



**University of Otago**  
*Te Whare Wānanga o Otāgo*

*A research-led university with an international reputation for excellence*

**Response to the Productivity Commission's Issues Paper:  
New Models of Tertiary Education**

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## 1.0 Introduction

This submission has been prepared by the University of Otago in response to the Productivity Commission's *New Models of Tertiary Education* Issues Paper.

While other submissions may be made by various members of Otago's academic community, this submission represents the official position of the University, approved by the Vice-Chancellor and endorsed by the University's senior executive team.

We have not sought to address the matters raised in the Issues Paper question-by-question. Instead, this submission provides an Otago perspective on the key themes that overlay the specific questions.

Our submission opens by placing Otago in context, both nationally and internationally. This is important because we are a very specific type of institution – an internationally regarded, research-led and predominately residential university – within a national tertiary sector that contains a diverse array of institutions and providers.

The submission then seeks to provide a perspective on the matters raised as questions in the Issues Paper under the following general headings:

- Government Strategy, Policy and Funding Environment
- The University Business Model
- Research – Including its Application and the Teaching-Research Link
- Teaching and Learning – Pedagogy and Technology
- Improving Access and Outcomes for Under-Represented Groups
- Meeting Employer and Industry Needs, Graduate Attributes and Outcomes
- Internationalisation and International Education
- Disruptive Technology and Innovation
- Other Matters

Otago welcomes the opportunity to have input by way of this submission into this early stage of the Productivity Commission's review. Further, we invite the Inquiry Director and others involved in the inquiry to visit Otago in follow-up to our submission to gain a deeper, first hand understanding of our views, perspectives and future foci.

## 2.0 Context

In his introductory lecture at the opening of the University of Otago's second session in May 1872, Professor James Gow Black, New Zealand's first Professor of Natural Sciences, stated that one of the aims of a scientific education is to enable a person *"to produce a pound of corn, or wool, or iron, or gold, at half the expenditure which it previously cost"*.

This statement is a reminder that the notion of a university education having a strong relevance to productivity is as old as the New Zealand university system itself.

An understanding of universities within that tertiary sector, as well as the distinctive features of the University of Otago, defines an important context for this submission.

### 2.1 Universities in the New Zealand Tertiary Sector

New Zealand is home to eight of the approximately 10,000 universities that exist worldwide. Together, our universities account for over 40% of all New Zealand's tertiary sector enrolments and – because of their involvement in research and high-cost subject areas – our universities account for 55% of the Government's spend on tertiary education.

Data from the Ministry of Education and Tertiary Education Commission show that New Zealand's universities:

- Deliver the highest pass and completion rates in the sector, and produce approximately 85% of the country's degree-level graduates;
- Achieve the best graduate outcomes<sup>1</sup> of any part of the tertiary sector;
- Produce the overwhelming majority of research that emanates from the sector.

A distinctive feature of the New Zealand system is that the use of the term 'university' is protected by legislation, with the key attributes required to be a university in this country specified by that legislation.<sup>2</sup>

These attributes would certainly not be met by all 10,000 universities in the world. However, they are the attributes that apply to the vast majority of universities that rank in the top echelon internationally.

This careful specification of what is required to be a university in New Zealand plays a role in ensuring that our eight universities are well-regarded internationally. This, in turn, helps sustain the international reputation of our entire tertiary sector.

### 2.2 The University of Otago: Special Character, Mission and Role

The University of Otago is defined by a tradition of innovation and excellence in research, research-led teaching and outreach across a range of traditional, professional and applied programmes and subjects.

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<sup>1</sup> As measured, for example, by average earnings in the five years following graduation.

<sup>2</sup> Section 162(4) of the Education Act 1990 states that: *"a university is characterised by a wide diversity of teaching and research, especially at a higher level, that maintains, advances, disseminates, and assists the application of, knowledge, develops intellectual independence, and promotes community learning"*. Additionally, it lists five characteristics that an institution must exhibit to be a university. Other types of tertiary organisation only need to exhibit one of these five characteristics.

### 2.2.1 International Context

As one of only two New Zealand universities ranked in the top three percent of universities worldwide across all three of the major rankings,<sup>3</sup> Otago judges itself in an international context. Key elements that frame this international context include:

- The large number of subject areas in which Otago ranks in the top 200 internationally, including a School of Dentistry that is ranked 12<sup>th</sup> in the world;<sup>4</sup>
- The fact that over 60% of our academic staff either come from overseas, or are New Zealanders who have gained an academic qualification overseas;
- The high proportion of our academic staff who are rated world class for their research;<sup>5</sup>
- Our international partnerships, including our cornerstone Matariki Partnership;
- The importance of student exchange, as well as the more traditional recruitment of overseas students, as a crucial dimension of internationalisation.

By world standards, Otago is medium in size, comprehensive and – having been founded in 1869 – very well established.

### 2.2.2 National Context

As New Zealand's first university, Otago has always embraced a national role as well as regional responsibilities that build on the following dimensions of the University:

- A research-led culture which, in turn, underpins excellence and innovation in teaching, professional training and service;
- A broad curriculum that encompasses traditional scholarship and new knowledge;
- A concentration of special professional schools, with particular strengths relative to other New Zealand universities in the sciences, health sciences and the humanities;<sup>6</sup>
- An outstanding and nationally unique residential campus learning environment in Dunedin, with health sciences campuses in Wellington and Christchurch, and specialist facilities in Auckland and Invercargill;
- A very high proportion of students who come from outside the University's home region of Otago and Southland;
- The transformative effect that living and studying at a residential university has on Otago's students as they progress through study and emerge as well-rounded, confident and independent work-ready graduates;
- A focus on strong external linkages that enable us to provide high-quality graduates for a range of professions, and to apply research to deliver public good and economic benefit.

Otago's standing as a leading research university is confirmed by its ongoing success in competitive research funding rounds<sup>7</sup> and by independent assessments including PBRF and international

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<sup>3</sup> Otago consistently places as one of only two New Zealand universities inside the top 150 in the annual QS international rankings and inside the top 300 in the Shanghai Jiao Tong rankings and Times Higher Education rankings.

<sup>4</sup> The latest QS subject rankings place Otago in the international top 100 in 13 subjects, and in the 101-200 band for a further 11 subjects.

<sup>5</sup> *Performance-Based Research Fund: Evaluating Research Excellence—the 2012 Assessment*. Otago had 58.5% of staff rated as 'A' or 'B', equating to a total of 684 FTE (Table A-1, p. 89-4).

<sup>6</sup> The TEC's annual summary profiles confirm that Otago has a greater proportion of its activity concentrated in the natural and physical sciences than any other New Zealand university, and also greater concentration in the health sciences.

<sup>7</sup> Otago has ranked first in the Health Research Council funding rounds in four of the past five years, and first in the annual Marsden research funding round for eight of the past nine years. Otago was also the top-performing university in the Ministry of Business, Innovation and Employment's 2012 Science Investment Round, a host or partner in five of the six new CoREs, and a host or partner in 10 of the 11 National Science Challenges.

rankings.<sup>8</sup> We demonstrate an ongoing commitment to increasing our focus on the application of knowledge, with the value and extent of our activities in this developing area gaining increasing recognition.<sup>9</sup>

The Tertiary Education Commission's annual Educational Performance Indicators confirm the quality of Otago's teaching outcomes, consistently ranking Otago as first amongst universities for course completion and student retention.<sup>10</sup> Similarly, high levels of performance in respect of Māori students are a particular source of pride for Otago as we seek to contribute ever more effectively to national imperatives in this area.

An indicator of teaching quality is Otago's success in national tertiary teaching awards. It has been the top-performing university in these awards since their inception in 2002, securing 22 awards, and winning the Prime Minister's Supreme Award six times, including four consecutive wins from 2012-2015 (no other university has won this award more than twice).

The characteristics that will continue to differentiate Otago's contributions as a leading university in the future are as follows:

- Our status as a residential, destination university based in a true university town. As well as being unique in Australasia, this status is rare internationally, but it is a hallmark of many of the world's great universities;<sup>11</sup>
- Our standing as one of only two New Zealand universities ranking in the top echelon of the world's leading universities;
- Our specific discipline expertise and professional schools, encompassing a particular concentration in the sciences and health sciences, within the wider context of Otago as a fully comprehensive university<sup>12</sup> with internationally recognised excellence and professional training in the humanities and business;
- Our demonstrated ability to achieve consistent excellence in our research alongside consistent proven excellence in our teaching;
- Our willingness to embrace and incorporate new pedagogical and technological innovations in our teaching, and to systematically test the relevance and effectiveness of our courses and degrees with key stakeholders;
- Our focused, partnership approach to achieving improved participation and outcomes for Māori and Pacific peoples;
- Our ability to produce graduates who are both work-ready and equipped more broadly as confident, articulate, thoughtful and well-connected people who can make a lasting contribution as national and international citizens;
- Our increasing capacity to apply our research in ways that deliver social, environmental, commercial and economic benefit, both nationally and internationally.

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<sup>8</sup> For example, Otago is consistently rated as New Zealand's top university in the citation component of the annual Academic Ranking of World Universities (ARWU).

<sup>9</sup> For example, Otago spin-off company Pacific Edge is the only New Zealand university spin-off to have been listed on the main board of the New Zealand Stock Exchange. Otago was reported to be "well engaged with business", with external subcontracting [deploying our science expertise for commercial purposes] "well above the mean" for New Zealand universities. Ministry of Science and Innovation, University of Otago 2010/11 Summary (Wellington, May 2012).

<sup>10</sup> Otago typically places first or second for qualification completion and in the top three for progression.

<sup>11</sup> All of the top ten universities in the annual Shanghai Jiao Tong world university rankings are residential universities, and many are located in urban areas with populations of less than 250,000. These include Stanford (in Palo Alto, population 65,000), Princeton (in Princeton, population 30,000), Cambridge (Cambridge, UK, population 123,000) and Oxford (Oxford, UK, population 165,000).

<sup>12</sup> This fully comprehensive nature is the norm for leading universities worldwide.

## 3.0 Government Strategy, Policy and Funding Environment

### 3.1 Tertiary Education Strategy

The Productivity Commission's *History of Tertiary Education Reforms* background paper provides a useful overview of the pathway to our current tertiary system.

One of the notable features of the past 10 to 15 years that the paper does not fully capture is continuity in the Government's strategic priorities for the tertiary sector, spanning the 2008 change from a Labour-led government to a National-led government.

This continuity is appropriate given that many of the key priorities identified (for example, those relating to Māori and Pasifika) have deep-seated systemic and inter-generational dimensions that require complex, long-term attention to solve. Other priorities, such as a desire for research to be more relevant, tend to receive a change in emphasis rather than a complete change in focus across the political spectrum.<sup>13</sup>

Continuity at the strategic level is appreciated by Otago, due to the time it takes to produce one of our core outputs, a degree-level graduate. Leading-edge research is, to an even greater extent, the product of a long-run investment, as is the aligned production of PhD and Masters graduates.

The current Tertiary Education Strategy (TES) is high level, as it must be, to cover an extremely diverse sector.<sup>14</sup> So, while there are elements of the TES that are applicable to all parts of the sector, large portions of it are not.

Government seeks to overcome this by specifying which parts of the TES are more (or less) applicable to which sub-sectors, and by issuing periodic 'priorities' for the sector that focus on particular areas.

At present, for example, there is a focus on the role the sector plays in adding economic value (both via graduates and through research). This focus is also apparent in the brief for the Productivity Commission inquiry, which at this stage largely ignores the wider and equally vital role the tertiary sector plays in developing and supporting a cohesive and healthy society with a high proportion of knowledgeable, engaged citizens.<sup>15</sup>

For universities at least, a light-handed approach is taken by the Tertiary Education Commission (TEC) in using the TES to direct outcomes. This light-handed approach can, if accompanied by appropriate incentives, support institutionally-driven innovation. However, because it is so broad, institutions are unable to feel any strong ownership for the TES as a whole.

Alternative approaches or system-level business models worth considering are a broader overarching TES underpinned by a more specific sub-strategy for each sub-sector, or a separate strategy and business model for each sub-sector. From a university perspective, either would better recognise the broader role (as specified in the Education Act) that we fulfil compared to other types of tertiary

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<sup>13</sup> For example, slightly greater attention was given to the societal benefits of relevance under the previous government, while the current government tends to stress economic outcomes more.

<sup>14</sup> The TES applies to a wide range of organisations, from very small private providers delivering short-term training in a specific subject to a handful of students from a local geographic catchment, through to large complex entities such as Otago, producing research as well as teaching to thousands of students, across dozens of subject areas, from an international catchment.

<sup>15</sup> The impact of wider societal factors to which universities may also contribute on productivity is also ignored. These include such things as health, and the impact of more general social change (for example: a decrease in religiosity has enabled a productivity gain through trading on Sundays; changes of attitudes in respect of working women have transformed both the size and make-up of the workforce).

education provider. Either of these approaches would also mitigate the risk of a return to a ‘one size fits all’ approach to addressing key issues.

### **3.2 Tertiary Education Policy**

The core of tertiary education policy is, in our view, sound. The Inquiry asks specifically about the extent to which the TEC’s independent funding role and its Crown Monitoring role align or are in tension. Otago has found these two roles to be complementary and appropriately managed. However, there is some confusion in the broader policy setting, and both confusion and inefficiency in the vital translation from policy to implementation.

The gap between policy development and implementation has been an issue at least since the formation of the TEC as an implementation and monitoring agency, while the Ministry of Education (MoE) remains as the tertiary education policy arm. The issue has increased with the formation of the Ministry of Business, Innovation and Employment (MBIE), which has roles in both policy and implementation that overlap with MoE and TEC.<sup>16</sup> Add in the interest and roles of other agencies (e.g. Careers NZ) and it is unsurprising that duplication and policy-implementation disconnects occur.<sup>17</sup> These disconnects are inefficient for both the agencies and the institutions. Additionally (see section 3.3 below) they can – like over-regulation – stifle innovation and responsiveness.

### **3.3 Translating Strategy and Policy into Investment**

The Issues Paper pays almost no attention to the role that Investment Plans play in the current system. It may be that the Productivity Commission has overlooked Investment Plans because it judges that – with so much funding being formula-driven – there is no genuine investment decision being made.

