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and Workplace Relations

LISTENING TO STUDENTS' AND EDUCATORS' VOICES

THE VIEWS OF STUDENTS AND EARLY CAREER EDUCATORS
ABOUT LEARNING WITH TECHNOLOGIES IN AUSTRALIAN EDUCATION AND TRAINING

Research Findings

LISTENING TO STUDENTS' AND EDUCATORS' VOICES • KATHRYN MOYLE & SUSANNE OWEN

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1. Executive Summary

This report outlines findings collected from listening to and analysing the views and expectations of students within Australian education and training institutions about learning with technologies. The overarching question for this research was: ‘what are the views of students and early career educators, about learning with technologies in Australian education and training?’ In 2008, students in primary and secondary schools, vocational education and training (VET) institutions, international students studying education in universities and pre-service teacher education students contributed to the research based upon their current experiences and views. Early career teachers were asked to reflect on their experiences as pre-service teachers. Data was collected through online surveys and focus groups. The research design was informed by a literature review, which is available at: <http://www.aictec.edu.au/aictec/go/home/priorities/pid/233>.

The purposes of this research were:

- (a) To gain an improved and contemporary understanding of the expectations and experiences of learners and early career educators, of how information and communication technologies (ICT) may be utilized to improve learning outcomes; and
- (b) To develop a better understanding of students’ and educators’ requirements regarding ICT in education and training.

The data collected shows that within their educational institutions and at home, students and early career educators have access to and use a range of technologies for teaching and learning purposes, but in particular, use computers and the Internet. Access and convenience to computers and the Internet within education and training institutions varied for the different respondent groups, according to specific locations, including within their education and training institutions. In general, more use of the computer and Internet for educational purposes is made by students as they progress through the respective levels of education. Participants indicated they use technologies to research information; for communication and group work activities with other students and educators; for solving problems; presenting assignments; and for reflection, planning and for creative purposes.

All cohorts indicated the importance of high quality teachers who form positive relationships and can construct relevant and engaging learning contexts, with and without technologies. Survey and focus group responses identified the following benefits of including technologies in education and training:

- Access to detailed and easy-to-access information;
- Skill building through problem-solving;
- Development of maths and other literacies;
- Opportunities to practice tasks;
- Increased motivation to learn through self-directed and interest-focused work;
- Improved presentation of work including the use of office productivity and multi-media software applications;
- Personalized learning that supports different learning styles and levels; and
- Increased control of their own learning.

The value of technologies for communication and group work activities was recognised by all cohorts. Tertiary students in particular, indicated they value communication with their lecturers through using technologies such as email and discussion lists. Despite students’ preferences for varying approaches to learning however, many students reported their classroom activities often involve considerable teacher/lecturer information-giving.

Online games and social networking and media sites were reported to be of interest and used frequently by many respondent groups, particularly outside of educational institutions. Despite some concerns about possible distractions, over half of the respondents from most groups indicated that educational games should be more widely used because of their motivational and educational benefits.

The value of social networking sites for learning received variable responses. MSN was commonly identified as 'often' or 'sometimes' being used across all groups. Unique to secondary students however, was the extent of their involvement in chatting online with other students in regard to their studies, with over 70% of online survey respondents indicating they did so.

There were mixed responses about the value of Myspace, Instant Messaging, Facebook, Although 50% of primary students reported using MSN for learning, around 70% of primary students indicated they believe sites such as MySpace, Facebook and YouTube are more for fun than for learning, and should be accessed from home rather than from schools. On the other hand, about half of the post-school, adult respondents disagreed with the younger students. The adult students instead indicated they believe social networking and media sites such as YouTube and Flickr can be used for educational purposes.

All respondents indicated they have high expectations about access to and use of computers and the Internet at various education and training locations and want intranet access from home. Respondents also indicated they expect teachers and lecturers to have confidence in using technologies and to use email to communicate with them.

Across all cohorts concerns were raised about issues related to teaching and learning with technologies. These concerns included insufficient time, lack of access to and use of the Internet, concerns about the speed of the Internet, and concerns about the level of teacher/lecturer skills. These concerns were raised by about half of respondents in most groups, although some issues were identified as being of greater concern for some respondent categories than others.

About a third of adult participants indicated they believe that improving lecturers' knowledge of online games would improve students' learning. Over 40% of primary students and 60% of secondary students raised concerns about online sites being blocked at their educational institutions and the impact of this filtering on their studies. Issues such as plagiarizing, distractions in lessons caused by playing games, online bullying, and viruses were raised by some in focus groups. In the surveys, these issues were not seen as a concern by around half of respondents in all groups.

All cohorts emphasized the importance of good relationships and communication between students and educators, and indicated they would like to receive more formative feedback from their teachers and/or lecturers. Participants also indicated they would like greater variety and more interesting learning approaches, more personalized learning that caters for their individual requirements, and the opportunity for individual help. Importantly however, focus group respondents highlighted the importance of face-to-face teaching aided by technologies, rather than advocating only face-to-face or only online learning. Furthermore, while more up-to-date technology, faster Internet speed, more accessible computers such as laptops, and less blocked Internet sites were suggested by respondents, the quality of the teachers and lecturers was reiterated across all cohorts. The challenges then are before us.

2. Method

Data for this research was gathered during 2008 using online surveys and focus groups. The research method was developed following a review of Australian and overseas literature. This review is available at <http://www.aictec.edu.au/aictec/go/home/priorities/pid/233>. Approval to collect data was provided by the University of Canberra, Committee for Ethics in Human Research. Access to individual universities, schools and training organisations was approved by the relevant organisation or government department. Access to these institutions was assisted by key officers or ‘conduits’ for the project who were self-identified within each of the participating organisations.

2.1 Online surveys

Specifically designed online surveys addressing the same core topics, were developed for each cohort of participants. Additional questions about their practicum experiences were developed for the pre-service and early career teachers’ surveys. Access to the online surveys was available throughout Australia. Although the surveys addressed the same topics across all cohorts, where appropriate, to meet the reading age of the different student and educator groups, the survey questions were slightly reworded or re-ordered for ease of use. The surveys remained available for a three month period. A total of 1082 surveys were analysed, with survey numbers for the various cohorts indicated in Table 1.

Table 1: Participant numbers for online surveys

Participant cohort	Responses
Primary students	502
Secondary students	152
VET students	70
International students	23
Pre-service teacher education students	235
Early career teachers	100
Total number of responses	1082

The number of VET students who completed the online surveys was lower than for all the other cohorts except for international students. To build a fuller picture of VET students’ learning with technologies, the findings for the VET cohort of students collected through this research, have been reviewed in light of the data collected through the *2008 E-Learning Benchmarking Project*¹. The *E-Learning Benchmarking Project* surveys students and others annually regarding the uptake, use and impact of e-learning in the VET sector. The *E-Learning Benchmarking Project* provides complementary data to that collected through this research. The student findings from the *2008 E-Learning Benchmarking Project* surveys have been used to confirm the VET student data collected through this research. Survey findings collected from the international students have been treated as indicative only, due to the small number of responses.

¹ I & J Management Services (2008), *2008 E-learning Benchmarking Survey Final Report*, Australian Flexible Learning Framework, http://e-learningindicators.flexiblelearning.net.au/survey_results08.htm.

2.2 Focus groups

Key issues emerging from the surveys were followed up in focus groups. The focus groups were conducted with each cohort group, in metropolitan and regional locations. Each focus group consisted of only one cohort of students at a time. That is, primary students participated in focus groups consisting only of primary students of the same age, and similarly with secondary students. Focus groups with VET students included participants from a range of different trade areas. Focus groups with the university students included both under-graduate and post-graduate students. The early career teachers' focus groups consisted of teachers in their first five years of teaching.

The focus groups were conducted to provide complementary data and to add richness to the data collected through the online surveys. Discussions in the focus groups enabled clarification of issues and allowed views to be both challenged as well as accepted. Technologies were integrated into the research method through the data collection for the focus groups, using the electronic Zing system.

Zing is an Australian tool that combines hardware with a software application to enable the connection of multiple keyboards to a single computer to create a shared working space. It allows individuals and groups to work together in the same space and time. Zing is used in face-to-face settings, with several cursors working on the same screen at once. Each cursor is allocated its own self-contained display space which presents as a common image to all participants.

The Zing system is beneficial for assisting data collection in focus groups because it utilises facilitated discussions and the flexibility of the format characteristic of focus groups. Zing has the added benefit that it has the capacity for participants to simultaneously record their own thoughts electronically. The focus group format allows the researcher to explore unanticipated issues and encourage interaction among participants. Ideas recorded by participants into Zing means that the participants' views are collected directly, rather than indirectly through transcription processes. The participant records in Zing can be turned into text with two mouse clicks.

Using Zing offsets one of the weaknesses of traditional focus groups methods where discussions can be sidetracked or dominated by a few vocal individuals and the collection of data can be cumbersome. The traditional data collecting methods used in focus groups, (such as tape recorders and note takers), can be disconcerting to the participants and the transcriptions time-consuming for the researcher to produce. Zing generates reports immediately from the data recorded by participants, which enables data collection and analysis to be rapid.

The version of Zing used in this research had 8 keyboards linked to a portable computer thereby allowing a total of 9 cursors (i.e. the 8 key boards and the portable computer's cursor) to operate on the same screen at once. With the use of a datashow and large screen, research questions were shown visually to all the participants simultaneously, and read out by the researcher-facilitator.

Participants were encouraged to discuss the questions and then to record their individual responses with the keyboards. At the conclusion of each focus group, the Zing system generated reports of the responses from the participants. An analysis of the key themes has subsequently been undertaken.



Zing keyboards



Zing set up

The focus group participant numbers for each cohort of primary and secondary students, VET and tertiary international students studying education, pre-service teacher education students, and early career teachers, are shown in Table 2. Forty focus groups involving 299 participants were conducted.

Table 2: Participant numbers for focus groups

Participant cohort	Number of focus groups	Number of participants
Primary students	15	148
Secondary students	9	61
VET students	4	32
International students	2	6
Pre service teacher education students	5	25
Early career teachers	5	27
Total	40	299

Again, given the number of international students involved in the focus groups was small, the results from these students are taken as indicative only.

Most participants in this research had more than five years of experience using computers and the Internet. Almost all participants indicated they felt they know how to use the Internet. Table 3 summarises these characteristics about the participants.

Table 3: Years of experience using a computer & self-rated Internet knowledge

	Less than 1 yr %	1-3 yrs %	3-5 yrs %	More than 5 yrs %	Don't know %	Internet Knowledge	
						Yes %	No %
Primary students	3	12	30	50	6	100	0
Secondary students	1	6	8	84	2	97	3
VET students	5	0	10	85	0	100	0
International students	6	0	0	94	0	100	0
Pre service students	0	1	3	97	0	100	0
Early career teachers	0	1	7	93	0	100	0

Further details about the demographics of participants is available in Appendix One.

