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Researching Possible Futures to Guide Leaders Towards More Effective Tertiary Education

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Abstract

This research aimed to inform institutional leaders by producing and disseminating a system-wide view of what tertiary education might look like in Aotearoa New Zealand, 5 years into the future. The researchers were responding to a challenge in a speech by highly respected national leader, Dr Peter Coolbear, at the DEANZ 2010 conference. The outcome was this research, known as the DEANZ2016 scenario set. Using JISC scenario-planning methodologies, including interviews of 16 national and international education leaders, the scenario set was developed on an *x*-axis depicting the tension between facing the academy and facing New Zealand employers, professions and iwi; and a *y*-axis depicting the tension between standardised education and customisation to personalise learning. Each of the quadrants aimed to expose and contrast potential future scenarios. These quadrants were entitled: *Articulation*, *The "supermarket"*, *Quality branded consortia*, and *Self-determination*. The project was innovatively disseminated via the web, and the DEANZ2016 website became the most popular section of the larger Ako Aotearoa website, stimulating further research into the uptake and effect of the project.

Keywords: futures; scenario planning; DEANZ; tertiary leadership; open education; open educational resources; OER; open educational practices; online support services

Introduction

This paper presents the research and findings of a project that aimed to develop leadership in the tertiary sector, and so to improve the successful outcomes for tertiary students in Aotearoa New Zealand. Ako Aotearoa, the National Centre for Tertiary Teaching Excellence, stimulated and supported the project, which was entitled *DEANZ2016 Scenario Guide to Effective Tertiary Education in New Zealand*. The project, led by the authors, was managed and supported by DEANZ (the national association for open, flexible, and distance learning), which also contributed in many other ways, including expertise.

In 2010, the biennial conference of DEANZ (held in Wellington at Te Papa Tongarewa, the national museum), included two important speeches that are relevant background for this project. Professor Sir Mason Durie, recently knighted to recognise his contributions to Aotearoa New Zealand and the world, presented a keynote that addressed the misconception that Māori are averse to communication through digital technologies or other forms of open, flexible, and distance learning. Durie emphasised that Māori value engagement of learners and teachers on a personal level, but this has little to do with the physical distance between the people involved.

Using communication technologies can enable two or more people to be engaged on a personal level even when they are geographically distant. Durie (2011) also explored future scenarios for Māori education in 2025, including this one:

Te Hononga Ipurangi

Suppose, in this scenario, that Māori have embraced communication and information technology with enthusiasm... The virtual classroom pioneered through Kaupapa Ara Whakawhiti Matauranga, CRS Education and Paerangi in the early 2000s will have become the norm. Though students will still attend schools, most learning will be through the internet. Being a small school will no longer prevent students from studying a wide range of subjects, including those where there is a national shortage of teachers (Durie, 2011, p. 135).

Dr Peter Coolbear, Chief Executive of Ako Aotearoa, gave a very able synthesis that closed the conference. He challenged the conference and the association to design general (not specifically e-learning) research that would inform and develop tertiary leaders. In contrast to Durie's distant future, Coolbear indicated that he wished to enable better impact with futures that focus on a nearer horizon of only 5 years (see also Davis, Zaka, Higgins, Anderson, & Suddaby, 2012).

The 2011 Horizon New Zealand Advisory Board explored emerging technologies and their potential impact in a New Zealand context. Amongst the trends identified was the expectation that teaching, learning, and research behaviour would change so that learners would constantly be offered flexible learning and working opportunities (Johnson, Adams, & Cummins, 2011). In addition to increasing access, open educational resources (OER) were expected to further enhance learners' experiences and enable educational transformation that would lead education providers towards open educational practices (Ehlers, 2011).

Since 2011, these trends have become more and more evident, and tertiary education students, as competent users of digital technologies in everyday life, expect to remain connected (Anderson, 2010). They also expect their tutors to blend digital technologies effectively in their face-to-face learning environments. In this context, tertiary education providers have evolved and increasingly adopted e-learning in ways that address the new demands. In 2008 Higgins and Prebble (2008, p. 1) had already noted that, in New Zealand in particular, "'e-Learning' in its various forms is transforming the way New Zealand tertiary educational institutions are teaching and supporting their students". The rollout of ultrafast broadband to 75% of the population and 95% of schools, one of the highest priorities of the government over the years 2010–2016, has and will continue to increase the uptake of blended teaching and learning by education providers (Davis, 2011) and stimulate further changes in tertiary education, including initial teacher education (Davis, 2015).

