman M. Conducting focus groups: Experience from nursing research. Junctures: The Journal for Thematic Dialogue 2008.
41. Interprofessional Education. Division of Health Sciences. https://www.otago.ac.nz/healthsciences/staff/ipe/otago810646.pdf. accessed 7/03/23,
42. Hean S, Craddock D, O'Halloran C. Learning theories and interprofessional education: A user's guide. Learning in health and social care 2009;8:250-62.
43. Pullon S, Symes A. A curriculum and quality framework for interprofessional education at Otago: Divisional Interprofessional Education Governance Group and IPE Centre, University of Otago; 2019.
44. Gordon M. Non-technical skills training to enhance patient safety. The clinical teacher 2013;10:170-5.
45. Ormandy J, Austin D. Piloting an interprofessional education session for midwifery and medical students. Interprofessional Education Showcase Sustaining interprofessional innvoation and momentum in 2021 19 November 2021 (virtual presentation); 2021; Auckland.

UNIVERSITY TEACHING DEVELOPMENT GRANT
FINAL REPORT

Project Title: Moana Theology

Project Overview

The aim of the project was to design and deliver an undergraduate paper in Pacific Theology, and to explore the ways in which Pacific pedagogies might enhance teaching and learning within the Theology Programme, especially, but not exclusively, for Pacific students. It was intended to undertake this project in close collaboration with Pasifika stakeholders of the Theology Programme. The aims were accomplished inasmuch as the paper was successfully delivered as a Pre-Christmas Summer School paper in 2022, (rather than a semester 1 paper in 2023 as orginially planned) and co-hosted by the Congregational Christian Church of Samoa, (CCCS), Mangere East, with whom the University has an MoU. The challenges associated with working with an external partner and negotiating the cultural protocols and expectations were considerable and a good deal was learned in the process. Both the Theology Programme and the Church are committed to repeating the project in future. Student evaluation of the paper indicated that it was well-received by students.

Introduction

The University of Otago is the only university in New Zealand to offer degree programmes in Christian Theology. It is uniquely placed therefore, to develop opportunities for students to undertake the study of Christian Theology from a Pacific perspective. The Theology Programme takes seriously the commitment expressed in Goal 5 of the University's 'Pacific Strategic Framework' to 'increase Pacific content and perspectives in curricula'. Although staff have been involved in undertaking and supporting postgraduate research in Pacific theology, and while a number of papers in the Theology Programme utilise source material by Pacific theological scholars, there was, prior to this project, no paper that offered sustained attention to Pacific theological perspectives.

A number of recent developments in the Theology Programme have encouraged us to expand our attention to Pacific theology in the curriculum. We have successfully developed a paper in Māori Theology and Religion (also funded initially by a CALT grant). This paper has proven to be very popular with students and has attracted new Māori students to the Programme and to the University. The success of this initiative served as a precedent for the development of a paper in Pacific theology. The second recent development was the successful implementation of a series of Workshops exploring the fruitfulness of talanoa methodology for engaging Pacific students in study of the Bible. This project, led by Professor David Tombs, served as a pilot project for the further development of Pacific theological study.

Other factors prompting this initiative were the appointment in 2020 of Emeritus Professor Fele Nokise as an Honorary Fellow in the Theology Programme. Professor Nokise, a graduate of this University, is the former Principal of Pacific Theological College in Fiji and one of the Pacific's leading theologians. He was an advisor for the present project. The Theology Programme has a long-standing MoU with Piula Theological College in Samoa under which we have seen four Piula graduates and current staff members complete their

PhD's at Otago. Two further graduates from Piula have completed Masters degrees and one is currently engaged in PhD study at Otago. One of the recent PhD students is Latuivai Kioa Latu who has recently completed his PhD and will graduate in May 2023. Latu was engaged to be the primary teacher of the new paper with assistance from Professor Murray Rae and Dr Wayne Te Kaawa. Considerable use was also made of guest lecturers and presenters.

In addition to the relationship with Piula Theological College, we also have long-standing relationships with Malua Theological College in Samoa and Pacific Theological College in Suva. An MoU with Malua was signed in 2022. One Malua staff member is currently working towards his PhD at Otago.

The principals of both Piula and Malua Colleges were guest presenters (by Zoom) in the Pacific Theology course.

We have seen recent increases in enrolments in Theology papers by Pasifika students and we expect the introduction of this paper to stimulate further increases.

Approach

Initial discussions about the feasibility and value of the project were undertaken by Theology Programme staff and the Latuivai Kioa Latu, and consultation was undertaken with a panel of expert advisors, including Prof Fele Nokise, several Pasifika Otago PhD graduates, and the Associate Dean Pacific for the Division of Humanities. Consultation was also undertaken with Piula Theological College in Samoa and, increasingly as the project developed, with Revd Victor Pouesi from the CCCS in Mangere East, and Tofilau Nina Kirifi-Alai, the Auckland based Pacific Community Engagement Manager for the University.

As a result of these consultations, a course design was developed, teaching material was prepared, and the complex logistics and culutral expectations involved in hosting an intensive course at a Pasifika Church in Auckland were negotiated.

As well as promoting the paper to current theological students the paper was also commended to students taking other degrees. A number of events within the programme including two public lectures and a panel discussion with Pacific Church leaders, were open to the public and were well attended.

Consonant with our aim to provide students with an opportunity to experience Pacific culture, the course commenced with attendance at the Sunday morning worship service at CCCS, followed by a formal meal and speech-making. An 'ava ceremony was hosted by the Church on the first day of teaching. Reflection upon the cultural and theological significance of these events constituted an important part of student learning.

Key Outcomes

Key outcomes of the project include:

- Students who completed the paper were introduced to a range of Pacific theological thinking, much of which was new to them, especially to Palagi students.
- Relationships with external stakeholders, especially the CCCS in Mangere East, were further developed and strengthened.