3. Findings

The data in each of the surveys has been collected and aggregated for each question and aggregated by topic across respective cohorts, with major themes within each survey and across respective surveys being identified. Data from the focus groups was collected electronically and analysed to determine major themes for each cohort. Analysis has involved aligning major themes from the survey and focus group data. In relation to VET students, analysis of the data collected has been made, and compared with that collected through the *2008 E-Learning Benchmarking Project*.

Key findings from the surveys and focus groups are presented here using the following themes:

1. Access and use of technologies;
2. Online and computer games;
3. Social networking;
4. Learning styles and educational value of technologies;
5. Support for learning with technologies;
6. Practicum experiences and becoming a teacher; and
7. Future expectations.

3.1 Access and use of technologies

Key findings

All participant groups reported

- ◆ high levels of use of computers and the Internet from
 - Home; and
 - Education and training institutions
- ◆ high levels of mobile phone ownership and use.

All participant groups reported

- ◆ Low levels or no use of computers and the Internet from:
 - Local libraries; and
 - Internet cafes

All participant groups indicated that

- ◆ technologies assisted their studies; and
- ◆ they felt confident using technologies in their studies.

3.1.1 Access to technologies

Participants reported their use of technologies includes computers and the Internet, mobile phones, digital cameras, video cameras, computer and online games and GPS systems. They mostly access the Internet and use the technologies at their disposal for specific purposes, including for education and training. This section reports findings specifically in relation to the most common technologies used for education and training purposes: computers, the Internet and mobile phones. This section outlines findings in relation to

- home access;
- frequency of access to technologies from education and training institutions; and
- main locations from which students access technologies.

Appendix Two provides further details about students' access to technologies

Home access

All participant cohorts reported high levels of computer and Internet access from home. Over 75% in all student cohorts accessed the Internet more than once per week from home with 70% of students in all cohorts except the primary students reporting they access the Internet daily from home.

Frequency of access to technologies from education and training institutions

Students reported accessing computers from within education and training institutions in computer laboratories (labs) and libraries, but with less access and use reported in classrooms and lecture theatres, as Figures 1 and 2 show. Everyday use of the Internet from computer labs is lowest for primary students and pre-service teacher education students, but primary and secondary students report Internet access once to twice per week from their schools' computer labs.

Figure 1: Regularity of access and use of the Internet in computer labs according to student cohort

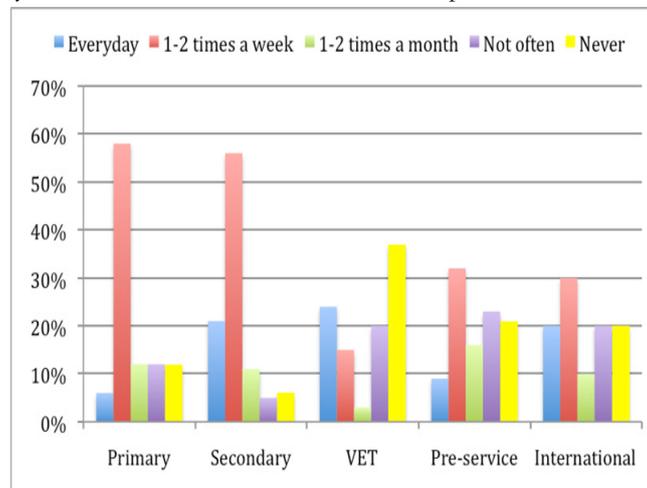
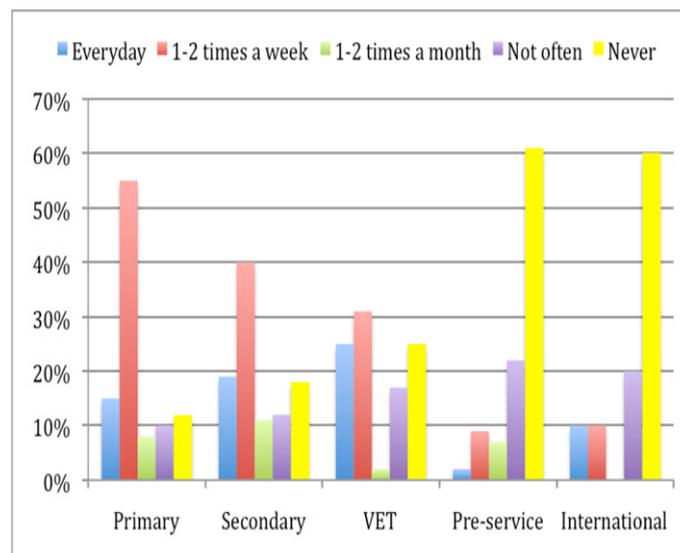


Figure 2: Regularity of access and use of the Internet in classrooms or lecture theatres according to student cohort



Figures 1 and 2 indicate that Internet access in classrooms and/or lecture theatres is highest among the primary and secondary school students. These findings were reiterated

in the focus groups, where the adult students and early career educators reported limited use of the Internet in lecture theatres. Indeed, 60% of pre-service and international student respondents indicated they never use the Internet in their lecture theatres, and about 20% of these students also reported they do not use the computer labs at their universities.

Main locations from which students access technologies

The main location to access computers and the Internet reported by participants, was at home. It can be seen in the figures below that the degree of home access to technologies increases with the age of the respective cohorts. Access from various locations in their respective education and training institutions was the second most common point of access, except for the university students. Very few participants reported accessing the Internet from Internet cafes and public libraries. Figures 3 to 6 provide further details about the locations each student cohort reported accessing the Internet.

Figure 3: Where primary students access the Internet

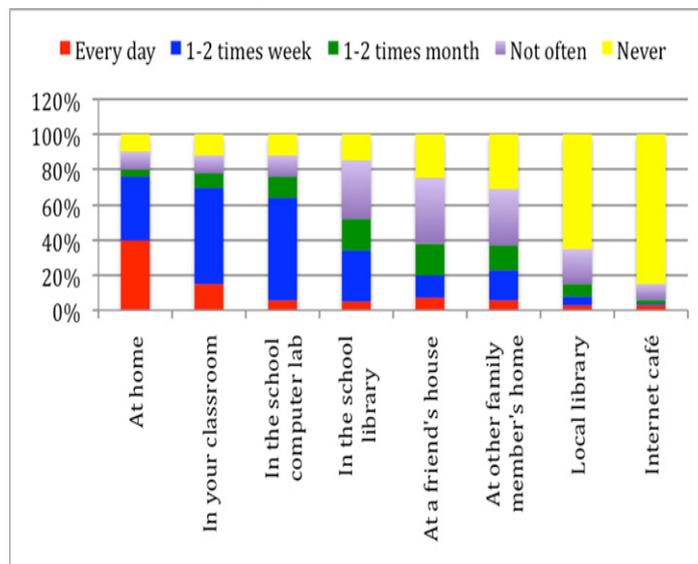


Figure 4: Where secondary students access the Internet

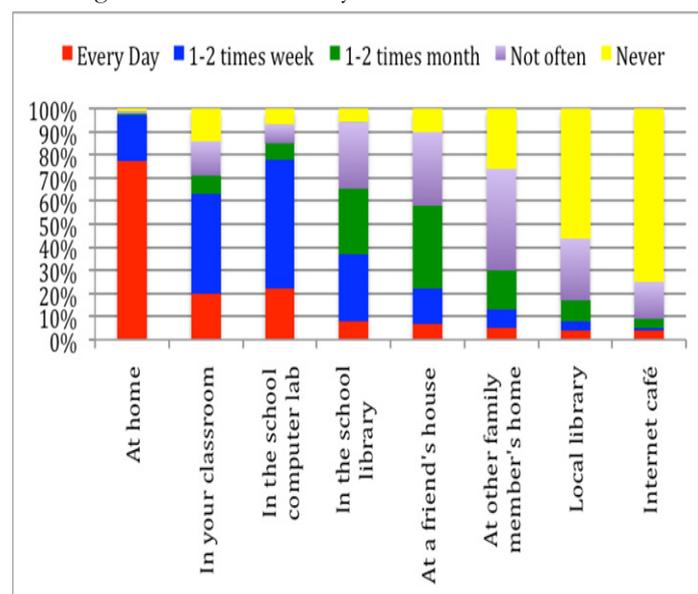


Figure 5: Where VET students access the Internet

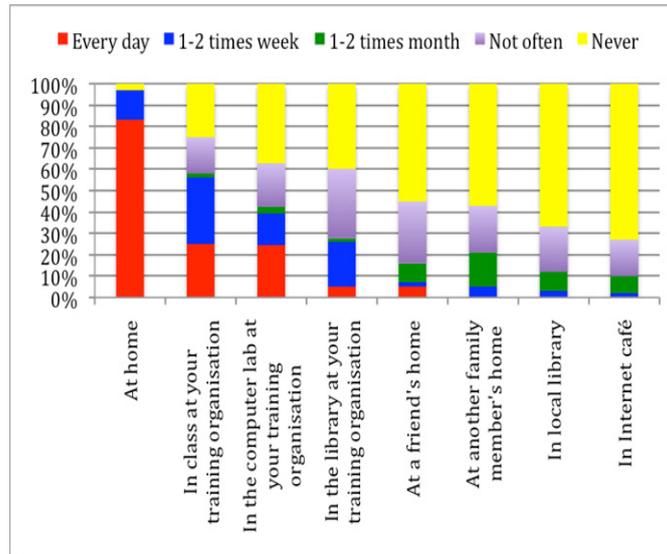
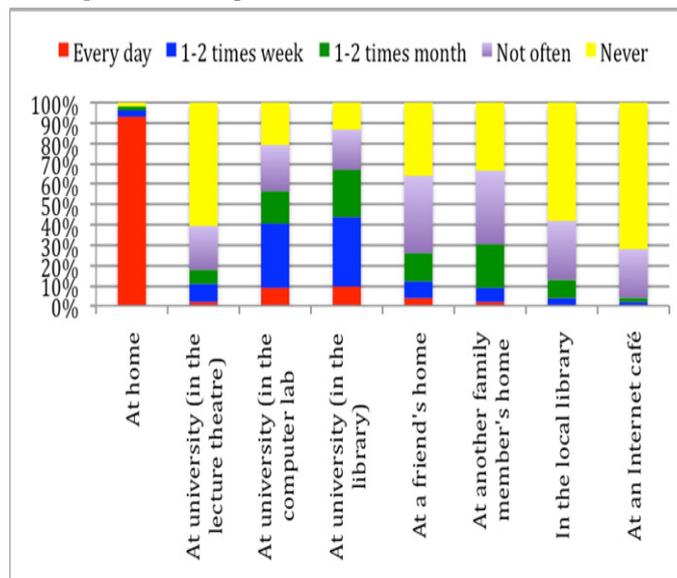


Figure 6: Where pre-service teachers access the Internet



3.1.2 Use of technologies

Participants in all cohorts reported using a range of technologies. Here, the use of the computer, Internet and mobile phones is reported.

