SECONDARY TEACHING AT A DISTANCE: A NEW ZEALAND CASE STUDY

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Introduction

New Zealand is a sparsely populated country and with a population of just over 4 million, there are on average only 17.6 people per square kilometre (Wikipedia). It is thus not surprising to find that many schools in New Zealand are very small, particularly in the rural areas. In Hattie's (2002) study on the comparative achievements of students, he divided all New Zealand schools by size into four quarters, and 25% of them only had a roll of between 1 and 67 students. At the secondary level, due to the small size of many schools, there is limited availability of specialist teachers to teach senior secondary courses. Until recently, students who were unable to take classes in their own schools would usually take distance courses offered by the New Zealand Correspondence School (http://www.tekura.school.nz/about-us/our-history). Established in 1922, the Correspondence School now provides courses from early childhood through Year 13. While increasingly being supported by digital technologies, these courses by and large are self-study courses.

In the mid-1990s, a few rural high schools began to form into networks to facilitate cross enrolment of courses supported by digital technologies. Students in a network school would be able to take distance courses offered by other schools within the network (Stevens, 1994). More clusters of schools have been formed since and one of the pioneer clusters was the OtagoNet, which used video-conferencing technologies and a community approach to provide real-time learning for students in the South Island of New Zealand. For a typical OtagoNet sponsored distance class, there was a one-hour video-conferencing session and three hours of self-study per week throughout the school year. Teachers were recruited and trained to use technologies to support their teaching and classes were offered through a teacher's home school (Lai & Pratt, 2009). In collaboration with university researchers, some OtagoNet teachers used the knowledge building approach (Scardamalia & Bereiter, 2006) in their teaching (Lai, 2015). OtagoNet has become a leader of distance teaching in New Zealand and in 2013 it expanded and merged with other networks to become a national organisation. Renamed NetNZ, it started to offer online courses for students all over New Zealand. There are now 54 secondary and area schools associated with NetNZ and in 2017 it offers over 80 National Certificate of Educational Assessment (NCEA) level classes in science, math, languages, technology, social science, art, and health and physical education subjects (The New Zealand's National Certificates of Educational Achievement (NCEA) are national qualifications for Year 11 to 13 students. There are three levels in NCEA, and each has its

achievement standards (AS) assessed through internal and external assessments. New Zealand secondary students are assessed nationally based on these standards.). Small in scale, it was estimated that in 2016 there were over 2,000 online students enrolling with clusters of networks, and about 700 of them enrolled in NetNZ courses (K. Pullar, personal communication, December 2, 2016). With the rapid increase of Internet connectivity, many NetNZ courses now use Google handout to conduct class sessions.

There is great potential for distance and online teaching to grow in New Zealand, particularly at the secondary level. For example, distance courses could be offered to urban students providing them a more personalised choice, and allowing them to complete a high school qualification online, similar to what countries such as the U.S. did (Tonks, Weston, Wiley, & Barbour, 2013). To realise this potential, there is a need to have a deeper understanding of how distance teaching is practiced by online teachers, since distance online teaching should not be seen simply as a reproduction of face-to-face teaching (Lai, 2014). Unfortunately, little research has been conducted in New Zealand to document why teachers become online teachers, how they feel about online teaching, and how they can be better supported. The purpose of this paper is to fill this knowledge gap.

The study

The purpose of this study is to investigate how distance online teaching is supported in New Zealand at the secondary level, using NetNZ as a case study. As part of a larger project investigating the pedagogical and cultural practices of New Zealand online teachers, this paper reports findings from a preliminary analysis of data collected in December 2016 to investigate specifically (a) why New Zealand teachers engage in distance teaching and how they feel about teaching online; and (b) what professional development and learning is needed to support and sustain online teaching.

An email was sent to all 48 NetNZ teachers in December 2016 who taught classes in 2016, inviting them to participate in an online survey. The email included information about the study and a link to a questionnaire on a Google form. The questionnaire had 44 closed and open-ended questions. 32 teachers successfully completed the questionnaire and the response rate was 67%. We understand response rates of online surveys are often much lower than paper surveys (Vehovar & Manfreda, 2008) so having two-third of the NetNZ online teachers completing the questionnaire was considered satisfactory. Data collected from the Google forms was exported into SPSS for analysis. Both quantitative and qualitative analyses were conducted. For the purpose of this paper, the analyses were primarily descriptive, although group differences based on gender and teaching experience are also reported.

Findings

The respondents

Of the 32 respondents, 15 (47%) were male, and 17 (53%) were female. In 2016 NetNZ offered over 60 high school courses, including science, maths, languages, technology, arts, humanities

and social science, and Health and physical education. The courses taught by the respondents were well represented, as can be seen from Table 1.