Research evidence is clear that e-learning has the potential to improve learner outcomes in tertiary education when implemented effectively (Higgins & Prebble, 2008; Greenwood & Te Aika, 2009; Means, Toyama, Murphy, Bakia, & Jones, 2009), and includes effective support systems (Smith, Erlam, Quirke, & Sylvester, 2014). Strategies and approaches have been identified to increase success for the increasing diversity of learners and staff. These include identifying a range of strategies that are appropriate for indigenous people (Tiakiwai & Tiakiwai, 2010; Durie, 2011), and when teaching adults with literacy and numeracy needs (Davis & Fletcher, 2010). Effective partnerships also play an important role in increasing access and positive outcomes with e-learning for diverse people and contexts (Davis, 2010; Anderson, 2010). For example, although Gorski (2009) notes that digital technologies in the United States tend to increase existing inequities, in New Zealand, Greenwood, Te Aika, and Davis (2011) found that using blended learning across collaborating providers can be an effective approach for Māori, particularly when they adopt and adapt digital technologies with a kaupapa (an agenda) that includes capacity building.

However, tertiary education providers face many challenges in effectively addressing demands that are constantly changing. According to the Ako Aotearoa-funded project *E-learning and Higher Education: Understanding and Supporting Organisational Change in New Zealand*, e-learning implementation involves a range of issues for tertiary organisations (Marshall, 2012). Experience from the dissemination of the Ako Aotearoa-funded project *Taking the Lead: Strategic Management for e-Learning* (Higgins & Prebble, 2008) indicated that leaders and other staff need resources to inform their planning and to address key issues with e-learning. Because e-learning can have both positive and negative implications for indigenous students (such as challenges to cultural practices), the need for informed strategic decisions is also important in the context of te reo Māori and kaupapa Māori education (Tiakiwai & Tiakiwai, 2010).

Marshall (2012) described a set of key factors that leaders of tertiary education organisations need to consider in order to respond effectively to technological opportunities. These factors included time, leadership, strategic and operational outcomes, external coercion, and chance. Higgins and Prebble (2008) identified six key areas (strategy, structure, resourcing, decision-making, collaborating and outsourcing, and selecting technologies) on which institutional leaders were recommended to focus, and the authors provided some guidance as to how these areas might be addressed. In a world of rapid change, there is likely to be a continual need to revise and clarify educational pathways and quality outcomes in ways that inform strategic planning for professional and organisational development. It is increasingly recognised that strategic planning is essential for effective education.

Scenario planning is a tool for strategic planning that is used to understand future trends and driving forces (JISC, 2008). It has been used to make flexible long-term plans that address big shifts, such as those relating to global economics and new technologies. Research into the future of education with scenario-building strategies has been carried out internationally. For example, the Beyond Current Horizons programme (2009) was undertaken in 2009 in the United Kingdom to explore the future of education beyond 2025. Its aim was to provide a better understanding of the current and emerging socio-technological changes/trends and their implications (positive and negative) for the education sector, and to suggest ways to increase education systems' resilience in a world of rapid socio-technological change. By doing so, the programme also aimed to support educational stakeholders and policy makers in their long-term strategic planning (Facer, 2009). Similar goals appear in the work of the Institute for the Future (2013) in the United States, in the highly graphical report "From educational institutions to learning flows."

Along this spectrum, with support from Ako Aotearoa and DEANZ, the authors led research into the future of tertiary education in New Zealand for 2016 and produced the first system-wide set of scenarios to guide tertiary education towards more effective practices. Based on the broad question: "What will tertiary education 'look like' in 2016?", the *DEANZ2016 Scenario Guide to Effective Tertiary Education in New Zealand* became a collective scenario set of tertiary education in Aotearoa New Zealand for 2016. The scenario set was developed to inform organisational strategies, collaboration, and services to improve outcomes for 21st century tertiary students.

Methodology

The research developed, created, and verified a set of scenarios for New Zealand tertiary education in 2016 by identifying and describing promising precursors of the future tertiary education ecosystem that were recognised in 2011. The national teaching and e-learning reference group (TeLRG) acted as a reference and advisory group.

The project question: "What will tertiary education 'look like' in 2016?" stimulated identification of a number of issues that were used to promote discussion during semi-structured interviews

with educational leaders. These interviews with 16 expert leaders in the tertiary sector in New Zealand and internationally, as well as relevant literature, were analysed with scenario-building strategies developed by JISC (a United Kingdom body that supports higher education and research). The JISC methodology is based on creating a series of “different futures” generated from a combination of known factors that were used as the key driving forces. These factors were demographics, with plausible alternative political, economic, social, technical, legal, and environmental (PESTLE) trends.

Leaders in tertiary education were identified and contacted as possible participants for the project. The research team tried to involve participants from all forms of tertiary education in New Zealand, including universities, institutes of technology and polytechnics (ITPs), wānanga, (indigenous Māori institutions) and private training establishments (PTEs). International experts were also included on the advice of the TeLRG, whose members helped to identify relevant expertise. The participants and their main characteristics are listed in Appendix A.