Computer and Internet use

Across all cohorts, computers and the Internet were recognised as assisting with students' studies. Over 70% of all cohort groups agreed the use of computers and the Internet assists them with their studies 'most' or 'all of the time'. Similarly all cohort groups indicated the computer and the Internet assists them with their studies at home, 'most' or 'all of the time', although primary and secondary students gave lower responses to this question than the other cohorts. The majority of all cohorts except the primary students, indicated that computers and the Internet help them to control their learning. Table 4 summarise these results.

Table 4: Percentage of respondents who indicated that ‘most’ or ‘all of the time’ computers and Internet assist their studies

% response Agree most or all of time	Computer+Internet help with studies	Computer+Internet help study at home	Computer+Internet help control learning
Primary	71	67	47
Secondary	87	73	54
VET	97	94	85
International	100	100	88
Pre service	94	92	80
Early career	90	90	77

Respondents were also generally confident about their skills using computers and the Internet in their studies, as Figure 7 illustrates. All cohorts indicated that either ‘all the time’ or ‘most of the time’ they felt confident using the computer and the Internet for their studies. Similarly, the 2008 *E-Learning Benchmarking Project* also found that students expressed confidence in using technologies in their studies.

Figure 7: Extent of confidence in their use of computers and the Internet for their studies



Participants in the focus groups also indicated they were confident using technologies to assist their learning, and that they found using technologies motivational for their learning. The following statement from a primary school student is indicative of such sentiments.

We like to learn with hands-on activities like computers. Our favourite activities are putting our minds together to do cool subjects like science experiments and educational computer games and brainteasers.

Participants in all cohorts also reported they either ‘strongly agree’ or ‘agree’ they can use the Internet to locate information of interest to them generally, and for their studies. Primary and secondary students reported playing online games (primary 88% and secondary 70%), but these were of less interest to the adult students and early career educators.

Respondents to the surveys indicated they use the Internet for a variety of purposes including for:

- searching for information (range 91%-100%);
- finding locations (range 59%-94%);
- talking with friends using Instant Messaging (IM) (range 64%-94%);
- downloading music (range 42%-86%); and
- contributing to social networking sites (range 40%-69%).

Table 5 summarises these findings from the online survey results.

Table 5: Specific uses of the Internet across cohorts

% yes responses	Search for information	Play online games	Contribute to social Sites (eg MySpace Facebook)	Talk friends with Instant Messaging	Communicate with family members	Download music	Download media	Find Locations (eg Google earth)
Primary	91	88	40	64	50	55	26	59
Secondary	95	70	66	80	44	86	56	62
VET	100	18	48	70	71	42	42	85
International students	100	6	50	94	100	62	81	94
Pre service	100	36	69	72	86	70	61	77
Early career	100	48	66	69	90	74	72	93

Mobile phones

A high number of survey respondents across all groups indicated they can use a mobile phone. Primary students had the lowest affirmative response rate to being able to use a mobile phone, with 91% reporting they are able to do so. Mobile phone ownership ranged from 95-100% ownership (except for primary school respondents, of whom 55% reported ownership).

Table 6 shows the percentage of respondents in each cohort who reported ‘yes’ that they can:

- use a mobile phone (91%-100%);
- own their own mobile (55%-100%); and
- regularly use other people’s mobile phone (32%-64%)².

² International student data not included

Table 6: Use and ownership of mobile phones across the participant cohorts

% yes responses	Use mobile phone	Own a mobile phone	Use of other people mobile phone
Primary students	91	55	56
Secondary students	98	96	64
VET students	100	95	32
International students	100	100	31
Pre service teacher education students	100	99	51
Early career teachers	99	99	55

The mobile phone functions identified as being of highest use across the cohorts were for:

- phone calls (range 85%-100%);
- text messaging (range 70%-100%); and
- photography (range 44%-83%).

Table 7: Main functions used on mobile phones by all cohorts

% of responses from the respective student and educator cohorts	Phone calls	Text Messaging	Games	Photos	Video	Music listening
Primary	84	70	77	77	60	54
Secondary	90	94	50	83	51	60
VET	97	92	17	54	22	20
International students	95	100	19	44	12	38
Pre service	97	98	30	66	26	22
Early career	100	97	25	66	31	24

Other popular uses of mobile phones especially among primary and secondary students included:

- listening to music (primary 54% to 60% for secondary);
- playing games (primary 77%, secondary 50%); and
- using the video functions (particularly primary 60%, secondary 51%).

Table 8 provides an overview of survey respondents' less-used functions on mobile phones. Of interest here is the degree of use of the 'addresses' function reported by respondents.

Table 8: Other functions used on mobile phone by the respective cohorts

% of responses from the respective cohorts	Internet	Email	Diary	Download music	Radio	TV	GPS	Addresses	Notes	Share files
Primary	14	11	12	22	16	9	6	36	27	15
Secondary	13	6	7	10	10	2	9	49	13	32
VET	12	7	27	5	5	0	2	41	22	5
International	31	31	19	6	12	0	12	50	31	12
Pre service	17	4	28	4	9	1	8	42	23	6
Early career	28	15	47	7	15	1	7	63	25	4

Across all cohorts then, mobile phones now seem to be more a multi-function device that happens to be able to make phone calls, rather than being a telephone per se.

3.2 Online and computer games

Key findings

- ◆ All cohorts reported a level of interest in playing games on computers, online and on mobile phones, with school students showing the most interest in doing so
- ◆ Over a third of all respondents indicated they have played an online game, with over 95% of school students indicating they had done so
- ◆ Action and strategy games were reported as being of most interest to primary and secondary students
- ◆ Across all cohorts, most interest was expressed in strategy games
- ◆ A majority of school students indicated that playing computer games assists them to learn how to solve problems
- ◆ Fine motor skills (learning to be quick with their fingers) was reported by over 40% of all cohorts as a benefit of playing computer games
- ◆ Educational computer and online games were identified as having motivational worth for students' learning
- ◆ Games were also seen as a possible distraction in class to the learning by some students
- ◆ Some lack of surety was identified by the adult cohorts about the value of online and computing games for educational purposes

All cohorts indicated they play games on computers, online and on mobile phones, but the degree varied across respondent groups. It can be seen in Tables 5 and 7 (above) that there is high use of the Internet and mobile phones to play games by some groups, especially primary and secondary students: 88% of primary students and 70% of secondary students indicated they play online games. Almost all primary and secondary students indicated they had played online games (see Table 9 - 95% and 97% respectively), with 92% and 73% of these students also indicating they are 'interested' or 'very interested' in playing online games.

Table 9: Percentage of each cohort that reported having played online games and the degree of interest expressed in online games by cohort

%	Ever played online games?	Interested & Very Interested to play
	Yes	online games
Primary	95	92
Secondary	97	73
VET	51	15
Preservice	61	34
International students	56	37
Early career	32	37

Asked about their level of interest in different types of computer games, it can be seen from Table 10 that the school students were more interested in the different types of computer games than all other cohorts, except for pre-service and early career teachers' interest in strategy games. Primary students reported most interest in action, sport, driving and strategy

games while secondary students indicated most interest in action and driving games. Across all cohorts, strategy games were identified to be of most interest generally, although secondary students indicated more interest in action and driving games ahead of strategy games.

Table 10: Degree of interest in various types of computer games

% Interested & Very Interested	Action games	Sport Games	Driving games	Role Play games	Strategy games	Flight simulators	Other games
Primary	76	72	69	44	67	52	
Secondary	60	44	59	46	55	32	42
VET	30	24	30	30	42	21	35
International	20	25	26	20	30	5	10
Preservice	23	19	24	28	50	13	27
Early career	34	25	28	36	52	25	28

There were some cautions raised in the online surveys about the educational value of games however. About a third of all response groups ‘agreed’ or ‘strongly agreed’ that computing games can be a distraction to their learning (response range 28%-42%)³, as Table 11 illustrates. Interestingly though, the response rates for ‘not sure’ about whether computing games are a distraction or not, ranged from a fifth to about a third of the adult cohorts.

On the other hand, educational computer games were seen to be able to keep students’ interest in learning, where responses across the different cohort groups ranged from 62% to 73% for all groups except VET students, who had a lower response at 48%. While generally there was strong agreement to educational games engaging students in their learning, there was again a lack of surety about the value of educational computing games, with just under a fifth to a quarter of the adult respondents indicating they were unsure about whether educational computing games keep students’ interest in learning.

Table 11: Degree of agreement about the benefits or not of computing games

% responses	Educational computing games keep students’ interest in learning		Computing games are a distraction to my learning	
	Strongly agree or Agree	Not sure	Strongly agree or Agree	Not sure
Primary	73		37	
Secondary	67		42	
VET	48	27	28	32
Pre service	70	19	40	28
International students	71	24	65	29
Early career	62	21	38	22

There was also a degree of uncertainty expressed by the adult cohorts about what skills and abilities may be learnt by students playing computer games. Table 12 shows that while the majority of both primary and secondary students indicated in the online surveys they believe they learn to solve problems by playing computer games, the other cohorts in this study were not as sure. There was less conviction among all cohort groups about the value of computing games to assist with the development of interpersonal skills such as learning to work with others and learning to get on with other people. A majority of the school

³ International students showed 68% agreement that games are a distraction to their learning, but given the small number of respondents, this information is provisional only.

students indicated they learn how to make decisions; to solve problems; and gain dexterity from playing computer games.

Table 12: Degree of agreement about what is learnt by playing computer games

% responses By playing computer games I ...	Learn To Make Decisions		Learn to concentrate better		Learn to work with others		Learn to solve problems		Learn to get on with people		Learn to be quick with my fingers	
	Strongly agree or agree	Not sure	Strongly agree or agree	Not sure	Strongly agree or agree	Not sure	Strongly agree or agree	Not sure	Strongly agree or agree	Not sure	Strongly agree or agree	Not sure
Primary	57		49		46		54		41		72	
Secondary	44		38		35		54		30		63	
VET	20	36	28	27	18	38	26	29	16	36	41	25
Pre service	35	25	26	31	21	26	39	23	16	30	40	23
International students	30	59	30	53	31	56	30	59	18	47	47	41
Early career	37	32	32	33	28	31	39	27	23	30	48	28

There was some enthusiasm from the school students to use more computing games for their learning, while 40% and 45% of early career and pre-service teachers respectively also agreed that education institutions should use more computing games to assist students' learning. Primary and secondary students in the focus groups commented on their preferred learning styles citing computer and online games, hands-on learning, group work and self paced approaches with computers, as most preferred. Underpinning these teaching approaches was the view of participants that positive teacher relationships and well-structured activities support varied and effective teaching and learning approaches. School students also indicated they liked playing online games outside of school time, because of the complexity of the problem-solving required in these games.

