E-learning provision, participation and performance

Learners in tertiary education

This report forms part of a series called Learners in tertiary education.
Other topics covered by the series are access, pathways, support, participation, retention, and qualification completions.

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E-learning provision, participation and performance[1]

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[1] This report is best viewed in colour due to the graphs and tables we have used to present its data.

1   SUMMARY

This report examines courses delivered in the university, polytechnic, and private training establishment sectors looking at the use (or not) of e-learning. It updates our two earlier reports that made an initial analysis of these topics to see the extent of the change since 2005.

The analysis draws from data collected from the Single Data Return (SDR) on the extent of e-learning enabled study. The SDR collects information on whether a course is:

No Access: where no part of the course is accessible online (**referred to in this report as No ICT** (Information and Communication Technologies)

Web-Supported: where a course provides students with *limited access* to online materials and resources

Web-Enhanced: where a course *expects* students to access online materials and resources

Web-Based: where a course *requires* students to access the accompanying online materials and resources[2] (Ministry of Education, 2016)

KEY FINDINGS

We found that overall, the proportion of equivalent full-time students (EFTS) in courses delivered by No ICT dropped from 53 percent to 43 percent between the 2005-2009 period and the 2010-2014 time period.

At non-degree level, the majority of EFTS were still in courses delivered without internet access during the 2010 to 2014 time period. However, compared with the 2005-2009 time period, a larger proportion of non-degree EFTS were in courses delivered by blended methods[3]. At higher levels, the majority of EFTS had been in courses that had had an e-learning element in the 2005-2009 period; the proportion with e-learning increased further over the 2010-2014 period.

Disparities in course completion rates between e-learning courses and courses without e-learning have reduced markedly. In the 2005-2009 time period, completion rates for some student groups, providers and fields of study enrolled in Web-Based courses (and to a lesser extent, Web-Supported or Web-Enhanced courses) were lower than the corresponding rates in courses delivered with No ICT. However, by the 2010-2014 time period, this had changed; there was either no discernible difference in the completion rates of courses delivered by e-learning and others or else, the gap between them had been significantly reduced.

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[2] A Web-Based course is not necessarily delivered solely via the internet.
[3] For the purposes of this report blended delivery is defined as where traditional delivery is supported to varying degrees by e-learning.

2   INTRODUCTION

This report updates two earlier reports (Guiney; 2011, 2013) by looking at tertiary education sector e-learning trends, patterns and highlights from 2005 to 2014. During this period, there has been increasing internet use by individuals, schools, and tertiary education organisations (TEOs)[4]. Statistics New Zealand's Household Use of Information and Communication Technologies 2006 survey found that 58 percent of people without a tertiary qualification used the internet, compared with 80 percent of individuals with a tertiary qualification. In 2012, the comparable figures were 72 percent and 91 percent respectively (Statistics New Zealand; 2007, 2013).

In the schooling sector, the Ministry of Education's ultra-fast broadband programme's current phase is upgrading up to 500 schools networks for wireless capability. Most schools are also registered with the Network for Learning Programme, which provides a wide range of resources and content to teachers and students. Increasing numbers of TEOs are also adopting e-learning (Johnson et al., 2016)

This report allows us to assess if this increased use of the internet in the community and the compulsory education sector has led to more e-learning courses being offered in the tertiary education sector and if students' participation in them has increased. It also allows us to assess if the performance in e-learning courses has improved since our earlier report.

2.1 Report structure

The report will examine:

- provision of e-learning courses at the system, qualification and sub-sector levels (Chapter 3)
- student e-learning participation at non-degree, degree and postgraduate levels by ethnicity, age, full-time, part-time, and extramural status (Chapter 4)
- student performance in e-learning courses at the system and sub-sector levels, and by ethnicity, age, full-time, part-time, and extramural status (Chapter 5), and
- provision of, and student performance in, e-learning courses by field of study (Chapter 6).

2.2 Definitions

TEOs provide data to the Ministry of Education and the Tertiary Education Commission (TEC) through a collection called the Single Data Return (SDR). We used one of the fields in the SDR, the internet field, for the data in this report. The internet field asks TEOs to classify the delivery mode of their courses according to their use of ICT. The internet field has four possible values, representing different delivery modes, based on a course's internet access and requirements for students. These are:

- **No Access**: where no part of the course is accessible online (referred to in this report as No ICT (Information and Communication Technologies)
- **Web-Supported**: where a course provides students with *limited access* to online materials and resources
- **Web-Enhanced**: where a course *expects* students to access online materials and resources, and
- **Web-Based**: where a course *requires* students to access the accompanying online materials and resources (Ministry of Education, 2016)[5].

The No ICT and Web-Based modes can be mapped reasonably accurately. However, it is more difficult for TEOs to establish clear boundaries between the Web-Supported and Web-Enhanced modes. This may lead to differences in how courses are interpreted and mapped to the internet field (Ministry of Education and TEC, 2010). Therefore, while we look at each of the delivery modes

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[4] In this report TEOs does not include industry training organisations, unfunded international providers or those who do not offer courses of more than one week's duration
[5] These definitions have been adjusted slightly to reflect a more active role for students.

separately, the distinction between these two modes identified in this report should be treated with caution.

In analysing e-learning, we group qualifications as non-degree (all certificate and diploma level courses), degree (undergraduate degree courses, and graduate certificate and diploma courses), and postgraduate (honours degree courses, masters degree courses, doctoral degree courses, and postgraduate certificate and diploma courses).

We analyse participation by looking at the proportion of EFTS (equivalent full-time students) [6]for selected student groups in each of the delivery modes at non-degree, degree and postgraduate levels. We use a (level-adjusted) course completion rate as a proxy for performance for each of the delivery modes at a system, sub-sector, and field of study level as well as for the particular student groups.

We look at 'system level' by all formal courses of more than one week's duration[7] supplied to the SDR.

2.3 Methodology

Analytical approach
Internet field data is supplied through the SDR by all TEOs as part of their mandatory SDR return. For this and our earlier reports, we have taken the EFTS from the SDR returns and aggregated it by system, qualification, sub-sector, field of study, and for selected student groups. We use EFTS rather than a headcount of students as this is a standardised measure of volume, so is a more accurate indicator of provision, participation and performance than student numbers.

Calculating provision and participation rates
Using the 10 years of data available, we have constructed averages based on two five-year periods (2005-2009 and 2010-2014[8]) as the basis for establishing how many e-learning courses there were and how many students were participating in them. We use participation and provision rates to do this. We use averages rather than year-on-year analysis for our provision and participation, and course completion rates because this is a better method of showing trends and patterns over time, which is the main focus of this report.

Calculating completion rates
Given the link between level of study and course completion rates (Wensvoort, 2011) and the imbalance in the uptake of e-learning between levels (Guiney, 2011) the difference in completion rates between the different e-learning and No ICT modes may reflect that imbalance more than the influence of the delivery method. To allow for these differences and to avoid distortion, we use a standardised course-level-adjusted completion rate, which measures successful completion rates for the different e-learning and No ICT modes as if the mix of levels between them had been the same[9]. This is intended to remove any differences due to course level so we can focus on the effects of delivery mode on performance.

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[6] EFTS is a measure of consumption of education. A student enrolled in a programme of study full-time for the full year equates to 1 EFTS. A student enrolled full-time for a semester equates to 0.5 EFTS.
[7] These courses contribute to qualifications on the New Zealand Qualifications Framework
[8] These averages were constructed using standard formulas in Microsoft Excel.
[9] The report's completion rates were calculated as follows: Let sample completion rate at level = CR_k Let the number enrolled in the sample at level = N_k Then the overall completion rate = $\Sigma(CR_k * N_k] / \Sigma N_k$ If, across the whole system, the number enrolled at level$_k$ = M_k then the adjusted completion rate is $\Sigma(CR_k * M_k] / \Sigma M_k$

3   E-LEARNING PROVISION

In this chapter, we compare and contrast the proportions of EFTS in courses without internet access (No ICT) with those EFTS delivered by the three e-learning modes (Web-Supported, Web-Enhanced and Web-Based) at system, qualification and sub-sector levels. When we refer to blended delivery or methods, we are talking about both Web-Supported and Web-Enhanced.