If so, that view is understandable; one of the problems with the current system is a lack of funding for allocation in support of institution-led innovations that do not fit within the existing funding levers.

However, Investment Plans merit further examination, and not just because they are the basis on which the TEC is required to make its investment funding decisions: they are core documents in which institutions formally outline their responses to strategic priorities of Government. Investment Plans also outline intentions and commitments around change, innovation, and performance, demonstrating the ways in which institutions are currently responding to the environments they operate in, and to ongoing changes in those environments.

Consideration should also be given to the new investment approach which the TEC is currently developing; while the aims of this approach appear laudable, there is uncertainty about how the aims will be realised, or the funding and other mechanisms that might be made available to support what is promised as a more strategic approach.

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<sup>16</sup> This overlap affects all tertiary providers in relation to employment and innovation, and universities especially in relation to research.

<sup>17</sup> Two examples: TEC wants more postgraduates, but Government funding support for such students by way of loans/allowances is restricted. Government wants prospective students to have better information on the employment and income outcomes of their study, and the TEC pushes ahead to develop an elaborate provider-based system to deliver this, when Careers NZ already provides a fit-for-purpose (and arguably superior) tool.

### 3.4 The Funding Environment

Under the current system, a high proportion of Government funding is delivered as Student Achievement Component (SAC) funding according to enrolments (or forecasts thereof), weighted by subject area and level of study.<sup>18</sup>

One can debate the correctness or otherwise of the differentials by subject area and level of study within the SAC system, and question the lack of general increases to SAC funding rates in recent years. However, setting these issues aside, the SAC system has some significant positives because:

- It is well-embedded with core rules and regulations that are generally well defined;
- It has low compliance costs relative to the amount of funding delivered, and is hard to game;
- although funding is allocated based on forecasts of enrolments, it is later adjusted if those forecasts are significantly out of alignment with actuals;
- It provides scope for institutions to cross-subsidise internally (see below), which is both necessary in a practical sense, and consistent with the status of this funding under law as bulk funding.

For universities, the Performance Based Research Fund (PBRF) is the second key funding source. From an Otago perspective, PBRF is a vital element of the funding system: it provides funding support that rewards and helps maintain a strong core of research capability with organisations that are required to be strong in research; and it is the one significant element of the funding system that delivers funding on the basis of quality rather than volume.

The other element of 'on-plan' funding,<sup>19</sup> Equity Funding, has the fine intent of supporting initiatives in relation to the participation and achievement of Māori, Pasifika and students with disabilities. However, while any funding to support work in these areas is welcome, the amount of funding delivered via this mechanism is well short of the actual funding deployed by Otago to support its existing initiatives in these areas. It falls even shorter of the amount needed to support an upscaling of initiatives that could deliver even greater results.<sup>20</sup>

Off-plan funding tends to support specific Government priority projects (e.g. Centres of Research Excellence and ICT Graduate Schools). Issues arise with this funding when projects supported by special funds deliver relatively small amounts of additional funding with disproportionately high compliance costs,<sup>21</sup> though this has not always been the case.<sup>22</sup>

Two other elements of funding are controlled by Government to an extent:

- Competitive Research Grant Funding:<sup>23</sup> Government directly controls the quantum of funding allocated to the key funds such as the Marsden Fund, MBIE contestable funding and the Health Research Council (HRC). While the allocation of these funds in support of specific projects is independent, the allocation process has inherent inefficiencies;<sup>24</sup>

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<sup>18</sup> For Otago, SAC contributes around 75% of direct Government funding, and just over a third of total income.

<sup>19</sup> On-plan funding being the funding that is delivered in direct response to an institution's Investment Plan and under the general funding regulations.

<sup>20</sup> This important matter is covered in detail in section 7.0 of this submission.

<sup>21</sup> The ICT Graduate School initiative, for example, has been characterised by extraordinarily complex contracts, unwieldy and inefficient governance suggestions, and protracted negotiations.

<sup>22</sup> The old Encouraging and Supporting Innovation (ESI) fund was much better in its light-touch approach, and Centres of Research Excellence (CoRE) processes deliver long-term funding through generally well-managed contestable processes.

<sup>23</sup> The majority of this funding for Otago comes via the Marsden and HRC funds. Otago is one of New Zealand's top two universities in terms of securing grants from these two funds.

<sup>24</sup> Most obviously because only a relatively small proportion of high quality bids – all which are time consuming and thus costly to prepare – are able to be funded. This issue is not unique to New Zealand, but the success rate for bids to funds such as our Marsden Fund is appreciably lower than for its equivalents in jurisdictions such as Australia.

- **Domestic Student Fees:** These are tightly prescribed via the Annual Maximum Fee Movement (AMFM) mechanism. While the Government's desire to control domestic fees is understandable on both political and fiscal grounds, the AMFM perpetrates some embedded inequalities between institutions. Additionally, tight fee controls stifle the opportunity for differentiation on price that would, in most industries, be common for those who seek to position themselves as offering higher quality products.

The inability to differentiate upwards in fees for quality is, in conjunction with the absence of any element within the SAC system that rewards quality, a barrier to incentivising excellence and differentiation in the teaching side of tertiary delivery.<sup>25</sup>

Arguably, the absence of any funding incentive for service-type activities is also an issue, and one specific to universities, as they are the only organisations who have an absolute requirement under law to carry out such activities.<sup>26</sup>

### **3.5 Summary of Otago's Position**

- Continuity in tertiary education strategy is appropriate and appreciated, but there is scope to develop clearer strategy statements in respect of universities that are consistent with their distinct obligations under law;
- The current distribution of responsibilities for elements of tertiary education across multiple Government departments and agencies is, in tandem with the separation of policy and implementation functions, a cause of inefficiency and a barrier to innovation and responsiveness;
- Both the role of Investment Plans and the examples contained within them are worthy of greater consideration in the inquiry than has been the case to date, as is the TEC's planned new investment approach;
- While sound in its fundamentals, the funding system could be improved by ensuring that the quantum of funding provided by specific mechanisms is worthwhile, that funding to support innovation is not hamstrung by complex contracts and high compliance, and that some means – whether by greater fees freedom or a SAC premium – is provided to reward quality outcomes for teaching.

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<sup>25</sup> In making this statement, Otago does not deny the challenges of designing and implementing such a system in a way that is secure from easy manipulation. However, it is striking that the one current quality element in the SAC funding system – clawing back funding for poor outcomes – is punitive rather than positive.

<sup>26</sup> Otago estimates the cost of our service activities annually. The most recent estimate of this cost (for 2015) is \$31 million. This equates to approximately five percent of expenditure.

## 4.0 The University Business Model

### 4.1 The Business Model of New Zealand Universities

The high-level business model provided in the Productivity Commission's Issues Paper is, in Otago's view, a reasonable one for the university sector.

That said, and as with any model that seeks to describe a complex system in simple terms, it is not comprehensive. Additionally, as one of New Zealand's two top-ranked universities, Otago's perspectives may differ somewhat from others.

Key elements to note in this context include:

- The interdependence between teaching and research that is common to all of the world's leading universities is understated in the model (this is commented on in further detail in section 4.2 below);
- A number of important external factors that universities do not control are missed:
  - In an international context, these include the impact of exchange rates and international and national events on the ability to be competitive in recruiting students and staff from overseas;<sup>27</sup>
  - In a domestic context, these include other (primarily Government-driven) factors that impact on demand such as restrictions on access to loans and allowances, the impact of prevailing economic conditions, demographics and University Entrance standards.

Other observations pertinent to the Business Models section of the Issues Paper are:

- The extent to which continuous growth is a requirement has diminished for universities with the advent of PBRF, which is a significant component of funding determined largely independent of student enrolment volume;
- The reference to higher-performing students being lower in cost to educate is, in Otago's experience, misleading:
  - It is certainly true that students who arrive at university with a low level of academic achievement typically require greater support (and thus cost more) in the early stages of their degree education;
  - However, if a university takes its role of developing students to their full potential seriously, higher-calibre students can incur greater costs. Furthermore, they will tend to proceed to higher levels of study (e.g. honours streams within undergraduate degrees, and postgraduate study) where class sizes are much smaller, and there are no economies of scale benefits to be realised.<sup>28</sup>
- The critique of the business model at the end of page 10 of the Issues Paper is based on a flawed representation of how the TEC allocates funding; that funding is actually allocated, albeit with some lags and variations, in a manner that tends to follow demand over time.<sup>29</sup>

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<sup>27</sup> By way of example: international enrolments at Otago suffered following the Canterbury earthquakes due to a misconception that the entire South Island was impacted; a drive by reputable state universities in the United States to attract more international students to counter state funding cuts following the 2009 Global Financial Crisis increased competition for international students (New Zealand universities' ability to compete at this time being hindered by the relative strength of our currency against that of the United States).

<sup>28</sup> Additionally, high-calibre students are likely to be recipients of University-provided scholarships, which are an additional cost to the institution.

<sup>29</sup> Indeed, there are specific requirements within the funding system such as the requirement to repay funding below 99% of actual enrolments that forces an alignment with demand.

## 4.2 The Bundling of Teaching and Research

The relationship between teaching and research is an area that is replete with myth and misconception.

The requirement to undertake research alongside teaching is not – as the Issues Paper suggests – just a requirement of New Zealand, Australia, and “some US states”. It is one of the fundamental features of the world’s leading universities, wherever they are geographically located.

Otago gives explicit voice to this in its mission statement: “*A research-led university with an international reputation for excellence*”.

Otago is one of New Zealand’s two leading universities for research, but this research strength is intimately connected to our teaching mission. Our research certainly meets the needs of a variety of end-users, including government, NGOs, and the business sector, but it is also of great value because it is at the core of the knowledge and skills we teach our undergraduates. We also work intensively with our postgraduate students to develop their research capacity allowing them in turn to play very important roles in our culture of research. In light of these dynamic links between teaching and research, the TEU’s claim that research “*has become so ingrained in New Zealand universities that for many institutions it would be teaching, not research they would cut,*” does not hold true at Otago.

Our comprehensive response to this matter is covered in detail below. In summary, we have issues with the claim if applied to Otago on the following grounds:

- Philosophically: Otago affirms the interdependence of teaching and research, not the primacy of one over the other.<sup>30</sup>
- Our track record: Otago was founded in 1869 primarily to provide advanced education, and producing graduates remains a core role – and an extraordinarily satisfying one – almost 150 years on.
- Financial reality: Though Otago is a strong research university, teaching generates appreciably more of our income than research.

Consistent with this position, to secure an initial permanent position at Otago academic staff must demonstrate their ability to meet the performance objectives that attend to teaching, research and service. The same applies – with specified levels of performance required – in promotion and progression, including to the highest academic rank of Professor.<sup>31</sup>

The reasons Otago insists on these requirements are outlined in section 5.0 below.

It is inevitable that the requirement to engage in teaching and research and service should at times cause tension for university academics in balancing their duties. But similar (or even greater) tensions exist in many professions, and institutions have a range of systems and guidelines in place to help manage these tensions.

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<sup>30</sup> A guiding principle of Otago’s *Teaching and Learning Plan* is “achieving synergy between teaching and research.”

<sup>31</sup> To secure promotion to Professor at Otago one must demonstrate sustained outstanding leadership and competence in two of teaching, research and service, and outstanding competence in the third.

It is also relevant that:

- If there is a primacy accorded to research over teaching anywhere, it is in the basis on which the national and international academic community itself (not the institutions within which that community sits) most commonly judge success and accord professional respect.<sup>32</sup>
- The phrase ‘publish or perish’ is well known in academic circles as a descriptor of the pressure to publish academic work to sustain or further one’s career. That phrase does not have its origins in a response to 21<sup>st</sup> century developments such as PBRF or world rankings of universities; it was first used in 1942 to describe something that has clearly been part of academic life for decades.

### **4.3 Differentiation**

The differentiation of universities from other types of tertiary organisation is covered in more detail in the Universities New Zealand submission and referred to briefly in section 2.1 above. Section 2.2.2 provides coverage of the basis on which Otago differentiates itself amongst the universities.

It is worth recalling that in the early years of the current EFTS-based enrolment system, when rapid growth in tertiary study was the key objective, Government placed a low priority on differentiation. This resulted in considerable duplication and confusion. The current TES and funding mechanisms support – and indeed require – a much greater emphasis on differentiation. This increased emphasis is a positive feature of the current system.

### **4.4 Funding, Efficiency and Cross Subsidisation**

The Issues Paper’s observations in respect of Bowen’s law were interesting to consider.

Bowen’s law has significant limitations as a credible explanation for the supposed stagnant productivity in higher education in a system such as our own, where institutions are highly constrained in respect of raising revenue.

Universities will always tend to spend all the funds they raise because one of the key reasons they exist is to share, advance, promote and apply knowledge. So, just as a strong commercial entity will do well at generating a financial return to its shareholders, an effective university will excel in investing all that is available to it in producing knowledge-related returns.

That those which are relatively well-funded produce superior knowledge-related returns can hardly be doubted when one looks at the home universities of the world’s global superstars in advancing knowledge. This suggests that greater funding actually produces a greater return, usually in the form of greater knowledge advancement.<sup>33</sup>

For a small economy and tertiary system such as our own, comparisons with overseas jurisdictions will always be important in determining the extent to which we are appropriately funded, efficient, and productive. Such comparisons almost invariably show that we are quite lightly funded, and that we are highly productive in both teaching and research given the funding we receive.

New Zealand universities have faced increased financial pressure in recent years, and a common and appropriate response has been careful reviews of structures and costs<sup>34</sup>.

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<sup>32</sup> This is hardly surprising, as research is in essence the creation of new knowledge, and academic publication (and other forms of presentation) is the sharing of that knowledge with those who are best qualified to value it.

<sup>33</sup> The economic value one might place on that knowledge advancement is another matter, though major advances in knowledge can have profound economic impacts.

<sup>34</sup> Otago is currently in the midst of a review covering its support services, having already made a number of recent adjustments on the academic side in particular areas.

