Article

Taku teina, tōku rangatira. Recruitment, development and retention of Māori and Pasifika in science

Sarah T. Rewi (Ngāpuhi)[a]*, M. R. V. Welford (Moata'a)[a], M. Heke (Ngāti Kahu ki Whangaroa, Te Rawara)[b] and B. J. Dunphy[a,c]

[a]School of Biological Sciences; [b]School of Environment; [c]Institute of Marine Science; Waipapa Taumata Rau The University of Auckland.

The tuākana-teina (older-younger sibling) relationship is one of reciprocity that empowers leadership and support (Amopiu, 2020). In response to the struggles of Māori and Pasifika students within educational institutions, the tuākana-teina relationship has been incorporated to enhance their cultural and academic well-being (Bishop and Glynn, 2003; Callaghan et al., 2018; Oetzel et al., 2021; Parr, 2016). In 1991, based upon this philosophy, Professor Michael Walker began the Tuākana programme within the School of Biological Sciences at Waipapa Taumata Rau, the University of Auckland. This paper examines the role of the Tuākana Biology programme in the recruitment, development, and retention of Māori in Science at Waipapa Taumata Rau. Drawing from data and experiences of the programme from its inception to current day students, a secondary data analysis was conducted. Here we identify key components that make Tuākana Biology a success and challenges that restrict its implementation. We found the cultural space and community provided by Tuākana enhances Māori and Pasifika recruitment, development, and retention, positioning Tuākana Biology as a potential solution to Māori and Pasifika success within academia. Lack of funding, staffing capacity, and access to student data are the challenges the programme looks to overcome to realise its full potential.

Keywords: Indigenous; institutional space; Māori and Pasifika equity; higher education; science.

Introduction

Māori and Pasifika remain under-represented in universities throughout New Zealand indicating that Māori and Pasifika needs are not being met with only 4.8% of academics identifying as Māori and 1.7% identifying as Pasifika (Naepi et al., 2021). In the natural and physical sciences, Māori and Pasifika students follow this trend with enrolments never increasing above 4% (Naepi et al., 2021). This under-representation is not caused by a lack of available capability but rather by institutional exclusion, racism and hiring heavily influenced by PBRF rankings that is excluding Māori and Pasifika in academia (Naepi et al., 2020, 2021). Despite claims that universities are addressing diversity and equity in regard to Māori staff, there has yet to be an increase of Māori in the academic workforce (McAllister et al., 2019). Similarly, there has been no change in the Pasifika academic workforce who remain under-represented and employed in the lower levels of the academy (Naepi, 2019). It is therefore necessary for universities to commit to genuine and appropriate recruitment, retention, and development of Māori and Pasifika scholars (McAllister et al., 2019).

Moreover, a new generation of career Indigenous researchers are entering these institutions that, if fostered correctly, hold the potential to empower their communities through research that can act as powerful forms of resistance and connection (Rewi et al., 2022). Experiences of current Māori and Pasifika students in the sciences highlighted that excess cultural labour and superficial or unethical inclusion in academic spaces, were preventing them from being their authentic selves. However, despite the tension Pasifika academics experience between western systems of education and pacific pedagogies, Pasifika peoples continue engaging with tertiary education to advance community aspirations (Leenen-Young et al., 2021). These issues identify that the solution to improving representation of Māori and Pasifika in science, and academia, requires an urgent change in the learning environment (McAllister et al., 2022). We argue in this paper that the correct implementation of the tuākana-teina concept has the potential to create such a learning environment that can act as a cultural stronghold for students to develop and reach their potential.

The concept of tuākana-teina describes a significant relationship within Māori society that traces its origins back to the ancestral populations of eastern Polynesia (Amopiu, 2020; Reilly, 2010). It translates literally to the older and younger sibling of same sex, but it can also be applied to whakapapa (genealogical lineage) wherein family lines are organised according to the tuākana or teina status of the common ancestor (Mead, 2016; Reilly, 2010). Tuākana-teina invokes a reciprocity that encourages leadership and wisdom. It is a relationship that is premised upon cooperation, loyalty, and respect, that ideally maintains a moral balance between the tuākana and teina. As such, neither the teina nor tuākana should act in a way that diminishes

*Correspondence: sarah.rewi@auckland.ac.nz

the mana of their counterpart (Amopiu, 2020; Reilly, 2010).

Within education, the philosophies of tuākana-teina have been incorporated as a model of learning to address the often-isolating experiences of Māori in mainstream programmes (Callaghan et al., 2018; Cowie, 2015; Oetzel et al., 2021). The relationship between tuākana and teina, implemented as older and younger mentoring, acts as a cultural anchor that enhances well-being and social connectedness for Māori in mainstream science education (Callaghan et al., 2018; Oetzel et al., 2021). Such a framework affirms the validity, and creates an avenue for the respect and normalisation of Māori worldviews, knowledge, and communities to exist within these spaces (Oetzel et al., 2021).The resulting environment empowers the learning and growth of those students involved. Yet, like many theoretical frameworks, the practical application of the tuākana-teina relationship is not always appropriate, indeed at times even harmful. Often, tuākana are positioned as the expert or more knowledgeable person with the teina as the novice, as seen in Cowie (2015) and Cowie and Trevethan (2020). Whilst this is not necessarily incorrect, for those that do not intimately understand this concept, this framing of tuākana and teina can infer a superiority and inferiority dynamic to the relationship. Thus, creating an imbalance between the two. It disregards the value of knowledge teina bring to the relationship whilst assuming tuākana have little to learn or gain. This perspective is ignorant of the reciprocal nature of tuākana-teina which is vital in generating culturally appropriate and highly effective collective learning communities. The very nature of this reciprocity is a core concept in Polynesian educational philosophy known as 'ako', meaning both to teach and to learn. Subsequently, the term 'ako' appears in both the term for teacher (kaiako) and student (ākonga). This suggests that the status of students and teachers are interchangeable and fluid (Karaka-Clarke et al., 2021). Creating learning communities that are grounded in ako is crucial to Māori and Pasifika youth success by addressing both their cultural and academic needs (Marshall, 2014; McDonald, 2011; Morrison and Vaioleti, 2011).