Table 13: Views of whether more use of computing games should be used for learning

% responses	Education and training institutions should use more computing games for students' learning	
	Strongly agree or agree	Not sure
Primary	49	
Secondary	58	
VET	28	31
Pre service	45	38
International students	57	29
Early career	40	30

While interest in and use of online and computing games was reported particularly by school students, there was less surety about the value of such games for educational purposes among the adult cohorts. Other views expressed by the adult cohorts suggested however, that improving lecturers' knowledge of current directions in online games would improve students' learning. While some of the cohort responses indicated that the inclusion of computing and online games in students' learning would 'not help' or would only assist to a 'small' extent, over half the pre-service and early career teachers, to a 'medium' or 'high' extent did indicate that improving lecturers' knowledge of online games would assist in improving students' learning.

Further details about the views of pre-service teacher education students and early career teachers, are outlined in section 3.6: Practicum experiences and becoming a teacher.

3.3 Social networking

Key findings

- ◆ All cohorts indicated interest in YouTube and Flickr
- ◆ A majority of primary and secondary students indicated they use MSN for learning purposes
- ◆ Pre-service and early career teachers indicated they use Facebook to support their learning
- ◆ There were differing views expressed by the respective participant cohorts about the value of social networking and online media sites for students' formalised learning

Media sites such as YouTube and Flickr are of interest to all cohort groups. The social networking sites MySpace and Facebook were of more interest to the secondary students, pre-service and early career teachers than the other participant cohorts. Table 14 illustrates this.

Table 14: Degree of interest in social networking and media sites

%	Interested & Very interested MySpace & Facebook	Interested & Very interested YouTube & Flickr
Primary	41	77
Secondary	70	90
VET	49	61
Preservice	73	77
International students	56	75
Early career	67	75

Primary and secondary students in particular reported using MSN to assist in their learning. Indeed, the majority of respondents in these two cohorts indicated they use MSN 'sometimes' or 'most of the time' to chat with others to assist in their studies.

Table 15: Extent of use of social networking sites for learning

% Most of time/ Sometimes	Use Bebo	Use MSN	Use Myspace	Use Facebook	Use Livejournal	Use Live Windows
Primary	11	50	13	12	2	37
Secondary	13	71	45	28	5	43
VET	0	34	15	29	0	25
Pre-service	2	45	22	62	4	29
International	0	38	0	47	10	19
Early career	4	19	13	61	5	18

The data in Table 15 shows that while Bebo is used very little, MSN is used by a majority of primary and secondary students. The use reported of MSN however, differs between the early career teachers and the other student cohorts: 19% of early career teachers indicated they use MSN 'sometimes' or 'most of the time' for learning, compared with 50% of primary students and 71% of secondary students. Conversely, 61% of early career teachers and 62% of pre-service teachers indicated they 'sometimes' or 'most of the time' use Facebook for learning purposes compared to 12% and 28% of primary and secondary students, respectively. These findings were reiterated in the focus groups, where both pre-

service teacher education students and early career teachers outlined how they had self-initiated Facebook sites to foster discussion about aspects of their respective teacher education studies. They indicated they had initiated these sites to support discussions about their learning, albeit they were beyond the formal requirements of their courses.

The value of social networking sites for adult students can also be seen from Figures 8 and 9. While the school students indicated that social networking and media sites are more appropriate for use at home rather than at school, and are for fun rather than for learning, Figures 8 and 9 below illustrate that some cohorts disagreed with these statements. In general, the pre-service and early career teachers tended to disagree in larger numbers than the other cohorts about each of the statements in Figures 8 and 9.

Figure 8: Responses to statements about online media sites

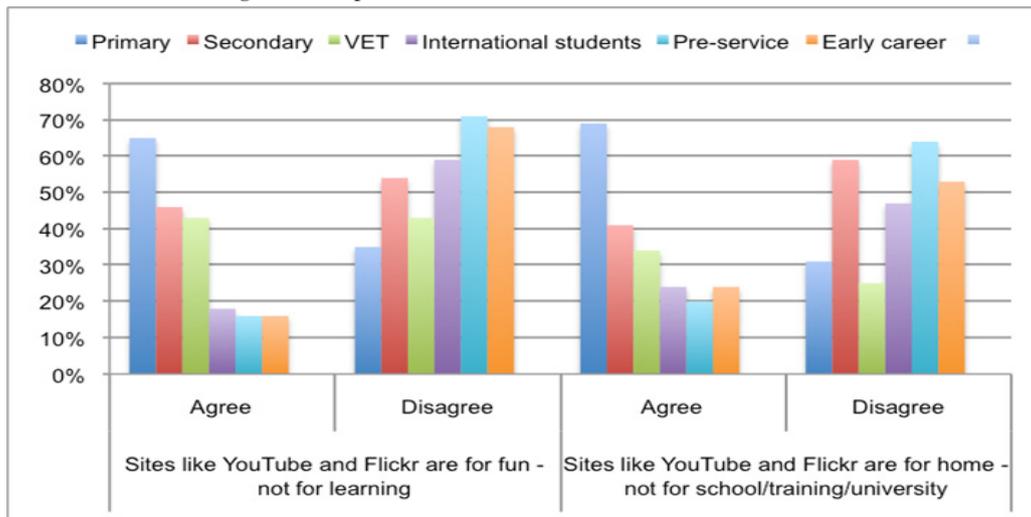
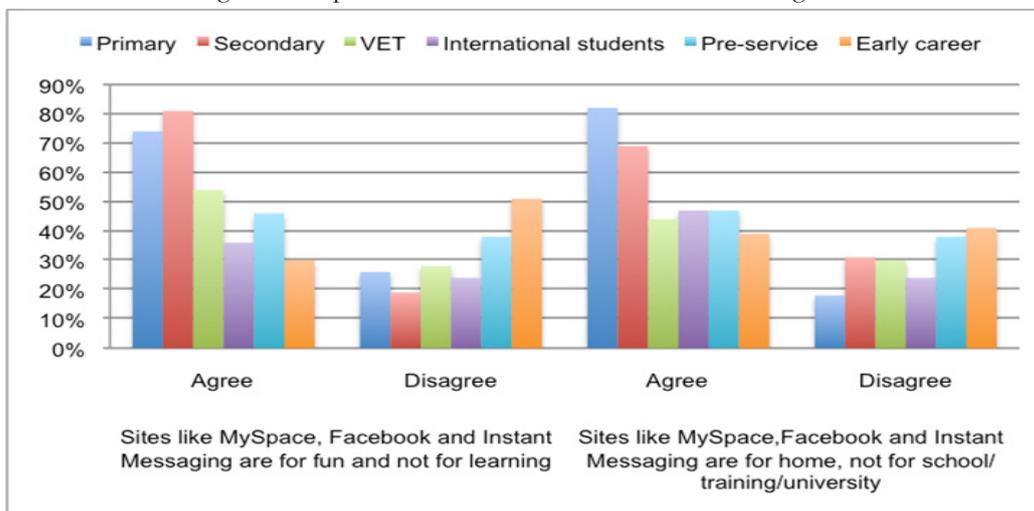


Figure 9: Responses to statements about social networking sites



It can be seen that the early career and pre-service teachers disagreed with the statements “sites like YouTube and Flickr are for home and not for school”; “sites like YouTube and Flickr are fun and not for learning”; and that “sites like MySpace, Facebook and Instant Messaging are for fun and not for learning”. In contrast, both primary and secondary students agreed that sites like MySpace, Facebook and Instant messaging were for use at home and not at school and are for fun and not for learning. Given the differing views about the value of social networking and media sites across the respective cohorts, more discussion about these sites within education and training communities is required.

3.4 Learning styles and educational value of technologies

Key findings

- ◆ Over 70% of all cohorts indicated they benefit from using technologies in their studies.
- All cohorts indicated
 - ◆ they prefer to learn using a variety of styles that are appropriate for the outcomes required
 - ◆ they like learning that includes technologies
 - ◆ ‘learning with technologies’ is one form of ‘hands-on-learning’
 - ◆ their learning experiences include working in groups, solving problems and using technologies
 - ◆ their learning experiences include a lot of time listening to teachers provide information
 - ◆ ‘good’ teachers were seen to be those who have strong interpersonal skills with their students
 - ◆ students in all cohort groups expect access to technologies in their education and/or training institution, albeit they may have access from home
 - ◆ the educational value of technologies rests in the assistance technologies provide to undertake both higher order or more complex activities (eg solving problems and analyzing information), as well as lower order activities (eg presentation of work and practicing skills).

All cohorts of participants through both the online surveys and the focus groups emphasised the importance of educators to be able to:

- form constructive relationships with their students;
- give simple explanations;
- structure relevant learning experiences for the outcomes to be achieved;
- use learning styles appropriate to both the content and the learners;
- ensure different learning styles are met;
- support students to learn the answers for themselves; and
- encourage activities that include technologies both for learning and assessment.

While respondents indicated their preferences for a variety of learning styles, a majority of respondents ‘strongly agreed’ or ‘agreed’ that “most of the time we have classroom lessons where the teachers/trainers give information and the students sit and listen”. It can be seen in Table 16 (over the page), the highest level of response to that statement was received from the pre-service teachers, with 82% indicating they ‘strongly agreed’ or ‘agreed’ they mostly listen to lecturers given information. The VET students were least in agreement, although 45% of those VET respondents also ‘agreed’ or ‘strongly agreed’. The high levels of agreement from pre-service teachers perhaps requires some further reflection, since it would appear that in their own learning they are experiencing one particular learning style more heavily than others.