The Issues Paper refers specifically to cross-subsidisation of teaching and research.

Cross-subsidisation of teaching and research (generally from teaching to research) has been a feature of New Zealand's tertiary education system since the advent of enrolment-driven EFTS funding in the late 1980s,<sup>35</sup> so predates developments such as PBRF and international rankings by many years.

It is also important to appreciate that cross-subsidisation occurs both within teaching<sup>36</sup> and within research, and that elements of cross-subsidisation are far from uncommon at research-based universities worldwide.<sup>37</sup> Our university system could not survive in either its current form, or remain internationally credible, without it.

Additionally, research and teaching are naturally intertwined and interdependent at a university such as Otago in multiple ways, over and above the research and independent enquiry components that are embedded in most advanced undergraduate programmes. Examples of this include:

- Research degree students being both taught and – as part of that process – engaged in producing their own original research and contributing more generally to research production;
- Research that is quite directly applicable back to teaching.<sup>38</sup>

There is also an inter-generational transfer from research to teaching that occurs when current students benefit in a learning context from the research funded by previous generations.

#### **4.5 Summary of Otago's Position**

- The business model for New Zealand universities outlined in the Issues Paper is adequate, but needs to be considered in the context of a wider range of external factors;
- A number of suggestions in the Issues Paper that refer to the need for growth and the relative costs of educating particular types of student are flawed;
- Otago regards the interdependence of teaching and research as fundamental to our endeavour, and rejects the view that teaching has become a secondary pursuit to research;
- It is important that differentiation between institutions and different parts of our tertiary sector continue to be emphasised;
- While cross-subsidisation certainly exists, this is natural and valid for a range of reasons, and is the norm at most research-based universities worldwide;
- The efficiency and level of investment in New Zealand universities must be considered in the context of the norms for similarly ranked universities worldwide.

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<sup>35</sup> The early funding rates for postgraduate enrolments actually included an explicit 'research top-up', in recognition that such cross subsidisation was required to maintain research.

<sup>36</sup> Due to factors such the imperfect nature of the SAC funding bands, the greater economies of scale that exist through teaching larger classes (typically at lower levels), and year-to-year volume variations by course.

<sup>37</sup> These reasons relate to the imperfect nature of funding systems, economy of scale factors, and year-to-year volume variations at the course and programme level.

<sup>38</sup> Assessed by cost, these two types of intertwined research accounted for 30% of Otago's total research activity in 2015, and close to half of all research activity other than that funded specifically from external sources.

## **5.0 Research – Including Its Application and the Teaching-Research Link**

### **5.1 The Teaching-Research Link**

Otago believes, like the majority of highly-ranked universities in the world, that unique benefits accrue when students participating in higher education have the opportunity to be taught by active researchers and to engage in research and independent enquiry as an integral part of their education at degree level and above.

While around half of tertiary education teaching in New Zealand is at below degree level, Otago is concerned almost exclusively with teaching and learning at undergraduate degree level and above.<sup>39</sup> Within this, we are also one of the major providers of postgraduate research degree programmes in New Zealand, and such degrees absolutely require high-calibre, active researchers to be engaged with graduate students to teach them and supervise their research.<sup>40</sup>

From a whole-of-system perspective, we are an institution focused almost exclusively on advanced teaching.

An effective and credible teacher at that level requires, as a minimum, a deep discipline-based knowledge and experience of how that knowledge is created. Both requirements come from being an active researcher in that discipline. Additionally, the higher order attributes we seek to develop in our students are learned through academic research processes embedded in our programmes, and it would not be tenable to have these taught by teachers who themselves are not active in research.

Graduates who have learned to create knowledge are ideally skilled to take their place in the new knowledge economies and society. These skills enable graduates to respond and contribute to a fast changing world in which factual forms of knowledge can become obsolete in a short time. If this type of education is the key to meeting society's needs in the future, then it requires greater emphasis than it receives at present to produce work-ready graduates. Learning higher order skills takes time and should begin at first year level in all subjects, with teaching led by high quality research-active academics.

Teachers who are active in research are, therefore, uniquely qualified for advanced teaching.<sup>41</sup> At Otago the overwhelming majority of teaching – including at first year level – is delivered by academic staff who are active researchers as well as teachers.

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<sup>39</sup> 98% of our teaching is at degree level or higher. The remaining 2% is foundation teaching to ready those who have not gained the appropriate skills for full degree study at school.

<sup>40</sup> With 1387 students undertaking doctoral study in 2015.

<sup>41</sup> Just under 80% of our teaching staff hold positions in which they are expected to undertake teaching, produce and publish research, and undertake service. This percentage has remained very stable in recent years. The vast majority of those who comprise the other 20% of our teachers are discipline-specific practitioners teaching in our professional programmes (e.g. health sciences, law, accountancy, teaching, surveying). They bring a vital professional rather than research perspective. Even in these environments, the staff that deliver components of these programmes based on their professional expertise are informed in their teaching by their colleagues who devote the majority of their non-teaching time to research.

## 5.2 Great Researchers and Great Teachers

Just as excellent teaching can occur independently of research, so excellent research can occur independently of teaching. However, it is important to acknowledge that excellent research and excellent teaching often go hand-in-hand, particularly at Otago, where our hiring decisions are based on an evaluation of skills in both areas and where the bar is set high.<sup>42</sup>

A number of our internationally renowned researchers have demonstrated this interdependence by securing top teaching awards.

Of the 44 staff who have attained our own Otago Teaching Excellence Awards since 2001, 42 have academic roles that encompass research as well as teaching. A significant proportion of these 42 awardees have built, or are building, outstanding international research reputations.<sup>43</sup> The proportion of Otago teaching award winners who have secured either an “A” (high international standing) or “B” (high national standing) rating for research under PBRF is – at close to two thirds – higher than the proportion of A and B-ranked researchers across the university as a whole: this suggests, if anything, a positive relationship between excellence in teaching and excellence in research.

Moreover, since the inception of the National Tertiary Teaching Excellence Awards in 2002, all but one of the 22 Otago staff who have received this honour have academic roles that encompass research as well as teaching. Again, strong performers in PBRF are disproportionately represented amongst our National Tertiary Teaching Excellence Award winners.

Similar observations apply when we look at the level of our academic departments: those that are strong in research<sup>44</sup> certainly do not rate less favourably than other departments for teaching;<sup>45</sup> indeed, our strong research departments are frequently our strongest teaching departments as well.

At Otago, even at first year level, our teachers include senior academics – Associate Professors and Professors – who are internationally renowned researchers. Exposure to academics of this calibre at first year level may not be universal across all universities, but it is embedded at Otago to such an extent that one of the key pieces of advice our teaching and learning experts give is “have your top professors involved in teaching first years”.

When our first year students comment on the classroom experience with someone who is a national or even world leader in their field, they use terms like “brilliant,” “inspiring,” “amazing,” and “constantly engaging.”<sup>46</sup>

Otago’s views in this area are consistent with one of the defining and nationally unique features of our senior academic leaders,<sup>47</sup> in that they are all required to continue to remain active in research and advanced teaching (most often as research degree supervisors).

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<sup>42</sup> Research and teaching are fundamental to the original idea of the university and to the education of students at this level. Maintaining a relationship between teaching and research is essential if New Zealand wishes to benchmark its higher education against international best practice.

<sup>43</sup> Including one whose success in the Otago Teaching Excellence Awards in 2015 was preceded by her winning our medal for outstanding early career research, and followed in short order by promotion to a full professorship.

<sup>44</sup> As rated, for example, by the PBRF scores for nominated academic units.

<sup>45</sup> As measured by student and graduate satisfaction with teaching.

<sup>46</sup> These examples come from first year students commenting on specific senior members of our academic staff in recent Student Opinion Surveys.

<sup>47</sup> Comprising our Vice-Chancellor, our three Deputy Vice-Chancellors and four Pro-Vice-Chancellors, as well as our academic Deans.

### 5.3 The Wider Application of Research

The Issues Paper business model for universities (Fig. 7, p. 11) focuses on research as an activity that is undertaken to maintain and grow revenue, through the attraction of staff who will enhance institutional reputation for the recruitment of high-quality domestic and international students.

This feedback cycle is relevant, but it does not consider the more fundamental elements of why research is valued at Otago (as at most of the world's leading universities) in addition to the positive impacts it has on teaching.

University research, as well as providing scholarship and critical thinking that enriches our culture and society generally, also provides crucial support for a nation's business and innovation systems. This manifests through technological progress that can feed into productivity enhancements for existing businesses, as well as the provision of skilled employees, from both graduate and undergraduate programmes, bringing a research-informed culture of innovation into the workplace. University research also leads directly to technological progress through knowledge spillover,<sup>48</sup> entrepreneurship and the generation of spin-off technologies and companies.

Taking evidence and information from tertiary education providers in other jurisdictions, a 2015 Deloitte report for the University of New South Wales<sup>49</sup> and the Australian University sector estimated that "the stock of technology and knowledge attributable to Australia's universities contributed approximately \$160 billion to GDP in 2014, almost 10% of total GDP." This outstrips Australia's mining industry, which accounted for approximately 9% of Australia's GDP in 2014.

The entrepreneurial impact of the 100,000+ MIT graduates has also been recently analysed<sup>50</sup> – these people contribute 4.2 million jobs (i.e. a ratio of 42 jobs per alumnus) and nearly US \$2 trillion in annual revenues to the US and global economy. Research intensity and research-engaged learning is at the heart of this, with 31% of MIT graduates holding one or more patents and 55% having engaged actively in leading product and project development efforts in existing firms.

Common to these international comparators, Otago University has an established and recognised track record in innovation from our research both nationally<sup>51</sup> and internationally, as one of only 15 universities worldwide (including UNSW and MIT) to gain a 5 Star Plus rating in the QS Stars quality benchmarking programme.<sup>52</sup> Similarly, other New Zealand universities have been recognised for their innovation and global leadership in creating university-based entrepreneurial ecosystems.<sup>53</sup>

The Issues Paper gives relatively little coverage to innovation through knowledge transfer, though this is a key area of developmental focus for many universities, and is highly relevant to productivity and economic growth. For these reasons, we have included a summary (Attachment A) of Otago's recent

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<sup>48</sup> Students taking ideas, innovations and technological advances from the university to the workplace.

<sup>49</sup> "The economic contributions of Australia's research universities – the UNSW example", October 2015. <http://www.smartinvestment.unsw.edu.au/sites/default/files/documents/Economic%20contributions%20of%20UNSW%20-%20Final%20report%20-%20Deloitte%20Access%20Economic....pdf> [Date accessed: 17 April 2016]

<sup>50</sup> Edward B. Roberts, Fiona Murray, and J. Daniel Kim "Entrepreneurship and Innovation at MIT: Continuing Global Growth and Impact" MIT Sloan School of Management, December 2015. Available online at <http://web.mit.edu/innovate/entrepreneurship2015.pdf> [Date accessed: 17 April 2016]

<sup>51</sup> A 2012 independent report for the then Ministry of Science and Innovation found Otago was reported to be "well engaged with business", with external subcontracting [deploying our science expertise for commercial purposes] "well above the mean" for New Zealand universities.

<sup>52</sup> In awarding Otago the maximum 5 Star Plus international quality rating earlier this year, QS accorded Otago the maximum possible rating for patents, and for joint publications with industry. Otago also scored highly for spin-off companies.

<sup>53</sup> A recent MIT Skoltech report identified the University of Auckland as a "rising star" for research commercialisation in more challenging geographical and economic conditions: "Creating university-based entrepreneurial ecosystems: evidence from emerging world leaders", June 2014. <http://web.mit.edu/sktech/sktech-program/entrepreneurship-innovation/benchmark.html>

achievements in this area as an illustration of how an outwardly-focused, research-rich university operates in this space.

## 5.4 Research Funding

The New Zealand research funding environment is rich and complex, but has changed during periods of tertiary reform, and more recently, to align well with the achievements of productivity gains from university research, be it through the provision of skilled, research-informed graduates or the direct knowledge transfer from university research. Many of these reforms, particularly the development of a new and comprehensive research framework under the *National Statement of Science Investment (2015-2025)*,<sup>54</sup> are very recent developments, so the full flow through to economic and productivity gains within the wider economy will take place over the next 5-15 years.

Elements of the current investment portfolio (e.g. through Callaghan Innovation grants) support universities to undertake business-focussed innovation through providing project funding, and enabling studentships, internships and subsidised placements for new PhD graduates. These enhance the direct transfer of skills and technologies from universities to businesses. The current investment portfolio also recognises the role of government in setting frameworks and investing in mission-led (e.g. CoREs and National Science Challenges) and investigator-led (e.g. Marsden Fund) research.

The full implementation of these reforms will require commitment from government to increase research funding over time, to the level of 0.8% of GDP that is indicated as a target in the NSSI.

The PBRF and CoREs are tertiary education-centred funding instruments that the TEC oversees, and which are at times criticised for their potential distraction from the core teaching and professional training missions of universities. However, independent analyses of both funding instruments by the Ministry of Education in 2013<sup>55 56</sup> revealed that both instruments made positive contributions with no evidence for any reduction in teaching quality or student achievement.

With revisions to clarify objectives and improve reporting frameworks, both instruments have been continued with increased investment and confirmed as core components of our NSSI for the decade ahead. Again, with appropriate and continued increases in investment as conditions permit, Otago sees PBRF and CoREs as valuable parts of our research and innovation ecosystem.

## 5.5 Summary of Otago's Position

- A strong research-teaching link is a defining characteristic of the world's leading universities, and if our universities are to remain well regarded internationally, this must remain so here as well;
- Claims that teaching is a poor cousin to research in the eyes of institutions, and that strong researchers either shy away from teaching or are not especially good at it, are at odds with what we can demonstrate is the case at Otago;
- Teaching by active and sometimes world leading researchers is fundamental to a university undergraduate education, starting at first year level;
- The role of research in advancing knowledge, and its role in fostering innovation requires careful consideration as part of the review.<sup>57</sup>

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<sup>54</sup> <http://www.mbie.govt.nz/info-services/science-innovation/pdf-library/NSSI%20Final%20Document%202015.pdf>

<sup>55</sup> "Analysis of the Impacts of the PBRF" Ministry of Education, 2013.