Whilst there is a hierarchical nature to tuākana-teina, it does not signify a power imbalance but rather acknowledges differing roles that each must play within the relationship. For instance, the tuākana as the first-born child is considered tapu (sacred) which gives them precedence and authority over duties and knowledge considered sacred (Reilly, 2010). In comparison the teina is less constrained by the requirements of tapu and are therefore able to undertake differing tasks. Subsequently teina were important economic leaders in pre-colonial society. Reilly (2010) summarises this concept by identifying it is the tuākana who holds the mana, but it is the teina, the doer, who gives it substance. This acknowledges the complementary skill sets that tuākana and teina have and equally values their unique contributions. It is this cooperation that is the true strength of the tuākana-teina relationship.

Founded by Professor Michael Walker, the Tuākana Biology Programme started in 1991 within the School of Biological Sciences at Waipapa Taumata Rau, the University of Auckland. Tuākana Biology is a learning community premised on the core concept of tuākana-teina. It provides a space where students feel connected through relationships that are grounded in common cultural values. Namely, prioritising their identity as Indigenous members of their communities before acknowledging their academic position within the institution. This assists students in navigating their academic journeys from an empowerment perspective rather than one of deficit. Consequently, creating an environment that fosters their personal and academic growth by meeting their social, cultural, and academic needs. Over the last 30 years, Tuākana Biology has supported hundreds of Māori and Pasifika students through their studies. The legacy of Tuākana Biology can be seen in the success of students that have passed through the programme. Evidence for this is detailed in the Māori and Pasifika student data section. The importance of Māori academics, such as Professor Michael Walker, for young Māori students cannot be overstated. As supervisors they act as a guide for postgraduate students and early career researchers, promoting student retention (Rewi et al., 2022). More importantly, their presence influences the implementation of Indigenous values and aspirations within career development which in turn contributes to Indigenous recruitment, development, and retention (Smith, 2007; Staniland et al., 2020).

Materials and Methods

Secondary data analysis, or the analysis of data collected by others, was the method used for this research. It utilises existing data for a purpose that differs from the original research (Johnston, 2014; Tripathy, 2013). Two advantages of using secondary data analysis are the efficiency and cost-effectiveness which provides more resource to explore the relevance of the data (Johnston, 2014; Tripathy, 2013). Another advantage is that it draws from knowledge and experience that may not otherwise be available. Secondary data analysis considers the purpose of the original study; who collected the information; when, what and how the information was collected; and the consistency of the information's source with other available sources (Johnston, 2014).

A collection of documents relevant to the inception of Tuākana Biology in 1991 were analysed to determine the origins of the programme. Documents were organised into three categories: data pertaining to Māori or Pasifika students; correspondence (letters, memorandums, etc.); and programmes/initiatives involved in Māori or Pasifika inequity. Of interest was the context that gave rise to the programme's establishment and its effectiveness as a strategy to address Māori and Pasifika inequities in science. Due to the large number of files, only key documents were scanned and included in the appendices. These documents were chosen by current Tuākana Biology coordinators based upon their relevance to the timeline of the programme's inception. The criteria for these documents included initial communications; descriptive summaries of Māori and Pasifika student data; examples of external communications; notable reports; and descriptions of pre-existing initiatives.

Whilst important for identifying the current state of Māori and Pasifika engagement in science, quantitative data

is limited in its ability to investigate experiences relevant to the context in which the data was collected (Rahman, 2017). This can be balanced by the deeper insights and context provided from a more qualitative approach. When engaging with Indigenous data, it is important to understand the cultural context of the data and engage with the communities from which the data is collected (Te Mana Raraunga Māori Data Sovereignty Network, 2018). It was therefore important to us that we engaged with past and present members of the Tuākana Biology programme to draw upon their experiences to evaluate our data. Their insights are a true reflection of the programme. Incorporating narratives into research is what Nadar (2019) refers to as 'data with soul'. This not only provides context to our analysis but also holds the academy accountable to its research theories and practices by highlighting how students experience their implementation.

Results

Professor Michael Walker's files were reviewed and organised into three categories: Māori and Pasifika student data, correspondence, and initiatives. These documents encapsulate the events that lead to the inception of the Tuākana programme within the School of Biological Sciences at Waipapa Taumata Rau, the University of Auckland in 1991. Understanding the history of Tuākana Biology and motivations for its establishment, lends important insights to guide current and future efforts for the programme. The analysis of these files provides these insights and highlights strategies that were successful for the programme during its inception.