A member of the research team interviewed each of the 16 leaders who consented to participate. The interviews were audio-recorded and transcribed. In 2011 the interview notes were analysed using a PESTLE analysis worksheet to identify major trends. The worksheet comprised seven basic categories that were adapted to the New Zealand context: these were political, economic, social, technological, legal, environmental, and institutional factors. After the initial analysis of the interview notes, two rounds of workshops were undertaken by members of the research team and their research mentors to develop future scenarios.

During the first round of workshops, members of the research team and project mentors reviewed the PESTLE analysis worksheet. The team first discussed the trends identified on the worksheet, and then additional trends. The latter trends were based on literature and the research team’s experience as faculty members and leaders in tertiary educational providers. The key trends were identified and brought forward for further reflection and consideration for the next steps of analysis.

The research team then used a brainstorming activity to discuss the forces behind the key trends that had been identified. These trends were presented in pairs of driving and opposing forces and were grouped according to their similarities, to identify the key pairs of forces that are likely to most affect tertiary education in New Zealand in the next 5 years. The major forces identified by the team were rephrased until they made sense in two axes that set out quadrants for four contrasting scenarios. This was an iterative process that involved revisiting and reflecting on the findings from the PESTLE analysis of the interview notes, current research, the relevant literature on the future of tertiary education, and their collective professional experience. This process continued until consensus was achieved.

During the second round of workshops the team discussed potential and emerging scenarios in each quadrant and the characteristics that could fit with the forces described by the position on each axis, which was unique to one scenario. Further discussion developed the first set of scenarios and the analysis of the interview data was revisited to add more detail and evidence for each of the four scenarios. Finally, in collaboration with a graphic designer, the research team worked on ways to visualise the scenarios and communicate the collective scenario set. This work with the graphic designer was iterative, moving from sketches on paper (see Figure 1) to the graphics presented in the next section and on the project’s website.¹

¹ <http://akoaootearoa.ac.nz/projects/2016-scenario-guideeffective-tertiary-education-new-zealand>

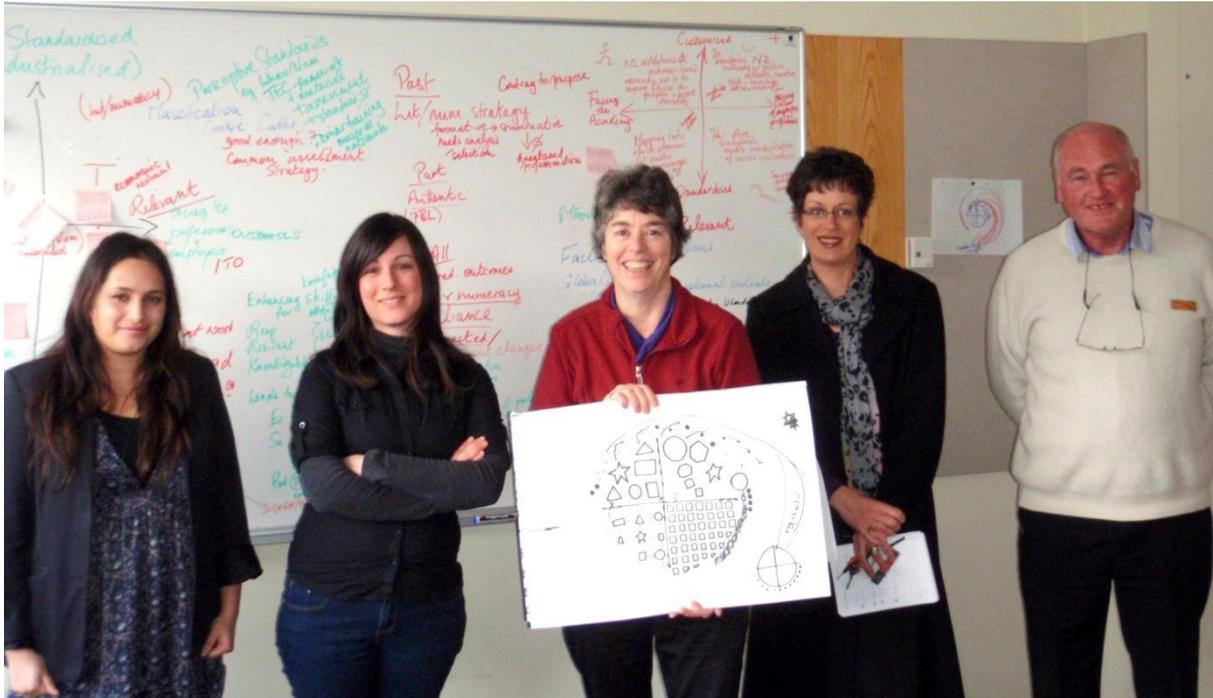


Figure 1 Project team at the second workshop in July 2011, with the first version of the graphics. From left to right: Janinka Babcock (Graphic Designer), Pinelopi Zaka (Research Assistant), Niki Davis (Principal Investigator/Researcher), Julie Mackey (Mentor), Andrew Higgins (Co-Principal Investigator/Researcher).