<https://www.educationcounts.govt.nz/publications/80898/analysis-of-the-impact-of-the-pbrf-interim-findings>

<sup>56</sup> "CoREs and Effect", Ministry of Education, 2013. <http://www.education.govt.nz/ministry-of-education/overall-strategies-and-policies/centres-of-research-excellence-cores/>

<sup>57</sup> So far, research seems to be considered mainly in the context of its role in relation to teaching and, indeed, as a potential distraction from teaching.

## **6.0 Teaching and Learning – Pedagogy and Technology**

### **6.1 The Key Characteristics of Effective Teaching**

However teaching is delivered, the fundamental principles that Otago believes underpin its effectiveness are:

- Encouraging students to take a ‘deep approach’ to learning;
- Encouraging a focus on learning;
- Ensuring equitable learning environments;
- Using ‘alignment’ as a key principle when designing programmes and curricula;
- Assessing appropriately;
- Evaluating practice to improve the student learning experience.

Our research has also identified a number of particularly relevant indicators of effective teaching that can be applied at the level of an individual, an academic unit, or a whole institution. These are available in our *Guidelines for Teaching at Otago* should the Productivity Commission wish to consider them in detail.

### **6.2 Developing and Supporting Excellent Teachers**

The Issues Paper observes that universities do not require their academic staff to gain a teaching qualification. This should not be taken to mean that universities fail to provide opportunities and support for staff to develop their teaching practice, and apply contemporary pedagogical research.

Indeed, this is a principal role for Otago’s Higher Education Development Centre (HEDC) and its equivalents elsewhere. A university’s activities to develop tertiary teaching will typically include:

- Providing professional development workshops;<sup>58</sup>
- Providing postgraduate qualifications in tertiary teaching for those that seek them and supporting research degree study (including PhD) in areas related to higher education;
- Ensuring that teaching developments and programme delivery are informed by current research into teaching and learning;
- Providing internal funding to facilitate teaching innovation.<sup>59</sup>

A specialist Medical Education Group also operates at Otago, providing leadership and liaison that supports curriculum initiatives and encourages the development of staff as effective facilitators of learning.

### **6.3 The Role of Student Voice**

The views of students play a vital role in shaping what a modern university does, and in confirming whether or not teaching in particular is being done well.

In advanced education students are, to an increasing extent, partners as well. This partnership element is especially evident in a predominately residential university like Otago, as the majority of students are physically part of the community 24/7 during the academic year.

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<sup>58</sup> In 2014 Otago provided 86 such workshops, with 1064 staff attendances.

<sup>59</sup> At Otago, this funding includes a specific element available to enhance teaching and learning with technology.

Our experience is that student input is valuable at a range of levels, from the highest levels of governance and academic decision making (via student representation on our Council and Senate (Academic Board)), through to membership of the subcommittees of those bodies, involvement in reviews, and the operation of a comprehensive class representative system.

Seeking regular and confidential student feedback by way of courses and individual teaching evaluations (which focus on specific papers and staff) is a vital means of monitoring teaching quality and, where necessary, focusing on improving that quality. Broader surveys are undertaken annually to test satisfaction with the wider learning experience (for example, at the level of degree and major) and with student life, facilities and the various support services we provide. Results of these surveys are taken back to academic departments and service units, and are also an important resource for our regular programme of internal reviews (see below).

In addition to its own teaching awards, the University supports the Otago University Students' Association (OUSA)'s annual teaching awards.<sup>60</sup> OUSA also operates our class representative system, and has a direct avenue to provide comment to the Vice-Chancellor and the senior executive on teaching and learning issues.

Involving students as partners in learning and many other aspects of campus life facilitates the development of some core attributes that are important for life after graduation.

#### **6.4 The Impact of Technology on Teaching**

There are two distinct strands to the Issues Paper's discussion on the impact of technology. The first relates to the impact of technology on what we do (mainly in respect of how we teach). The second relates to how we ensure that graduates develop the skills needed for a world that is being transformed by technology.

The changing needs of graduates and the possibility of a disruptive technological impact on universities (i.e. one that challenges, or makes redundant, a large portion of what we do) are covered in section 10.0 below. This section responds to incremental (but still highly significant) ways in which university teaching responds to the opportunities and challenges posed by new technologies.<sup>61</sup>

It is often forgotten that universities are rapid adopters of new ICT technology. Yet this is hardly surprising given that the pioneering development of computers, the internet, email and social media originated in universities and/or were developed by academics and students.<sup>62</sup>

Like other universities in New Zealand, Otago installed its first computer in the mid-1960s. Computing quickly developed in parallel as an academic subject in both science and commerce, as did the use of the latest ICT developments by the university itself.

Today, Otago provides an award-winning virtual student cloud computing environment which runs on any student-owned device (including tablets and smartphones). Wireless access is provided for all students' rooms in our Residential Colleges, and University-owned flats, and the roll-out of wireless and ultra-fast broadband across the wider North Dunedin university and student precinct is ongoing.

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<sup>60</sup> These awards are based on votes from students and include a top teaching excellence award and awards for top tutor/lab demonstrator, top summer school teacher, most inclusive teacher, and postgraduate supervisor of the year.

<sup>61</sup> 'New technologies' in this context equates to information and communication technologies (ICT).

<sup>62</sup> Starting in the digital era with the seminal work foundation, conception and practical work on the electronic stored-program digital computers in the 1930s and 1940s by the likes of Alan Turing (Cambridge University), John von Neumann (University of Pennsylvania), and extending to such things as Facebook (developed initially by students within Harvard University as a means of keeping in touch).

Otago tracks the extent to which each of our courses (papers) makes use of the internet and/or web technologies. In 2015, over 88% of our enrolments were in courses that are either web-supported or web-enhanced, and a further 9% were in courses that are fully web-based.

Ask a current Otago student about ‘Blackboard’, and they will likely talk about one of a number of Learning Management Systems that organises teaching activities, delivers course materials and provides a wide variety of teaching resources.<sup>63</sup> Ask about the role the library plays when researching for an assignment, and they may refer to using library catalogues – accessed from anywhere – as access portals to fully-searchable academic books, ebooks and journals available electronically via library catalogues. Ask a medical student to describe a dissection, and they may refer to a virtual dissection on a 3D simulator driven off datasets comprising digitised images of plastinated human body cross sections as well as images acquired via CT and MRI scanning.

The evolution of ICT at Otago is ongoing, and includes the evaluation and piloting of new ICT developments as they emerge. To support this we have an Information Technology Advisory Committee (ITAC).<sup>64</sup> Educational technology workshops are also held regularly and we have an Educational Technology group that works on ICT developments.

These specific examples are provided – along with further information in Attachment B about both ubiquitous and emerging technologies – because we detect in the Issues Paper an incomplete understanding about the extent to which tertiary institutions embrace new ICT developments comprehensively.

## 6.5 Learning in a Residential University

As noted in section 2.2.2 above, Otago is nationally unique in its status as a predominately residential, destination-based university in a true university city. This status is a hallmark of many of the world’s great universities.

The residential experience, typically starting with a year in one of our Residential College communities, followed by flatting with peers in close proximity to campus, is not for everyone, but it does offer a number of internationally recognised learning and life benefits. Most importantly, learning takes place in the widest possible context, as part of an enriching 24/7 experience that provides remarkable opportunities for personal as well as academic development.

Our approach, and particularly the Residential College experience, is shaped by what esteemed Harvard academic Robert J. O’Hara has described as “*elementary notions about education and human behavior that can hardly be disputed.*” For example: “*students learn better when they are seen as individuals rather than as part of an anonymous crowd; contact between students and faculty is important; diverse communities teach people more about life than monocultures do.*”<sup>65</sup>

We regard the Residential College experience and what follows as one the key reasons that Otago rates so well nationally for academic performance, retention and completion.

When our graduates reflect on what they have gained in their time at Otago, they frequently refer to skills and attributes such as independent judgement, teamwork skills, flexibility and adaptability, and cultural understanding being developed through their residential experience as well as in the classroom. Employers have also reported, in reference to Otago graduates in particular, independent

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<sup>63</sup> Blackboard is the trade name for a learning management system supported and available for student learning at Otago.

<sup>64</sup> ITAC, along with our Committee for the Advancement of Learning and Teaching (CALT) allocates funds for ICT-related developments well as providing strategic advice.

<sup>65</sup> See: <http://collegiateway.org/>

judgement, good negotiation skills, as well as a knowledge and appreciation of multiculturalism and ethical standards.

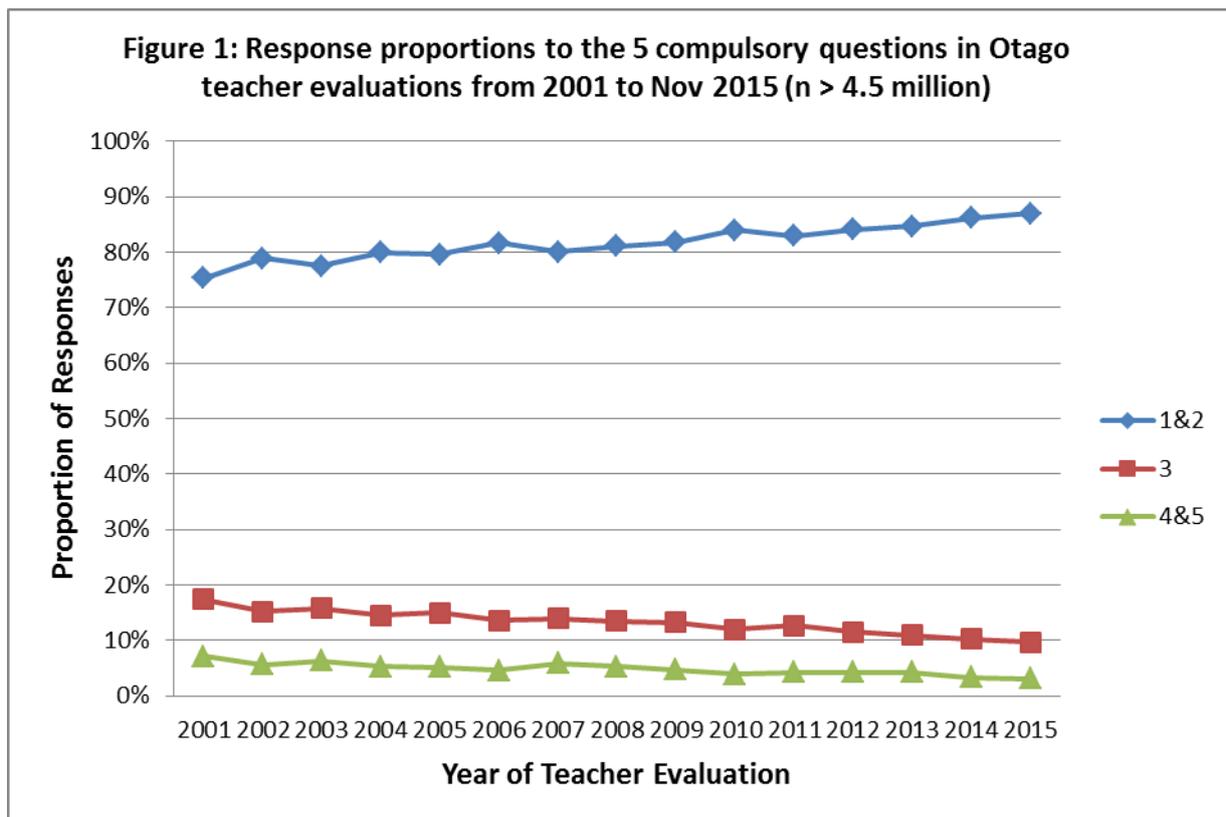
## 6.6 Measuring Teaching Quality

While teaching excellence awards are the ultimate accolades for teaching quality, and the production of well-qualified and employable graduates is one of the ultimate proofs of a teaching and learning environment that is working well, student feedback is also important for assessing the quality of teaching at the level of individual staff and papers.

The quality framework under which New Zealand universities operate includes a specific expectation that: *“universities should have processes for gaining feedback on student satisfaction with teaching, courses and student services and should be able to demonstrate that feedback is used to inform improvement initiatives”*.

At Otago, our Course and Individual Teaching Evaluations and Student Opinion Survey have been in place for many years, and so provide long-run evidence of teaching performance and change.

Figure 1 shows the aggregated responses to the five compulsory questions in the Course and Individual Teaching Evaluations year-by-year since 2001. The questions use a five point scale where 1 and 2 are positive assessments, 3 is neutral, and 4 and 5 negative.



To summarise, over the past 15 years:

- Positive assessments have risen steadily from 75% of responses to 87% (this rise is driven entirely by an increase in the proportion of rating at the highest level of '1');
- Neutral responses have dropped from 17% to 13%;
- Negative responses have dropped from 7% to 3%.

A similarly positive trend is evident in responses to the key teaching-related questions in the annual Student Opinion Survey.

## **6.7 Great Teaching Supports Great Outcomes**

High quality teaching should lead to high-quality outcomes.

This being so, universities should be able to find evidence that what they are doing is translated in the results of their students, both during their time at university, and following graduation.

Some of the key evidential items we look for are as follows:

- Pass, retention and completion rates (here we have access to comparative results for other institutions via the TEC's annual Educational Performance Indicators);
- Outcomes in respect of employment and progression to further study (access to comparative data in this area has been weak, but is rapidly improving).

When we consistently rank as first amongst New Zealand's universities for course completion and student retention, and very highly for other measures, we have confidence that what we are doing is working well.<sup>66</sup> The same is true when we consistently see more than 93% of our graduates proceeding to employment or further study within 18 months of graduating.<sup>67</sup>

## **6.8 Summary of Otago's Position**

- Universities provide a range of opportunities for academic staff to develop as teachers, as well as undertaking fundamental and applied research into teaching itself;
- An active voice from students in relation to teaching benefits both teaching, and the wider development of students;
- Universities are fully cognisant of the opportunities new technologies provide in respect of teaching, and take advantage of these on an ongoing basis;
- The experiences offered by a residential university are unique, and provide particular benefits in respect of both academic and personal development;
- It is possible to measure monitor both teaching quality and outcomes, and this is something Otago has done for many years;
- Unsurprisingly, we can demonstrate that high-quality teaching leads to high-quality outcomes.