KEY POINTS

Over time, the proportion of EFTS in courses delivered by e-learning methods increased. EFTS in courses delivered by blended methods are now a majority of provision largely because of their increasing dominance at degree and postgraduate levels. But the No ICT mode – which represented a majority of all delivery in the 2005-2009 period – now comprises only 43 percent of all provision. However, the No ICT delivery mode still has a higher proportion of EFTS than any of the individual e-learning modes largely because of its dominance at non-degree level.

Certificate Levels 1 and 2 had the largest proportion of EFTS in courses delivered by No ICT and this increased over time. For the other course levels, the proportion of EFTS in courses delivered by e-learning methods increased over time. Despite this growth, certificate Levels 3 and 4, diplomas, and doctorate degrees had a majority of courses delivered by No ICT. In contrast, degrees, Level 8 qualifications, and masters degrees had a majority of courses delivered by blended methods.

For universities and polytechnics, the proportion of EFTS in courses delivered by e-learning methods increased over time irrespective of qualification level. In contrast, for private training establishments (PTEs), the proportion of EFTS in No ICT courses increased over time at non-degree and postgraduate levels.

At non-degree level, polytechnics and PTEs had a majority of EFTS in courses delivered by traditional methods whereas universities had larger proportions delivered by blended methods. However, all the sub-sectors had a majority of their EFTS in courses delivered by blended methods at degree and postgraduate levels. This proportion was larger for universities and smaller for polytechnics.

3.1 System and qualification level

Figure 1

Proportion of the total and qualification level[10] EFTS in e-learning and No ICT courses

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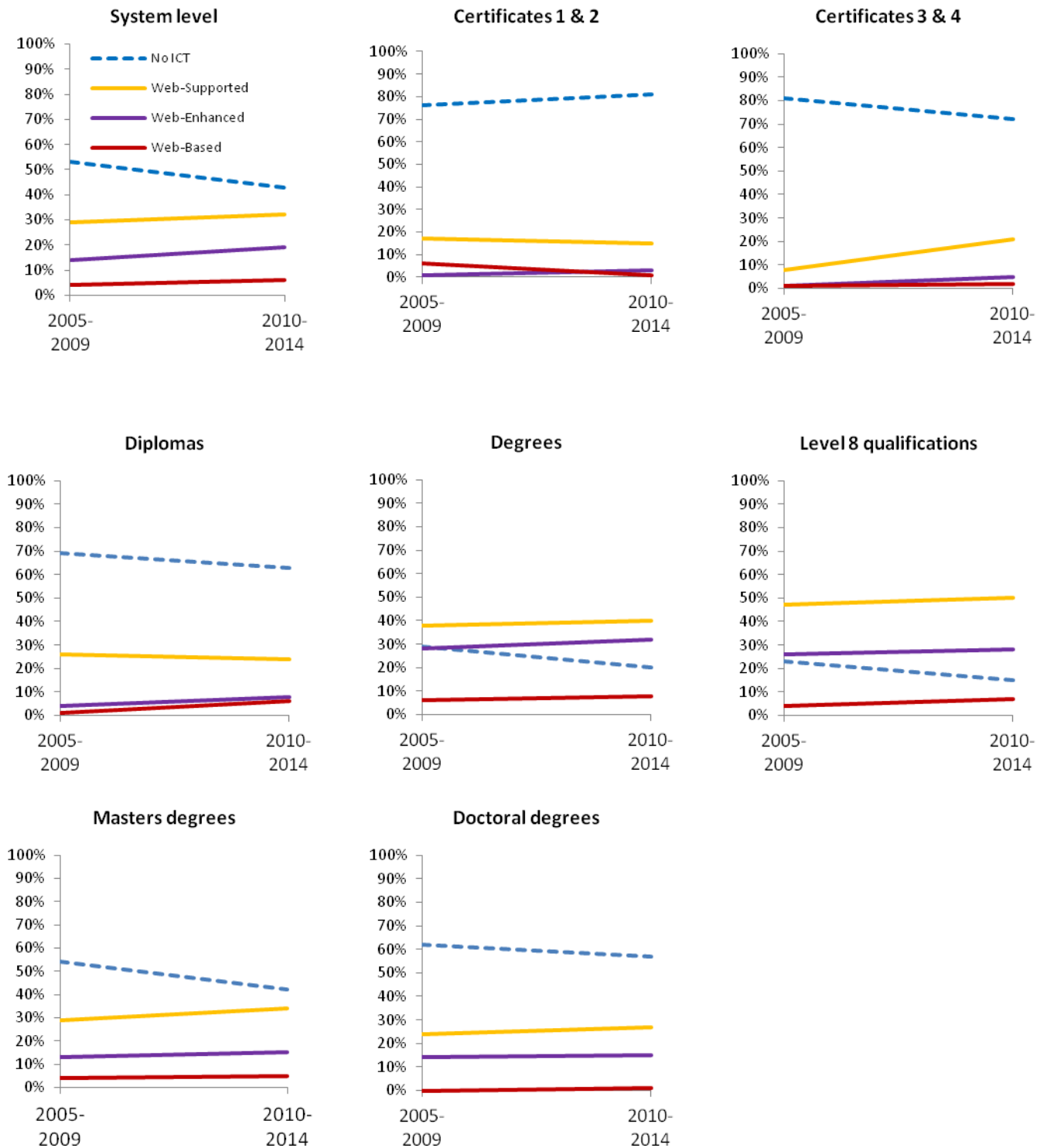
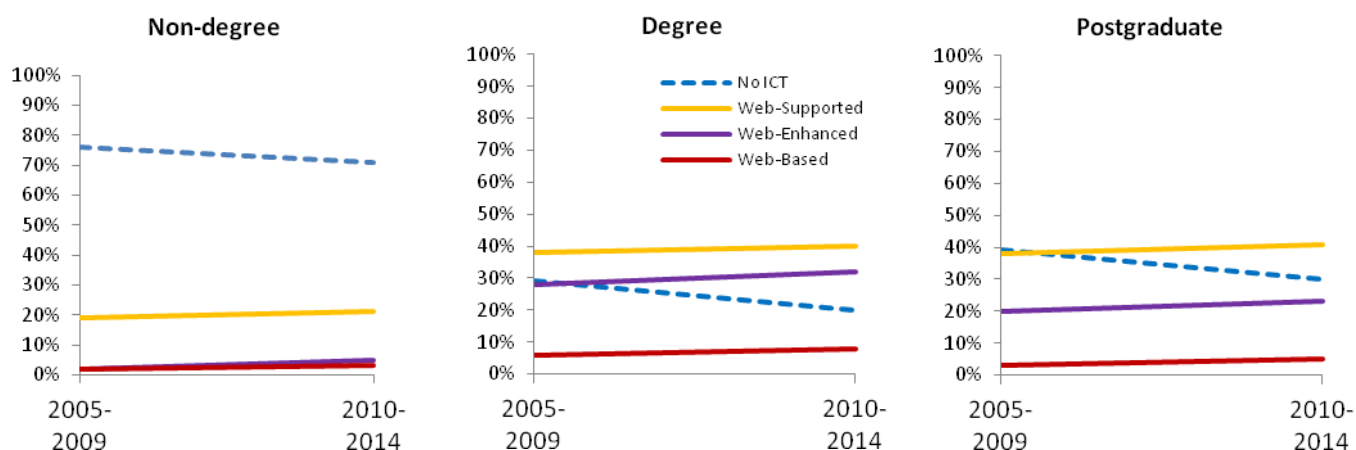[10] 'Degrees' includes graduate certificates and diplomas and 'honours degrees' includes postgraduate certificates and diplomas.

6   E-learning provision, participation and performance   **Ministry of Education**

Figure 2

Proportion of EFTS in e-learning and No ICT courses at non-degree, degree and postgraduate levels

The EFTS in courses delivered by No ICT went from over 50 percent of provision in the 2005-2009 time period to under 50 percent during the 2010-2014 time period. The proportion of delivery using e-learning methods grew at all qualification levels (except certificate Levels 1 and 2). This meant that by the 2010-2014 time period a majority of courses were delivered by blended methods. However, there was a larger proportion of No ICT courses than any of the individual e-learning modes at system level.