Māori and Pasifika Student Data

In response to the Science Faculty Māori Equity Committee report to all science staff in May 1990, data was collated relevant to Māori student numbers in papers; Māori student needs; Māori student demonstrator numbers; the presence of Ngā Tauira Puaho (Māori students in Science) on staff-student committees; assistance for Māori students; and Māori content in undergraduate papers (see Appendix A). Drawn from the Higher Education Research Office (hereafter HERO) workshop statistics, 1.7% of students enrolled in the Faculty of Science at the University of Auckland in 1990 identified as Māori. In the university overall, 4.5% of students and less than 1% of staff were Māori (see Appendix A). In addition to the HERO report, pass rates of first year BSc (Bachelor of Science) Māori students in 1982 were approximately 20% lower than non-Māori students (42.9% Māori pass rates, 60.2% non-Māori pass rates). From 1989 to 1991, Māori pass rates remained consistently below 50% (see Appendix B). Pass rates were consistently lower than non-Māori within separate scientific disciplines (Chemistry, Maths, and Zoology) from 1987 to 1989 also with Māori pass rates averaging at 48%, 43%, and 41% compared to non-Māori average pass rates 76%, 75%, and 71% respectively.

In response to these statistics, tutorials began for Māori and Pasifika students in Biology in 1991 (see Appendix C). A total of 45 Māori and Pasifika students were involved along with seven undergraduate and postgraduate tutors. Corresponding with these tutorials, Māori and Pasifika student pass rates increased by 13% and 14% in two stage 1 Biology papers from 1990 to 1991 (see Appendix D). Māori and Pasifika pass rates also varied between students that attended tutorials versus those that did not. For Biology papers 39.101 (Central Concepts of Biology) and 38.102 (Animal Evolution and Diversity), students that attended tutorials had higher pass rates of 37% and 25% respectively. During this period a follow-up report showed an increase of Māori students with 5.8% at the university overall, and 4.5% in the Faculty of Science (see Appendix A). Other reported changes included the recognition of Ngā Tauira Puaho; acquired equity funding from the government; and the initiation of surveys that investigated Māori student hires within the Faculty of Science departments.

Correspondence

Letters of correspondence identified key areas that were inhibiting Māori and Pasifika student success at university. These came from other institutions within the tertiary sector of Aotearoa, New Zealand. For instance, one letter from Te Tairawhiti Polytechnic highlighted the importance of the environment that staff and students work in rather than attempts to "honour the treaty of Waitangi or put-up bilingual signage". It acknowledged that this form of feedback does not carry weight with scientists, despite being vital to how Māori experience their workplace (see Appendix A). Similarly, a letter to the Vice Chancellor of The University of Auckland from staff members across the Faculty of Science in 1991, outlined the commitment of the University to provide such educational opportunities for Māori (see Appendix E). This letter also identified that Māori staff were the key to fulfilling the potential of Māori students, yet "distressingly low ratios" of Māori staff persisted across all faculties. It called for the acknowledgement of Māori knowledge, attributing the lack of relevance of science for Māori to the monocultural nature of the university.

Such initiatives require an enormous amount of support. Reflected in efforts from staff both within and outside the Department of Biology that contributed to the creation of Tuākana Biology. For example, Appendix F shows correspondence between Professor Michael Walker and Associate Professor Jack Grant-Mackie, a pākehā ally, of the Geology Department discussing the need for equitable funding. In fact, in response to the Science Faculty Māori Equity Committee request for Māori data a total of 26 submissions were received (see Appendix G), highlighting the need for partnership rather than the current deficit model. Submissions called for meaningful context to Māori within the curriculum, an increase in Māori staff and leaders, and sensitivity and awareness of Māori culture within the institution. Varying departments within the Faculty of Science contributed to this, including the Departments of Psychology, Geography and Chemistry (see Appendix H; I; J; and K).

Multiple faculties were also involved such as the Faculty of Law raising concerns around overloading, burn-out, criticisms of tokenism, and the monocultural view of what constitutes 'qualifications', particularly when Māori staff were hired individually (see Appendix L). Correspondence with

other tertiary institutions including the University of Otago (see Appendix M) and Manukau Polytechnic (see Appendix N) also provided data that contributed to the establishment of the Tuākana Biology programme.

Programmes and Initiatives

Key initiatives already active at the University of Auckland prior to Tuākana Biology also played an important role in establishing the programme. Ngā Tauira Puaho (Māori students in science) was one such initiative that highlighted the importance of a student voice for engagement (see Appendix A). A Faculty of Science committee on Māori equity was also established to investigate how the faculty could contribute as other faculties within the university that were already actively addressing the issue (Appendix O).

University wide programmes such as HERO were also working toward Māori and Pasifika equity. HERO was instrumental in the collection of students data and conducted a workshop in May 1990 to present their statistics to the Faculty of Science and address the needs of Māori students (Appendix A). An interfaculty staff initiative also gathered during this time inclusive of academics from disciplines varying from Anatomy to Zoology. Their purpose was to develop departmental structures to better reflect the needs of Māori students (see Appendix P). University of Auckland's Medical School provided a model of success with their Māori and Pasifika Admission Scheme (MAPAS) operating since 1972 (see Appendix Q). Other initiatives addressing Māori inequities included a Māori Advisory Council (Te Kaunihera Maori Kaitohutohu) in the Faculty of Medical Health Sciences, and a bicultural committee in the department of psychology.