- Relationships with Malua and Piula Theological Colleges in Samoa were strengthened. The principals from both Colleges each presented a lecture by Zoom and spoke very appreciatively of the opportunity to be involved in the project.
- The offering of this paper was a key factor in our subsequently attracting external funding of $300,000 to make a fixed-term three-year appointment in Pacific Theology. The appointment process for this posiiton is currently underway. The appointee will take over responsibility for teaching the new paper in 2023 and beyond, develop at least one new paper in the area of Pacific Theology, and provide input from a Pasifika perspective to other papers offered by the Theology Programme.

Student feedback indicating appreciation for the content and the location of the course includes the following comments:

- The Ava ceremony was such an insightful and enlightening experience for me personally. I found that my understanding of church service and its place in Samoan spaces was deeply enriched by the Ava ceremony in this context.

- It was a great pleasure having the opportunity to listen to them [the panel members] as well as their journey and experiences of being ministers from different churches. There were many conversations coming from every end from Mental health in Pacific churches to Monetary donations and so many more other interesting subtopics.

- Being Samoan I never sit to receive kava as girls are usually in the back ready to ka'i le sua and other behind the scene chores. So receiving this kava was a golden opportunity as I may not be able to experience this opportunity in the near time. Being able to listen to the chiefs speak in brutal language makes me very proud to be Samoan.

- I really adored the concept of using the Fale Samoa as the foyer. It serves as a representation of the Moana and how these Fale customs originated on the island. The entranceway is decorated to make you feel as though you are entering your own church. The sense of being welcomed and the house of connectedness is there, combining cultural and historical knowledge. It conveys a notion of stepping towards the future and honoring our ancestors and the paths they paved for us. It expresses the culture and way of life in various ways. it is a peaceful location that one may call home.

- Christine was given the responsibility to speak in the Kava ceremony. A ceremony that is typically dominated by male was in fact a very momentous event for Otago as well as for Samoan women. For a Tongan, it was quite a statement and powerful that she was given the chance to speak.

- I am humbled with my immersion at Puaseisei [Church] and to experience Moana peoples doing Moana Theology.

Key Findings and Discussion

Consistent with our experience of delivering a paper in Māori Theology as a fully-immersive experience on a marae, the offering of a paper on Pacific Theology on location at a Pacific Church in Auckland greatly enhanced the learning experience of the students, and enabled Pasifika students to feel 'at home' and honoured in a way that can't be achieved to the same degree in a campus lecture theatre.

There are also rich rewards to be gained by building connections with external stakeholders like the CCCS. These include building relationships of cooperation and respect, and increasing the levels of confidence among stakeholders, in this case Pasifika communities, that the University is accessible and hospitable to Pasifika cultures and people.

Engaging with the Pasifika community in the delivery of this project also brought challenges however, not least in negotiating the various cultural hierarchies at work across the Pasifika communities and honouring each community in equal measure, adapting to the very different practices and expectations around financial issues, and taking care not to offend against various theological commitments that are held by the church community. A good deal has been learned in this regard and will be applied to future iterations of the paper.

Conducting an intensive course co-hosted by a church community in Auckland is expensive. Discussions have been held with the PVC Humanities about how we might manage and reduce this expense in future, but, given the benefits attained through an immersive course with high stakeholder involvement and the close alignment between this mode of delivery and the goals of the Pacifc Strategic Framework, the Theology Programme is committed to repeating the course in future and managing the additional costs involved.

It must be admitted that the first iteration of the course, including extensive involvement of guest presenters, lacked overall cohesion with respect to the material covered. This will be mitigated to a large extent through the appointment of a full-time lecturer in Pacific theology who will have more time to dedicate to course design and delivery, and by further review and analysis of the course content. This will be undertaken in due course in conversation with the successful applicant for the lectureship. Despite the lack of overall cohesion however, individual segments of the paper as taught provided good learning experiences for the students.

Other Outputs

The development of the paper included production of a coursebook for students containing an introduction to each of the topics and to each of the set readings for the course. While the coursebook will require further development and modification it provides a good framework for further development of the paper.

The experience of teaching in an immersive setting has been shared with academic staff in the Theology Programme and frequent discussions are held about how to increase the levels of Pasifika (and Māori) content in our papers. The findings from this project have informed those discussions.

Expenditure of the grant is detailed in the accompanying financial report. The overspend of $269.00 was covered by external donor funds held by the department which are regularly used to support Māori and Psifika student learning.

Conclusion

I record my thanks to the DVC Academic for the provision of the grant and for the opportunity it has given the Theology Programme to further develop its commitment to the goals of the Pacific Strategic Framework.

Professor Murray Rae

CALT grant: Full Report

Title: Title: R code for training in data analysis using case study videos that motivate statistics learning

Team: Assoc. Prof. Matthew Schofield, Assoc. Prof. John Harraway, Greg Trounson

Snapshot: The purpose of the CALT Grant is develop R code for video case study exercises which are freely available on the Department of Mathematics and Statistics website. Lessons are currently provided for these videos in the Genstat statistical language. This project will look to convert the lessons to the R language. The R statistical package was founded at the University of Auckland in 1992 and is freely available online. R is extensively used both locally and globally, including the statistics teaching programme in the Department of Mathematics and Statistics.

Introduction:

There are 20 videos available on the Department of Mathematics and Statistics website. Each video presents a case study and describes how statistics was used to answer interesting research questions across a range of scientific disciplines. These videos are motivational for students who are taught statistics in almost every subject at the University of Otago as well as many who choose to major in statistics. Between April 2011 and the start of the project there have been over 103,000 visits from unique off-campus addresses. Individual hits on the videos come from 29 countries with users in the United States and China being the greatest users (see attached document). However, the usefulness (and popularity) of these videos is limited due to the software programme Genstat being used to analyse the data. When the videos were first developed, Genstat was free to schools in New Zealand and GenStat lessons have been built into the videos. However, Genstat is not free outside of schools, or internationally. To our knowledge it is not used for statistics education in any university in New Zealand. The reliance on Genstat limits the applicability of the videos for use within the University and beyond.