The later dissemination section of this paper presents a wide range of activities that illustrate ways in which the research continued to gather input and refine the scenario set. The workshops in the dissemination phase expanded the membership beyond the research team and their mentors. The scenario set is now presented as the first outcome or finding of the project.

The collective scenario set of a future tertiary education system

The collective scenario set was developed by the research team to provide a system-wide view across the whole tertiary education sector in Aotearoa New Zealand. Although JISC had produced such sets with individual institutions in the United Kingdom, this was the first nationwide scenario set to be produced. This system-wide view involves universities, ITPs, wānanga, PTEs, and adult and community education workplaces. It also included the forms which they were envisaged (in 2011) to evolve into by 2016.

The scenario set was based on two dimensions that were expected to have a major effect on the future of education in New Zealand for 2016, as shown in Figure 2.

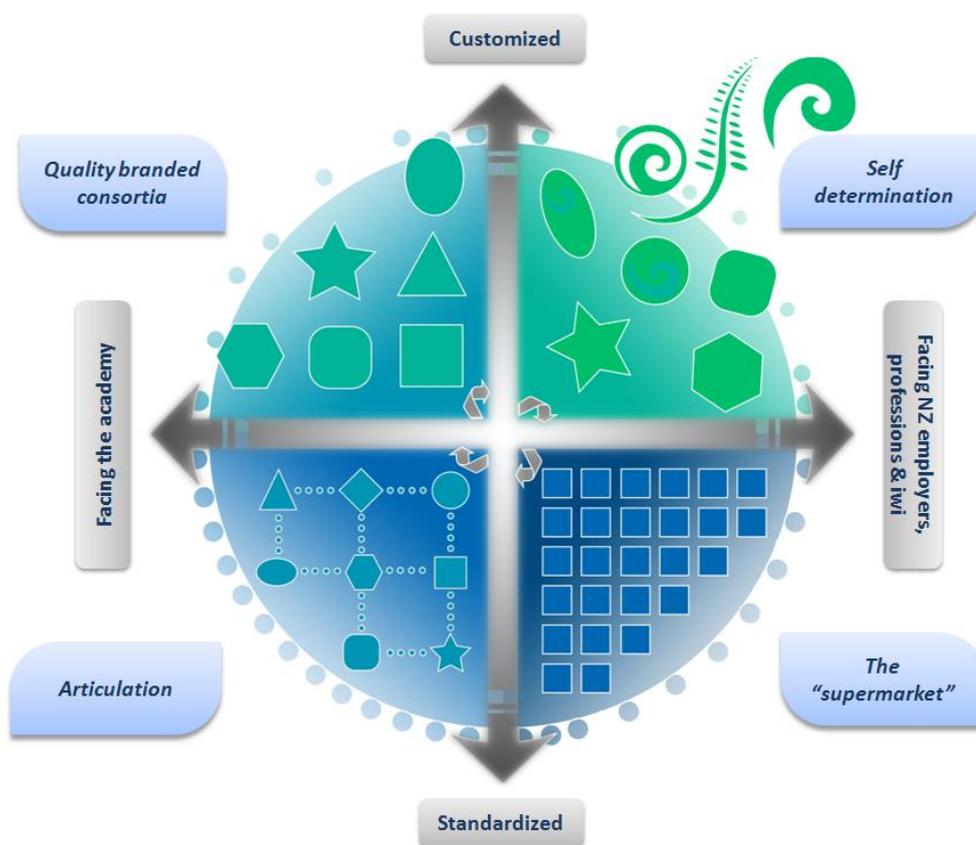


Figure 2 The DEANZ2016 scenario set graphic, created in 2011 to inform strategic planning of future tertiary education in New Zealand in 2016

The horizontal axis of the scenario set is formed by the tension between facing academia/discipline, and facing employers, professions, and iwi. The vertical axis shows the tension between standardised education and education, that is more customised to learners' needs and contexts.

The dotted lines around the globe shape indicate the permeability of the boundaries of the tertiary education system in each scenario, with some indicating an easier flow in and out of tertiary education than others. The ability for courses and resources to be recycled between scenarios is indicated by the arrows in the middle of the figure.

Articulation

Articulation of courses offers some flexibility for learners by providing mapped, portable, and transferable qualifications. Tertiary education providers in this quadrant focus on certainty rather than opportunity. Institutions are internally focused, so that traditional structures and past policies are sustained to avoid pedagogical and financial risks. Change in some aspects of teaching and learning is constrained by competing activities, such as research and quality assurance processes.