These system level trends were most likely a result of the distribution and growth in the modes among the different qualification levels. At non-degree level (especially Certificate Levels 1 and 2) the large majority of EFTS were in courses delivered by traditional methods. In contrast, at degree and postgraduate levels, the majority of EFTS were in courses delivered by blended methods. At degree and postgraduate levels, the decline in No ICT and growth in the e-learning modes is larger at than at non-degree level.

The delivery approach in doctoral degrees is mostly directed research. In many cases, this will involve personal, one on one contact between supervisor and student. In some cases, the student and supervisor will not be co-located, meaning there will be almost total reliance on electronic communication/direction. In nearly all cases, the student will be expected to supplement the supervisor's face-to-face direction with access to web resources. It is possible that the breakdown for doctoral courses shown in Figure 1 reflects differing interpretations of the internet field classifications by providers. The results in that graph should be treated with caution.

The dominance of No ICT at non-degree level could be due to factors not visible in the data, including willingness and/or ability of students to participate in e-learning, and TEO expectations or beliefs that non-degree level students are not as well suited to e-learning. The stronger growth and larger proportions of courses delivered by blended methods at degree and postgraduate levels most likely reflects the increasing number of TEOs that are delivering their courses in this way (Guiney, 2012; Johnson et al., 2016).

3.2 Sub-sector

In this section, we compare and contrast the proportions of EFTS delivered via No ICT courses with those delivered by the three e-learning modes at a sub-sector level. We examine the university, polytechnic and PTE   sub-sectors. We have not included wānanga because there was insufficient e-learning mode data to construct a reliable time series. However, wānanga students are included in Chapters 4-6.

Figure 3

Proportion of sub-sector non-degree EFTS in e-learning and No ICT courses
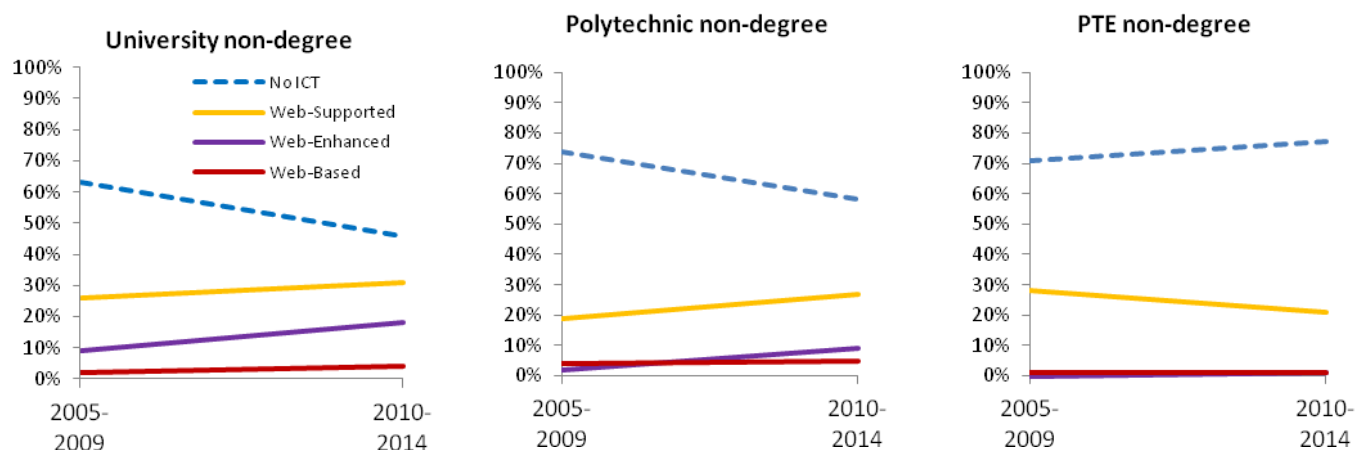
At non-degree level the university and polytechnic sub-sectors have a decreasing proportion of EFTS in courses without internet access. However, PTEs had increases in their proportion of EFTS in non-degree No ICT courses and a decline in their proportion of EFTS in Web-Supported courses. Universities had smaller proportions of EFTS in No ICT courses and higher proportions of EFTS in Web-Enhanced courses than the other sub-sectors. Polytechnics delivered more e-learning at non-degree level than PTEs.

Figure 4

Proportion of sub-sector degree level EFTS in e-learning and No ICT courses
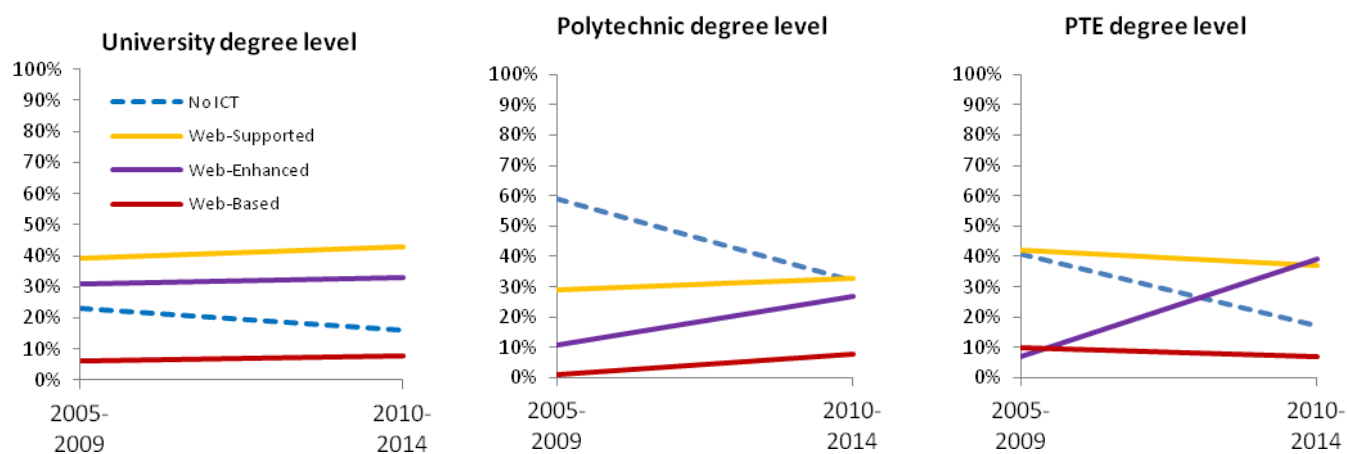
All sub-sectors show diminishing proportions of EFTS in No ICT courses and larger proportions of EFTS in Web-Supported and Web-Enhanced courses. However, universities had much larger proportions of EFTS in Web-Supported courses. Polytechnics had a greater proportion of EFTS in courses without internet access than the other sub-sectors, despite a large decline in these EFTS. They also had much larger increases in the number of EFTS in Web-Based courses than the other sub-sectors.

PTEs had the largest decline in the number of EFTS in No ICT courses. However, they also had the strongest increase in EFTS in Web-Enhanced courses, which meant that by the 2010-2014 time period they had larger proportions of EFTS in these courses than the other sub-sectors. Unlike the other sub-sectors, PTEs had a decline in their proportion of EFTS in Web-Supported and Web-Based courses.

These results suggest that the shift to blended delivery noted in the literature (Guiney, 2011, 2012; Johnson et al., 2016) is occurring faster and more completely at degree, not non-degree, level.