The purpose of the CALT Grant was to develop R code for all the case study exercises which currently are presented in Genstat. The R statistical package was founded at the University of Auckland in 1992 and is freely available online. R is extensively used both locally and globally. R is used throughout the statistics curriculum at Otago and other universities in New Zealand and worldwide.

The introduction of R code will make these videos more appropriate for integration within local teaching environments, potentially making the videos available to a greater number of New Zealand students. In this project the case studies described in the 20 videos will have R code developed for all analyses and for additional exercises to help mastery of R. The lessons currently used by some high school teachers will be rewritten with R software in mind.

Methods:

The most important aspect of this grant was finding a suitable research assistant. Jess Allen agreed to do this work, and she did an amazing job. The success of the project is due to the contributions she made.

We used Quarto to develop the new website. This is recently developed software that allowed us to integrate R software into website development. The result looks professional (in our opinion) and provides many features that we had not anticipated when the project began. These features aid the learning environment created with the lessons, and include the use of tabs, code hiding, and alert boxes.

Key outputs:

The primary output is the newly developed website. This is available at https://www.stats.otago.ac.nz/research/Statistics-in-Research/

There were several secondary outputs:

1. Assoc. Prof. John Harraway presented a talk on our work at the ICOTS 11 conference in Rosario, Argentina (self-funded). ICOTS (International Conference on Teaching Statistics, https://icots.info/11/) is the premier conference on matters related to statistical education.
2. A paper on our work was published in the ICOTS 11 conference proceedings with authors Harraway, Schofield and Allen. The paper was peer-reviewed as is available online (http://iase-web.org/icots/11/proceedings/pdfs/ICOTS11_300_HARRAWAY.pdf?1669865552). A pdf is attached to this final report.
3. Assoc. Prof. John Harraway presented a talk on our work at the New Zealand Statistical Association (NZSA) conference in 2022 (self-funded).

Discussion and implications:

The resource we have developed is freely available and we believe it will be widely used. Following the presentation of our work at the NZSA conference, Assoc. Prof. Harraway was approached by staff members at the Department of Conservation interested in the material. They are now planning on making use of the lessons we have produced for internal training to enhance their quantitative capability.

External feedback on the project was provided by Mike Camden. Mr Camden sits on the Statistics New Zealand Education subcommittee, although his feedback was done in a private capacity. He visited Dunedin and reviewed our work. He provided several helpful suggestions that were incorporated into the final version.

CALT Project Snapshot

Title: R code for training in data analysis using case study videos that motivate statistics learning

Team: Assoc. Prof. Matthew Schofield, Assoc. Prof. John Harraway

Snapshot: The purpose of the CALT Grant is develop R code for video case study exercises which are freely available on the Department of Mathematics and Statistics website. Lessons are currently provided for these videos in the Genstat statistical language. This project will look to convert the lessons to the R language. The R statistical package was founded at the University of Auckland in 1992 and is freely available online. R is extensively used both locally and globally, including the statistics teaching programme in the Department of Mathematics and Statistics.

MOTIVATIONAL CASE STUDY VIDEOS WITH R ANALYSES OF THE DATA

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Twenty motivational videos that focus on applied statistics are available on the University of Otago website. These are accompanied by data and lessons that are targeted at students in schools and universities that use GenStat software. The videos and lessons cover a range of techniques and have been popular with over 100,000 page visits since 2011. We outline transitioning the lessons to R software. R is freely available and widely used, including in the statistics curriculum at the University of Otago. The updated lessons are written using the Quarto package and are available online. Relative to static documents, no downloads are required, and the lessons offer new possibilities for interaction between the students and code.

INTRODUCTION

Twenty motivational videos for analysing research data have been developed to be used by students in schools and universities. A university course in statistics is required as a prerequisite for study and research in many academic subjects. Statistics is also a subject in the New Zealand school curriculum. The videos show real-world applications that demonstrate the ability of statistics to benefit science and society. The videos and lessons are freely available and can be accessed at https://www.stats.otago.ac.nz/videos/statistics. Each video uses real data collected or produced by an active researcher along with a set of lessons for each study relevant to that research.

The videos have proven to be popular. Since inception in April 2011, 112,436 visits have been logged to the central website. Over the past six months, 31 countries have more than 10 hits, with the most traffic from the United States (1,478 visits) and China (738 visits), where the origin of internet traffic comes from public records.

The available lessons guide readers through the statistical analyses discussed in the videos and assume the student is using the GenStat software package (2022). GenStat was an obvious choice at the initiation of the video programme 10 years ago because Vision International provided the GenStat package for free use in every high school in New Zealand, and a dedicated group of teachers developed lessons for each video using this software. However, most visitors to the site do not have access to GenStat. This limits both its appeal and its effectiveness.

We outline conversion of GenStat lessons to those written for the R software system. The R-project (R Core Team, 2022) is freely available software that is widely used in academia and industry. R is open source and can be used after studies have been completed. The software is well supported by the statistical community. At the time of writing there are nearly 2,000 packages available for download on CRAN (comprehensive R archive network) that extend the capabilities of the software, often including state-of-the-art statistical methodology. Integrated development environments (IDEs) are available for R (e.g., RStudio Team, 2022) that are user friendly. The R software is increasingly being used by applied researchers. For example, Lai et al. (2019) report ecology publications using R software increased from 11% in 2008 to 58% in 2017. At the University of Otago, the R language is used throughout the statistics curriculum, from introductory classes to graduate level courses. It is also being used in courses in other scientific disciplines, such as zoology and psychology. Making lessons available in R means that students develop familiarity with R, gaining confidence in a software package that will benefit their future training and research in their chosen fields.