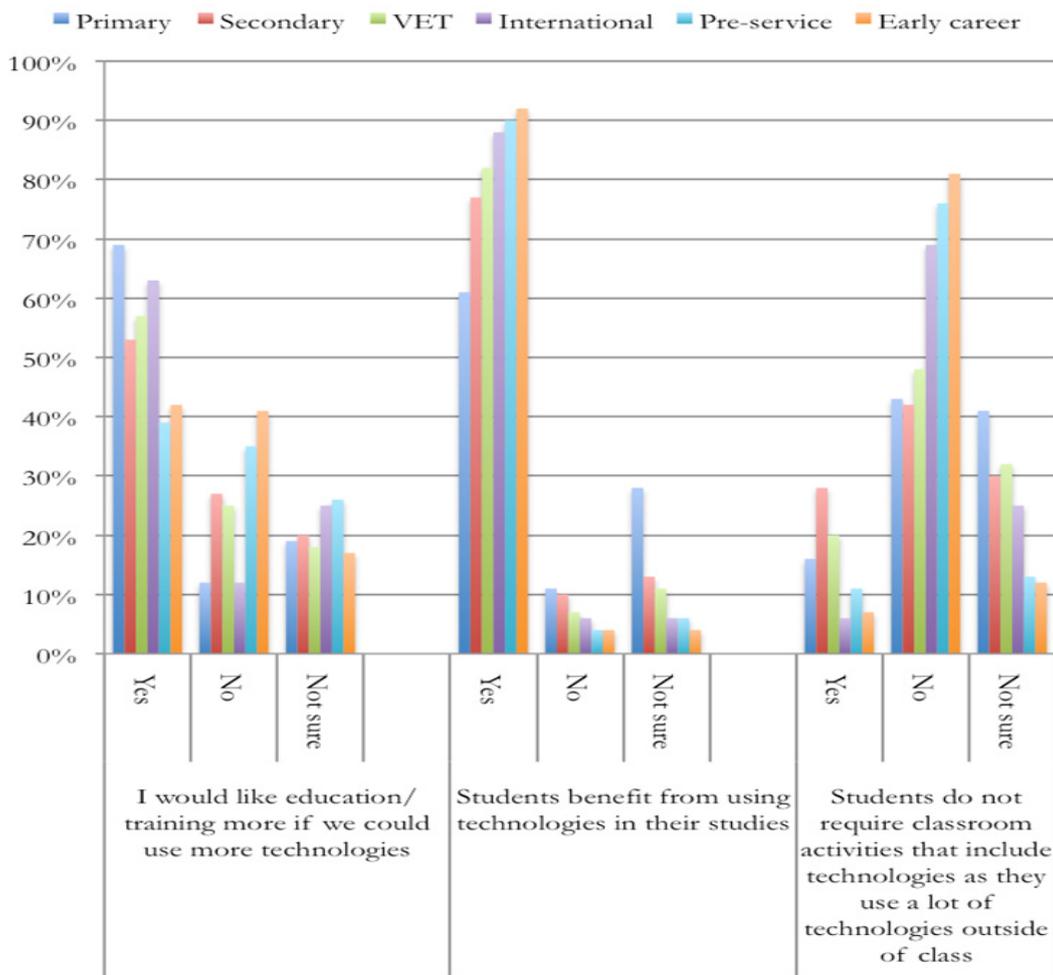
All cohorts were also of the view they feel it is important to have a say about what it is they are studying, and all cohorts indicated that in general, they do feel their views are taken seriously by their teachers/lecturers. The highest level of agreement on this matter was from the pre-service teachers. These findings provide some insights for teacher educators to consider.

Table 16: Degree of agreement to statements about their experiences of different characteristics of teaching & learning in education & training institutions

% Students Strongly agree/agree	Most of the time we have lessons where the teachers give information & students sit & listen	Work a lot with computers	Work in small groups	Do problem solving for learning	Feel views are taken seriously by teachers /lecturers	Feel it is important to have a say about what is being studied
Primary	59	59	52	60	50	65
Secondary	63	48	52	59	56	67
VET	45	82	69	82	73	87
International	63	63	75	69	50	81
Pre-service	82	47	72	73	62	85

Figure 10 (below) shows that when asked whether they would like school/training/university more, if they could use more technologies, all cohorts agreed they would.

Figure 10: Views of each cohort about including technologies into classroom activities



Primary students agreed most strongly. The VET students' findings in this study are consistent with those in the 2008 *E-learning Benchmarking Survey* which found 33% of VET

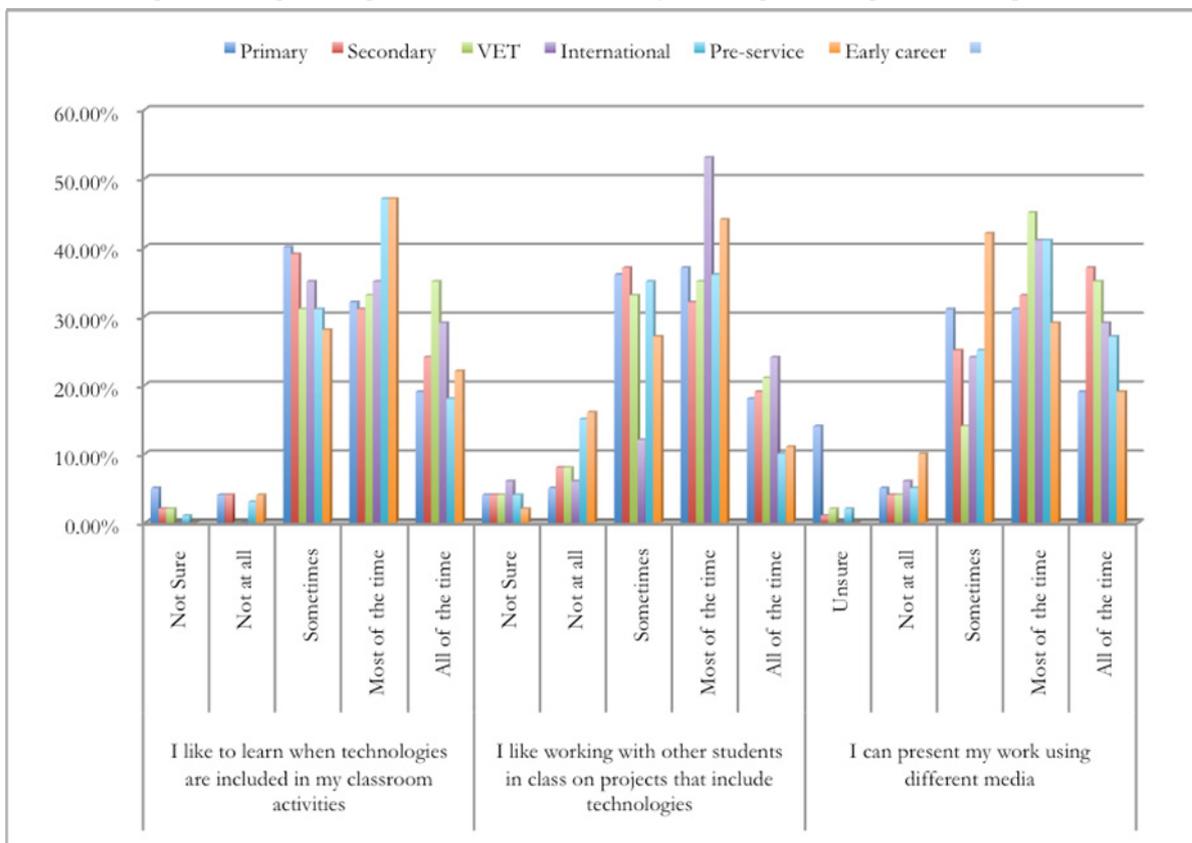
student respondents indicated they want ‘a lot’ of e-learning, and 46% indicated they want ‘some’ e-learning.⁴ Around 50% of the 2008 *E-learning Benchmarking Survey* student respondents also indicated the e-learning aspect of the VET courses was a factor in their choice of provider and course because of the flexibility and convenience provided with this mode of learning.⁵ Furthermore 60% of students responding to the *E-learning Benchmarking Survey* indicated that e-learning increased their engagement in learning.

Figure 10 also shows that all cohorts agreed that students benefit from using technologies in their studies, and furthermore, albeit students have access to technologies outside of their classes, all cohorts indicated they still think classes should include technologies. As a cohort, early career teachers and pre-service teachers were more strongly of the belief that students benefit from including technologies in their learning, but all cohorts agreed that students benefit from using technologies in their studies.

It can be seen too from these results that students find learning with technologies largely engaging, and that even though students have access to computers and the Internet outside of school, they nonetheless expect technologies to be included in their learning while at school, in their training, or studying at university.

Figure 11 shows that all cohorts indicated they like having technologies included in their studies, and like working with others where technologies are included. All cohorts also indicated they can present evidence of their work through the use of different media.

Figure 11: Degree of agreement about different ways of using technologies in learning



⁴ I & J Management Services (2008), *2008 E-learning Benchmarking Survey Final Report*, Australian Flexible Learning Framework, p33

⁵ Ibid, p2

Respondents in all cohort groups also indicated that computers and the Internet provide them with the capacity to undertake easy, fast and detailed research. Spell checking functions, neater presentation, lower physical demands of computers over handwriting, independent learning opportunities, online tutorials, opportunities to practice skills and improve to reading and writing, were specific benefits identified by participants. Figure 12 illustrates these findings from the surveys.

Figure 12: Degree of agreement to statements about how computers and the Internet are used by all cohorts

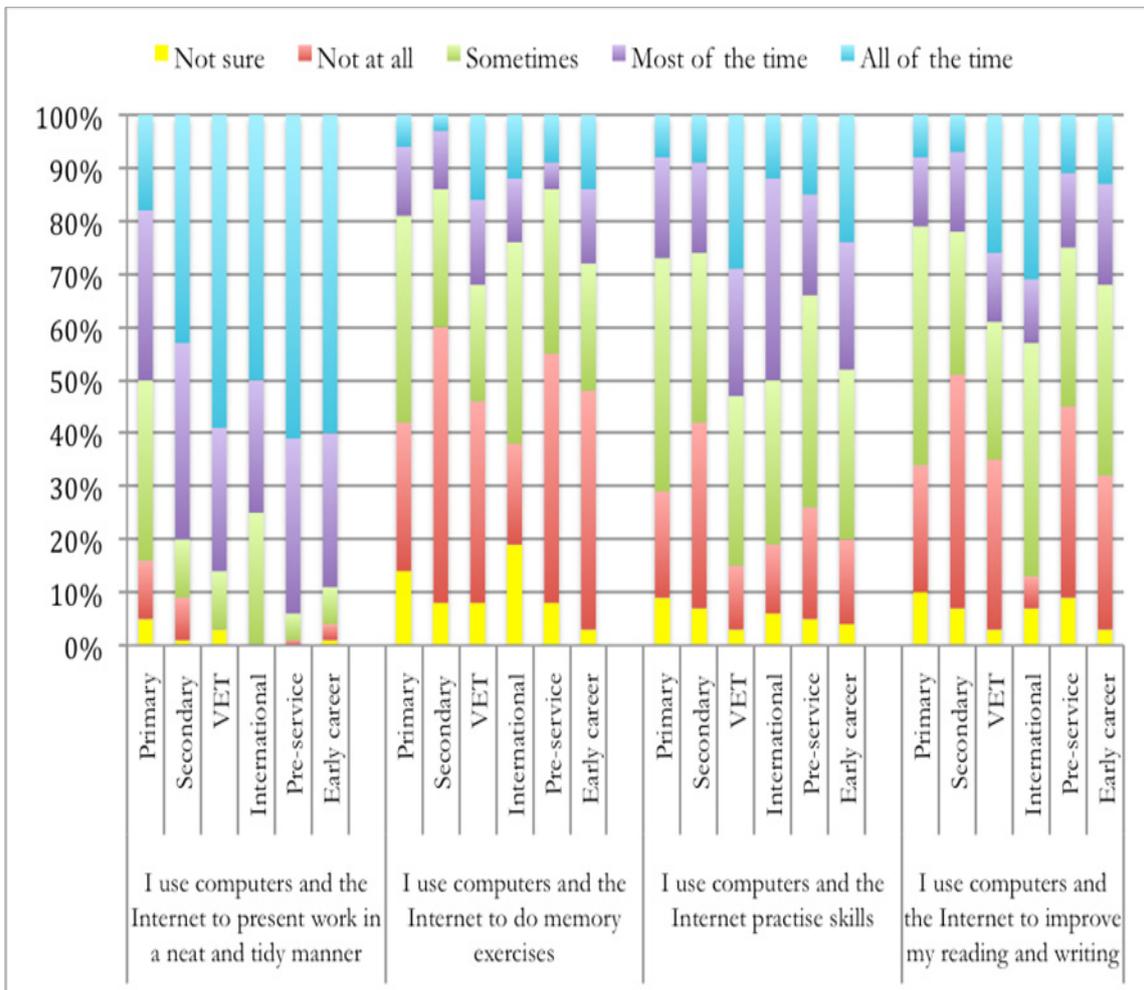


Figure 12 also shows that across all cohorts, a majority of the respondents use the computer and Internet to assist in skills development and practice, including for improving reading and writing and for memory development. As one secondary student stated in a focus group:

Technology only helps us to find facts and to help us write reports and to memorise things.