With lessons learned from the support of these programmes and initiatives, the Tuākana programme emerged as a bespoke solution for the Department of Biological Sciences. Aimed at improving retention, tutorials (although attended by staff) were largely led by graduate and senior Māori and Pasifika students. Impacts of tutorials were seen immediately with pass rates of two papers being 13% and 14% higher in 1991 compared with 1990 (see Appendix R). Many students attending the tutorials improved their grades substantially during the year with grades being 5-10% higher and pass rates 37% and 25% higher compared with students who did not attend. The engagement and success for Māori and Pasifika student performance is detailed in Appendix C. After such a successful first year, the Tuākana Biology programme looked to make improvements for 1992. Specifically, gaining access to student information for those who identify as Māori (and Pasifika) and seeking proper funding to support tutorials (Appendix R).

Discussion

Recruitment

From the files examined above, discrepancy between Māori and non-Māori pass rates highlights the Māori equity issues that students experienced at the University of Auckland in the late 1980s and early 1990s. Moreover, immediately following the first iteration of Tuākana Biology tutorials, increases in pass rates, grades, and enrolments of Māori and Pasifika students was observed. Reflected in these documents are lessons still pertinent today, where the importance of creating academic spaces where Māori and Pasifika cultures thrive is paramount. Māori academic success expands beyond the need for the education of individuals to secure their economic futures. Education and culture are inseparable, and the integration of Māori culture can only be achieved through culturally appropriate educational programs (Hook, 2007). Similarly, Pasifika learning is enhanced when cultural values, language, identities, and knowledge are an implicit component of educational practices (Fletcher et al., 2009).

Today recruitment for Māori and Pasifika in the natural and physical sciences remains stubbornly low; with a call that Māori undergraduate enrolment requires more investment (Naepi et al., 2021). Pasifika education also currently experiences this drop in student engagement due to exclusion of Pacific pedagogy, languages, cultures, and relationships (Matapo and McFall-McCaffery, 2022). For us working in Tuākana Biology it is all about 'space' where the concept 'for Māori by Māori' and 'for Pasifika by Pasifika' has greater resonance. We continue to combat the deficit perception of the programme as merely a remedial or support system. Whilst Tuākana Biology finds its roots as an equity initiative, our language and actions have evolved along the lines of an empowerment perspective. Tuākana has emphasised the importance of space as vital to Māori and Pasifika development by increasing student positivity and participation. However, it is not just the physical rooms that are important but the intangible space for students to 'be' unapologetically Māori or Pasifika. A space to sit, eat, cry, and laugh unimpeded. To show that we are not nameless, faceless individuals on a roll - but an integral and vibrant component of the university community. For the university, tutorial attendance is taken as the key metric of success for the Tuākana programme. Yet to us, it is the outcomes of attendance that are important. How our community thrives is the real measure of student recruitment and success.

It is also important to note the unique relationship that exists between Māori and Pasifika peoples. Like Māori, Pasifika education is a strategic priority for the Ministry of Education, yet Pasifika agendas in the institution continue to be undervalued, undermined, and under-resourced (Fa'avae, 2022). Although our connections predate colonization, our current positionalities under a colonial state cannot be ignored (Leenen-Young et al., 2021). In spaces such as tertiary institutions, Māori and Pasifika often must compete for limited funding to support our individual concerns and initiatives (Kidman and Chu, 2019). This reality is acknowledged by Tuākana Biology in accepting that successful education outcomes can differ between all cultures throughout the Pacific. Yet we also hold fast to the ancient ties that connect our peoples. We see the separation of Māori and Pasifika as a division of hosts and visitors rather than one of ethnicity because in our shared knowledges and cultural histories we also have many similarities. Whilst Kidman and Chu (2019) critique the romanticisation of this relationship, Tuākana Biology actively works to balance the

cultural needs of all our tuākana and teina. This is reflected in the representation of our staff, leadership positions, and allocation of resources. This centring of Māori and Pasifika relationships is an intentional act by Tuākana Biology as it fosters an environment that creates a space for students of all Polynesian backgrounds. The subsequent community that has developed from this is crucial for making newly recruited students more comfortable in the space and in their cultural identities.

Non-Māori and non-Pasifika also play an important role in creating these spaces for student recruitment. However, it is important for them to take responsibility for informing themselves, creating their initiatives and keeping the relevant Māori and Pasifika collectives informed (Appendix H). Creating cultural spaces requires organisations to examine themselves and the impact of their own institutional culture on others. This requires reflection upon their own assumptions, biases, stereotypes, and structures to hold themselves accountable for providing culturally safe environments (Curtis et al., 2019). Such spaces will naturally attract Māori and Pasifika as they can achieve educational equity and academic excellence within them.

Development

Tuākana Biology is only one of many solutions developed in tertiary institutions throughout Aotearoa, New Zealand to overcome Māori and Pasifika inequities. Within Waipapa Taumata Rau, the University of Auckland, other programmes, and initiatives such as MAPAS (Māori and Pasifika Admission Scheme from the Faculty of Medical and Health Sciences), and HERO (Higher Education Research Office) were active prior to the Tuākana Biology programme. These initiatives played an important role in the design of Tuākana Biology as they assisted in data collection and modelled various approaches.