CONVERSION TO R

The current GenStat lessons are available as a document download in portable document format (PDF). Our goal was not only to transition to the R language, but also to avoid lessons downloaded as static documents. Instead, we wanted the R code and any output (graphics, tables, etc.), to be available embedded on the website. Moreover, we wanted to ensure that any content was interactive, easy to access, and reproducible. To achieve this, we use the software Quarto (Allaire, 2022). Quarto can be thought of as a next generation version of R markdown (Allaire et al., 2022). It offers a writing and publishing environment for technical content that allows integration of code from several software

In S. A. Peters, L. Zapata-Cardona, F. Bonafini, & A. Fan (Eds.), *Bridging the Gap: Empowering & Educating Today's Learners in Statistics. Proceedings of the 11th International Conference on Teaching Statistics (ICOTS11 2022), Rosario, Argentina.* International Association for Statistical Education. iase-web.org

languages, including R, Python, and Julia. There are several output formats, including html, pdf, and Microsoft Word. We have used Quarto rather than R markdown for two reasons. The first is that Quarto offers more flexibility in designing the layout of the new lessons. The second is that we expect Quarto to receive more development and support in future years.

The website featuring the R code is under construction. The main page introduces and provides an overview of the project. It also provides an overview of the website, provides information about the lesson structure, and offers tips about how to interact with the lessons. The next page provides information about getting started with R and does not assume prior knowledge of the software. It provides a comprehensive and easy to follow introduction to the R language. Those already familiar with R can skip this page. Each lesson includes the following.

- *Video*: A motivational video embedded in the html document. The videos focus on a real-world application and on statistical methodology. The analyses presented do not rely on any statistical package. The videos give context and appreciation for the research undertaken and motivate the corresponding lesson.
- *Learning outcomes:* A list of outcomes students can expect to learn by completing the lesson.
- *Data:* Data that are freely available to download in Excel format.
- *Lesson Task 0*: Installation of any necessary R packages and loading the data into R.
- *Tasks:* Individual lesson components, with full explanations given for each task.

We expect the website to be complete in 2022. The content of the lessons themselves are largely unchanged (albeit converted from GenStat to R). Any modifications were made to allow easier conversion for use with R, or to ensure consistency between lessons. To illustrate many of the features of the website we use screenshots from a lesson based on a study that considers data from two populations of dolphins. One of these populations is based off the South Island of New Zealand, the other off the North Island of New Zealand. For each, measurements were collected for a sample of animals. Of interest is the evidence that the two populations are different species. Screenshots for this lesson are presented in Figures 1 and 2. We note that the lesson is still under development and that the final version may differ from that shown.

The lessons have been arranged hierarchically, which differs from the existing website where lessons are ordered chronologically. As new lessons were developed, they were added to the end of the list, which was convenient but far from optimal for student learning. The new website separates videos into three categories: (a) continuous data, (b) count data, and (c) time series data. Within each grouping, videos are arranged by difficulty of the problem. Earlier videos allow for students to learn core concepts that are reinforced in later lessons in the grouping. To assist with this, we make use of alert boxes. An orange alert box means that the current task is related to content from a previous lesson. There is a link to the previous lesson, allowing student to easily navigate and interact with the previous material (see Figure 2). Blue alert boxes inform the student that their current task is related to an earlier task in the same lesson.

The use of alert boxes focuses students' attention on important concepts. We use a yellow learning box to emphasize the learning outcomes at the start of each lesson (see Figure 1). The learning outcomes could be statistical (e.g., interpreting a simple linear regression), or they could be related to coding in R. Other important information is given in green alert boxes.

Having lessons available in html gives greater flexibility than lessons available as static documents. For example, we make use of tabs. Each task consists of at least three tabs. These correspond to 'task,' 'code,' and 'solution.' (See Figure 2.) The task tab is the tab that is initially open to the student. This tab outlines the objective of the task, e.g., 'Load data into R.' The second tab (which can be opened by clicking on the heading) is the code tab that displays the code necessary to complete the task. The use of Quarto enables two features in this tab. The first is easy copying of the R code via a clipboard button (see Figure 2(b)), which can be useful for those learning R because typographical and formatting errors can otherwise hinder learning and progress. The second feature is code folding, where certain 'chunks' of code can be shown or hidden with the click of a button. We set the default behavior of the code folding (whether the code is hidden or available) based on where the task falls in the lesson hierarchy. For tasks that involve multiple coding steps, we may choose to have steps that are familiar to students be initially hidden, whereas new material is shown for ease of learning. Users can reveal any hidden code with a single mouse click.

The third tab is the solution tab. This shows the output generated by running the code and includes any discussion or interpretation (if appropriate). In addition to providing balance for the website design, the tabs allow for self-directed, scaffolded learning (Al Mamun et al., 2020). In early lessons students can make extensive use of the code tab to assist with learning R. Similarly, the solution tabs can help with understanding statistical content. As students gain confidence, they can attempt to answer the questions before checking their answers by selecting the tabs.

A fourth tab entitled 'extension' is available in some tasks, particularly in later lessons. It contains extension questions that allow students to build their confidence, knowledge, and understanding, making use of what they have learned in the main task.