Beyond using technologies for neatness, practice and drill purposes, over a quarter of online survey respondents indicated they also use computers to assist them in their studies to:

- solve problems;
- analyse information;
- test ideas;
- discuss issues with others; and
- learn from others.

Table 17 illustrates that in general, using computers and the Internet in more complex ways is done so by the adult students more than by the school students.

Table 17: Degree of agreement across cohorts about ways of using computers and the Internet for learning

I use the computer and the Internet to ... % responses Agree most or All of time	Learn with others	Solve problems	Discuss issues with other students	Test ideas	Analyse information
Primary	31	28	17	23	32
Secondary	44	48	33	32	42
VET	68	67	43	51	56
International	81	69	44	25	44
Preservice	56	71	44	38	57
Early career	68	79	43	56	72

Similarly, the adult cohorts of participants indicated that they ‘most’ or ‘all of the time’ use computers and the Internet to undertake activities related to their studies. Table 18 provides some insights into the extent to which participants agreed with statements about how they use computers and the Internet to plan and reflect on their studies, and to communicate with their teachers and/or lecturers and other students.

Table 18: Degree of agreement about ways participants use computers and the Internet to support their learning

I use the computer & Internet to ... % responses Agree most or all of time	Make concept maps of ideas	Reflect on things learnt	Plan study	Be creative	Communicate with teacher/ lecturer outside of class	Communicate with other students outside class	Work with other students on an activity	For specifically designed tasks
Primary	14	24	25	42	9	42	22	21
Secondary	17	25	32	44	22	59	31	25
VET	25	47	48	52	50	50	46	59
International	44	50	56	56	47	40	25	25
Pre-service	25	39	46	62	64	60	45	42
Early career	45	45	75	69	72	34	59	64

These results are consistent with findings by the *2008 E-learning Benchmarking Survey* which showed that around 70% of students indicated confidence in the use of computers and technology prior to course commencement and that this confidence increased through undertaking their studies using some e-learning.⁶ Furthermore, 39% of respondents in the *2008 E-learning Benchmarking Survey* indicated they had participated in an online group discussions in their course; 48% had posted messages to a group through an online bulletin board; and 62% had participated in structured email communication involving learners and /or lecturers.⁷

⁶ I & J Management Services (2008), *2008 E-learning Benchmarking Survey Final Report*, Australian Flexible Learning Framework, p2

⁷ Ibid, p32

3.5 Support for learning with technologies

Key findings

- ◆ The majority of university students surveyed consider their lecturers' skills in teaching and learning with technologies could be improved
- ◆ All cohorts indicated they feel
 - they are safe online within their education or training institution; and
 - their private online information is safe at their education or training institution
- ◆ No cohorts indicated major concerns about online bullying or the receipt of unwanted emails at their education or training institution
- ◆ About a third of participants in all cohorts consider the Internet speed at their education or training institution is not fast enough
- ◆ About half the adult students indicated they are able to receive assistance from their lecturers outside of class via the Internet, and less than 20% of the school students indicated this to be the case.

All cohorts indicated they agree there are enough people within their respective institutions to assist them with technical issues. Views varied across the respective cohorts however, about the ability of teachers and lecturers to support students in their learning with technologies.

Table 19 shows that although a majority of primary and secondary students agreed that 'most' or 'all of the time' their teachers' and/or lecturers' skills with technologies are 'good', these views were not held by the pre-service and early career teachers. Only a third of the pre-service and early career teachers agreed 'most' or 'all of the time' their lecturers' skills with technologies are 'good'. Furthermore just over a quarter of pre-service teachers and just over a third of early career teachers agreed 'most' or 'all of the time' their lecturers are able to support their learning with technologies. Alongside of this, half of the pre-service and almost half of the early career teachers indicated they agree 'most' or 'all of the time', their teachers' and/or lecturers' skills with technologies could be improved.

Table 19: Degree of agreement about access by participants to support of teachers/lecturers, and participants views about the skills with technologies of teachers/lecturers for teaching and learning

% responses Agree most or all of time	There are enough people to assist me with technical issues at school/training/ university	My teacher/lecturer is able to support my learning with computers and the Internet	My teachers'/lecturers skills with technologies are good	My teachers' /lecturers' technical skills could be improved
Primary	63	57	54	28
Secondary	73	51	54	44
VET	59	64	63	22
International	38	51	43	33
Pre service	58	28	33	50
Early career	57	36	30	45

Although the majority of school students rated their teachers skills with technologies as able to support their learning, these sentiments were not so strongly expressed in the focus groups. The following statement from a secondary student indicates that some students support their teachers to learn about technologies.

Most of the time we teach the teachers about IT. Well it depends on the teacher. We don't teach the IT teacher.

The majority of participants in all cohorts indicated they feel safe on the Internet at their education or training institution and that similarly, they feel their private information is safe online within those institutions. Neither online bullying or unwanted emails were considered to be much of an issue for these participants, although the primary student cohort reported the highest number of participants 'agreeing' that online bullying occurs at their schools. Table 20 presents these findings. Plagiarizing, online bullying, viruses, and the blocking and filtering of websites were raised as issues by some participants in the focus groups. These issues however, were not considered major issues by the survey respondents. It should be noted though that the highest level of agreement to statements about online bullying came from the primary students. Around half of all respondent groups on all of these issues however, indicated these issues were not at all of concern.

Table 20: Degree of agreement about online activities occurring at school/training/university

% responses Agree most or all of time	Online bullying occurs at my school/training/ university	Unwanted emails is a problem at my school/training/ university	I feel safe on the Internet at school/training/ university	I feel that my private information online is safe at school/training/ university
Primary	17	14	72	53
Secondary	9	15	84	70
VET	2	13	77	72
International	0	12	57	57
Pre service	1	11	79	76
Early career	3	12	75	68

Teaching and learning with technologies is possible when the infrastructure works: the Internet is fast enough for students to undertake activities using it, and the computer programs work without problems, and without viruses. When the infrastructure works then teaching and learning with technologies can be seamless: not be noticed and be a normal part of teaching and learning. It can be seen in Table 21 that about a third of primary (36%) and VET students (37%), and less than half of the pre-service teachers (44%) agreed that 'most' or 'all of the time' the Internet speed at their school, training institution or university, is fast enough for their learning requirements. Similar numbers of respondents conversely however, did not think it was fast enough 'sometimes' or 'at all'.

Participants commented in the focus groups however, that accessing computers and the Internet is not the endpoint for their learning. It is the application of these technologies to their studies that is important, as the following statement from a VET student indicates.

Practical application of learning requirements within the classroom would help aid in comprehension and retention of material. More use of technology within the classroom

environment to help aid us in the use of this technology in the environment would also help as would faster computers within the campus.

The majority in all cohorts agreed the computer programs worked at their education or training institution, although again the primary students were the least convinced of this statement. Similarly, viruses were not seen as getting in the way of using computers at school, in training or at university, although the primary students reported the highest agreement ‘most’ or ‘all of the time’, that viruses stop them from using the computers at school. Table 21 illustrates these findings.

Table 21: Degree of agreement about some technology functions in education and training institutions

% responses Agree most or all of time	Internet speed is fast enough for me at my education or training institutions	The computer programs work at school/training/university	Viruses stop me using the computers at school/training/university
Primary	36	53	18
Secondary	57	71	10
VET	37	70	4
International	61	63	6
Pre service	44	73	2
Early career	64	66	10

All participant cohorts in the focus groups expressed a level of concern about the extent of filtering and blocking of websites they would otherwise like to access for their studies. The degree of agreement to the statement in the online survey that “there are some sites that I would like to use for my studies I am not allowed to use at school/training/university”, received less agreement from the adult cohorts, but a majority of the secondary students (64%) and over 40% of primary students agreed with the statement ‘most’ or ‘all of the time’. While only 5% of pre-service teachers agreed that filtering limited their access to sites they would otherwise want to use, 27% were ‘unsure’. Table 22 also shows that about a third of the respondents indicated their teachers are concerned about students’ plagiarizing from the Internet although this was lower for VET students (21%) and higher for secondary students (42%).

Table 22: Degree of agreement about use of Internet by participants

% responses Agree most or all of time	There are some sites that I would like to use for my studies that I am not allowed to use at school/training/university	My teachers/lecturers are concerned about plagiarism
Primary students	42	36
Secondary students	64	42
VET students	25	21
International students	0	38
Pre service teachers	5	36
Early career teachers	19	38

Table 23 shows around half the adult students (44-51%) agreed that ‘most’ or ‘all of the time’ they are able to receive assistance from their lecturers outside of class via the Internet. Only 12% of primary students and 18% of secondary students agreed this was the case with their

teachers. Furthermore, between a third and a half of pre-service and early career teachers agreed that ‘most’ or ‘all of the time’, they had been able to get assistance from other classmates, but this response rate fell to 20% for primary students.

Table 23: Degree of agreement about support from teachers and other students using the Internet

% responses Agree most or all of time	I get help from teachers/lecturers outside of class using the Internet	I get help from other students outside of the class using the Internet
Primary students	12	20
Secondary students	18	28
VET students	47	44
International students	47	46
Pre service teachers	44	38
Early career teachers	51	50

Participants in the focus groups made suggestions for improving the quality of teaching and learning with technologies. Not all suggestions included technologies, but all suggestions were considered to impact on the quality of teaching and learning with technologies. Their suggestions included:

- improved teacher relationships and more varied and interesting learning approaches;
- personalized learning approaches and more individual help;
- smaller class sizes;
- faster equipment and Internet access;
- more computer access e.g. a laptop per student;
- the use of more educational games;
- less websites blocked;
- more podcasts produced for home access to lectures and lessons;
- the continuance of face-to-face teaching and learning but with technologies included;
- professional learning of educators about teaching and learning with technologies;
- better communication with students from teachers/lecturers including via the Internet;
- care with overuse of presentation slides, interactive whiteboards and lecturing;
- the continued use of text books;
- the use of more simulations to enhance experiences; and
- the provision of practice tests, sample exercises that are available online.