Courses are offered in a range of modes, such as on campus or through online/blended learning options. The use of e-learning has increased student choice and enabled more flexible use of space.

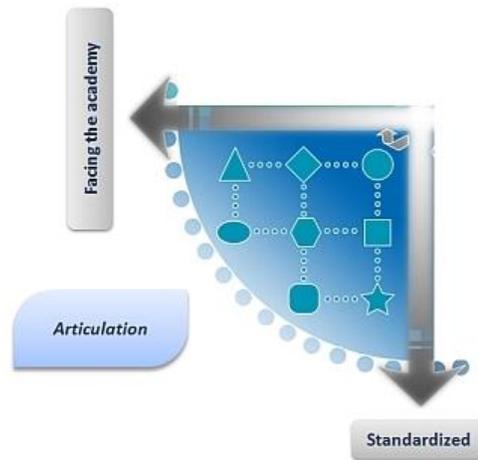


Figure 3 The Articulation scenario

This scenario is shown in Figure 3. The high density of the dotted line around the *Articulation* quadrant shows relatively little flow in and out of tertiary education. The geometric shapes and the dotted lines between them represent articulated courses within and between tertiary education programmes.

The “supermarket”

Learning environments in *The “supermarket”* scenario follow specific academic and production quality standards to address the needs of New Zealand employers, professions, and iwi. These environments have massive courses and units of study that are particularly effective whenever they engage with learners’ needs. The role of quality assurance authorities, such as Industry Training Organisations and the New Zealand Qualifications Authority, is very important.

In this scenario, e-learning has been adopted to increase efficiency in producing learning materials and assessment. Individual learner analytics are often available, providing useful data to teachers who can then direct learners to access additional useful resources. Because a range of available resources have been redeveloped and are available in online environments, the use of OER is promoted.

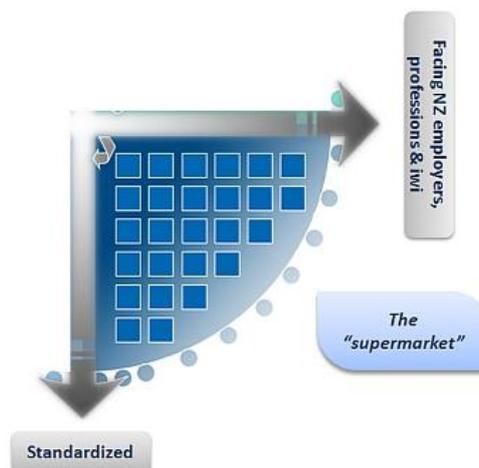


Figure 4 The “supermarket” scenario

The density of the dotted line around *The “supermarket”* scenario in Figure 4 indicates a relatively higher flow in and out of tertiary education than that shown in the *Articulation* scenario. The shelved rows of boxes in this quadrant represent the extensive range of learning objects, courses, and other resources that are offered to learners.

Quality branded consortia

In the *Quality branded consortia* scenario, there is more customisation to learners’ needs than in either the *Articulation* or *The “supermarket”* scenarios. However, tertiary education is strongly influenced by the academy. Learning environments respond to increasing demands from learners for programmes that link them to professional networks within and across the country. New Zealand is brought to the global market through international partnerships, with an edge on particular areas, such as creativity through diversity. Interdisciplinary programmes and faculty collaborations are increasingly observed and students often collaborate to carry out project work.

E-learning has been employed to encourage access to OER, sharing presentations and resources, and collaborative project work. Students showcase their project work through online publications, including digital portfolios.



Figure 5 The Quality branded consortia scenario

The dotted line around the *Quality branded consortia* scenario in Figure 5 indicates a higher flow in and out of tertiary education than in the *Articulation* and *The “Supermarket”* scenarios. The larger geometric shapes that may spread beyond the semi-permeable boundaries of this quadrant represent courses and programmes of study that may be offered through collaboration across tertiary educational providers.

Self-determination

In the *Self-determination* scenario, learning environments are highly customised to learners’ needs, with the support of society to establish relevant life-long learning. Learners are provided with contextualised support by mentors from the workplace and/or community organisations that collaborate with tertiary education advisors and staff. There is higher use of interdisciplinary resources than in the other scenarios, and learners have more opportunities to participate in vocational and research projects and to contribute their own resources. Learning teams emerge in and beyond tertiary organisations, and support staff have a key role in these creative learning environments. Space is used in different ways and there are a few strong overseas partnerships including multinational companies, and communities that need support.

In this scenario e-learning has been deployed in ways that encourage self-determination by learners, who enhance their learning and develop digital portfolios to showcase their knowledge and skills. Mobile technologies are used by learners to access resources and to gather more evidence about their learning. Digital technologies are also used by learners to contribute resources that support their programme of study and/or their authentic contexts.