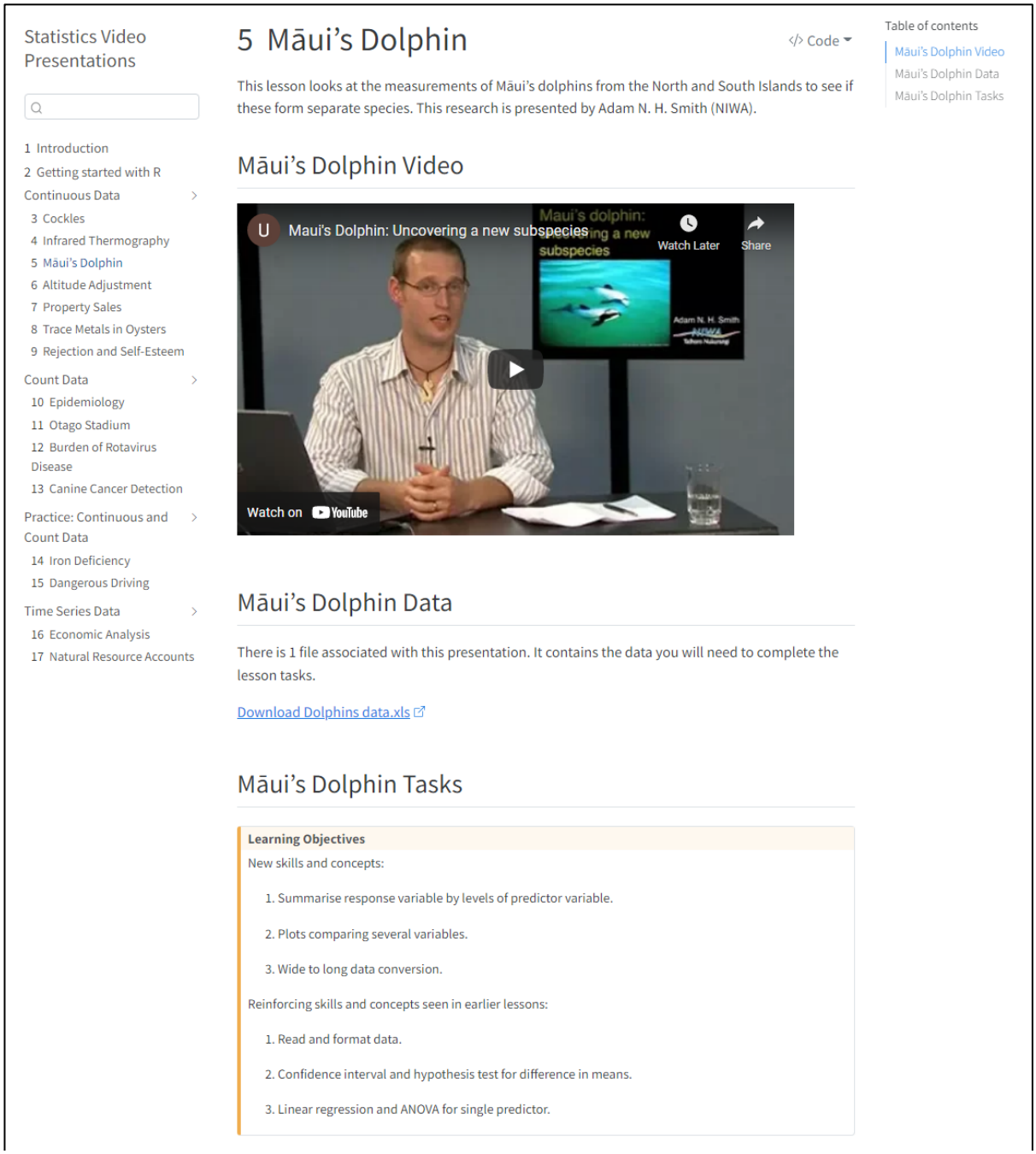
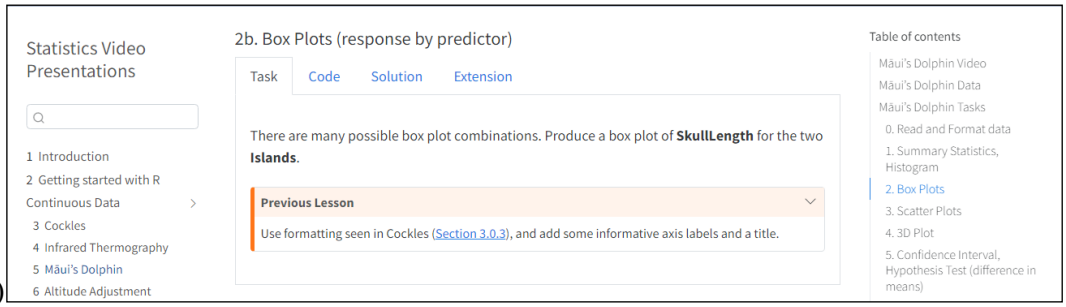
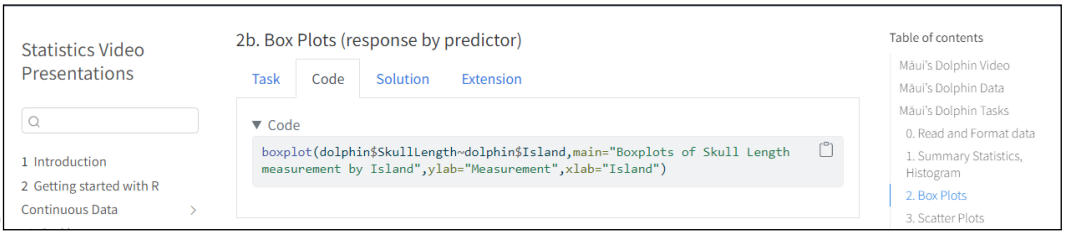


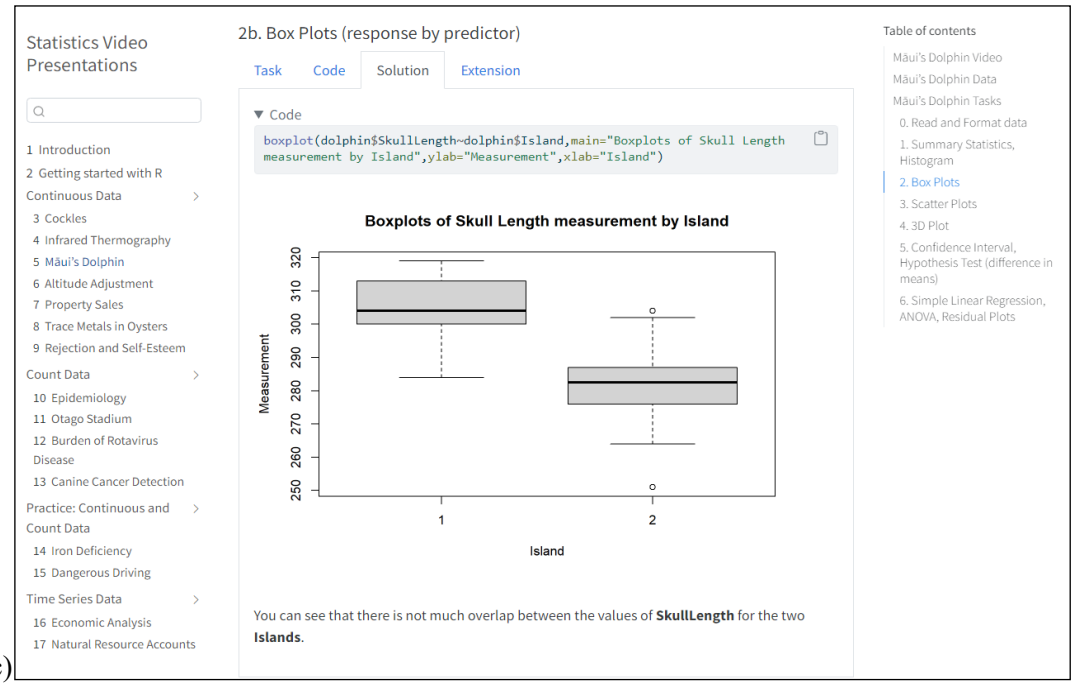
Figure 1. Screenshot of the start of Lesson 5: Māui's Dolphin, with learning outcomes stated in the yellow alert box