Figure 5
Proportion of sub-sector postgraduate level EFTS in e-learning and No ICT courses
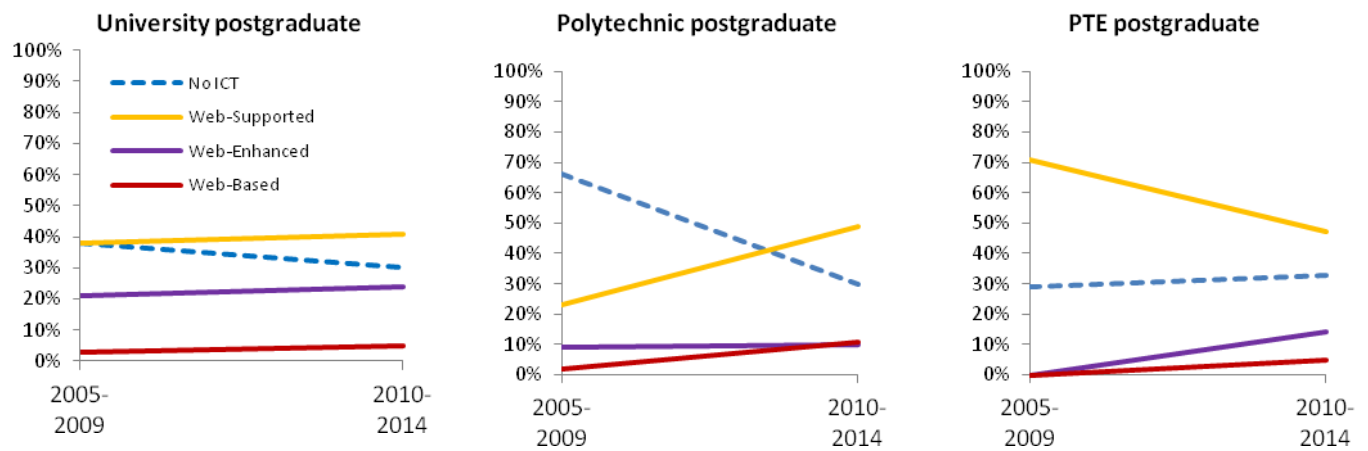
Because the universities are responsible for the great majority of postgraduate delivery, the trends in postgraduate take-up of e-learning observed in Figure 2 are replicated in the university sub-sector graph in Figure 5 – with increasing proportions of EFTS in Web-Supported courses than No ICT courses over time. Polytechnics had a much larger decline in the proportion of EFTS in courses without internet access and a stronger increase in the proportion of EFTS in Web-Supported courses. They also had stronger growth in the proportion of EFTS in Web-Based courses.

These patterns meant that by the 2010-2014 period, polytechnics delivered a higher proportion of EFTS in Web-Supported and Web-Based courses than the other sub-sectors at this level. PTEs, unlike the other sub-sectors, had a small increase over time in the proportion of EFTS in courses without internet access and a large decrease in the proportion of EFTS in Web-Supported courses. PTEs also had a larger increase over time in the proportion of EFTS in Web-Enhanced courses.

These results for polytechnics and PTEs might be due to the relatively small number of them that offer postgraduate courses. This could mean that changes to the mix of delivery of postgraduate provision within individual polytechnics and PTEs might have a large influence on the sub-sector results. Polytechnics and PTEs also have smaller numbers of postgraduate EFTS, so their sub-sector results could also be caused by changes within certain fields of study. Field of study e-learning provision at all qualification levels will be explored in more detail in Chapter 6.

4   E-LEARNING PARTICIPATION

In this chapter, we look at students' participation in courses delivered by e-learning. We analyse the participation by level of study, by ethnicity, age, full-time, part-time, and by extramural status. We focus on particular student groups here and also in Chapter 5 as they contain priority learners and/or provide examples of alignment with, or differences from, the overall trends and patterns identified at system level.

For example, we examine Pasifika at non-degree and postgraduate levels because they show greater variation than other ethnic groups from the overall trends and patterns highlighted in Chapter 3. But at degree level, we look at Māori because their participation trends and patterns differ more markedly than other ethnic groups from the overall trends and patterns in Chapter 3.

> KEY POINTS
>
> Looking at non-degree level courses, we see that most student groups had higher participation rates in No ICT courses at non-degree level. However, extramural students had higher participation rates in Web-Based courses at all qualification levels and in Web-Enhanced courses at degree and postgraduate levels; but they had lower participation rates in Web-Supported courses at degree and postgraduate levels.
>
> Part-time part-year students also had lower participation rates in Web-Supported courses at degree level. The 40+ age group had higher participation rates in No ICT courses at postgraduate level. However, the 40+ age group had higher participation rates in Web-Supported courses, as did Māori at degree level and Pasifika at non-degree and postgraduate levels.

4.1 Non-degree level

Figure 6

Proportion of extramural, Pasifika, under 25, and full-time part-year students' non-degree level EFTS in e-learning and No ICT courses
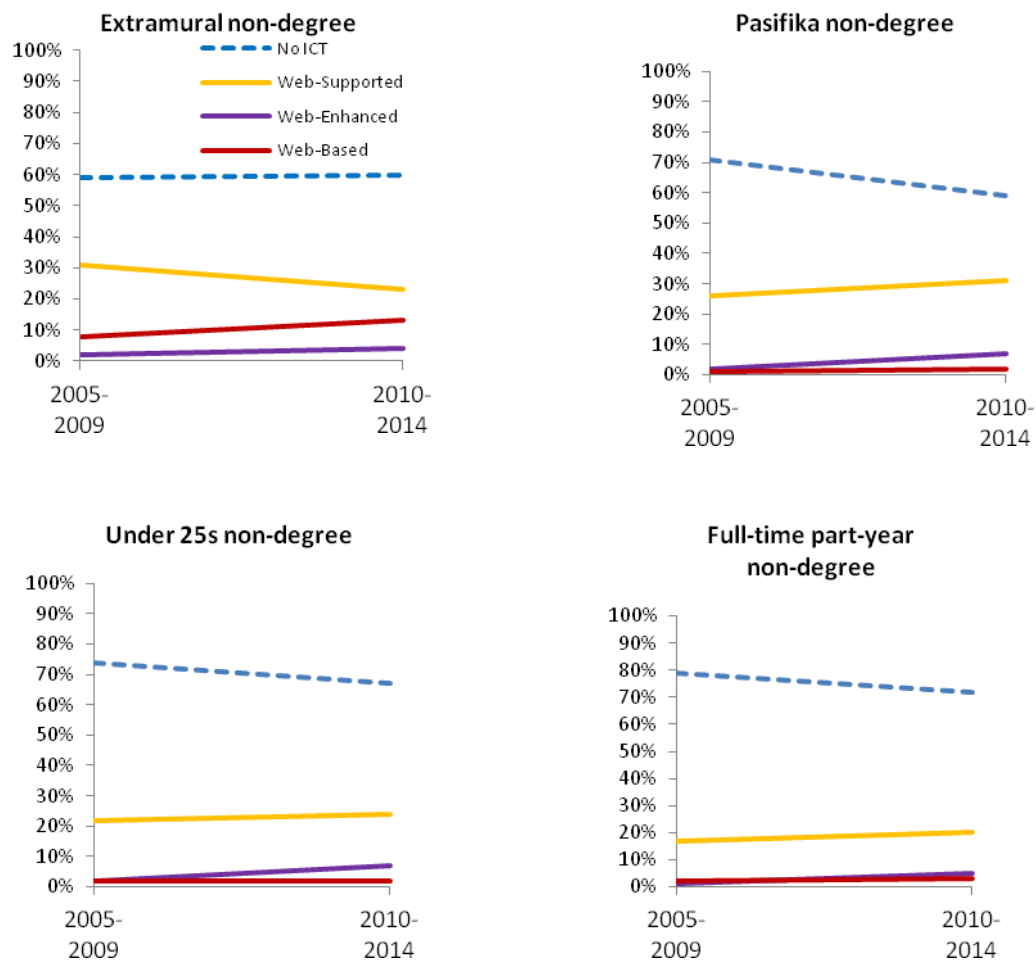
The under 25s and full-time part-year student groups' participation rates in e-learning courses at non-degree level largely reflects the growth patterns and distribution observed in Figure 2. Pasifika had a significant decline in their participation rate in No ICT courses without internet access and by the 2010-2014 period this was at a lower level than all non-degree provision.

Pasifika also had higher rates of participation and stronger growth in the participation rate in Web-Supported courses. In contrast, extramural students appear to be shifting from less to more web-intensive courses, with a large decline in their participation rate in Web-Supported courses, but an increase in participation rate in Web-Based courses.

The higher participation rate in No ICT courses suggest that the choices TEOs make about how their non-degree courses will be delivered are an important factor in determining students' participation in courses delivered by e-learning. For example, our data suggests that it is likely that the higher proportions of EFTS in No ICT courses at non-degree level for extramural students are because wānanga that offer a large proportion of extramural EFTS do so at non-degree level through No ICT.