Table 1: Courses taught by the respondents

Science	Physics, Chemistry
Maths	Mathematics, Calculus, Statistics
Language	Te Reo Maori, Chinese, Japanese, French, Spanish
Technology	Computer Science, Design and Visual Communication, Crafting History, Graphics
Humanities and Social Science	Classical Studies, Geography, History, Media Studies, Accounting, Psychology
Arts	Performing Arts, Art History, Performing Arts, Drama
Health Education	Physical Education

The majority of the respondents were experienced teachers, having on average taught for 22 years, but their online teaching experience was much limited, having on average of only 5 years of experience. Table 2 is a breakdown of teaching and online teaching experiences of the respondents by gender.

Table 2: Teaching Experience by Gender

	Average number of years of teaching	Average number of years of online teaching	Self-rated as very experienced or experienced online teacher (in %)	Self-rated as very experienced or experienced digital technology using teacher (in %)
Female	18	4	47	29
Male	26	7	80	60

As can be seen from Table 2, on average the male respondents had more teaching as well as online teaching experiences than female teachers. When teachers were asked to rate their online teaching experience naturally a much larger proportion of the male teachers (80%) rated themselves as very experienced or experienced, as compared to only 47% of the female teachers giving the same ratings, and 60% of the male teachers rated themselves as very experienced or experienced technology using teachers, as compared to 29% of the female teachers providing the same ratings. It is interesting to note that online teaching experience seemed to correlate with digital technology using experience, with the more experienced teachers being the more experienced technology using teachers. However, when chi square tests were conducted to test gender differences, no significant differences between the two groups of teachers in terms of online teaching experience or technology use experience were found.

Why did NetNZ teachers choose to teach online?

In the questionnaire there was an open-ended question asking the respondents why they had become online teachers. Of the 28 NetNZ teachers who responded to this question, there were three main reasons as to why they taught online classes. The most frequently reported reasons were personal ones (43%), with most of the respondents in this category reporting that it was

an opportunity to develop themselves further as a teacher. The following are some typical comments.

> *Opportunity arose. I was interested in being involved. Was interested in extending myself and doing something different (P23, female, 16 years of teaching experience).*

> *Good to experience a different way of teaching (P4, male, 15 years of teaching experience).*

> *To push my limits and discover new ways to teach and learn (P22, female, 13 years of teaching experience).*

> *I enjoy the challenges unique to the online environment (P8, male, 36 years of teaching experience).*

For over one-third (36%) of the respondents, there was institutional pressure for them to take up the role as an online teacher. Initially the lack of enrolment in their classes was a major reason, even though some teachers eventually found other reasons to sustain their online teaching. For example,

> *I started teaching online because I was asked to replace the online teacher who was retiring. I continue to teach online as I enjoy the contact with a variety of students, the challenges of teaching and learning environment and the continual leanring that it provides me with (P24, female, 7 years of teaching experience).*

> *I enjoy it; but it is a requirement of my position within the school (P18, female, 16 years of teaching experience).*

> *I teach online because I come from a small school and I could see the advantages of being able to access courses that we are unable to deliver due to numbers, timetables and other similar issues (P29, female, year of teaching experience not provided).*

> *Not enough numbers to run a normal class in my school so decided to teach online to be able to do this (P17, female, 14 years of teaching experience).*

For the rest of the respondents (21%), the primary reason for taking up online teaching was to provide learning opportunities for their students who otherwise would miss out.

> *Everyone should have the opportunity to learn [subject] even if they have no access in their area. I believe students should not be restricted by what their socio means leaves them (P12, male, 5 years of teaching experience).*

> *To provide students with additional options beyond the limitations of their own school (P6, male, 37 years of teaching experience).*

How did NetNZ teachers feel about online teaching?

In the questionnaire there were 5 items which were designed to measure the attitudes of the teachers towards online teaching. The internal consistency of this subscale was tested and it was found that it had a Cronbach's alpha co-efficient of .689, showing an acceptable level of internal consistency (Clark & Watson, 1995). The following table summarises the responses of the NetNZ teachers towards online teaching.

Table 3: Attitudes of NetNZ teachers on online teaching (in percentage)

	Strongly agree/agree	Neutral	Strongly disagree/disagree
I enjoyed teaching my 2016 online class	88	13	0
Online teaching is interesting	94	3	3
I am more successful in online teaching than on-site teaching	10	68	23
I have more flexibility in online teaching than on-site teaching	55	39	6
I prefer teaching online than teaching on-site	19	59	22

While almost all NetNZ teachers found online teaching interesting and they enjoyed teaching their 2016 classes, when comparing with on-site teaching, the respondents did not have a clear preference between the two modes of teaching. However, proportionally more teachers considered that they were more successful in on-site teaching than on online teaching.

It is interesting to see whether there were any gender differences on how NetNZ teachers felt about online teaching. Chi square tests were conducted and no significant differences were found. However, when the respondents were divided into two groups, the less experienced (with online teaching experience of 1-3 years, N = 14), and the more experienced (with online teaching experience more than three years, N = 18), it was found that the more experienced teachers felt more successful in teaching online classes than the less experienced teachers (X^2 (3, $N = 32$) = 7.975, $p < .05$) in 2016. Of the other four items, no significant differences were found.