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<sup>66</sup> Otago typically places first or second for qualification completion and in the top three for progression.

<sup>67</sup> Of the remaining 7%, a considerable proportion are not working or studying because they are either mature students studying in retirement, or because they are taking time out to travel, have families or volunteer after graduation.

## 7.0 Improving Access and Outcomes for Under-Represented Groups

### 7.1 Overarching Observations

The Issues Paper seeks comment on measures that have improved access, participation, and achievement outcomes for six different groups. Otago provides views in respect of the three groups it has given priority to supporting: Māori, Pasifika and people with disabilities.

A number of general observations and approaches apply:

- We provide a dedicated service, discrete to each group. This service operates in coordination with other more general support services that the University provides, and focuses on social and cultural provision as well as academic support;
- Close engagement with whānau/family is often critical to success, as is having credibility in the wider communities from which these students come;
- Achieving successful outcomes requires innovative approaches, and a range of different approaches;
- Achieving successful outcomes requires a long-term commitment and is not cheap. For each group, the resource we commit is significantly above the TEC funding provided to support progress in these areas;<sup>68</sup>
- Where students are coming from lower socio-economic backgrounds, as is often the case for Māori and Pacific students, the cost of tertiary study is frequently a major barrier;<sup>69</sup>
- The ‘full immersion’ 24/7 tertiary residential experience is found to be especially valuable by Māori and Pacific students;<sup>70</sup>
- Rigorous, evidence-based testing of the success (or otherwise) of what we are doing is vital.

Otago is proud to have shown visionary leadership and innovation in this area, through which we are achieving some outstanding results, with a number of initiatives gaining international recognition. We are convinced that the approaches we are taking are capable of being adapted (and often all that would be needed is up-scaling) to achieve even more.

This notwithstanding, our deepest frustration is the lack of funding support available through existing mechanisms to support us going to ‘the next level’ in these areas.

We see it as critically important to give the Inquiry a sense of what a deeply committed university such as Otago does and can achieve in this vital area, as outlined in the following sections of this submission. A ‘boots on the ground’ site visit to Otago would be particularly productive in this regard as well.

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<sup>68</sup> We bridge the gap by deploying additional resources from our operating budget, and by securing supplementary third-party funding (mainly, from Government agencies other than the TEC).

<sup>69</sup> This is often compounded by the following factors: a reluctance – based on past experience of debt – to take on debt, even by way of Government student loan; and the reality that for some, a semester or year of foundation study may be required to ensure adequate preparation for degree-level study.

<sup>70</sup> Such students, and especially those from socially and/or economically disadvantaged backgrounds, commonly tell us that getting away from home and into our academic community has been a vital ingredient in their academic success.

## 7.2 A Particular Focus on Health Sciences and Sciences

Otago has a particular focus on Māori and Pasifika achievement in the sciences and health sciences. This focus stems from the following:

- Our core strengths as New Zealand's most science and health science-focused university,<sup>71</sup> and home to the country's largest medical school and only dental school.
- The fact that science and the health sciences are fields in which both Māori and Pasifika have been most obviously under-represented over the years, both as students, and in employment.
- Our ability to secure additional funding and other support from an agency (Ministry of Health) that is seeking the workforce transformation we are able to provide.

To address this, we have a range of initiatives in place – most in place for five to six years now – that may be broadly characterised as follows:

- **Outreach:** to raise the aspirations of Māori and Pasifika for science and health sciences study, and lift their secondary school performance in the sciences.
- **Transition:** to lift Māori and Pasifika students who have ability and commitment, but who have not achieved strongly in sciences at school, to a level at which they can succeed in sciences and health sciences study at university.
- **Support Mechanisms:** which, along with affirmative action in admission, enable Māori and Pasifika students to achieve to their full potential, particularly in health sciences study.

It is noted that while Māori and Pasifika are referred to collectively above, the Issues Paper asks its questions on participation and achievement separately for each group. This is an important acknowledgment (and one lacking in many current tertiary education documents) because while Māori and Pasifika have an unfortunate commonality in educational under-achievement, the causes (and thus the solutions) are not always the same for these two distinct groups.

## 7.3 Improvements in Respect of Māori

General Participation highlights:

- The number of Māori students studying at Otago has increased by over 50% in a decade. In 2015 Māori students (totalling 1,759 EFTS) comprised an all-time record for Otago of 9.9% of the domestic roll.
- In 2016 we have had another significant increase in Māori enrolments. Māori will comfortably exceed 10.0% of our domestic roll this year.

General Achievement highlights:

- Our pass rate for Māori in 2015 of 83.5% is the highest for Māori at Otago since pass rate data by ethnicity started being compiled.
- It will likely be one of the best pass rates for Māori in the tertiary sector.
- Over 1,800 Māori have graduated from Otago in the last five years, including 487 with postgraduate qualifications.
- Employment outcomes for our Māori graduates are on a par with those for our graduating cohort as a whole.

In respect of health sciences:

- The number of Māori students gaining entry to Otago's professional health sciences programmes has risen from a previous long-run average of about 30 annually to more than 70 (73 last year, rising to 76 this year).

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<sup>71</sup> As measured by the proportion of our enrolments and academic activity in these areas.

- Within this, an all-time record of 48 Māori students gained entry to our medical degree programme this year, compared to just 9 students as recently as 2006.
- These 48 students represent 16.7% of our commencing medical cohort, which is an all-time high, and exceeds the percentage of Māori in this country's population.
- We expect 46 Māori students to graduate with medical degrees at the end of 2016. This will increase the number of Māori medical doctors in this country by close to 10% in a single year.
- As similarly large cohorts of Māori graduate annually over the next few years, the ethnic composition of the medical workforce will be transformed.

#### **7.4 Improvements in Respect of Pasifika**

General Participation highlights:

- We have increased the number of Pasifika students studying at Otago by over 50% in a decade. In 2015 Pasifika students (totalling 804 EFTS) comprised a record 4.2% of the domestic roll.
- In 2016 we have had a further strong increase in Pacific enrolments.

General Achievement highlights:

- Our pass rate for Pasifika in 2015 of 74.8% is the highest for Pasifika at Otago since pass rate data by ethnicity started being compiled.
- Over 720 Pacific students have graduated from Otago in the last five years, including 220 with postgraduate qualifications.
- Employment outcomes for our Pasifika graduates are on a par with those for our graduating cohort as a whole.

In respect of health sciences:

- The number of Pacific students gaining entry to our professional health sciences programmes has risen from a previous long-run average of about 15 annually to a record 37 last year.
- Within this, an all-time record of 24 Pacific students gained entry to our medical degree programme this year, compared to just 4 students as recently as 2006.
- These 24 students represent 8.3% of our commencing medical cohort, which is an all-time high, and exceeds the percentage of Pasifika in this country's population.

#### **7.5 People with Disabilities**

Otago has achieved significant increases over recent years in both the number and proportion of our students who identify as having disabilities affecting study, and in the number of these students who access our support services.<sup>72</sup>

In 2015, students who identified as having disabilities affecting study comprised 5.8% of our roll. Of these students – 1,203 in all – over half (some 669 in 2015) were supported by learning assistance and/or special equipment during the year that required a specific investment by the University.

Compared to 2011, the number of our students who identify as having disabilities affecting study has increased by 39%, and the number we have supported with learning assistance and/or special equipment has increased by 32%. Over the same period, the tagged funding we receive to support students with disabilities via Equity Funding has not increased.

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<sup>72</sup> We regard the increases outlined above as an achievement for the University because we take a proactive approach to recruiting and supporting students with disabilities. However, it is also important to acknowledge that changes to the way in which the compulsory education sector and society more generally have also contributed to these increases.

Given that we have absorbed these significant volume increases without additional funding support, we are pleased to have maintained course completion rates at around 80% for students with disabilities.

The keys to our success in this area are not especially complex, and involve:

- A proactive approach to recruiting and supporting students with disabilities;<sup>73</sup>
- A dedicated disabilities support service that works with individual students to identify and implement tailored programmes of support;<sup>74</sup>
- Teaching and awareness raising events, including the recognition of excellence in supporting students with disabilities to reach their academic potential;
- Taking advantage of technological innovations to provide both enhanced support and – in some cases – more efficient support.

One of the most significant issues we face in supporting students with disabilities is volatility in the number of students that require especially intensive support and the cost of that support.

By way of example, full support for a profoundly deaf student studying full-time over a year towards a general degree costs approximately \$56k.<sup>75</sup> The level of support becomes even higher for degrees with internships and/or practicum placements.<sup>76</sup>

As is the case with Māori and Pasifika, students with disabilities affecting study tend to be slightly more satisfied with the quality of their courses than the student population as a whole.

## 7.6 The Impact of Funding Constraints

In section 7.1 above we express a deep frustration at the lack of funding support available through existing mechanisms to support going to ‘the next level’ in achieving improved access, participation, achievement for Māori, Pasifika and students with disabilities.

The TEC’s Equity Funding rates have remained static for years, with \$320 per EFTS in funding support for Māori and Pacific Students at undergraduate degree level, and disabilities funding allocated on the basis of total student enrolments at a rate of \$28.60 per EFTS.

In 2015, the funding received from Government and Otago’s expenditure on focused support for each of these groups was as follows:

- Māori: \$0.9 million from Government<sup>77</sup>, expenditure of \$3.2M;
- Pasifika: \$0.7M from Government<sup>78</sup>, expenditure of \$2.1M;
- Disabilities: \$0.5M from Government, expenditure of \$0.9M.

In all, only \$1.1 million of the \$2.1 million in Government funding included above is Equity Funding provided by the Vote Tertiary Education budget. The balance is provided via Vote Health to support our initiatives for Māori and Pasifika in the health sciences.

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<sup>73</sup> Including some dedicated scholarships for such students.

<sup>74</sup> The main types of support required by students – in order of frequency – are assistance with note-taking, special examination arrangements, and additional tutoring.

<sup>75</sup> This will cover New Zealand Sign Language (NZSL) interpreters for classes and exams, note-takers (electronic) and additional tutorials.

<sup>76</sup> Otago recently supported two Deaf students who were enrolled in our Bachelor of Teaching programme. This involved full day practicum placements in schools over a three week period at an additional cost of \$15k.

<sup>77</sup> Of which roughly half is Vote Health funding to support our initiatives in respect of health sciences.

<sup>78</sup> Of which over 70% is Vote Health funding to support our initiatives in respect of health sciences.

Even with that Vote Health support we spend close to three times what we are allocated to achieve improved access, participation, and achievement for Māori, Pasifika and students with disabilities. That level of additional investment from core funding is barely sustainable going forward.

Equally importantly, the outstanding outcomes for Māori and Pasifika in the health sciences indicate that much more could be achieved with adequate targeted funding support.

## **7.7 Summary of Otago's Position**

- Well-designed, innovative programmes will deliver marked improvements in access, participation, and achievement outcomes for under-represented groups;
- There is no 'one size fits all' model for success in these areas, but there are sets of principles and approaches that are likely prerequisites for success;
- Taking students out of their home setting rather than taking the teaching to their home setting is a vital ingredient for success;
- While educational under-achievement is a common factor for both Māori and Pasifika, the root causes are not necessarily the same, and solutions must be tailored with this in mind;
- Inadequate funding, not a lack of ideas or knowledge about what needs to be done, is the major barrier to improving the outcomes for under-represented groups at a greater rate than is currently the case.

## 8.0 Meeting Employer and Industry Needs, Graduate Attributes and Outcomes

### 8.1 Meeting Employer and Industry Needs

Regular interaction with employers and industry ensures that a university maintains an up-to-date understanding of what is required in workplaces, and that employers and industry have a reasonable knowledge of what is changing within the university. As well as facilitating the development of work-relevant skills in graduates, this interaction can lead to (or take the form of) opportunities for mutually beneficial opportunities in research.

We suspect Otago is relatively typical in the various ways we interact with employers and industry, and the professional bodies that represent specific professions. These include:

- Input at the highest level of institutional governance;
- Permanent advisory boards that support particular (usually vocationally-focused) schools, departments and programmes<sup>79</sup>;
- External accreditation reviews for these same schools, departments and programmes;
- Employer, industry or professional representation on panels for our own internal reviews;
- Visits by employers for recruitment purposes;
- Involvement in student internships;<sup>80</sup>
- Our academic staff sharing their expertise and undertaking research with industry, policy makers and/or end users;
- Periodic surveys of employers.

A feel for the extent of these interactions with Otago can be gained by the fact that we currently maintain 68 specific accreditations with professional bodies for various academic programmes (all of which require periodic accreditation reviews), and we will typically have 150 or more businesses present on campus in any given year.<sup>81</sup>

Otago is also unique amongst New Zealand universities in being a formal partner in the economic development strategy for the main city in which it is based. This partnership – which includes the Otago Chamber of Commerce, the Otago/Southland Employers Association, the Dunedin City Council, Otago Polytechnic and local *rūnanga* – allows us to engage around employment and economic outcomes at both a strategic and project level.<sup>82</sup>

In 2015, Otago received feedback from 149 major New Zealand employers on a range of matters, including the attributes, qualities and competencies that employers looked for in graduates, and about graduates' preparation and expectations more generally. A summary of the feedback is included as Attachment C.

The extent and importance of informal interactions should not be discounted either. There are tens of thousands of Otago graduates in the workforce (including some who are major employers and/or business owners), and a good number maintain contact with their *alma mater*.

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<sup>79</sup> For example, at Otago, the advisory boards for our School of Business, and for our Applied Science programmes.

<sup>80</sup> While often thought of purely in respect of business student internships, Otago also operates internships for its applied science students. Internships and/or practicums are also long-established in our health sciences professional programmes and, of course, are integral to teacher education.

<sup>81</sup> Including local, national and international businesses.