Correspondence documents show significant collaboration with these initiatives, demonstrating communication across the university's departments, faculties, and even with other tertiary institutions. These communications highlighted the need for student engagement and the ongoing challenge of requiring and securing funding for creating these cultural education spaces (e.g., Appendix F). However, it is the extensive collaboration that is most remarkable about the origins of Tuākana Biology. It reflects the collective approach that continues to resonate throughout the programme. Prompting active discussions with the wider academic community allows the collective to determine their own needs and aspirations. Furthermore, these networks are crucial to student development. They create a broad range of pathways and opportunities for Māori and Pasifika to build their own network relationships. This collaboration also reiterates the role of non-Māori and non-Pasifika. In accordance with the partnership outlined in Te Tiriti o Waitangi, nurturing Māori students is not solely the responsibility of Māori staff. It is up to all of us to instigate practical systems to achieve positive action (Whaitiri, 1991).

Indigenous role-modelling, teaching, and leadership are key social factors that contribute to Māori and Pasifika educational development and success (Mayeda et al., 2014). This is where the emphasis of tuākana-teina in Tuākana Biology is particularly relevant. It places students into leadership roles early in their academic journeys by positioning them as tutors, mentors, and coordinators. In doing so, the tuākana develop a range of skills whilst the teina are modelled successful pathways that feel attainable and relatable. Thus, the shared experience between the students is beneficial to both the tuākana and teina. To us, this practical implementation of tuākana-teina places emphasis on the 'sibling' relationship, i.e., that tuākana and teina are the same generation and thus have similar experiences and responsibilities.

Indeed, this aligns with many of the factors of educational success for Pasifika identified by Chu et al. (2013). The structure of the programme creates a 'learning village' space within the School of Biological Sciences where students can create respectful and meaningful relationships with each other, their mentors, and teaching staff that engage with the programme. In this space Tuākana Biology is also committed to the hiring of only Māori and Pasifika (where possible) to keep these cultures embedded in the learning space as well as providing strong leadership and important role models for younger students.

In contrast, other educational initiatives have emphasised the older-younger dynamic of the tuākana-teina concept. Often reflected through an expert-novice relationship that aligns more readily with the hierarchical structure of the tertiary education system. Tuākana Biology attempts to resist this structure by using a tuākana-teina model which places Māori and Pasifika within reciprocal relationships. We posit that this creates a space for students, staff, and researchers to express themselves, and consequently thrive. Due to this, they develop their individual identities within the Tuākana Biology learning community which then disseminates out to their communities beyond the walls of the institution. Tertiary education is a priority for Māori and Pasifika as it also improves outcomes for their communities (Theodore et al., 2018). Therefore, the impacts and success of students belonging to the Tuākana programme cannot be measured solely by their development and achievements at university.

Retention

As Tuākana Biology enters its 32nd year, recruitment and development efforts continue to be successful, leaving retention of Māori and Pasifika as the main challenge. Retaining undergraduate students through their postgraduate studies, and further through to their doctoral studies is not currently a robust pathway for Tuākana Biology. This trend is reflected in the literature with retention and enrolment of Māori and Pasifika students requiring further inquiry and investment (Naepi et al., 2021). Subsequently, improving Māori and Pasifika retention is a nationally recognised challenge for tertiary education (Wilson et al., 2011). The number of Māori and Pasifika holding doctorates, whilst increasing, still remains well below parity. Thus, the need for retention and leadership of Māori and Pasifika in academia has never been greater (Naepi et al., 2020; Whitinui et al., 2013). Relationships between Māori supervisors and Māori

doctoral students tends to impact retention (Smith, 2007). The same trend is seen with Pasifika (Carter et al., 2018). Students' first-year experience is also an important element in retention and degree completion (van der Meer et al., 2010).

For Tuākana Biology, successful implementation of the programme is constrained by three current challenges: access to students and their data; funding; and staffing capacity. Funding and staffing is especially essential for the retention of Māori and Pasifika. Despite Auckland being the largest Polynesian city there remains a severely low ratio of Māori and Pasifika staff at Waipapa Taumata Rau, the University of Auckland. Currently the few who are hired experience burnout or receive criticism of fulfilling a token Māori staffing role (Appendix L). There is a clear requirement for departments to commit to funding for Māori and Pasifika appointments and for resources and training of non-Māori and non-Pasifika staff in these initiatives (Appendix H). Without these staff the needs of Māori and Pasifika cannot be met which is a barrier to them realising their full potential (Appendix E). Internationally, institutions have found cluster hiring has improved retention of staff of colour and reduced feelings of isolation by providing social networks (Sgoutas-Emch et al., 2016). With cohorts of talented students continually moving through the Tuākana programme, we heartily support this strategy. From a tuākana-teina perspective, when a talented teina does not feel, or is not recognised, they will move over to another whānau to which they are related (Reilly, 2010). Similarly, when our students are not provided with the opportunities deserving of their abilities, retention failure is inevitable.