4.2 Degree level

Figure 7

Proportion of Māori, 40+, part-time part-year, and extramural students' degree level EFTS in e-learning and No ICT courses
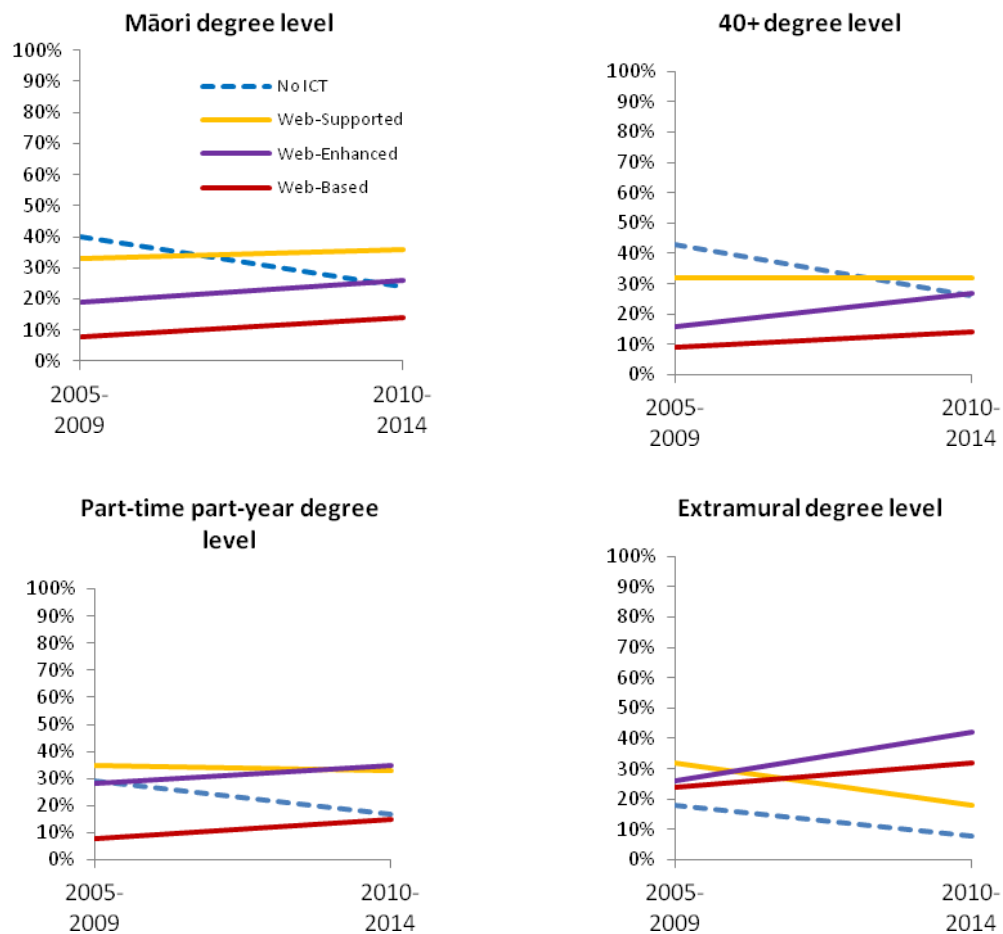
The trends and patterns shown in Figure 7 broadly align with those observed at degree level for the sector, as observed in Figure 2. However, Māori and the 40+ age group had larger declines in their participation rate in No ICT courses and stronger growth in their participation rate in Web-Supported courses.

Extramural students showed a decline in their participation rate in Web-Supported courses, with corresponding growth in their participation rate in Web-Enhanced courses. While all the student groups shown in Figure 7 had larger growth in their participation rate in Web-Based courses, extramural students were much more likely to participate in them than the other students.

A small number of TEOs have larger numbers both of degree level Web-Based courses and of degree level extramural students, so this is the most likely factor in their higher levels of participation in Web-Based courses.

4.3 Postgraduate level

Proportion of Pasifika, 40+, part-time part-year, and extramural students' postgraduate level EFTS in e-learning and No ICT courses
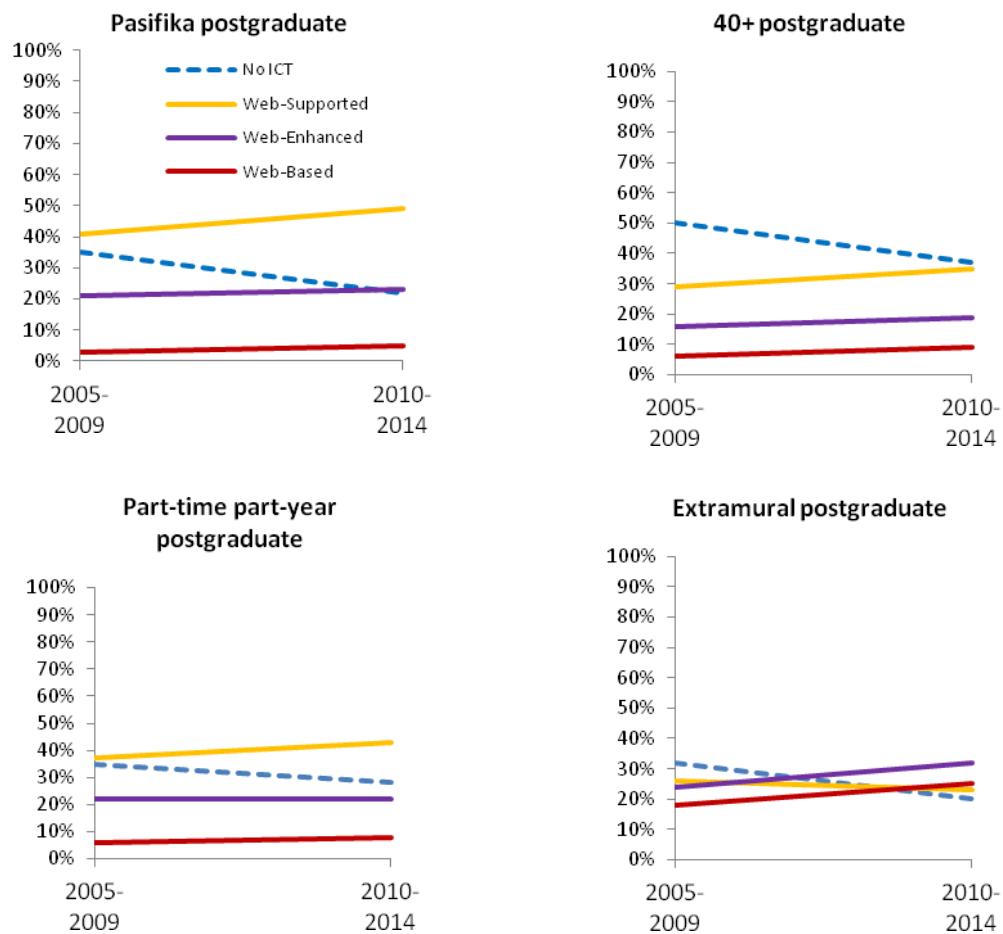
The participation rate of part-time part-year students in postgraduate e-learning courses mirrors the trends observed in Figure 2. However, Pasifika, the 40+ age group, and extramural students showed a decline in their participation rate in courses without internet access, greater than observed for the system as a whole in Figure 2. Pasifika had high rates of participation in Web-Supported courses.

Despite growth, the 40+ age group had lower participation rates in Web-Supported courses than the other student groups. Extramural students also had lower participation rates in Web-Supported courses; and extramural students had stronger growth in, and higher participation rates in Web-Enhanced and Web-Based courses.

Few TEOs offer postgraduate courses and, outside of universities, the number of these courses is small. Therefore a change in how TEOs deliver their postgraduate courses is the most likely factor in students' e-learning participation in them.

5 PERFORMANCE IN E-LEARNING COURSES

There has been a substantial improvement in course completion rates across the tertiary education system since 2010, when the TEC began the publication of each provider's educational performance indicators – including their course completion rates. This chapter looks at the extent to which that improvement is mirrored by delivery mode.