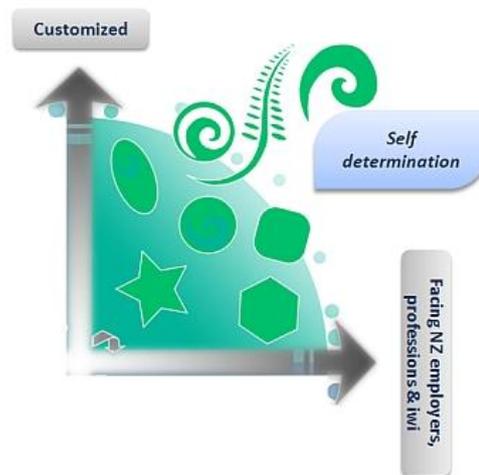


Figure 6 The Self-determination scenario

Figure 6 shows that the flow in and out of tertiary education is higher than in the other three scenarios. This quadrant includes larger shapes, a few of which escape the permeable boundaries of tertiary organisations to become more embedded in New Zealand society (represented by koru and fern shapes). This fluidity indicates self-determination by learners for their own tertiary education programme.

Dissemination

The final draft of the DEANZ2016 scenario set was updated following feedback from a face-to-face meeting of experts of the TeLRG and a webinar that gathered feedback from DEANZ members. Once the final scenario set was ready, Ako Aotearoa proposed that, rather than continuing their previous practice of printing paper-based materials to share with the sector, the project would collaborate with the Ako Aotearoa web designer to support dissemination by redeveloping the project's website to be interactive. This was undertaken and unveiled at the Tertiary Education Summit in November 2011 (see Appendix B).

The project also collaborated with Larry Johnston to take advantage of the two Horizon Report workshops that led to the publication of a regional New Zealand Horizon Report in 2011 (Johnson et al., 2011). Each of the Horizon Report morning workshops was complemented with an afternoon workshop on the DEANZ2016 scenario set. As a result of this strategy, more national and international leaders and experts became engaged with the DEANZ2016 scenario set.

In recognition of the diversity of needs and preferred modes of communication, Ako Aotearoa also stimulated the production of self-study guides for two levels of institutional leaders: senior managers, (including chief executives), and programme leaders and those at head of department or unit level. Instead of being printed, the guides were freely available to download from the

website as PDF files that could be printed or read on screen. Both self-study guides included more direction and illustrations.

The ongoing dissemination then took advantage of events frequented by these institutional leaders, resulting in 17 events between September 2011 and June 2013 (see the events referred to in Appendix B). Each presentation was adapted to the purposes of the event and its participants, and was often complemented with blog entries on the project's Ako Aotearoa website and microblogging in other venues such as Twitter. For example:

Future scenarios of tertiary education in New Zealand will be presented in the HERDSA2013 conference news: [http://us6.campaign-archive2.com/?u=760aac30f043b6ed11a8c6854&id=a6bcb7adfe ...](http://us6.campaign-archive2.com/?u=760aac30f043b6ed11a8c6854&id=a6bcb7adfe...)
#DEANZ2016 (Tweet @ProfNikiDavis on 15 May 2013)

ITES NZ tertiary summit now on Ministry web site
[http://www.minedu.govt.nz/theMinistry/Consultation/TheInnovationsinTertiaryEducationDeliverySummit2014.aspx ...](http://www.minedu.govt.nz/theMinistry/Consultation/TheInnovationsinTertiaryEducationDeliverySummit2014.aspx...) and also linked to #DEANZ2016 for Breakout 1 following Salman Khan (Tweet @ProfNikiDavis on 27 May 2014)

Twitter was also used to link current events with the scenario set. For example:

The NZOpenEd Symposium Report is ready for release and circulation - futures envisaged by the #DEANZ2016 research are coming closer (Tweet @ProfNikiDavis on 13 November 2012)

Opportunities were taken to teach with the scenario set and related materials. The project's focus on the future stimulated and supported the first author in innovative design of learning and teaching. In 2013, Niki Davis became the acting leader of her College of Education, and had an opportunity to collaborate with Wayne Mackintosh on her course. When she realised the relevance of the project's resources, Niki was able to capitalise on Wayne's expertise (a detailed account is provided in Davis & Mackintosh, 2013). As a result, the DEANZ scenario set was further developed to become part of two workshops (a micro open online course, or a mOOC) and a section of the 2013 University of Canterbury postgraduate course on 'Change with Digital Technologies in Education' (EDEM630). Thus the scenario set became part of the resources that are openly available for adoption and adaption in the tertiary sector of Aotearoa New Zealand and globally. Readers might reflect that the resources could be given as an example of a resource in *The "supermarket"* scenario, and as an activity that could be studied by a self-directed student in the *Self-determination* scenario.