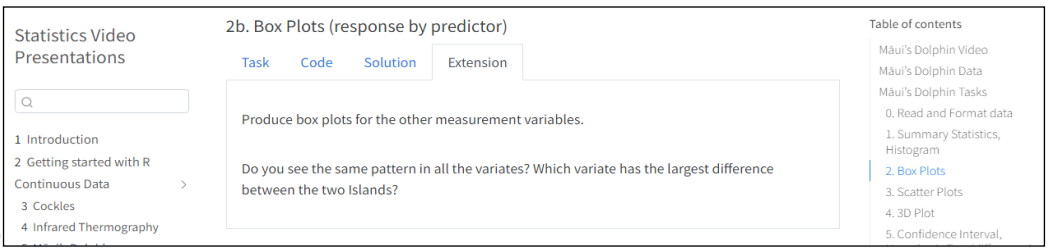
(a)



(b)



(c)



(d)

Figure 2. Screenshots showing Task 2b from Lesson 5 (Māui's Dolphin). (a). Default tab outlining the task and including an alert box with a reminder of previous work in Lesson 3 (Cockles). (b). Code tab that shows the R code required to complete the task, with a clipboard symbol on upper right that enables code copying and a code folding arrow above the code box. (c). Solution tab that shows completed boxplot. (d). Extension tab that presents additional tasks to complete (i.e., obtain boxplots of other variables in the dataset).

DISCUSSION

The videos and accompanying lessons using R can be used as a training resource for large introductory statistics classes. The videos can motivate students in their studies, highlighting the value of statistics in a wide range of real applications. Working through the videos helps students gain the skills they need in their respective disciplines. It can aid them in understanding the quantitative results in research and statistical reports. The videos have been grouped according to the type of data being analysed, and further ordered according to the complexity of techniques that are being taught. This occurred as part of the conversion to R, with the intention of providing a more structured learning environment for students to gain confidence in applied statistical modelling and computation. The Cockles lesson introduces the construction of graphs, confidence intervals, hypothesis tests, Analysis of Variance (ANOVA), and multiple regression for continuous data sets. Subsequent lessons reinforce these techniques and present more advanced ones, including summary measures, function writing, and bootstrapping in the Infrared Thermography lesson and principal components analysis in the Trace Metals in Oysters lesson. Plotting, confidence intervals, hypothesis testing, logistic regression, ANOVA, and bootstrapping techniques are applied to categorical data in the Epidemiology and Titi lessons. These are practiced, along with higher level multiple logistic regression, stratification, and missing data strategies, in lessons such as Otago Stadium and Burden of Rotavirus Disease. The Iron Deficiency, Dangerous Driving, and Tourism applications involve a combination of data types and have many activities, potentially for use with extension and assessment. Canine Cancer Detection explores diagnostic testing. An introduction to time series visualization, decomposition, and interpretation is provided in the Economic Analysis lesson, with practice available in Natural Resource Accounts.

Use of the R language makes the videos appealing to a wider pool of students. We have taken care to ensure that there is introductory material that can support those with no previous knowledge of the R-project. Learning R from real examples is ambitious and challenging but comes with high payoffs. These payoffs include gaining familiarity with a tool, R, that is widely used in both academia and industry. For students, such knowledge can be of great benefit in their future studies, particularly if it involves a research component with data analysis. As well as this, familiarity with the R language is increasingly important in the job market.

The videos and lessons are also of benefit for those in the workforce, who may already have knowledge of R. This will be the case for the Indian Statistics Institute, who use the videos to train public service advisors for statistics work in developing countries. The same applies to Public Service workers being trained by the United Nations Institute for Training and Research (UNITAR) in Geneva through, e.g., the UNITAR e-learning course: *Understanding data and statistics better—for more effective SDG (Sustainable Development Goals) decision making*. The videos are available for both these organizations to use as they wish.

Another benefit of this development is to use the videos and R analyses for e-learning, not only in person at university, but also internationally. The R package is freely available for external students taught online. The importance of online learning has been highlighted by the COVID-19 pandemic that disrupted in-person education worldwide. Such videos could be used as a resource, not only for domestic students, but also for the education of international students. This is particularly relevant if there are limits to international travel. An example of this is New Zealand, where international students were unable to enter New Zealand between 2020 and 2022.