<sup>82</sup> [https://www.dunedin.govt.nz/\\_\\_data/assets/pdf\\_file/0008/262997/Dunedins-Economic-Development-Strategy-2013-2023.pdf](https://www.dunedin.govt.nz/__data/assets/pdf_file/0008/262997/Dunedins-Economic-Development-Strategy-2013-2023.pdf). Specific projects undertaken under this partnership include: the operation of a StartUp Space for early stage entrepreneurs (operated by the University's School of Business, in conjunction with the Polytechnic and City Council); and a well-established summer business internship programme (in 2015/2016 placing 48 students in 32 different local businesses).

Utilising these networks is a way of overcoming two obvious barriers to effective employer/business engagement: firstly, the large number of small-medium enterprises in this country; secondly, the absence of an obvious single industry to engage with in respect of our general degree graduates.

A final point easily overlooked is that universities are themselves significant enterprises, employing dozens of graduates in general and specialist non-academic roles.<sup>83</sup> We therefore have first-hand experience of changing employer needs, and of responding to many of the key forces of change – technologically driven or otherwise – in the same way as businesses and other employers.<sup>84</sup>

## 8.2 Graduate Attributes

Otago takes a deliberate approach to identifying the skills and attributes it seeks to develop in its students. While some of the skills and attributes will vary, or receive a greater or lesser emphasis in particular qualifications,<sup>85</sup> there is an overarching set of attributes we seek to inculcate in all students.

These attributes, which are presented in Attachment D, have been chosen to help ensure that our graduates start their careers with the expertise, social attitudes and principles that will allow them to advance effectively, and to grow as morally responsible people, while retaining a resilient passion for lifelong learning.

The attributes link very directly to what employers tell us they are seeking from graduates, and to the key attributes that the Productivity Commission's Inquiry has identified will be important for graduates to possess in the future.

Otago takes an innovative approach to assessing attributes development and subsequent application by asking our graduates – 18 months after graduation – to reflect on the extent to which they feel they developed these attributes while at Otago, and the extent to which they have since applied them.

This, in conjunction with an annual performance target for at least 90% of graduates to report the development of each attribute<sup>86</sup> and periodic employer feedback, enables the monitoring of both effectiveness in developing each attribute, and its relevance (or need) following graduation.

Because we have been gathering feedback in this way for two decades now, we are able to map development and application over long periods, and identify and respond to increases in need. The following trends are illustrative of what has occurred over the shorter time-frame of the past twelve years:

- The *ability to be creative* attribute has seen the biggest increase in need over this period, followed by *academic rigour*, *written communication skills* and the *ability to solve problems*. In each case, this has been matched by an increase in the extent to which graduates report they have been supported to develop these attributes while students at Otago;
- The same is true of *teamwork skills*, where Otago has put considerable effort into increasing development opportunities for teamwork over the same period (not an easy thing to achieve in some disciplines).

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<sup>83</sup> Otago, for example, is easily the largest employer in our home city of Dunedin, and one of the largest employers in the South Island.

<sup>84</sup> For example, our purchasing, finance and accounting functions have been completely transformed by technologically-led automation and system developments over the past two decades.

<sup>85</sup> For example, a dentistry graduate requires specific professional skills that a law graduate does not.

<sup>86</sup> In recent years we have reached or exceeded the 90% target for 60-75% of the core attributes, and made progress towards this target in several others.

Because the results of the graduate surveys are fed back to our academic departments, those at the teaching coalface have the opportunity to identify gaps and changes in attribute development and application, and to address these as part of programme and paper design and delivery.

### **8.3 The Outcomes Graduates Seek**

The Productivity Commission Inquiry is part of a wider push by Government for students to make what might be termed ‘economically rational’ or ‘economically optimal decisions’ that optimise income and employment outcomes.

Otago is proud of the vital role that qualifications and wider student experience play in setting students on the path for successful working life; gainful, fulfilling employment is a key outcome most students, their families, and the taxpayers expect from a university education.

However, it is worth pausing to consider if current and incoming generations of students (Gen Z and its successor) have either subtly or substantially differently life goals (including around employment, income expectations, and work-life balance) than so called Gen X and Gen Y.

There is certainly a body of research internationally that suggests this may be the case, and we observe some of the differences in our own student cohort. A potentially valuable source of national insights into this is the Graduate Longitudinal Study New Zealand (GLSNZ), which is tracking the life intentions and lifecourse of a representative sample of several thousand 2011 graduates from the eight New Zealand universities.<sup>87</sup> Interaction between the Productivity Commission team and the leaders of the GLSNZ could be extremely valuable.

### **8.4 Employability and Return on Investment**

Just as we take pride in the employment outcomes of our graduates at Otago, we acknowledge how well graduates from New Zealand universities achieve as a whole. As the Universities New Zealand submission to this Inquiry and plenty of other evidence shows in more detail:

- The employment outcomes for graduates from our universities are amongst the best in the world;
- Almost without exception, university degrees – including a general arts, science or commerce degree – deliver positive returns on investment quite quickly;
- The short-term employment outcomes for degrees are far superior overall to those for lower level qualifications, and the attributes possessed by degree-level graduates leave them far better equipped for employment in the long term too.

One of the issues we face is a popular myth, founded on a combination of ignorance and atypical individual examples, that none of the above is true.

Considering return on investment in a wider context, we suggest attention be given to the extent to which a degree-level graduate is a positive return on investment because of what they contribute to, and are less likely to demand, from society.<sup>88</sup>

Otago, as a residential university, is especially well placed to support students to develop some of these positive qualities of good citizenship. Indeed, doing so is one of our core strategic priorities.

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<sup>87</sup> This study is being conducted by Otago’s Centre for Lifecourse Studies, whose long-running Dunedin Study is one of the most influential and highly regarded longitudinal population studies in the world.

<sup>88</sup> As numerous studies here and overseas have shown, graduates are more likely to be represented in the ranks of positive contributors to society, and much less likely to feature in economically costly ways such as crime, poor health and long-term unemployment.

## **8.5 Summary of Otago's Position**

- Interaction with employers and industry is embedded in universities to a greater extent than is often recognised;
- Universities can adjust to changing employment needs by identifying the specific attributes one seeks to develop in students and tracking both the extent to which they are developed, and the extent to which they are relevant once students have completed their studies;
- The extent to which the outcomes the current generation of graduates are seeking in life may differ from those of previous generations needs to be considered;
- Some myth busting is required to build a proper understanding of the extent to which a New Zealand university degree represents a strong return investment (for both the graduate and taxpayer).

## 9.0 Internationalisation and International Education

The Issues Paper asks some pertinent questions about internationalisation.

Otago would like to stress at the outset of this section of its submission that while the focus of internationalisation within New Zealand (and especially from Government) is very strongly on the recruitment of students from overseas to study here, internationalisation encompasses far more than that: dimensions such as internationalisation of the curriculum, student exchange, the flow of New Zealand students overseas (which is increasing at the undergraduate level), and staff in an international context are also important.

Additionally, it should be acknowledged that New Zealand universities are, by global standards, already highly internationalised in terms of both the number and proportion of international students and international staff.<sup>89</sup> A number of our universities, Otago included, also rate very highly for other key indicators of internationalisation.<sup>90</sup>

The Issues Paper correctly identifies a number of risks that New Zealand providers (and others) face in what is a highly dynamic and fast-evolving area of tertiary education activity.

### 9.1 Challenges and Opportunities in Internationalisation

We anticipate that the combination of massive ongoing investment by the major Asian nations in higher education and other factors in Asia such as Chinese demographics will provide the major long-run challenge to international activity. Not only will these countries – led by China – continue to ‘dry up’ as a source of high-volume international recruitment, they will increasingly become our competitors for international students from elsewhere.<sup>91</sup>

As a result, New Zealand will be increasingly unable to treat international student recruitment as a high-volume, high-margin business at the undergraduate degree level, and will instead have to think about international students in the context of a more mature approach to internationalisation.

Emerging opportunity will therefore take some of the following forms for universities:

- Greater diversity in the countries we recruit significant volumes of international students from;
- Increasing proportions of those students being either postgraduates, and/or coming to a New Zealand either on undergraduate or postgraduate exchange, or as part of conjoint or twinned degrees between a New Zealand and overseas institution;
- Increased activity in respect of New Zealand students going overseas on exchange or as part of conjoint or twinned degrees between a New Zealand and overseas institution;
- Increased involvement by New Zealand universities in international networks of universities and in partnerships with specific overseas universities;
- Joint staff appointments between New Zealand and overseas institutions.

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<sup>89</sup> International staff in this context may include both overseas staff who have been recruited to New Zealand, and New Zealanders who have returned to academic roles here having completed a degree (usually their doctorate) overseas.

<sup>90</sup> For example, in our recently awarded QS 5 Star Plus quality rating, Otago was awarded maximum points for international research collaborations, international faculty, international students (both as a proportion of the roll and the diversity of our international student cohort), and the range of religious facilities in close proximity to our main campus.

<sup>91</sup> For example, while China is currently a net exporter of tertiary students, there are already tens of thousands of overseas students studying in China. It could conceivably become a net importer of students within a decade.

Developments as outlined above are already evident at some New Zealand universities, Otago included.<sup>92</sup>

A number of changes to the Government policy settings around student loans and allowances access, qualifications, SAC funding and immigration requirements will be required to facilitate an effective response. Ongoing investment will also be needed to ensure that New Zealand's leading universities remain ranked as world class.

Global economic and political developments will continue to have the potential to disrupt international student recruitment quite sharply; diversification and a range of embedded reciprocal arrangements such as those outlined above will be the best protection against these.

We expect the leading New Zealand universities to continue to recruit staff internationally, as the top academics required in strong research-led universities are in demand on the world stage. If anything, staff recruitment will become more rather than less competitive internationally due to factors such as the aging academic workforce in many established universities, and emerging Asian universities seeking to build their reputations through staff recruitment.<sup>93</sup>

The Issues Paper identifies a potential tension between the education of international students and the other goals of a tertiary institution. In our view that tension emerges most obviously when international students are regarded primarily as an income stream, without regard being given to the impact of this on either their own educational experience, or that of the domestic students they typically study alongside.

The obvious response to the Issues Paper's observation that "*there may be disagreement about whether the TEI's international activity should lead, complement or be subservient to their domestic mission,*" is that international activity must be complementary.

However, Otago would go further and suggest that the domestic and international dimensions of our activity must be integrated. To suggest otherwise is to miss what meaningful internationalisation is all about: an experience that enriches and provides new perspectives and understanding for both international and domestic students, for staff, and for the institution as a whole.

## **9.2 The Role of Brand New Zealand**

The comments in the Issues Paper in respect of Brand New Zealand are quite correct.

One of the key roles Government must continue to play to protect that brand is to ensure that unscrupulously or poorly run providers (most likely, based on past experience, to be private providers) do not take advantage of international students – or domestic students – in ways that damage the brand. As noted in the previous section, ongoing investment to ensure that New Zealand's leading universities remain ranked as world class is also needed to maintain the international credibility of the brand.

One tension we do face from time to time is pressure to respond quickly to Government-led initiatives (whether specifically educational or more general) for which there has been little or no prior

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<sup>92</sup> We currently recruit our more than 2,000 international students from approximately 100 different countries, have exchange agreements with 92 universities in 32 different countries, and hold a number of international accreditations for specific academic programmes. We are part of a close network of seven top-ranked residential universities worldwide, and have our first joint qualifications in place with overseas institutions.

<sup>93</sup> To compete in this environment, New Zealand will need to provide an internationally competitive research environment. Such an environment must span both what universities provide (e.g. equipment and well-trained support staff) and what Government provides (e.g. adequate research funding streams).

discussion with universities. This can lead to awkwardness when there is pressure to work with an overseas institution, or to consider taking overseas students that are unsuitable.

### **9.3 Summary of Otago's Position**

- Internationalisation encompasses far more than the recruitment of international students, and an ongoing reliance on high-volume recruitment (predominately from Asia) will be not be possible beyond the short term;
- Greater diversity in sources of students and an increased emphasis on student exchanges, joint and twinned qualifications, and other forms of cooperative arrangements with overseas institutions will be the way of the future;
- The domestic and international dimensions of a university's activity must be complementary, if not integrated;
- It is appropriate for Government to continue to play a role in protecting Brand New Zealand from an education perspective.

## 10.0 Disruptive Technology and Innovation

### 10.1 Challenges to the Fundamentals of Tertiary Education

One of the most important big-picture questions raised in the Issues Paper is whether or not we are on the verge of a dramatic transformation that will change the fundamental nature of tertiary education.

Those who suggest that this is the case generally cite developments in ICT in concert with the globalisation of tertiary education (along with much else) as the likely drivers of such a transformation. However, as the Issues Paper outlines (pp. 64-66), the novelty of new technologies can lead to their impact being overstated.

Otago has given careful consideration to this matter, with particular reference to MOOCs, which are also mentioned in the Issues Paper. Our views are outlined in Attachment E, in an opinion piece written by the Vice-Chancellor last year.

In summary, we do not see MOOCs as game-changers for research-led universities like Otago. Rather, they are simply another dimension of change (and some opportunity) to be taken into account as universities evolve and embrace new technology as outlined in section 6.4 above.

More generally, even in this age of instant online information and doing-by-viewing virtual experiences, our commitment to maintaining strong hands-on experiences for budding scholars remains firm. At Otago, we know that students – and especially young undergraduates – learn best in a supportive social environment, surrounded by highly motivated peers and by teachers who are passionate about their subject of expertise. We know that these experiences not only help them to learn the content of the material they encounter, but also help them to learn about themselves.

While our perspective is clearly that of a primarily residential university, it is also informed by our decades of experience embracing technology, and providing education at a distance in specialist (mainly postgraduate) fields,<sup>94</sup> and by what our graduates tell us.

### 10.2 Adjusting to Rapidly Changing Employer and Industry Needs

In section 8.0 of this submission we provide some perspectives on staying in touch with evolving workforce needs, and adjusting what we do to respond to these.

In looking to the uncertainty of the future, it is easy to lose sight of how uncertain and unknowable where we are now was from the perspective of the past. This uncertainty has long prompted some within society to react with call to action messages along the lines of “*prepare now for an unknowably different future or face extinction*”.