In this chapter, we examine performance in e-learning courses by comparing student course completion rates by delivery mode, at a system and sub-sector level and by ethnicity, age, full-time, part-time, and extramural status. The course completion rates are all adjusted for course level (except at system level for comparative purposes).

> **KEY POINTS**
>
> At the system level, for universities, and most student groups, there was little difference between their No ICT and e-learning modes' course completion rates. This resulted from significant improvements over time in completion rates in Web-Based courses. However, at a sub-sector level, polytechnics had a lower Web-Based course completion rate and PTEs had a lower Web-Enhanced rate.
>
> Extramural and part-time part-year students had a higher completion rate in No ICT courses. Extramural students' completion rates in the 2010-2014 period in No ICT courses was similar to the comparable rate for intramural students. The 2010-2014 period Web-Based rate for Māori almost matched their No ICT rate.

5.1 Performance in e-learning courses at the system level

Figure 9

System level course completion rates for the No ICT and e-learning modes
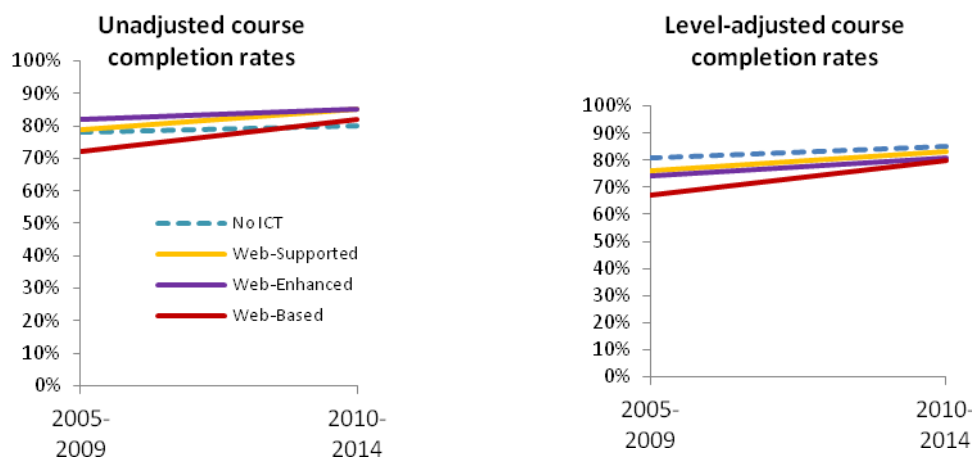
Whether we adjust for course level or not, course completion rates have improved in all four of the delivery modes we monitor. For the e-learning modes, particularly Web-Based, this improvement was significant. This improvement in Web-Based meant that by the 2010-2014 period, there was little difference in course completion rates by delivery mode, whether we adjust for course level or not.

5.2 Performance in e-learning courses at the sub-sector level

Figure 10

Sub-sector course completion rates for the No ICT and e-learning modes
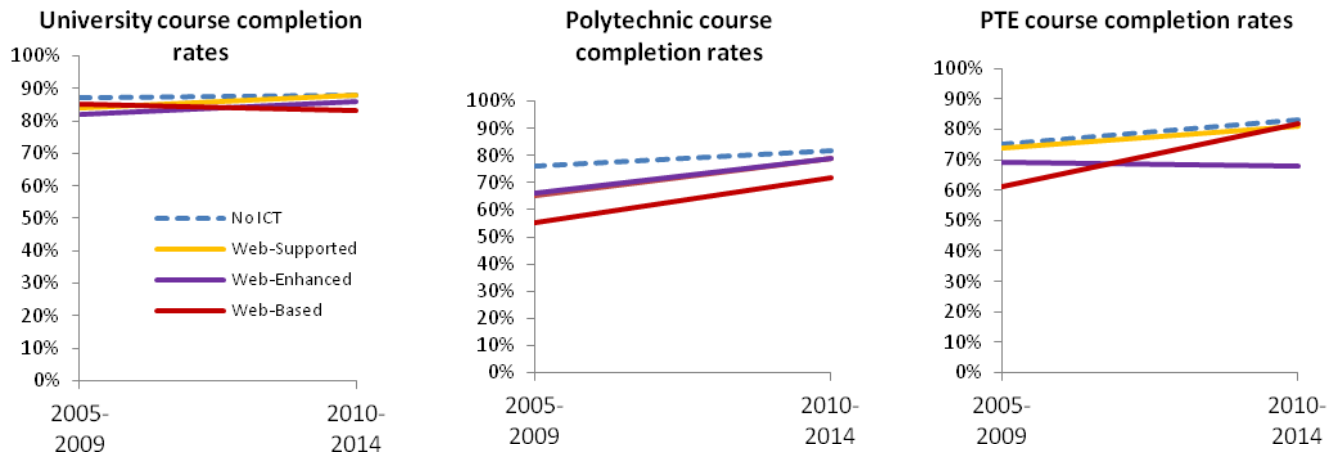

Note: Polytechnics had the same completion rate for Web-Supported and Web-Enhanced for the 2010-2014 time period

Universities had higher course completion rates than the other sub-sectors and no significant differences by delivery mode. Polytechnics had higher increases in completion rates than the other sub-sectors in the Web-Supported and Web-Enhanced modes of delivery, so by the 2010-2014 period there was only a small difference between these rates and the completion rate of polytechnic No ICT courses. Completion rates in Web-Based courses at polytechnics improved but, this mode still had a noticeably lower rate than the other modes in that sub-sector.

PTEs had larger increases in their No ICT and Web-Based rates than the other sub-sectors. By the 2010-2014 period PTEs had little difference between their Web-Supported, Web-Enhanced and No ICT rates. However, because of a small decline in their Web-Enhanced rate, it was much lower than the other modes.

5.3 Students' performance in e-learning courses

Figure 11

Course completion rates for the No ICT and e-learning modes for the 40+ age group, Māori students, part-time part-year students, and extramural students
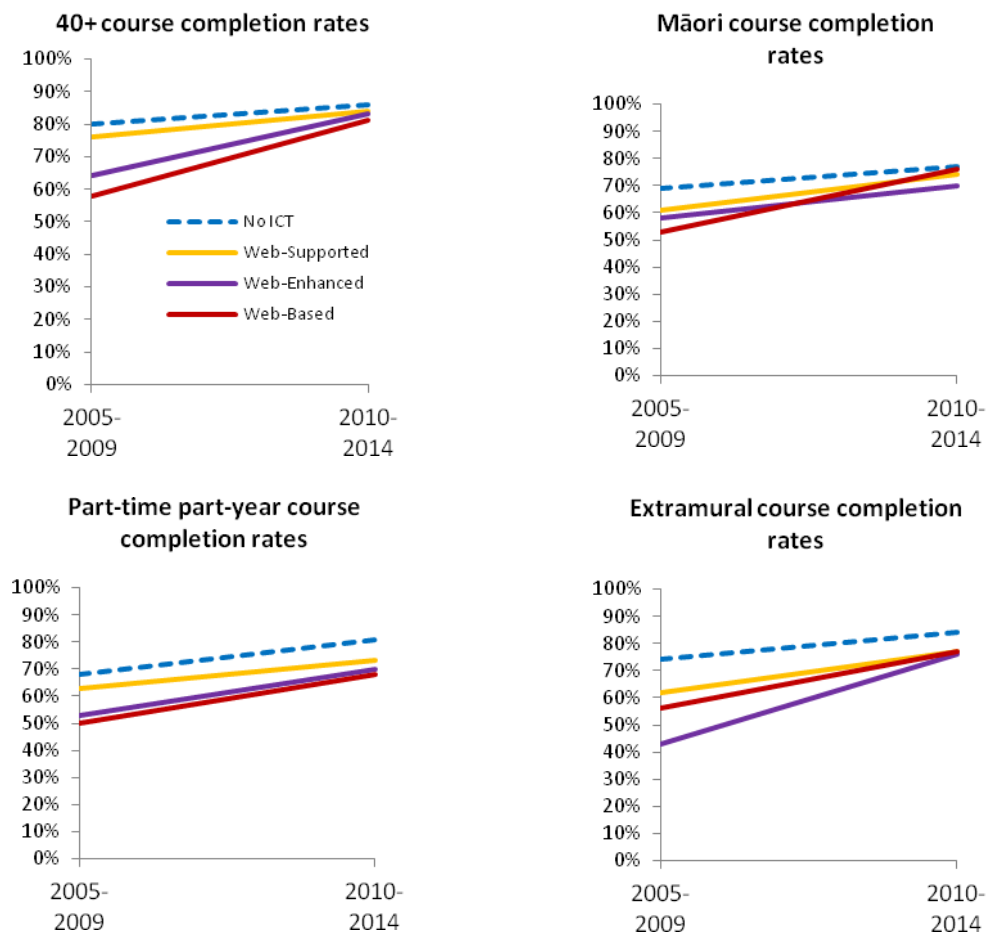
The general increase in course completion rates since 2010, noted in the introduction to this chapter, is also evident when we focus on student groups of interest.