To retain student interest in this project, the videos need to be refreshed periodically with new case studies. This will highlight the interdisciplinary nature of statistics by showing an increasingly diverse range of applications. It will also ensure that students are being taught current and relevant statistical techniques. For example, the new study on the training of dogs to diagnose prostate, bowel, and cervical cancers in an accurate, safe, and non-invasive way has recently been made available on the website (this is the 20th video). This study was conducted by K9 Medical Detection, a health research group based in Dunedin, New Zealand (https://www.k9md.org.nz/research). It involves a biostatistician assessing the performance of canine detection of cancer. It involves the estimation of sensitivity, specificity, false negatives, and false positives for data collected in a double-blind testing procedure on laboratory-developed urine samples. Reports of hospital oncologists, scientists developing the urine samples initially in the laboratory for training the dogs, and reports of staff caring for the dogs are included. Proof of concept has been confirmed by the biostatistician; the dogs have now been trained to identify the cancers from laboratory developed odors for these three different types of cancer. A

clinical trial on patients from hospitals and General Practice Clinics is about to be undertaken. Similar trials are also using dogs for early detection of other diseases, including COVID-19. Diagnostic testing methods are an important part of statistical analysis. Students at all levels can learn from this case study that features the importance of a clinical trial after proof of concept.

When fully operational, we plan to get feedback on the webpage. We intend to survey users of the site. This will include students as well as schoolteachers, those in the workforce from developing countries being trained in India at the Indian Statistical Institute or online at the UNITAR in Geneva.

REFERENCES

Al Mamun, M. A., Lawrie, G., & Wright, T. (2020). Instructional design of scaffolded online learning modules for self-directed and inquiry-based learning environments. *Computers & Education*, *144*, Article 103695. https://doi.org/10.1016/j.compedu.2019.103695

Allaire, J. J. (2022). *Quarto: R interface to `quarto' markdown publishing system* (Version 1.2) [Computer software]. Quarto. https://CRAN.R-project.org/package=quarto

Allaire, J. J., Xie, Y., McPherson, J., Luraschi, J., Ushey, K., Atkins, A., Wickham, H., Cheng, J., Chang, W., & Iannone, R. (2022). *Rmarkdown: Dynamic documents for R* (Version 2.13) [Computer software]. RStudio. https://rmarkdown.rstudio.com

GenStat. (2022). *GenStat data analysis software* (Version 22.1) [Computer software]. VSN International. https://vsni.co.uk/software/genstat

Lai, J., Lortie, C. J., Muenchen, R. A., Yang, J., & Ma, K. (2019). Evaluating the popularity of R in ecology. *Ecosphere, 10*(1), Article e02567. https://doi.org/10.1002/ecs2.2567

R Core Team. (2022). *R: A language and environment for statistical computing* (Version 4.2) [Computer software]. R Foundation for Statistical Computing. https://www.R-project.org/

RStudio Team. (2022). *RStudio: Integrated development environment for R* [Computer software]. RStudio. http://www.rstudio.com/

Title of Project: - Learning on clinical placements – understanding placement culture

Researchers:

- Professor Tim Wilkinson (TW), Otago Medical School;
- Dr Dale Sheehan (DS), Otago Medical School;
- Dr John Thwaites, (JT) Te Whatu Ora Waitaha Medical Education Unit

Snapshot of the project

The aim was to explore the varied ways in which culture in the workplace influences the learning environment and therefore impacts on the learning of medical students and newly graduated doctors.

A critical partnership was established with the Medical Education Unit that supports newly graduated doctors for Te Whatu Ora in the Canterbury region to ensure that perspectives from the pre and immediate post graduate medical education curriculum were included in both the research team and the participants. We interviewed participants from the TI year and relief Registered Medical Officers (RMOs) giving us the observations from new eyes as well as from those who experience a range of clinical environments.
We wished to make explicit the hitherto implicit aspects of workplace culture to assist both supervisors and learners to develop a shared mental model of the environment that learning will take place and recognise that each environment is situated within complex, unique and multifactorial cultures.

The key findings to date are that we have identified key features of the placement environments that vary across placements and that together describe behavioural features that inform the culture. We have also identified four key themes that summaries what participants believed they need to do to "impress on this placement". We anticipate being able to integrate the findings from both these sets of results.

The final phase is yet to be completed as one of the team has been on sick leave and only returned to work this month. We therefore request an extension to this project until June 30th to complete stages 4 and 5.

Full Report

The 5 phases of the Project

Phase 1. The establishment, partnership and ethics phase went as planned but Covid interrupted plans for face-to-face focus groups and most data collection moved to zoom. There were smaller groups and some individual interviews resulting in a higher number of meetings. The quality of the data collected however was very high.

Phase 2. We collected data from 15 participants who discussed two sites per meeting and discussed experiences across 13 placements. We spoke to more TIs than RMOs but detected no important differences in their perspectives or experiences when discussing the same site or context. This meant the data could be combined. Data collection was completed in December 2022.

Phase 3. Data analysis of phase 2 data. These data have been collated and organized according to clusters of descriptors of placements and these descriptors are reported below.

Phase 4. The final stage of data analysis involves all researchers meeting to discuss and review the data and discuss the findings making observations across clinical contexts**.** The focus group with Intern Supervisors was planned for February or early March. However, one of the researchers critical to this stage (Dr Thwaites as Director of the Medical Education Unit) has been on sick leave for this period.

Phase 5. Member checking with the participants to discuss our data and recommendations for using insights from the work to develop a tool for placement coordinators, work supervisors (individual and teams) and novice practitioners to understand and manage expectations, team practices and ways of working across the varied placement cultures they will encounter.

Results

These preliminary results come from data from Trainee Interns and RMOs and are yet to be presented to Medical Education Unit Intern Supervisors to check for alignment with their experience of culture across the organisation.

Key features of the placement environments as described by participants were identified that vary across placements and that together describe behavioural features that inform the culture. For each feature we have identified a range of descriptors to refine in the final phase of this work.

1. **How people greet new people on the ward**
   This tells people what the structure is, where they fit in the structure, and it appears to signal how much they are valued.
2. **Supervisor and learner interactions**
   Is an indicator of how support and supervision is provided and the availability of feedback.
3. **Teaching and learning opportunities**
   Indicates a range of formal and informal opportunities and reflects how teaching is valued.
4. **Systems to allow HO and medical student and team communication**
   Makes explicit the formal and informal ways team members stay in touch.
5. **All placements are busy but there are different types of busy.**
   These statements describe what "Busy-ness" looks like which is impacted by factors such as length of patient stay, the nature of patient demand and proximity of all team members.
6. **Collaboration as a health team and with patient**
   These statements indicate the range of ways this occurs and the extent that it is enacted.
7. **Valuing Equity**
   Process and actions to promote or block equitable access to care.
8. **Valuing Patient Safety and Quality Improvement.**
   Actions that indicate how Patient Safety and Quality Improvement re valued and addressed.