Since its inception, Tuākana Biology has worked with minimal funding but has still managed to achieve great success (Appendix S). Inconsistent funding has also posed issues throughout the programmes' duration (Appendix C). Without the appropriate funding, the Tuākana programme cannot progress past providing the bare minimum for its community. Funding is required to expand outreach and develop new initiatives. Its purpose is to support the growth of a programme rather than maintaining the status quo (Earne and Sherk, 2013). Furthermore, greater, and longer-term funding are important facilitators for recruiting and retaining researchers (Thomsen et al., 2006). In the early 1990s, changes in Government funding saw the university re-evaluating its allocation of resources and the potential for positive action to redress funding for Māori and Pasifika initiatives (Appendix R). Once again, these changes are occurring with 'Taumata Teitei - Vision 2030 and Strategic Plan 2025' (Waipapa Taumata Rau The University of Auckland, 2020). Taumata Teitei outlines the university's commitment to grow Māori and Pasifika transdisciplinary scholarship and invest in equity objectives for the Māori and Pasifika research workforce. They also aim to strengthen relationships with Māori and Pasifika communities and build capabilities in Vision Mātauranga driven research and research impact. Herein lies the potential for funding and resource allocation to improve the quality of service that Tuākana Biology can deliver to retain Māori and Pasifika students.

Conclusion

Tuākana Biology is a learning community that provides a cultural space which connects Māori and Pasifika through their academic journeys. This is achieved through the programme's implementation of the tuākana-teina concept, premised upon the shared experiences and responsibilities of Māori and Pasifika in the institution. The Tuākana programme aims to foster leadership and empower pathways of success for students modelled by their peers. For over 30 years Tuākana Biology has successfully engaged with Māori and Pasifika in the School of Biological Sciences at Waipapa Taumata Rau, the University of Auckland. After a successful first year of improving Māori and Pasifika pass rates and average grades, the Tuākana programme looked to make improvements for 1992. Access to students and their data; funding for optimised capability; and staffing for improved capacity were identified as key requirements for the programme's success. In 2023 these remain unchanged. Understanding the history and journey of Tuākana Biology helps to inform decisions and optimise the programme to adapt to the needs of the community. In this light, we position Tuākana Biology as a structural pathway to Māori and Pasifika success within academia. Moving forward our ambitions are to continue enhancing Māori and Pasifika recruitment, development, and retention to build generations of successful Māori and Pasifika scientists.

Acknowledgements

First and foremost, we would like to acknowledge Professor Michael Walker and his family for the immense work it took over the last 30 years to run the Tuākana Biology programme. Your efforts have impacted hundreds of Māori and Pasifika students through their academic journey. We would also like to acknowledge the past student coordinators of the programme who worked tirelessly throughout their studies to keep the Tuākana community together. These include Melanie Hayden; Dr Melanie Cheung; Indigo Michael; Dr Kimiora Henare; Cronje Paea; Latisha Fia; Emma Lambert; Dr Leilani Walker; Peter van Kampen; Amy Maslen-Miller; Dr Josh Guilbert; Dr Helen Nathan; Te Kahuratai Moko-Painting; Robert Vennell. Here we also acknowledge all past and present Tuākana Biology students who are too numerous to name.

References

Amopiu, M. (2020), A Kaupapa Māori study of sibling and whānau relationships: A Pūrākau approach, Master's thesis, Auckland University of Technology. https://openrepository.aut.ac.nz/items/4fbfc4bc-1be9-4b53-a23f-600cc2097398

Bishop, R. and Glynn, T. (2003), *Culture counts: Changing power relations in education*, Zed Books.

Callaghan, P., Paraone, R., Murray, M., Tahau, N., Edgarton, S., Bates, E., Ataria, E., Heremaia, H., Rupene, N., Wilson, E., Hanham, L., Soal, D. and Ataria, J. (2018), 'Tuākana/Teina Water Warriors Project: A collaborative

learning model integrating mātauranga Māori and science', *New Zealand Journal of Marine and Freshwater Research* **52**(4), 666–674.
https://doi.org/10.1080/00288330.2018.1509880

Carter, S., Laurs, D., Chant, L. and Wolfgramm-Foliaki, E. (2018), 'Indigenous knowledges and supervision: Changing the lens', *Innovations in Education and Teaching International* **55**(3), 384–393.
https://doi.org/10.1080/14703297.2017.1403941

Chu, C., Abella, I. S. and Paurini, S. (2013), *Educational practices that benefit Pacific learners in tertiary education: Summary report*, Ako Aotearoa, National Centre for Tertiary Teaching Excellence.

Cowie, B. (2015), *Equity, Ethics and Engagement: Principles for Quality Formative Assessment in Primary Science Classrooms*, Springer Netherlands, Dordrecht, pp. 117–133.
https://doi.org/10.1007/978-94-007-4240-6_6

Cowie, B. and Trevethan, H. (2020), *Funds of Knowledge and Relations as a Curriculum and Assessment Resource in Multicultural Primary Science Classrooms: A Case Study from Aotearoa New Zealand*, Springer International Publishing, Cham, pp. 1–32.
https://doi.org/10.1007/978-3-030-37743-4_59-2

Curtis, E., Jones, R., Tipene-Leach, D., Walker, C., Loring, B., Paine, S.-J. and Reid, P. (2019), 'Why cultural safety rather than cultural competency is required to achieve health equity: a literature review and recommended definition', *International Journal for Equity in Health* **18**(1), 174.
https://doi.org/10.1186/s12939-019-1082-3