Because of growth in the e-learning completion rates for these student groups', there was little difference between their completion rates by delivery mode by the 2010-2014 period. The 40+ age group had higher completion rates. Māori had lower No ICT and Web-Enhanced rates than other groups, but these rates had lifted since the 2005-2009 period. Part-time part-year students had lower Web-Supported and Web-Based rates but these, too, had risen.

Part-time part-year and extramural students had larger increases in their No ICT rates, which meant that there remained a gap between their No ICT and e-learning course completion rates. Extramural students also had larger increases in their completion rates for the e-learning modes, particularly Web-Based and Web-Enhanced. Māori, too, had a large increase in their Web-Based rate so by the 2010-2014 period, it almost matched their No ICT rate (after being the lowest in the 2005-2009 period). Extramural students' No ICT and Web-Based rates were similar to the comparable rates for intramural students by the 2010-2014 period.

6 E-LEARNING PROVISION AND PERFORMANCE IN E-LEARNING COURSES BY FIELD OF STUDY

We examine e-learning provision and performance by field of study because variations in e-learning provision and course completion rates between fields of study may also help explain some of the differences noted in this report across all results.

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KEY POINTS

The proportion of EFTS delivery that had no e-learning component declined in all fields of study, except Management and Commerce at degree level and Architecture and Building, and Natural and Physical Sciences, at postgraduate level.

At non-degree level, Health had the largest growth in the proportion of EFTS in Web-Supported courses; for Web-Enhanced courses it was Society and Culture; and for Web-Based courses it was Education.

At degree level, the largest increase in the proportion of EFTS in Web-Supported courses was in Engineering and Related Technologies. For Web-Enhanced courses, the largest increase was in Education.

At postgraduate level, Creative Arts had the strongest growth in the proportion of EFTS in Web-Enhanced and Web-Based courses. Information Technology had the strongest growth in the proportion of EFTS in Web-Supported courses.

Course completion rates increased for most fields in all the modes of delivery.

There was a large increase in the completion rates for Management and Commerce and Architecture and Building for courses that were delivered in the Web-Supported mode; Society and Culture had the strongest growth in its Web-Enhanced course completion rate; and Engineering and Related Technologies and Mixed Field Programmes had the biggest growth in their Web-Based completion rates.

The only fields with a significant difference between modes in course completion rates were Agriculture, Environment and Related Studies and Mixed Field Programmes.

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6.1 Field of study e-learning provision

Table 1

Percentage point change in the proportion of e-learning provision by field of study from 2005-2009 to 2010-2014 at non-degree level (the percentages in brackets denote the proportion of courses in the 2010-2014 period)

Field of Study	No ICT	Web-Supported	Web-Enhanced	Web-Based
Natural and Physical Sciences	-20% (43%)	8% (35%)	5% (13%)	6% (9%)
Health	-15% (65%)	10% (25%)	2% (7%)	4% (4%)
Society and Culture	-14% (66%)	-1% (11%)	13% (20%)	2% (3%)
Engineering and Related Technologies	-13% (75%)	6% (18%)	6% (7%)	0% (0%)
Architecture and Building	-10% (71%)	6% (21%)	1% (3%)	2% (4%)
Creative Arts	-10% (71%)	4% (19%)	4% (6%)	3% (4%)
Education	-10% (64%)	-1% (23%)	4% (5%)	8% (8%)
Food, Hospitality and Personal Services	-4% (80%)	2% (17%)	1% (2%)	1% (1%)
Information Technology	-2% (62%)	-3% (24%)	5% (10%)	1% (4%)
Management and Commerce	-1% (61%)	3% (30%)	2% (5%)	-4% (4%)
Mixed Field Programmes	0% (66%)	-6% (26%)	6% (7%)	-1% (0%)
Agriculture, Environment and Related Studies	-2% (85%)	0% (11%)	1% (3%)	2% (2%)
Non-degree level – all fields of study	-5% (71%)	2% (21%)	3% (5%)	1% (3%)

Note: The shades are used to demonstrate growth patterns. Red denotes a decline in growth with the darker shades being used to show where the larger decreases have occurred. Green denotes an increase in growth with the brighter shades being used to show where larger growth has occurred.

Apart from Agriculture, Environment and Related Studies, the provision of e-learning at non-degree level across fields of study reflects the balance of delivery modes across the system as shown in Figure 2, with declines in No ICT courses and growth in e-learning courses.

Natural and Physical Sciences had the largest decline in the proportion of EFTS with No ICT component. This field is less likely than the other fields to have EFTS in No ICT courses and more likely to have EFTS in Web-Supported and Web-Based courses. However, at this level, Natural and Physical Sciences represents a small share of total EFTS delivery – two percent in the 2010-2014 period. Agriculture, Environment and Related Studies was more likely than the other fields to have EFTS in courses with No ICT component and, along with Society and Culture, less likely to have EFTS in Web-Supported courses.

Health had the largest increase in the proportion of EFTS in Web-Supported provision. Mixed Field Programmes had the largest decline. Society and Culture had the largest increase in the proportion of EFTS in Web-Enhanced provision. Agriculture, Environment and Related Studies was the only field that had a decline. Education had the largest growth in the proportion of EFTS in Web-Based provision. Management and Commerce had the largest decline.

Table 2

Percentage point change in the proportion of e-learning provision by field of study from 2005-2009 to 2010-2014 at degree level (the percentages in brackets denote the proportion of courses in the 2010-2014 period)

Field of Study	No ICT	Web-Supported	Web-Enhanced	Web-Based
Mixed Field Programmes	-41% (29%)	0% (27%)	11% (13%)	30% (30%)
Engineering and Related Technologies	-26% (29%)	22% (47%)	0% (19%)	4% (5%)
Health	-22% (23%)	12% (34%)	7% (38%)	3% (4%)
Creative Arts	-21% (33%)	9% (39%)	7% (19%)	4% (8%)
Agriculture, Environment and Related Studies	-18% (19%)	-1% (30%)	12% (42%)	7% (9%)
Education	-17% (16%)	5% (38%)	19% (29%)	-2% (17%)
Food, Hospitality and Personal Services	-7% (24%)	3% (42%)	3% (33%)	0% (0%)
Information Technology	-7% (16%)	0% (30%)	8% (42%)	-1% (12%)
Society and Culture	-4% (10%)	-3% (25%)	6% (62%)	1% (3%)
Natural and Physical Sciences	-2% (9%)	-1% (43%)	1% (39%)	4% (10%)
Architecture and Building	-1% (51%)	-5% (29%)	8% (19%)	-2% (1%)
Management and Commerce	1% (17%)	-3% (37%)	-3% (37%)	5% (10%)
Degree level – all fields of study	-9% (20%)	2% (40%)	4% (32%)	2% (8%)

Note: The shades are used to demonstrate growth patterns. Red denotes a decline in growth with the darker shades being used to show where the larger decreases have occurred. Green denotes an increase in growth with the brighter shades being used to show where larger growth has occurred

At degree level, all the fields (except for Management and Commerce) showed a reduction in the proportion of EFTS in courses with No ICT element. This decline was largest for Mixed Field Programmes (MFP); however, there are very few courses at degree level that are in this field of study – in the 2010-2014 period, MFP represented less than one percent of all delivery at degree level. Engineering and Related Technologies had the largest growth in the proportion of EFTS in Web-Supported courses, while Education had the largest growth in Web-Enhanced courses. Architecture and Building had the largest decline in the proportion of EFTS in Web-Supported and Web-Based courses.