Participant responses to the question "What does it take to impress on this placement" have been clustered into four key themes that appear linked to placement culture.

Our initial thoughts here are that there may be similarities between the style of patient care valued in the environment and the style of team inclusion used in that environment.

1. **Supporting the style of patient care**
   "They want you to think of lots of stuff and be really detailed. Think widely holistically. "
   "Being able to come up with plans that keep pts safe while doing rehab and safe when go home. In depth thinking around this will impress I think"

2. **Thinking about the team members and their needs.** Being aware of the values and the requirements of other professions for performance and how to help.
   "*The nurses love patient flow."*
   "One day I put in 10 lines takes workload off the HO."
   "I try to get on with my team and the relationships I develop with the team."

3. **Putting yourself out there**
   "If push self in front they will respond. Take initiative."
   "Ask pts for feedback use it and tell your supervisor"
   "If you take more responsibility than you are comfortable with will impress"
   "Double edged keen learner or a walkover afraid to say no. Need to do both"

Implications

Throughout this project we have been reminded that too often the term learning environment (and learning culture) is used as a metaphor for something the organisation has. But learning culture is a complex construct is multi-layered and multifaceted and many and varied cultural subgroups make up our healthcare organisations. We have observed that within one building each service and even each ward will have their own cultures and therefore their own learning environments.

We have argued previously that understanding placement experience culture is key to support and improve workplace learning.[1] As such it is not something that should hover veiled and barely visible in the background or unrecognised. Our view is that the cultural and environmental dimensions of placements are an important substrate on which improvement focused change may be sought and the experience of short-term immersion (on a 3-month placement) in these cultures and environments can be purposely accommodated by educators and novice practitioners, provided they are mapped and therefore made explicit and discussed.

We are proposing the results may inform a tool or methodology to map the culture of a placement, that draws attention to specific aspects of placement experience. The shared patterns of feeling, thinking, talking, and accomplishing that underpin local practice, if made visible, can enhance rapport and role clarification. By understanding how clinical practice, team working, the rhythm of work itself, and the variety of ways placement cultures are enacted in response to the range of service delivery mechanisms we hope to uncover targeted opportunities to manage placements. Opportunities too, to better support new practitioners by preparing them to adapt to a variety of cultures by making the manifestations of these culture and their role within them visible before starting work.

Our position is not to identify good or bad placements, as they are all impacted by external pressures and demands driven by the very nature and goals of the service. It is rather they are good or bad for some students and potentially this is due to the match of interactions between the learner and the placement culture rather than attributes on either side.

We anticipate mapping the surface features of a range of placements to identify what makes them unique. Then having done that, identify the clusters of activity attached to teaching and learning so that:

- The implicit can be made explicit, so that different cultures can be recognised, considered explained and accommodated, not judged or criticised.

- Placement coordinators can reflect on how the environments operate before placing students and thereby prepare them adequately and describe their role to ensure it is fit for context. This would mean learners would know what to ask about, what to plan what to expect and how to traverse the varied cultures they encounter.

- Supervisors can reflect on their environments cued by our prompts and questions and be aware of the ways they can best inform, support and guide learners who may have had very different placement experiences.

- Learners can prepare themselves for their regular rotations through the work and learning environments and consider how they can accommodate their learning needs, apply skills to join new teams and negotiate membership to these teams, and importantly realistically imagine the role of a TI or an HO on that placements. Having a sense of the culture and understanding of the differences in how professions in a particular placement manage work, interactions and hierarchy can inform and encourage constructive behaviours.

Outputs to date

Zoom workshop for the Australian and NZ Association for Health Professional Educators (ANZAPHE) in partnership with the Australasian Interprofessional Practice and Education Network (AIPPEN). One finding that surprised us is the association between interprofessional collaborative practice and the positive values it contributes to placement environments. We explored this by facilitating this zoom workshop.

Publication on "The future role of healthcare mentors and coaches in navigating workplace culture." We co-authored this paper with Australian colleagues for a special edition for the 50th Anniversary of the Australian and New Zealand of Health professional Education (ANZAPHE).[2]

Outputs we expect to provide:

1. A formal report to the MBChB curriculum committee and the Medical Education Unit for use in their curriculum design with a focus on a tool to make transparent the service features of each placement, culture with associated tips for placement preparation, orientation, and support of TIs. It will likely also include some recommendations regarding the role of registrars in placement support in some cultures and coaching and ideas for supporting them in this role **(DS TW)**
2. Presentation to the 2023 Prevocational medical education conference **(JT)**
3. Publication in an international education journal (**DS TW JT)**
4. Publish a viewpoint article or infographic that is more readily accessible to a clinically based NZ audience. **(DS TW JT)**

Grant Spending Summary (attached)

The financial report shows that of $12,000, $5,298 has been spent for Dale Sheehan (in 2022) for salary $5,270 and ACC levy. You have $6,702 left in this account according to the March 2023 PI report. However, we note that the payment of $1,187 gross claimed in March and paid 2 April and the latest of $1,924 submitted April do not appear to be included. On our calculation there is $3,595 to be claimed. This will be claimed once the final 2 phases are completed.

References

1. Sheehan D, Wilkinson TJ. Widening how we see the impact of culture on learning, practice and identity development in clinical environments. Med Educ. 2021;1-7. doi:10.1111/medu.14630

2. Martin R, Copley J, Dunwoodie R, Forbes R, Joyce L, Mandrusiak A, 2 Noble C, Pearson A, Radford J, Wilkinson T, Sheehan D. The future role of healthcare mentors and coaches in navigating workplace culture. FOHPE. 50th Anniversary Series (In Press)