Earne, J. and Sherk, L. (2013), *The New Microfinance Handbook: A Financial Market System Perspective*, The World Bank, pp. 377–412.
https://elibrary.worldbank.org/doi/abs/10.1596/978-0-8213-8927-0

Fa'avae, D. T. M. (2022), 'Wayfinding waves and winds of change: The currency of the post-covid gaze into Pasifika/Pacific education's trajectory', *Waikato Journal of Education* **27**(3), 7–20.
https://wje.org.nz/index.php/WJE/article/view/1020

Fletcher, J., Parkhill, F., Fa'afoi, A., Taleni, L. T. and O'Regan, B. (2009), 'Pasifika students: teachers and parents voice their perceptions of what provides supports and barriers to Pasifika students' achievement in literacy and learning', *Teaching and Teacher Education* **25**(1), 24–33.
https://www.sciencedirect.com/science/article/pii/S0742051X0800108X

Hook, G. R. (2007), 'A future for Māori education Part II: The reintegration of culture and education', *MAI Review* **2007**(2), 17.

Johnston, M. P. (2014), 'Secondary Data Analysis: A Method of which the Time Has Come', *Qualitative and Quantitative Methods in Libraries* **3**(3), 619–626.

Karaka-Clarke, T., Fletcher, J., Macfarlane, A. and Bell, B. (2021), 'Kōrero Mai: Kaiako Experiences of Synchronous Online Teaching and Learning in New Zealand', *Journal of Open, Flexible and Distance Learning* **25**(2), 4–22.

Kidman, J. and Chu, C. (2019), ''We're not the hottest ethnicity': Pacific scholars and the cultural politics of New Zealand universities', *Globalisation, Societies and Education* **17**(4), 489–499.
https://doi.org/10.1080/14767724.2018.1561247

Leenen-Young, M., Naepi, S., Thomsen, P. S., Fa'avae, D. T. M., Keil, M. and Matapo, J. (2021), ''Pillars of the colonial institution are like a knowledge prison': the significance of decolonizing knowledge and pedagogical practice for Pacific early career academics in higher education', *Teaching in Higher Education* **26**(7-8), 986–1001.
https://doi.org/10.1080/13562517.2021.1928062

Marshall, S. (2014), *Open Educational Curricula Interpreted Through the Māori Concept of Ako*, Springer New York, New York, NY, pp. 55–70.
https://doi.org/10.1007/978-1-4614-7366-4_4

Matapo, J. and McFall-McCaffery, J. T. (2022), 'Towards a vā knowledge ecology: mobilising Pacific philosophy to transform higher education for Pasifika in Aotearoa New Zealand', *Journal of Higher Education Policy and Management* **44**(2), 122–137.
https://doi.org/10.1080/1360080X.2022.2041258

Mayeda, D. T., Keil, M., Dutton, H. D. and Ofamo'Oni, I.-F.-H. (2014), '"You've Gotta Set a Precedent": Māori and Pacific voices on student success in higher education', *AlterNative: An International Journal of Indigenous Peoples* **10**(2), 165–179.
https://doi.org/10.1177/117718011401000206

McAllister, T. G., Kidman, J., Rowley, O. and Theodore, R. F. (2019), 'Why isn't my professor Māori? A snapshot of the academic workforce in New Zealand universities', *MAI Journal* **8**(2), 235–249.

McAllister, T., Naepi, S., Walker, L., Gillon, A., Clark, P., Lambert, E., McCambridge, A. B., Thoms, C., Housiaux, J., Ehau-Taumaunu, H., Connell, C. J. W., Keenan, R., Thomas, K.-L., Maslen-Miller, A., Tupaea, M., Mauriohooho, K., Puli'uvea, C., Rapata, H., Nicholas, S. A., Pope, R.-N.-A.-R., Kaufononga, S. A. F., Reihana, K., Fleury, K., Camp, N., Carson, G. M. R., Kaulamatoa, J. L., Clark, Z. L., Collings, M., Bell, G. M., Henare, K., Reiri, K., Walker, P., Escott, K.-R., Moors, J., Wilson, B.-J., Laita, O. S., Maxwell, K. H., Fong, S., Parata, R., Meertens, M., Aston, C., Taura, Y., Haerewa, N., Lawrence, H. and Alipia, T. (2022), 'Seen but unheard:

navigating turbulent waters as Māori and Pacific postgraduate students in STEM', *Journal of the Royal Society of New Zealand* **52**(sup1), 116–134. https://doi.org/10.1080/03036758.2022.2097710

McDonald, J. (2011), A Collaborative Exploration of Ako Māori and its Impact on Māori Learners in Legal Studies, Master's thesis, Victoria University of Wellington. http://researcharchive.vuw.ac.nz/handle/10063/1655

Mead, H. M. (2016), *Tikanga maori: Living by Maori values*, Huia (NZ) Ltd.

Morrison, S. L. and Vaioleti, T. M. (2011), 'AKO – A TRADITIONAL LEARNING CONCEPT FOR MAORI AND PACIFIC YOUTH, AND ITS RELATIONSHIP TO LIFELONG LEARNING', *Bildung und Erziehung* **64**(4), 395–408. https://doi.org/10.7788/bue.2011.64.4.395

Nadar, S. (2019), *Stories are data with soul*, Routledge, pp. 34–45. https://doi.org/10.26686/wgtn.12592181.v1

Naepi, S. (2019), 'Why isn't my professor Pasifika?', *MAI Journal* **8**(2), 219–234.