Natural and Physical Sciences was least likely to have EFTS in courses with No ICT. Architecture and Building were most likely to have EFTS in courses with No ICT element. Engineering and Related Technologies was most likely to have EFTS in Web-Supported courses. Society and Culture was most likely to have Web-Enhanced courses.

Table 3

Percentage point change in the proportion of e-learning provision by field of study from 2005-2009 to 2010-2014 at postgraduate level (the percentages in brackets denote the proportion of courses in the 2010-2014 period) [11]

Field of Study	No ICT	Web-Supported	Web-Enhanced	Web-Based
Creative Arts	-37% (20%)	1% (29%)	24% (38%)	11% (12%)
Health	-14% (27%)	10% (45%)	1% (18%)	3% (9%)
Education	-13% (22%)	4% (37%)	5% (23%)	3% (17%)
Information Technology	-9% (24%)	13% (35%)	-3% (35%)	-1% (6%)
Society and Culture	-9% (21%)	0% (18%)	9% (59%)	0% (2%)
Agriculture, Environment and Related Studies	-7% (61%)	0% (18%)	6% (19%)	2% (2%)
Management and Commerce	-3% (29%)	0% (41%)	-1% (23%)	4% (6%)
Engineering and Related Technologies	-1% (15%)	2% (57%)	0% (28%)	0% (0%)
Natural and Physical Sciences	1% (51%)	-2% (31%)	0% (17%)	1% (1%)
Architecture and Building	6% (30%)	-1% (51%)	-2% (13%)	-3% (6%)
Postgraduate level – all fields of study	-9% (30%)	3% (41%)	3% (23%)	2% (5%)

Note: The shades are used to demonstrate growth patterns. Red denotes a decline in growth with the darker shades being used to show where the larger decreases have occurred. Green denotes an increase in growth with the brighter shades being used to show where larger growth has occurred

The delivery mix for some fields does not follow the trend in Figure 2, where there was a large decline in the proportion of EFTS in No ICT courses and higher proportions of EFTS in Web-Supported courses. Architecture and Building had the largest growth in the proportion of EFTS in No ICT courses, but also the largest decline in Web-Based courses. Information Technology had the largest growth in the proportion of EFTS in Web-Supported courses, but the largest decline in Web-Enhanced courses. Creative Arts had the largest growth in the proportion of EFTS in Web-Enhanced and Web-Based courses, but the largest decline in No ICT courses. Natural and Physical Sciences had the largest decline in the proportion of EFTS in Web-Supported courses.

Agriculture, Environment and Related Studies were most likely to have EFTS in No ICT courses, but least likely to have EFTS in Web-Supported courses. Engineering and Related Technologies were most likely to have EFTS delivered in Web-Supported courses, but least likely to have EFTS in No ICT and Web-Based courses. Society and Culture was most likely to have EFTS in Web-Enhanced courses, but least likely to have EFTS in Web-Supported courses. Architecture and Building was least likely to have EFTS in Web-Enhanced courses. Education was most likely to have EFTS in Web-Based courses.

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[11] At postgraduate level we do not include Food, Hospitality and Personal Services or Mixed Field Programmes because the number of EFTS is too small to allow for the construction of a time series comparable with the other fields.

6.2 Performance in e-learning courses by field of study

Table 4

Percentage point changes in course completion rates by field of study in the No ICT and e-learning modes from 2005-2009 to 2010-2014 (the percentages in brackets denote the proportion of courses in the 2010-2014 period)

Field of Study	No ICT	Web-Supported	Web-Enhanced	Web-Based
Food, Hospitality and Personal Services	12% (82%)	8% (84%)	3% (81%)	-6% (73%)
Information Technology	6% (82%)	7% (78%)	4% (77%)	8% (74%)
Management and Commerce	8% (84%)	15% (82%)	12% (80%)	16% (74%)
Architecture and Building	3% (83%)	15% (84%)	2% (83%	0% (80%)
Education	3% (89%)	3% (90%)	1% (88%)	8% (88%)
Engineering and Related Technologies	3% (85%)	8% (83%)	7% (82%)	37% (77%)
Mixed Field Programmes	3% (74%)	14% (74%)	2% (53%)	34% (71%)
Society and Culture	3% (83%)	3% (82%)	13% (83%)	7% (83%)
Creative Arts	4% (87%)	2% (86%)	7% (83%)	9% (80%)
Health	4% (91%)	5% (89%)	1% (90%)	-2% (87%)
Natural and Physical Sciences	0% (83%)	4% (83%)	4% (82%)	8% (81%)
Agriculture, Environment and Related Studies	-9% (71%)	-8% (54%)	-8% (69%)	5% (80%)
System level	4% (85%)	7% (83%)	7% (81%)	13% (80%)

Note: The shades are used to demonstrate growth patterns. Red denotes a decline in growth with the darker shades being used to show where the larger decreases have occurred. Green denotes an increase in growth with the brighter shades being used to show where larger growth has occurred

Most fields of study had an improvement in completion rates in each mode and a narrowing of the gap between them over time. This was driven largely by the general increase in completion rates since 2010. The change is most marked for the e-learning modes, especially Web-Based.

7   CONCLUSIONS

Some commentators have overstated the potential of e-learning to revolutionise tertiary education. This is exemplified by some initiatives such as the United Kingdom's e-University and, more recently, by the commentary on Massive Open Online Courses (MOOCs). These predictions are often based on a belief that e-learning will replace traditional delivery (Guiney, 2014). The findings reported in this paper do not support this assumption. Delivery of Web-Based courses (courses wholly taught via e-learning) has grown, but this mode has had lower growth than delivery that blends e-learning and other modes. Web-Based delivery still represents a lower proportion of delivery than blended courses at system and qualification level. And for most students Web-Based is a minority of their participation.

In recent years, the major role of e-learning has been to support or complement traditional delivery. According to the literature and commentators, blended delivery is becoming much more common (Guiney, 2012; Johnson et al., 2016). This paper supports this view; higher proportions of courses are delivered in the Web-Supported and Web-Enhanced modes. Student participation in these modes is also generally increasing.

Our report suggests that this shift to blended delivery is evolutionary and uneven. While the overall proportion of EFTS in No ICT courses continues to decline, the rate of growth in the proportion of EFTS in Web-Supported and Web-Enhanced courses is modest. And at non-degree level, No ICT is still the predominant delivery mode. In contrast, at degree and postgraduate level, Web-Supported is the main delivery mode. These differences between qualification levels is likely to see the overall proportion of EFTS in courses delivered by blended methods continue to grow, especially as the numbers of students in higher level qualifications grows at the expense of numbers at lower levels.

In a comprehensive study published in 2001, Russell found that there was no significant difference in student outcomes between different delivery modes. Our earlier report on student achievement (Guiney, 2013) did not entirely support this because for certain sub-sectors, fields of study, and student groups, completion rates for courses delivered by the e-learning modes, especially Web-Based were lower than the corresponding rates for courses that had No ICT element.

In contrast, the updated data in this report supports Russell's thesis because for most student groups, there is now little discernible difference between their modes' course completion rates – a reflection of the focus in the sector since 2010 on lifting performance by all students. Even where there is still a difference (for example extramural students) the gap has reduced significantly.

The larger gaps in performance in e-learning courses are occurring at sub-sector and field of study level. For instance, polytechnics and PTEs had lower Web-Based and Web-Enhanced course completion rates respectively. Agriculture, Environment and Related Studies had a higher Web-Based course completion rate while Mixed Field Programmes had a much lower Web-Enhanced rate.

This report challenges some strongly held assumptions about student performance. It has long been noted that extramural students are consistently outperformed by their intramural peers (Guiney, 2014a). This report shows that the performance of extramural students in No ICT and Web-Based courses was comparable to intramural students. Similarly, it has long been assumed that Māori have a strong preference for traditional delivery and do not typically favour Web-Based courses. However, this data shows that the completion rates for Māori in No ICT and Web-Based courses are nearly the same.

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