By May 2013 the DEANZ 2016 website had become the most popular part of Ako Aotearoa's website. According to the project evaluator's first report (Weir, 2013, p. 2):

In early May 2013 the project page on our website has been visited 5973 times, (2888 unique). The resource for programme leaders has been downloaded 53 times (48 unique), and resource for senior managers has been downloaded 52 times (43 unique).

The final stage of the project has been to complete an extension that researched its uptake and impact, stimulated in part by the apparent popularity of the website. In brief, the findings of the extension, which included four additional interviews (see Appendix A), indicated that it was hard to trace the impact of the project back to change in specific intuitions or in the sector nationwide.

Recommendations included that innovative web-based dissemination methods be complemented with hands-on workshops with leaders, where feasible. Care needs to be taken in the background design of websites so that data is automatically gathered on users when the information is downloaded: that is, “Ensure IP data is harvested for communications, follow-up, dissemination and evaluation purposes.” (Higgins & Davis, 2015, p. 8)

Conclusions and recommendations

When viewed as a whole, the DEANZ2016 scenario set can be seen to have described an accurate future for tertiary education in Aotearoa New Zealand in 2016, which is exhibited as a diverse range that has blended two or more of the scenarios, rather than the four that were placed neatly into the quadrants. Global technical and economic pressures have increased since 2010. A strong trend, which the DEANZ2016 scenarios aimed to communicate in the most innovative quadrant, implies that tertiary education institutions responded mostly to ‘NZ employers, professions and iwi’ with tertiary education ‘customised’ to the learner. While the DEANZ2016 scenarios did not include the term ‘MOOC’ (Marshall, 2013), these were incorporated over time and added as a mOOC experience: for example, in 2013 during the dissemination phase.

Later forecasting publications have validated the trends foreseen by DEANZ2016. For example, the Institute for the Future (2013) stated in its report, “A combination of drivers is breaking learning—and education overall—out of traditional institutional environments and embedding it in everyday settings and interactions, distributed across a wide set of platforms and tools.” (IFTF, 2013, p. 1) In addition, the most recent regional Horizon report (Johnson, Adams Becker, Cummins, & Estrada, 2014) validates the two more radical scenarios:

The panel agreed that the use of digital content has become commonplace and the growing awareness of its importance is an important driver of decisions across the continent. The growing interest in online and hybrid learning is fuelling the rise of related approaches in Australia, such as the flipped classroom, badges, and open content. In fact, both Australian panels emphasised the growth of open content, making it a top-ranked trend in back-to-back years. This consensus conveys the immense value of open educational resources and open-source educational platforms in the continent—a movement that is expanding access to high-quality learning materials for all Australians. (p. 3)

The early intensive phases of the research led to a dissemination phase that involved a range of activities, which also fed back into the application and further dissemination of the scenario set. It appears that using scenario planning to inform strategic planning has increased in tertiary education, although leaders are unlikely to remember exposure to the DEANZ2016 scenario set. Some tertiary institutions have been strongly influenced by shocking events such as the Canterbury earthquakes, which have also increased financial pressures. For example, all institutions are likely to have buildings that require earthquake strengthening and most have also recognised the strategic importance of cloud computing for resilience.

This research and scenario set aimed to stimulate leaders and other colleagues to recognise and support foresight to inform future developments in tertiary intuitions and across the sector nationally and globally. Stimulated by a key leader in Aotearoa New Zealand, the project successfully generated and disseminated the first future scenario set for a nation. Although the project did not focus on open and flexible learning, a core message of the research and scenario set is that as we increase learner-centred education, we must include digital technologies in our core infrastructure.

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The project was also promoted through the Ako Aotearoa homepage, the Ako Aotearoa Alert and the e-bulletin. (Weir, 2013)

Biographical notes

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Niki is Distinguished Professor of e-Learning and Director of the e-Learning Lab in the University of Canterbury College of Education, Christchurch, New Zealand. In addition to researching e-learning in teacher education and professional development, Niki teaches and researches about change with digital technologies in education and related areas of scholarship. Niki is a past President of DEANZ and Editor-in-Chief of the *Journal of Open, Flexible and Distance Learning*. Niki was the Principal Investigator in this research.

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Andrew has been a Director of e-Learning at AUT University and is a past President of both the Distance Education Association of New Zealand and of the Australian Rural Education Research Association. He has been a member of Ministerial Advisory Committees in New Zealand and in Queensland, Australia. His areas of work include strategic planning, e-learning, distance education, and the history of education. Andrew was the Co-Principal Investigator in this research.