It will be interesting to reflect upon these findings in 2010, in light of the Australian Government *Digital Education Revolution*⁸ policy initiatives. During 2008 and 2009, as a result of the *Digital Education Revolution*, deployments of computers have been made to all Australian secondary schools students in years 9 to 12. The intention is to give each student in these year levels access to computing technologies at school. It would probably be instructive to re-administer the online surveys and focus groups questions used in this research in 2010, to ascertain whether students’ views and expectations about the quality of the infrastructure, and their perspectives about the capabilities of their teachers/lecturers, have changed over time.

⁸ See <http://www.digitaleducationrevolution.gov.au>

3.6 Practicum experiences and becoming a teacher

Key findings

- ◆ The majority of both pre-service teacher education students and early career teachers indicated to a ‘medium’ or ‘high’ extent that
 - pre-service teacher education would benefit as a result of greater use of social networking sites; and
 - lecturers' knowledge of current directions in online games would have improved their pre-service teacher education studies
- ◆ About half of the pre-service teachers and early career educators indicated their lecturers had not assisted them at all with strategies for keeping safe on the Internet during their teacher education studies
- ◆ Over 40% of both pre-service teacher education students and early career teachers included technologies in their own classroom activities, once to twice a week during practicum
- ◆ Both pre-service teacher education students and early career teachers indicated they
 - received little assistance to learn how to include technologies into their classroom practices; and
 - expressed concerns about the quality of the support from both their university lecturers and supervising teachers about teaching and learning with technologies, when on practica
- ◆ Between a third and almost a half of the pre-service and early career teachers respectively, considered there was ‘insufficient’ or ‘rarely sufficient’ technical support available in their practicum schools.

This section outlines findings from the data gathered from pre-service teacher education students and early career teachers about their university and practicum experiences. Early career teachers were defined as being in their first five years of teaching. In addition to the core suite of online survey and focus group questions, the pre-service teacher education students and the early career teachers were asked questions about their views and experiences of their preparations for becoming a teacher: pre-service teacher education students were asked about their experiences in their practicum and that of their university classes. Similarly, early career teachers were asked to reflect on their experiences on practicum and as pre-service teacher education students.

A total of 235 pre-service teacher education students and 100 early career teachers completed the online survey and 25 pre-service teachers and 27 early career teachers from the schools and VET sectors participated in the focus groups. Of the pre-service teachers

- 74% indicated they were studying an under-graduate teacher education degree;
- 13% indicated they were studying a diploma of education; and
- 13% indicated they were studying a post-graduate education qualification.

Of the pre-service teacher education students:

- 35% reported they were in their first year of their qualification;
- 13% reported they were in their second year of their qualification;
- 19% reported they were in their third year of their qualification;
- 31% reported they were in their fourth year of their qualification; and
- 2% reported they were in their fifth year of their qualification.

86% of the pre-service teachers indicated they were full-time students and 14% part-time. 79% of those completing the online survey indicated they were female and 21% indicated they were male respondents. The majority of the pre-service teachers indicated they were preparing to become either a primary or secondary school teacher. Appendix One provides further details of the year levels for which both the pre-service and early career teachers were preparing to become.

The early career teachers were also asked about the type of teacher education qualification they had undertaken. Of the 100 early career respondents,

- 53% indicated they had completed an under-graduate teacher education degree;
- 18% indicated they had a diploma of education (ie following another degree); and
- 29% indicated they had completed a post-graduate education degree.

The early career teachers were also asked to indicate in what year of teaching they were.

- 27% indicated they were in their 1st year of teaching;
- 15% indicated they were in their 2nd year of teaching;
- 30% indicated they were in their 3rd year of teaching;
- 12% indicated they were in their 4th year of teaching; and
- 16% indicated they were in their 5th year of teaching.

Of the early career teachers, 80% of the respondents indicated they completed their teacher education qualification full-time and 20% indicated they completed it on a part-time basis. 34% of the early career teacher respondents indicated they were male and 66% indicated they were female. 23% of the early career teachers indicated they were currently undertaking post-graduate study.

The majority of the early career teacher respondents (55%) indicated they currently work in government schools; 10% of the respondents indicated they work in Catholic schools; and 12% indicated they work in Independent schools. A further 14% indicated they work in a registered training organisation and 5% indicated they work in a university. Another 4% indicated they work in other education and training institutions.

A summary of the demographics of the pre-service teacher education students and early career teacher participants involved in this research, is provided in Appendix One.

The responses from the participants in this study suggest there is room for improvement in the quality of teacher education programs in relation to preparing these new educators to include technologies into their own teaching and learning practices. In the focus groups the pre-service teacher education students indicated the opportunities for learning how to include technologies into their classroom activities within their practicum experiences, varied according to the schools and teachers in which they were placed.

Both the pre-service teacher education students and the early career teachers did express concerns about the ability of their university lecturers and their supervising teachers to assist them to learn how to include technologies into their teaching and learning while on their respective practica. Figures 13 and 14 provide insights into students' views about the quality of the skills of their supervising teachers on practicum, and of their lecturers at university. Only 26% and 19% of the pre-service teacher education students and early teachers respectively, thought that 'most of the time' their supervising teachers skills with

technologies were high enough to support them to include technologies into their classes while on practicum.

Alongside of these findings, 74% of the pre-service teacher education students and 82% of the early career teachers indicated to a ‘medium’ and ‘high extent’ that their lecturers’ technical skills required improvement.

Figure 13: Students’ views of their supervising teachers on practicum

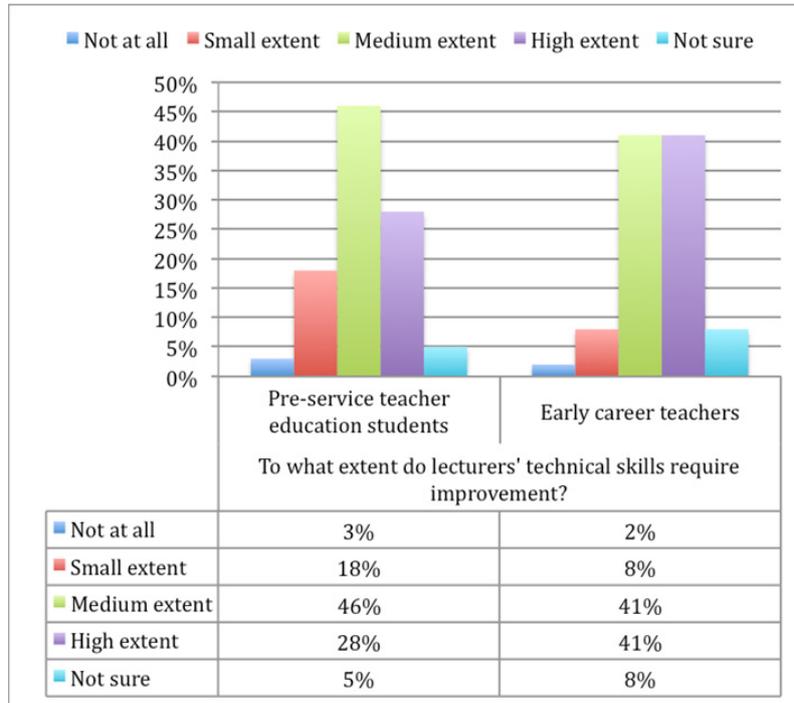
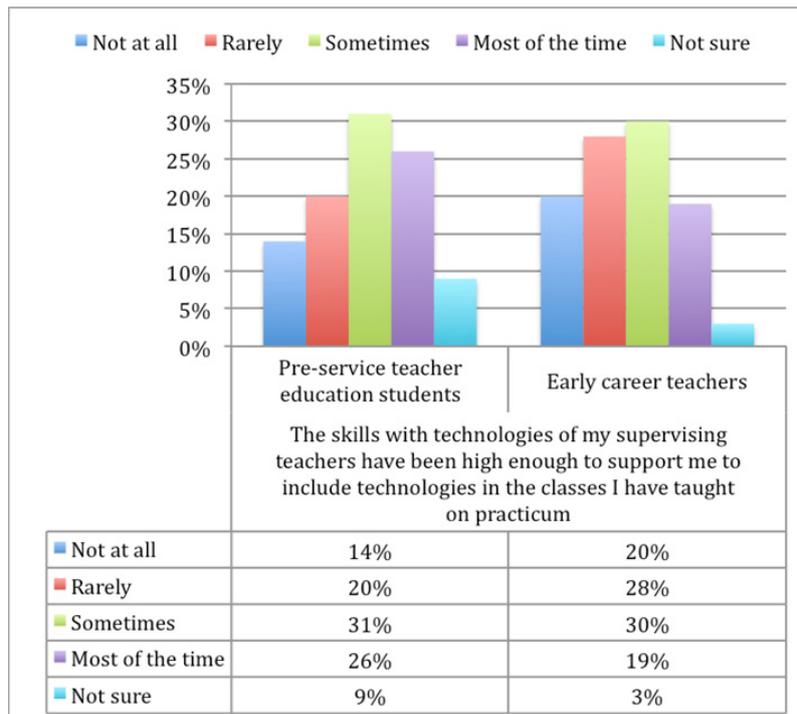


Figure 14: Students’ views of lecturers’ technical skills



Similar findings emerged from the focus groups. Early career teachers in the focus groups also reported that many of their in-school supervisory teachers had only basic level technology skills related to Internet use, emailing, word processing and administration purposes. These participants indicated they felt their supervisory teachers did not have the skills relevant to the workplace, referring to the curriculum, classroom management and administration skills required to include technologies in their teaching and learning. There was also a theme of concern in the focus groups about the quality of students' practicum experiences citing:

- minimal feedback from their supervisory teachers;
- lack of freedom (eg in planning, activities, classroom methodologies);
- negativity from older teachers about the profession; and
- a sense of artificiality of the experiences.

Focus group respondents highlighted that the skills of many of their supervising teachers' skills were of varying quality, with some teachers using little technology in their own teaching and learning and having limited access to technologies. These respondents indicated that they thought it was important that for their practica, they were placed into positive school cultures where there was a critical mass of skilled and enthusiastic teachers able to include technologies in their classroom activities, who could be their role models.

A smaller number of focus group participants however, did report positive encouragement to include technologies into their classroom activities while on practicum. Several early career teachers reported in the focus groups that their skills in the use of interactive whiteboards were improved during their practica. The following comment by one participant is indicative of this.

Using technologies was very much encouraged. The classroom teacher was very skilled at using the interactive whiteboard and took the students for computing classes once a week. The students also used computers in the classroom every morning. For me this was the first time I had used the interactive whiteboard and I had not been given any experience with this before, so it was a steep learning curve for me.