Such messages are fine attention grabbers, but Otago treats them with considerable scepticism, not least because they are often based on hype and wondrous expectation rather than solid evidence.<sup>95</sup>

Having said that, the impact of new technologies (especially digital technologies) has had a profound impact on the nature of work over the past three decades. That impact has included making some jobs obsolete, transforming the nature of other jobs, and changing the very nature of working life. This

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<sup>94</sup> That distance delivery, which has been transformed by recent innovations in technology, is concentrated in the health sciences, and accounts for 37% of our postgraduate taught delivery. It encompasses students based both here in New Zealand, and overseas.

<sup>95</sup> As such, these messages – which are currently delivered in the context of the impact of technology – have many antecedents or parallels in religious millennialism.

impact will extend into the future, and while the Productivity Commission's Issues Paper is certainly correct in suggesting unskilled jobs will continue to be the most impacted, roles performed by graduates will change too.

The best general preparation a university can give its students for the future is to equip them with the kinds of transferable skills and attributes identified in section 8.0 above. This task, we suspect, represents a far greater challenge to non-university providers.

In the case of specific skilled professions where technology has a fundamental and quite rapid impact, there is ample evidence that universities are able to respond quickly and effectively.

The transformation of accountancy as a profession is probably one of the more widespread examples of effective response. Surveying (a profession for which we are the only provider of education in New Zealand) is probably the best example of a profession utterly altered by technology for Otago.

Until the latter part of the 20th century, surveying relied on refined versions of tools and associated techniques that date from the time of the Egyptian pharaohs' pyramid builders to the 16<sup>th</sup> century navigators. Today the profession is technology-rich and highly digitalised, and our students are trained in techniques that did not exist previously, but which are integral to contemporary surveying.<sup>96</sup> Working in close liaison with the profession, the University's surveying programme has been continuously transformed to meet workforce needs. Our graduates emerge with an internationally recognised qualification from a world-class School of Surveying, with quite outstanding employment and career prospects.

Other universities will doubtless have equivalent examples that confirm that universities not only can, but are, adjusting our teaching to meet rapidly changing workforce needs.

Our engagement in research is, incidentally, an important element in our ability to be responsive; often it is our own staff, and the colleagues they engage with worldwide, who are pioneering either the development or professional application of these new technologies and techniques.

### **10.3 Retraining and Upskilling**

The Issues Paper foresees an increase in the need for workforce upskilling and re-credentialing.

We anticipate that, as is already the case, some of this need will be met through the registration requirements associated with specific professions, and through programmes and courses run by the relevant professional bodies.<sup>97</sup>

More substantial upskilling will likely see increased demand for the types of courses and programmes many universities – Otago included – already offer. These typically comprise a mix of non-credit and credit-bearing courses that sit under the general umbrella of executive education, and specialist qualifications – typically at the postgraduate coursework level. This has been targeted as an area for development and growth by Otago for some years.<sup>98</sup>

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<sup>96</sup> Including: computational trigonometry tools (making the slide rule and log tables obsolete); laser-based distance measurements (making the 'chain man' obsolete); GIS and GPS 'total station' processing (making the theodolite less common); spatial databases and web mapping (revolutionising cartography); online or free and open source software (FOSS) for land registry and cadastral applications (including New Zealand's world-leading LINZ Landonline system developed with strong input from Otago survey graduates); engineering visualisation; Computer Aided Design (CAD) tools; remote sensing and digital photogrammetry (revolutionising spatial planning and land-use design processes); and sophisticated wide-swath and multiband sonar bathymetry systems for hydrographic surveying.

<sup>97</sup> University academics already contribute to many of these programmes and courses on a contract basis.

<sup>98</sup> This complements rather than conflicts with our belief in the benefits of a residential university experience, as the latter pertains particularly to younger students and those completing their first degrees.

Credit-bearing programmes of this type (branded as postgraduate certificates and diplomas and coursework masters' degrees) currently account for over 10% of Otago's enrolments in head count terms. Many have been developed in direct response to industry demand, and well over a third of enrolments are for off-campus study (including offshore) using a range of web-based and audio-visual delivery mechanisms.

#### **10.4 Summary of Otago's Position**

- MOOCs are simply another dimension of change to be taken into account as universities evolve and embrace new technology, not fundamental game-changers;
- Universities have already demonstrated an ability to develop their programmes to meet the demands of professions transformed by technology. The fact that we are research-led supports rather than hinders us in this;
- Similarly, developing and delivering programmes that explicitly address retraining and upskilling is something we are familiar with doing. The need for many of these programmes to be available to off-campus students is a given.

## 11.0 Other Matters

### 11.1 Quality Assurance

A number of questions are asked about the quality assurance systems (NZQA, CUAP, Academic Audit, etc.) under which we operate. Otago has had input into the collective Universities New Zealand submission, and supports its view that these arrangements are satisfactory.

It is certainly true that qualification approval via CUAP is a time-consuming process: the most obvious way to deal with this would be to follow what is the norm in many parts of the world, and delegate complete authority over qualification approval to the universities themselves. However, the advantages of this would likely be far less than expected because:

- Most of the time taken to develop a qualification is actually development, review and approval time within the institution;
- In the absence of CUAP approval, the TEC and NZQA would likely have to require additional steps in institutional approval to ensure that a new qualification complied with the relevant qualification framework and funding requirements.

It should also be acknowledged that qualifications are complex, and the core product universities offer in respect of teaching and learning. Getting such a product wrong is both inefficient and potentially damaging reputationally and for the early cohort of graduates. Complex products in any industry typically take a long time to get from the conceptual stage, through research and development, and into the marketplace; this is because established businesses, like universities, must take care to get their products right.<sup>99</sup>

A matter the Issues Paper does not really touch on is the role of external accreditations (including international accreditations) in quality assurance. These are a requirement in respect of almost all professionally-focused qualifications, and in other areas – such as business – may play important roles in making an institution attractive or credible to prospective (and especially international) students.

### 11.2 The Impact of Fees and Costs on Student Demand

The impact that increasing fees have or do not have on demand (and, by extension, accessibility) is raised in the Issues Paper, and has also captured political and media attention in recent weeks and months.

There are some important points that often seem to be missed when this matter is raised:

- Fees are but a portion of the cost of studying, and indeed not even the majority cost.<sup>100</sup> So, if fees go up by (say) 3%, it does not follow that the cost of study has gone up by this amount;
- The majority of students have access to what is, by international standards, a reasonably generous Government funding support scheme, comprising interest free loans and, for some, allowances;
- One of the reasons fees have risen at a faster rate than the CPI in recent years is that there have been no general increases in SAC funding rates over those years.

Additionally, there have been significant increases over the past three years in the number of entrance scholarships being provided by the institutions themselves, and in the value of many of those

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<sup>99</sup> This is true even in the IT industry for products of equivalent complexity and importance to qualifications, such as new or updated software or hardware.

<sup>100</sup> For a full-time domestic student living in a flat, living costs easily outstrip tuition and other fees as a cost.

scholarships.<sup>101</sup> As a result, for a large number of commencing students, the cost of studying now is actually going to be lower than it would have been a few years ago.<sup>102</sup> So, while there are certainly pros and cons to the increased investment by institutions in entrance scholarships, in financial terms, students are the winners.

Despite all of this, cost is certainly a factor that may deter some from tertiary study. However, we have not seen any evidence of this being an issue of sufficient frequency to act as widespread dampener on demand.<sup>103</sup>

### 11.3 Summary of Otago's Position

- The current mandated quality assurance arrangements for New Zealand universities are satisfactory;
- The importance of external accreditations – including international accreditations – should not be overlooked;
- Any credible analysis of changes in the cost of tertiary education to students must take account of changes in the full cost of study (including living costs), not just student fees;
- Any credible analysis of changes in accessibility should look at changes in participation and completion rates, not changes in the actual numbers participating and completing.

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<sup>101</sup> To the extent that far more students who have achieved to a reasonable level at school (NCEA Level 2 or 3 endorsed with Merit) are now guaranteed a scholarship – and therefore a reduction in their costs – for university study (albeit not necessarily at their university of choice).

<sup>102</sup> These include scholarships directed specifically at under-represented groups, and awarded on the basis of financial need, as well as those rewarding stellar academic performance.

<sup>103</sup> Presumably this is something that would be relatively easy to test by looking at progression rates of appropriately qualified school leavers and others to tertiary study.

## 12.0 A Concluding Concern

It is concerning that when the Issues Paper asks the quite fundamental question “*what factors best explain the discrepancy between growing levels of tertiary education attainment without a significant productivity dividend,*” the possibility that there is no causal link, a very weak link, or a significant time lag in the system,<sup>104</sup> are not seriously entertained.

As a result, it seems to be taken for granted – without any supporting evidence – that a failure of the New Zealand economy to achieve the productivity gains the Government is seeking represents a failure of tertiary education. This could be so, yet it is entirely possible that any one of the following may instead be true:

- The failure to achieve the productivity gains the Government is seeking is due to factors entirely separate from tertiary education (i.e. there is no causal link);
- The situation would actually be worse were it not for the impact of tertiary education;
- We are actually in the early to middle phases of a sustained productivity rise with the growth in our technology sector (for example), fuelled by appropriately skilled and entrepreneurial graduates produced over the past 5-10 years;
- The failings rest in particular parts of the tertiary sector rather than across the sector as a whole.

We are also surprised that the claims in the Issues Paper in respect of the lack of a productivity dividend appear to be based on data for the period 2004-2009.

This data is not only 7-12 years old, but it also predates the massive Global Financial Crisis (GFC), through which the key economies used in those 2004-2009 comparisons have fared far worse than our own. It is likely that a post-GFC comparison would show New Zealand productivity in a far better light relative to these other economies, and possible that the outputs of our tertiary education sector have played a significant role in our economic resilience through the GFC.

It is vital in our view that the Productivity Commission addresses these possibilities convincingly, assessing the available evidence, and seeks more evidence if what is already available does not provide an unequivocal answer.

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<sup>104</sup> Finland, in transforming their economy from primary production and commodity supply to the former Soviet Union to one based on high-productivity technology companies, was graduating between 100 and 200 engineering PhDs per annum from its universities for more than a decade before the peak in the growth of Nokia’s inventor network (Hendy and Callaghan, *Get off the Grass*, AU Press, 2013, Fig. 4.3, p. 81).

## **Attachment A: Industry-Facing Innovations and Knowledge Transfer**

Over the period 2013-2015, the consulting, commercial and intellectual property income of the University Group (as measured by a three-year rolling average) was \$78.2 million, up from \$69.1 million for the period 2010-2012.

The following points are also useful markers of our performance. They include examples drawn from the achievements of Otago Innovation Limited, our wholly-owned subsidiary of the University that has responsibility for the commercialisation of Intellectual Property arising from research within the University.

In 2015:

- A number of technologies were successfully commercialised. Two that are in the public domain are Upstream Medical Technologies Ltd (formed to commercialise a suite of diagnostic markers developed at Otago's Christchurch campus) and Chitogel Ltd (formed to commercialise an Ear, Nose and Throat (ENT) surgical gel developed by the Chemistry Department).
- Several licences were agreed with pharmaceutical and diagnostic companies worldwide.
- Together with Otago Polytechnic and the Dunedin City Council, the Business School continued to operate a StartUp Space for entrepreneurs. Located at the University, it offers Dunedin entrepreneurs desk space for a year, experts to consult with and collegial support.
- Otago continued its close involvement in the city-led Sexy Summer Jobs business internship programme. Now in its 8<sup>th</sup> year, the 2015/2016 edition of this programme placed 48 students in 32 different local businesses for summer internships.
- The 2015 Otago Innovation Proof of Concept Grant competition was strongly contested by 26 entries, a record. The winners were Drs Phil Heyward and Alex Tupps who have discovered plant extracts with the potential to lower blood glucose levels in diabetic patients.
- The annual Audacious student business start-up programme continued to prove popular, and a busy programme in 2015 culminated in the annual Audacious Awards. The top award went to LED Light Australasia, a student business idea for locally assembled LED lights with a substantial edge over imported lights in price, quality and life.
- Fruitful discussions were held in respect of linking the University's well-established business-facing Food Science capability with FOODSOUTH, the South Island hub of the New Zealand Food Innovation Network.
- Otago became one of five organisations collaborating on the Otago Participatory Science Platform, launched in July. Part of the Ministry of Business, Innovation and Employment's Nation of Curious Minds strategy, this project – known as Otago Science in Action – aims to help local people and groups bring their research ideas to fruition.

In 2014:

- The Freedom4 portable DNA diagnostic device was unveiled and its commercialisation proceeded in partnership with New Zealand company Ubiquitome. This world-leading field tool for rapidly detecting viruses or bacteria in samples and determining infection levels was developed by a multi-disciplinary team led out of our Department of Anatomy.
- Our Annual Proof of Concept competition netted 18 new opportunities, of which 11 went before an assessment panel. In addition to the winner and runner up, we are engaging in the development of four further projects from the competition.
- Our Department of Chemistry continued to provide high-end analysis of geoisotopes to provide proof of origin provenance for the biosecurity, food and food service industries.
- We formed a new partnership with Beef + Lamb NZ Genetics to build research capability in Quantitative Genetics for NZ's primary industries.

- Following on from our work in tracing the origin of the Varroa bee mite infestation, we completed and delivered the first nationwide survey of genetic diversity of bees to underpin future bee-breeding programmes.
- Pacific Edge Ltd. was granted a US patent for skin cancer detection, paving the way for the development of a new product line for the biotech company.
- Otago projects funded in the 2014 MBIE science investment round include further work on a recently developed novel method for extracting food-safe digestible protein from natural wool. This offers an exciting opportunity to add value to New Zealand's currently low-valued medium to coarse wool clip.