Davis, N. E., & Higgins, A. (2015). Researching possible futures to guide leaders towards more effective tertiary education. <i>Journal of Open, Flexible and Distance Learning, 19(2)</i> , [8–24].
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Appendix A: Research participants interviewed, and their characteristics

Year interviewed	Participant	Type of organisation	Region	Involved with technology	Māori perspective	Pasifika perspective
2011	A	Employer	New Zealand			
2011	B	University	New Zealand		•	•
2011	C	Employer	Asia Pacific	•		
2011	D	University	New Zealand			•
2011	E	PTE	New Zealand	•		
2011	F	PTE	New Zealand		•	
2011	G	Employer	USA	•		
2011	H	University/ employer	Europe	•		
2011	I	ITP	New Zealand	•		
2011	J	University	Australia	•		
2011	K	University	USA	•		
2011	L	University	New Zealand	•		
2011	M	Employer	Europe	•		
2011	N	Employer	New Zealand	•		
2011	O	University/ ITP	USA	•		
2011	P	Employer	New Zealand	•		
2015	Q	PTE	New Zealand	•		
2015	R	University	New Zealand	•		
2015	S	University	New Zealand	•		
2015	T	Government department	New Zealand	•		

Appendix B: DEANZ2016 dissemination activities (in chronological order)

- Davis, N. E., Higgins, A., & Suddaby, G. (2011, September). A scenario guide to tertiary education for New Zealand in 2016. DEANZ webinar, online September 2011.
- Johnston, L., Higgins, A., & Davis, N. E. (2011, October). *Horizons workshop*. Auckland.
- Johnston, L., Suddaby, G., Davis, N. E., & Anderson, W. (2011, October). *Horizons workshop*. Wellington.
- Davis, N. E. (2011, November). *Future scenarios for tertiary education in 2016: Evolving designs with e-learning*. The 3rd Annual New Zealand Tertiary Education Summit, Wellington, New Zealand.
- Davis, N. E., Zaka, P., Higgins, A., Anderson, B., & Suddaby, G. (2012, March). *Validating a collective scenario of tertiary education in 2016 with SITE*. In P. Resta (Ed.), Proceedings of the Society for Information Technology and Teacher Education International Conference 2012 (pp. 3170–3176). Chesapeake, VA: AACE.
- Higgins, A. (2012, March). *Future scenarios for tertiary education in 2016: Evolving designs with e-learning*. Higher Education Summit, Auckland, March 2012.
- Davis, N. E., & Fletcher, J. (2012, July). *The co-evolution of e-learning with continuing education and the workplace*. Keynote presented at IALS symposium on the New Frontiers of Learning and Work, Singapore.
- Davis, N. E., Zaka, P., Higgins, A., Anderson, W., & Suddaby, G. (2012, August). DEANZ research into the future of tertiary education in 2016. *DEANZ Magazine*, pp. 22–24. Retrieved from <http://deanz.org.nz/dnzwp/wp-content/uploads/2010/02/August12.pdf>
- Davis, N. E. (2013, March). *The co-evolution of digital technologies and tertiary education*. Presentation at Higher Education Summit, Auckland, New Zealand.
- Davis, N. E. (2013, May). *The co-evolution of digital technologies and education*. Seminar in University of Oxford Department of Education, United Kingdom.
- Davis, N. E., & Mackintosh, W. (2013, June). *Scenario building*. MicroMOOC/OERu short course online.
- Davis, N. E. (2013, July). *Scenarios for the future of tertiary education to inform views of place in learning and teaching*. Presentation to the Higher Education Research and Development Society of Australasia (HERDSA) annual conference, AUT, Auckland.
- Davis, N. E., & Mackintosh, W. (2013, July–August). *Scenario building*. MicroMOOC/OERu short course online. Also a section in postgraduate course EDEM630 *Change with digital technologies in education*, University of Canterbury.
- Davis, N. E., & Mackintosh, W. (2013, November). A mOOC prepared to make a difference. *DEANZ Magazine*, 1–7. Retrieved from <http://www.deanz.org.nz/home/images/newsletters/nov13%202.pdf>
- Davis, N. E., & Zaka, P. (2013, October). *DEANZ Ako scenarios of 2016: A planning tool for education in New Zealand*. Poster presentation at ULearn conference. Christchurch, New Zealand.

Davis, N. E., & Higgins, A. (2014, June). *What will tertiary education organisations look like in 2025?* Workshop in Innovations in Tertiary Education Delivery Summit 2014 (ITES), Auckland.

Davis, N. E. (2014, November). *Prizing open education*. Keynote to Australasian Society for Computers in Learning in Tertiary Education (ASCILITE) annual conference 'Rhetoric and Reality: Critical perspectives on educational technology', Dunedin, 23–26 November 2014. Retrieved from <http://ascilite2014.otago.ac.nz/keynotes-invited-speakers/>



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