Naepi, S., McAllister, T. G., Thomsen, P., Leenen-Young, M., Walker, L. A., McAllister, A. L., Theodore, R., Kidman, J. and Suaaliia, T. (2020), 'The Pakaru 'pipeline': Māori and Pasifika Pathways within the Academy', *New Zealand Annual Review of Education* pp. 142–159.

Naepi, S., Wilson, E., Lagos, S., Manuela, S., McAllister, T. G., Kidman, J., Theodore, R. and Kokaua, J. (2021), 'Where are we now? Patterns of Māori and Pasifika enrolment in the Natural and Physical Science and Society and Culture fields in Aotearoa New Zealand', *Higher Education Research & Development* **40**(1), 90–103. https://doi.org/10.1080/07294360.2020.1857345

Oetzel, J. G., Ruru, S., Zhang, Y., Simpson, M. L., Nock, S., Meha, P., Holmes, K., Clark, M., Adams, H., Akapita, N., Ngaia, K., Murphy, S., Moses, R., Reddy, R. and Hokowhitu, B. (2021), 'Enhancing Well-Being and Social Connectedness for Māori Elders Through a Peer Education (Tuakana-Teina) Programme: A Cross-Sectional Baseline Study', *Frontiers in Public Health* **9**. https://www.frontiersin.org/articles/10.3389/fpubh.2021.775545

Parr, J. M. (2016), *Accelerating Student Progress in Writing: Examining Practices Effective in New Zealand Primary School Classrooms*, Vol. 7 of *Literacy Research, Practice and Evaluation*, Emerald Group Publishing Limited, pp. 41–64. https://doi.org/10.1108/S2048-045820160000007002

Rahman, M. S. (2017), 'The Advantages and Disadvantages of Using Qualitative and Quantitative Approaches and Methods in Language "Testing and Assessment" Research: A Literature Review', *Journal of Education and Learning* **6**(1), 102–112. https://doi.org/10.5539/jel.v6n1p102

Reilly, M. P. (2010), 'Tuakana–Teina Relationship and Leadership in Ancient Mangaia and Aotearoa', *The Journal of Pacific History* **45**(2), 211–227. PMID: 20836258. https://doi.org/10.1080/00223344.2010.501698

Rewi, S. T., McLellan, G. and Heke, M. (2022), 'An indigenous research narrative: rangatahi in the research space', *Journal of the Royal Society of New Zealand* **52**(sup1), 46–56. https://doi.org/10.1080/03036758.2022.2090389

Sgoutas-Emch, S., Baird, L., Myers, P., Camacho, M. M. and Lord, S. M. (2016), 'We're Not All White Men: Using a Cohort/Cluster Approach to Diversify STEM Faculty Hiring.', *Thought and Action* **32**(1), 91–107.

Smith, K. (2007), 'Supervision and Māori doctoral students: A discussion piece', *MAI Review* **2007**(3), 1–4.

Staniland, N. A., Harris, C. and Pringle, J. K. (2020), ''Fit' for whom? Career strategies of Indigenous (Māori) academics', *Higher Education* **79**(4), 589–604. https://doi.org/10.1007/s10734-019-00425-0

Te Mana Raraunga Māori Data Sovereignty Network (2018), 'Te Mana Raraunga - Māori Data Sovereignty Network Charter.'. https://www.temanararaunga.maori.nz/tutohinga

Theodore, R., Taumoepeau, M., Kokaua, J., Tustin, K., Gollop, M., Taylor, N., Hunter, J., Kiro, C. and Poulton, R. (2018), 'Equity in New Zealand university graduate outcomes: Māori and Pacific graduates', *Higher Education Research & Development* **37**(1), 206–221. https://doi.org/10.1080/07294360.2017.1344198

Thomsen, J. L., Jarbøl, D. and Søndergaard, J. (2006), 'Excessive workload, uncertain career opportunities and lack of funding are important barriers to recruiting and retaining primary care medical researchers: a qualitative interview study', *Family Practice* **23**(5), 545–549. https://doi.org/10.1093/fampra/cml034

Tripathy, J. P. (2013), 'Secondary Data Analysis: Ethical Issues and Challenges', *Iran J Public Health* **42**(12), 1478–1479.

van der Meer, J., Scott, S. and Neha, T. (2010), 'Retention of First-Year Māori Students at University', *MAI Review* **2010**(2), 1–14.

Waipapa Taumata Rau The University of Auckland (2020), 'Taumata Teitei | Vision 2030 and Strategic Plan 2025'. https://www.auckland.ac.nz/en/about-us/about-the-university/the-university/official-publications/strategic-plan.html

Whaitiri, R. (1991), *Developing departmental structures to better reflect the needs of Maori students*, University of Auckland Higher Education Research Office.

Whitinui, P., Glover, M. and Hikuroa, D. (2013), *Ara Mai he tētēkura: Visioning our futures: New & emerging pathways of māori academic leadership*, University of Otago Press.

Wilson, M., Hunt, M., Richardson, L., Phillips, H., Richardson, K. and Challies, D. (2011), 'Āwhina: a programme for Māori and Pacific tertiary science graduate and postgraduate success', *Higher Education* **62**(6), 699–719. https://doi.org/10.1007/s10734-011-9413-3