In 2013:

- Otago Innovation won the 2013 BNZ Commercial Deal award for commercialising the TOXINZ database.
- Photonic Innovation Limited successfully raised capital from Angel investors during the year. Its management team has expanded and the company is now developing its first gas sensor device for industry.
- Novel diagnostic tests developed by Otago researchers became available for commercialisation, including tests for acute coronary syndrome (particularly myocardial infarction), unstable angina, and ovarian function.
- The mobile applications Flora Finder, Bonedoc, HelpMePublish were released.<sup>105</sup>
- Our Department of Food Science undertook large scale trial and testing of consumer perception of meat tenderness in partnership with Silver Fern Farms and FarmIQ and – with Nutrition departments – worked with industry to develop new smart drink products for the international travel market.
- Pacific Edge Limited's Cxbladder tests received regulatory approval in the US market and was also launched in Australia and New Zealand. The share price and market capitalisation has increased, and a new colorectal cancer prognosis (CRC) intervention has received regulatory approval. Pipeline products still in development include gastric and endometrial cancers and melanoma interventions.
- We formed a new partnership with NZ Merino to explore added value to wool products.
- Working in conjunction with Zespri, we undertook clinical trials of Vitamin C availability from kiwifruit in conjunction with Zespri, producing exciting results about heightened Vitamin C levels relative to artificial supplements and improvements in mood and allied measures of health and well-being.
- We applied a unique gene expression system developed for biomedical research to the international agritech sector to the subject of pest and pathogen control.

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<sup>105</sup> Flora Finder allows users to instantly identify native plants using a smart phone's camera. Bonedoc is a serious game which allows users to perform virtual orthopaedic surgery. HelpMePublish is a tool designed to help researchers analyse, harness and contribute to the publication of research.

## **Attachment B: Examples of Technological Innovations/Evaluations at Otago**

The following are now close to ubiquitous in their use at Otago:

- Purpose-built web platforms known as Learning Management Systems to organise teaching activities, deliver course materials and a wide variety of teaching resources to students.
- Purpose-built web platforms known as Student Management Systems giving students real-time access to a wide variety of information about their academic progress, including detailed information about their assessment tasks, and statistical information to help them evaluate their progress and compare their achievement against aggregate information about their cohort.
- Provision of fully-searchable academic books and journals electronically via library catalogues. This makes a wide variety of research resources available to students in their homes or while away from the university, on internships, at teaching hospitals or in schools. It also enables efficiencies, as electronic books and journals do not take up shelf space, and can be accessed by multiple users simultaneously.
- Provision of a rich media experience in lecture rooms via teacher-designed digital presentations delivered by high-quality data projection systems, often harnessing dedicated software on the students' own devices to maximise interactions in large-group teaching.
- Internet services for plagiarism checking (e.g. SafeAssign) evaluate student assignments using dedicated academic web search engines as well as international repositories of student work.

Technology has also transformed teaching in very specific areas, notably in medical and dental education. Dental students work with sophisticated computer-aided virtual reality simulators (called Phantom Heads) that are integrated with advanced mechanical tools, called haptic devices that enable the user to feel the feedback forces, etc., while working on an artificial patient). As another example, in anatomy training we augment the traditional work on cadavers with extensive use of simulators that are driven off datasets comprised of digitised images of human body cross sections as well as images acquired via CT and MRI and scanning.

Developments that are increasingly common (rather than ubiquitous) in teaching at Otago include:

- Rich media podcasting of teaching sessions (using systems such as Otago Capture) allowing students to review lectures prior to exams.
- Interlinking of lecture theatres allowing very large lectures to be delivered in unison across multiple virtually-linked lecture theatres.
- Building and maintenance of blogs and curation of various social media resources.
- Enhancing formative assessment through the development of electronic lab books.
- Use of videoconferencing tools (such as Zoom) and text chat sessions for distance learning or supporting campus-based courses.
- Development of discipline-specific electronic teaching environments using virtual reality and gamification. These have been developed both as commercialisation projects (e.g. Aki and Bonedoc) and in collaboration with external companies such as AD Instruments.
- Electronic marking using systems such as Crocodoc, allowing advanced document mark-up and course-specific rubrics. These increase the amount and speed of feedback to students about their own learning while helping markers to maximise efficiency and consistency, particularly in the assessment of large classes.

## Attachment C: Employer Views on Key Graduate Attributes

In 2015, Otago received feedback from 149 major New Zealand employers on a range of matters, including the attributes, qualities and competencies that employers looked for in graduates, and about graduates' preparation and expectations more generally.

The following summarises the feedback received (note that this feedback is not specific to Otago graduates, but is a more general comment on graduates):

- **When short-listing** graduate applicants, employers placed most importance on job specific tertiary education, related work exposure (particularly through placement or internship) and looked for evidence of broad IT and computer skills. The applicant's quality of writing and grammar in the application and their ability to communicate clearly and convincingly were also considered important. Employers were also looking for evidence of the applicant being able to work well with others.
- **When interviewing** graduates, employers placed most importance on personal grooming, presentation and oral communication skills. Employers expected applicants to demonstrate that they can apply their knowledge and skills to real-world settings and to display a commitment to learning and self-development as well as the ability to work independently. Social skills were also seen as very important, particularly cultural awareness and the ability to build trust-based relationships. Confirmation of the applicant's reliability was considered important too.
- **When considering the "ideal graduate,"** employers reported that they should have organisational and time management abilities, a drive for ongoing learning and self-development, as well as the ability to work independently, flexibly and adaptably. Good conceptual and analytical skills and the ability to "sell" a solution and the integrity to complete it were also important. Employers also placed importance on interpersonal and teamwork skills and the ability to connect choices and actions to ethical decisions. High levels of information literacy, good research skills, independent judgement, good negotiation skills, as well as knowledge and appreciation of multiculturalism were also valued.
- **When considering the actual performance of graduates** employers observed that in general once graduates had learned about the organisation's nature of work they got on with their job tasks, applying their tertiary education and professional knowledge to their employment position. Over two thirds agreed that graduates who had been involved in industry placement were better prepared for employment. Employers talked about, and were very supportive of graduates gaining practical work experiences through industry placement.
- **When commenting on graduate expectations,** many employers indicated that graduates have unrealistic expectations about promotion and salary level. They suggested universities should prepare graduates with accurate information about starting their work life at a level appropriate for their experience and knowledge, with promotion and recognition following a strong work ethic. Generally employers indicated there were no issues with graduate motivation or commitment to long-term employment.

## **Attachment D: University of Otago Graduate Attributes**

In addition to knowledge and skills related to their specific area of study, Otago seeks to develop a clearly defined set of attributes in all of its graduates. These attributes are defined in the University's Graduate Profile. The extent to which these attributes have been developed during study and applied following graduation is tested annually through the University's Graduate Opinion Survey and reported against in the University's Annual Report. The attributes are reviewed periodically, and currently comprise nine attributes specifically sought by employers and four overarching attributes.

### *Overarching attributes*

**GLOBAL PERSPECTIVE:** Appreciation of global perspectives in the chosen discipline(s) and the nature of global citizenship

**INTERDISCIPLINARY PERSPECTIVE:** Commitment to intellectual openness and curiosity, and the awareness of the limits of current knowledge and of the links amongst disciplines

**LIFELONG LEARNING:** Commitment to the on-going acquisition of new knowledge and new skills, and an ability to apply these to an ever-changing environment

**SCHOLARSHIP:** Commitment to the fundamental importance of the acquisition and development of knowledge and understanding

### *Attributes specifically sought by employers*

**COMMUNICATION:** Ability to communicate information, arguments and analyses effectively, both orally and in writing

**CRITICAL THINKING:** Ability to analyse issues logically, to challenge conventional assumptions, to consider different options and viewpoints, make informed decisions and act with flexibility, adaptability and creativity

**CULTURAL UNDERSTANDING:** Knowledge and appreciation of biculturalism within the framework of the Treaty of Waitangi; knowledge and appreciation of multiculturalism; and an ability to apply such knowledge in a culturally appropriate manner

**ETHICS:** Knowledge of ethics and ethical standards and an ability to apply these with a sense of responsibility within the workplace and community

**ENVIRONMENTAL LITERACY:** Basic understanding of the principles that govern natural systems, the effects of human activity on these systems, and the cultures and economies that interact with those systems

**INFORMATION LITERACY:** Ability to apply specific skills in acquiring, organising, analysing, evaluating and presenting information, in particular recognising the increasing prominence of digital-based activity

**RESEARCH:** Ability to conduct research by recognising when information is needed, and locating, retrieving, evaluating and using it effectively

**SELF-MOTIVATION:** Capacity for self-directed activity and the ability to work independently

**TEAMWORK:** Ability to work effectively as both a team leader and a team member

*Note: When we ask recent graduates about the extent to which they have developed these skills at Otago and are now applying them following graduation, we split some of the above: for example, critical thinking is assessed by separate questions on analytical skills, independent judgement, creative thinking, and flexibility and adaptability; Communication is split into written and oral communication; and Scholarship is presented as academic rigour. This reflects the ways in which particular attributes manifest themselves in ways that are obvious to both graduates and employers.*

## Attachment E: The "Threat" of Massive Open Online Courses

The following is a piece by Otago Vice-Chancellor, Professor Harlene Hayne, published in the Otago Magazine in 2015.

“Late last year a worldwide movement forced universities around the world to stand up and take notice.

This movement involved something called Massive Open Online Courses, or MOOCs for short. These online courses combine brief talks by world experts with interactive coursework, online assignments, quizzes and games. Discussion groups and blogs link students from around the world.

Although online learning is not especially new, what is new about MOOCs is the size and scale of their operation. The three largest MOOC providers (Udacity, Coursera and edX) boast enrolments that range from 350,000 to 1.4 million. What is also new is the reputation of the biggest players – Stanford, Harvard and MIT. The key question is, do these MOOCs herald the demise of the traditional campus-based university education?

The University of Otago has considered the issue of MOOCs very carefully. Over this past January, I personally studied everything that I could lay my hands on about the subject. I sought specialist advice on the issue from international experts in distance education and online learning. I discussed the matter extensively with my counterparts in New Zealand and overseas. The conclusion from all of these quarters is that, although there may be a handful of opportunities in this space, the concept of the MOOC will not displace the traditional university experience and the business case for the future of MOOCs actually hangs by a thread.

Although the current enrolment in MOOCs is extremely high, completion of any given course is very low. In most instances, more than 90 per cent of the students who sign up for a course, never complete it. Given this, we have to ask ourselves two questions. First, why do so many sign up? That one is easy – the courses are currently free. Once this aspect of the MOOC system changes (and it will have to change if anyone is going to make any money), then I suspect that enrolments will plummet. Second, why do so many students fail to complete? There are probably many reasons, but the most parsimonious one is that the courses quickly get boring. Even when you place the best speaker in the world on the internet, the experience pales in comparison to face-to-face interaction.

In addition to low completion rates, there are at least three other fundamental problems with MOOCs.

First, a university education is about much more than knowledge transfer. Universities obviously educate doctors, lawyers, accountants, teachers, etc. but, more importantly, they nurture the next generation of citizens. Through their university education, students learn tolerance and compassion, they develop teamwork, oral communication and critical thinking skills, and they also learn the values of the world in which they live. All of this requires high-level human contact on a day-to-day basis. When we survey the businesses that employ our graduates, they tell us that what they value most is what students learn in the context of the larger university environment in which they live. These residential learning opportunities cannot be replicated over the internet.

Second, in a world that depends more and more on science and technology, it is vitally important that university students have more, not less, laboratory-based experience. Mastering chemistry is much more than memorising the periodic table or learning to balance chemical equations. It is more than hearing a world expert talk about the effect of carbon on climate change. Mastering chemistry (and any other scientific discipline) is about getting your hands dirty in a lab or in the real world (e.g., in the ocean, or on a drilling site); it is about making mistakes and learning from them. World-class

universities are defined by the quality of their scientific facilities and by the opportunities that students have to spend time, hands-on, with passionate scientific experts.

Finally, a MOOC is only about inputs, not about outputs. At present, the work that students produce in MOOCs is marked by peers or computers, not by professors. Students receive no feedback whatsoever from the world-class leaders who appear in the videos. If you want to pick one thing that New Zealand does better than perhaps anywhere else in the world, it is to put its best, brightest and most productive researchers (in all disciplines) in front of undergraduate classes. Unlike many of our highly-ranked peer universities overseas, students in New Zealand universities are actually taught and marked by senior academic staff – and this is particularly true at Otago.

So what does all of this mean for the future of the University of Otago? Clearly, we should keep abreast of all advances in education techniques. We remain committed to online education and distance learning in situations where it makes sense for us to do so. We will continue to enhance the technology available to students at Otago and we will encourage them to learn from a wide variety of sources, including online materials. But we will also stick to our core values.

As the only truly residential university in New Zealand, we will continue to deploy our resources, including our human capital, to ensure that current and future generations of Otago students have the opportunity to learn directly from teachers and directly from peers. We will also continue to enhance the other opportunities that also shape the young people who study with us – sporting, social, cultural and musical activities are vitally important to their growth and development.

In conclusion, much of the popular interest in MOOCs was generated by an article in Time Magazine that was published late last year. The article began with the compelling story of an 11-year-old Pakistani girl, Khadijah Niazi, who was studying university-level physics through a MOOC. In an attempt to stop anti-Muslim sentiment in a movie trailer that was inciting local riot, the Pakistani government shut down access to YouTube. As luck would have it, the shutdown occurred while Khadijah was in the middle of her final exam. When she posted her plight on an internet bulletin board, the entire online world came to her rescue. Eventually, a professor in Portugal managed to download all of the relevant material and then upload it on an unblocked site. The next day, using this internet workaround, Khadijah managed to pass the final exam with the highest distinction.

On the heels of this experience, Khadijah quickly became the poster child for the opportunities that MOOCs afford, but her own views on the issue were also very clear. When asked if in the future she would pursue a MOOC option, she said: “I would still want to go to Oxford or Stanford. I would love to really meet my teachers in person and learn with the whole class and make friends – instead of just being there in spirit.”

At the University of Otago, we applaud the wise counsel of an 11-year-old girl from Pakistan. We understand the irreplaceable value of learning and living with your peers under the guidance of world-class experts in your area of study. Our only hope is that when Khadijah Niazi is old enough to attend university, she chooses to study in New Zealand rather than in the United States or Britain. We are pretty sure that we have many things to teach her, but we are equally sure that she has many things to teach us, too.”