Have NetNZ teachers been well supported and what professional development and learning would they prefer in the future?

In the questionnaire there were two questions on how teachers felt about the efforts and support needed for teaching online classes. As can be seen from the following table, over two-third of the respondents reported needing more time and effort to teach an online class and over one-third of them needing more support in teaching their online class. No significant group differences were found in terms of gender and online teaching experience.

Table 4: Effort in online teaching (in percentage)

Item	Strongly agree/agree	Neutral	Strongly disagree/disagree	Gender difference	Experience difference
It takes more time and effort to teach an online class.	69	25	6	No	No
I need more support to teach an online class than an on-site class.	41	38	22	No	No

In terms of support provided by their home schools and NetNZ, only just over half of the teachers (52%) strongly agree or agree that their online teaching has been well supported by their home school. However, 87% of the respondents considered that they were well supported by NetNZ.

In the questionnaire the teachers were asked to indicate what aspects of online teaching they would need to develop further. The following table summarises the responses of the teachers.

Table 5: Professional development needed by NetNZ teachers (in percentage)

Topic	Less experienced online teachers	More experienced online teachers
How to organise and structure my online class	23	22
How to develop my class as a community of learning	71	67
How to develop online materials	43	50
How to assess my students online	43	11
How to support my online students socially	43	39
How to develop my online students as self-regulated and independent learners	64	72
The pedagogical models underpinning online teaching and learning	43	28

As can be seen from Table 5, the majority of the respondents required knowledge to develop their classes into a community of learning, and how to develop their students as self-regulated and independent learners. About half of the respondents also would like to learn how to develop online materials. For the less experienced online teachers, they required more professional development to understand the pedagogical models underpinning online teaching and learning. Chi square tests were conducted and there was a significant difference between the two groups in terms of the need to know how to assess online students, with proportionally more less experienced online teaches needing this professional development

$(X^2(1, N = 32) = 4.223, p < .05)$. No significant differences were found in any of these items between female and male teachers.

The respondents were also asked how they would prefer to engage in professional development and learning to enhance their online teaching. Table 6 summarises their preferences.

Table 6: Forms of professional development NetNZ teachers preferred (in percentage)

Forms of professional development	Less experienced online teachers	More experienced online teachers
Attend workshops	79	83
Take part in an on-going online community	64	61
Self-study	57	28
Enrol in postgraduate courses	21	11
Peer-supported group discussions	14	72
Team teach	29	17
Working with an expert teacher	43	28

As can be seen from Table 6, the majority of NetNZ teachers preferred attending workshops run by experts, and taking part in an ongoing community of practice. A larger proportion of less experienced online teachers preferred doing self-study with resources provided by experts and worked with expert teachers on a one-to-one basis than the more experienced teachers. For more experienced online teachers, proportionally more of them preferred regular face-to-face peer-supported group discussions. Chi square tests were conducted and no significant differences were found between the two groups. There were also no significant gender differences on the forms of professional development that the respondents preferred.

Discussion and conclusion

In this paper, findings from a preliminary analysis of a study investigating why NetNZ teachers engaged in online teaching and how they could be better supported was reported. While almost all the NetNZ teachers enjoyed online teaching, only a small proportion of them indicating a strong preference for online teaching, and few of them felt that they were particularly successful in online teaching as compared to on-site classroom teaching. There was a clear gender difference in online and technology using experience, with female teachers having less experience than male teachers. However, the lack of technology using experience did not seem to be a barrier for the female teachers to teach online. In terms of why teachers engaged in online teaching, while institutional pressure in terms of the need to provide students with more course options and increasing class sizes were important factors, proportionally more teachers in this study gave personal reasons such as the willingness of stepping out from one's comfort zone and developing different teaching skills as reasons for engaging in online teaching. These reasons may have implications for future recruitment of online teachers. For the NetNZ teachers, they were keen to learn how to develop their classes as a learning community, develop learning materials, and how to develop their students as self-regulated and independent learners. Support on how to assess online students should be

provided to beginning online teachers. For future professional development, most NetNZ teachers preferred to attend workshops run by experts, although they were also keen to participate in an ongoing community of practice. While less experienced teachers would like to work with an expert teacher on a one-to-one basis, more experienced teacher would like to take part in regular face-to-face peer-supported group discussions as a form of professional development.

While this study contributes to the online teaching and learning literature and its findings would be of interest to online educators, there are some limitations in this study. Firstly, the questionnaire sample was small and respondents all came from one online distance teaching organisation. Thus, findings of this study may be difficult to generalise to other contexts. Secondly, data gathered in this study were self-reports, which no doubt would be affected by the respondents' backgrounds and their differing experiences in online teaching. Due to the limitations on time and space, only a small number of the questions in the survey have been analysed and reported in this paper. Further analyses on the data would be needed to provide a more in-depth understanding of online teaching and learning in New Zealand.

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