Findings from the online surveys, summarised in Table 24 below shows that both pre-service teacher education students and early career teachers indicated to a 'medium' to 'high' degree that their lecturers' skills and knowledge of technologies could be improved. These participants also indicated in the online surveys, that pre-service teacher education courses would benefit from inclusion of computers and the Internet in their lectures, and from the greater use of social networking sites. Furthermore they indicated that the knowledge of lecturers about current directions in online games would improve pre-service teacher education studies. About half the pre-service and early career teacher respondents also indicated they had not received any guidance from their lecturers about how to stay safe on the Internet.

Table 24: Pre-service teacher education students and early career teachers responses about their views and experiences of their teacher education courses and lecturers' skills

Extent of agreement to the following questions		Not at all	Small extent	Medium	High extent	Not sure
To what extent should pre-service teacher education classes include computers and the internet in lectures?	Pre-service	1%	10%	44%	44%	1%
	Early career	3%	4%	33%	57%	3%
To what extent could pre-service teacher education benefit as a result of greater use of social networking sites?	Pre-service	3%	17%	45%	31%	4%
	Early career	0%	20%	31%	44%	5%
To what extent do lecturers' technical skills require improvement?	Pre-service	3%	18%	46%	28%	5%
	Early career	2%	8%	41%	41%	8%
To what extent do you believe lecturers' knowledge of current directions in online games would have improved your pre-service teacher education?	Pre-service	10%	27%	28%	23%	12%
	Early career	12%	28%	28%	26%	6%
Did your lecturers assist you with strategies for keeping safe on the internet?	Pre-service	52%	28%	11%	3%	6%
	Early career	49%	19%	17%	8%	7%

In response to the online survey question about how often they were able to include technologies into their teaching and learning with school students when on practicum however, about a fifth of the pre-service and early career teachers indicated they were able to do so daily. Over 40% of both cohorts reported they did so once to twice a week. Figure 15 below illustrates these findings. Data from the focus groups however suggests that these students included technologies in their practicum classroom activities in spite of the support they received rather than because of it. The following quote from a pre-service teacher is indicative of the sentiments expressed in the focus groups.

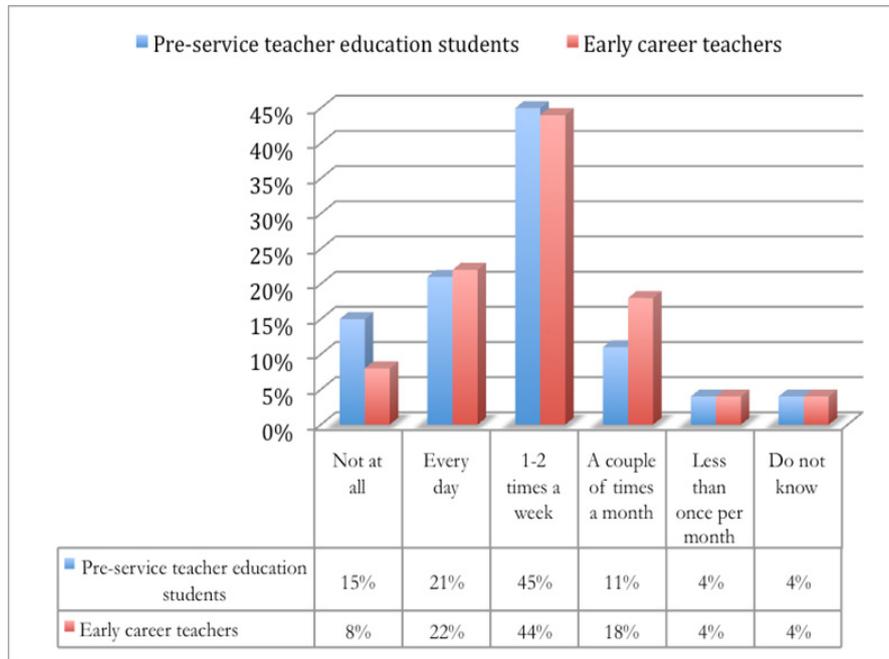
On a couple of occasions I borrowed a data projector from the library and I brought in my own laptop. I was told putting that much effort into a lesson is not worth it: stick to the whiteboard and textbook. I was told that the best strategy is to get kids to do rote learning by copying what is put on overhead projector.

The barriers to including technologies into teaching and learning expressed by the pre-service and early career teachers concerned their skills and confidence with classroom and behaviour management strategies. In the focus groups, both the pre-service teacher education students and the early career teachers indicated they required the classroom management skills to include technologies into their practicum classes. The following reflection from a pre-service teacher illustrates this point.

I am still learning behaviour management. I find computer lessons a bit difficult if students want to be loud, silly, need constant help and supervision. I also find time-wise it is more beneficial to get a heap of books out of the local library to use for class research rather than spend a heap of time looking up websites that are usually too difficult for year 4's to read. I have used digital cameras for taking photos of freeze frames e.g. for religion, and planning to make Powerpoints™.

These findings suggest that while the pre-service teacher education students were keen to include technologies into their classroom activities while on practicum, they felt they did not receive enough guidance or feedback about suitable strategies to do so.

Figure 15: Frequency of inclusion of technologies in their teaching and learning during practicum



Pre-service teacher education students and early career teachers were also asked their views about the impact of including technologies into students' learning, based upon their practicum experiences. These respondents' views are mostly based on experiences drawn from practica in two or more schools. Figure 16 summarises the number of schools in which pre-service teacher education students and early career teachers reported they had undertaken their practica.

Figure 16: Number of schools in which practicum had been undertaken by participants

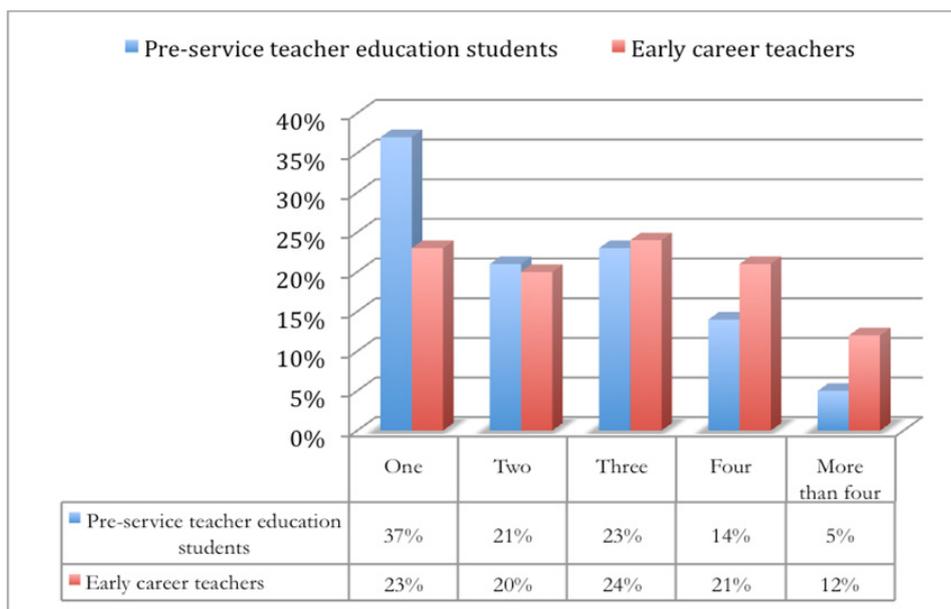
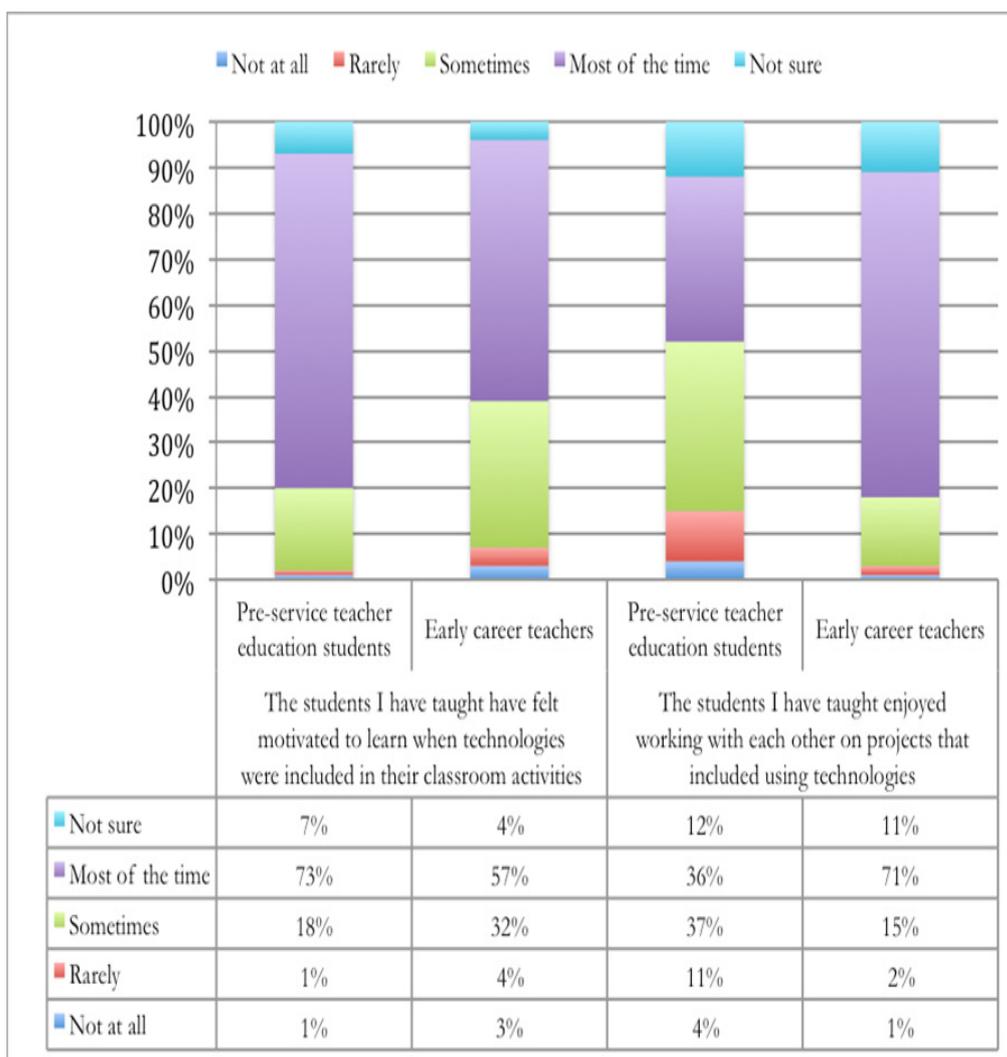


Figure 17 shows that both cohorts believed the students they taught during their practica felt motivated when learning with technologies. Figure 17 also shows that the majority of the pre-service teacher education students and early career teacher online survey respondents indicated that ‘sometimes’ or ‘most of the time’ the students they taught during their respective practica, enjoyed working with each other on projects that included learning with technologies.

Figure 17: Extent of motivation and enjoyment by the students taught by pre-service teacher education students and early career teachers during their practica



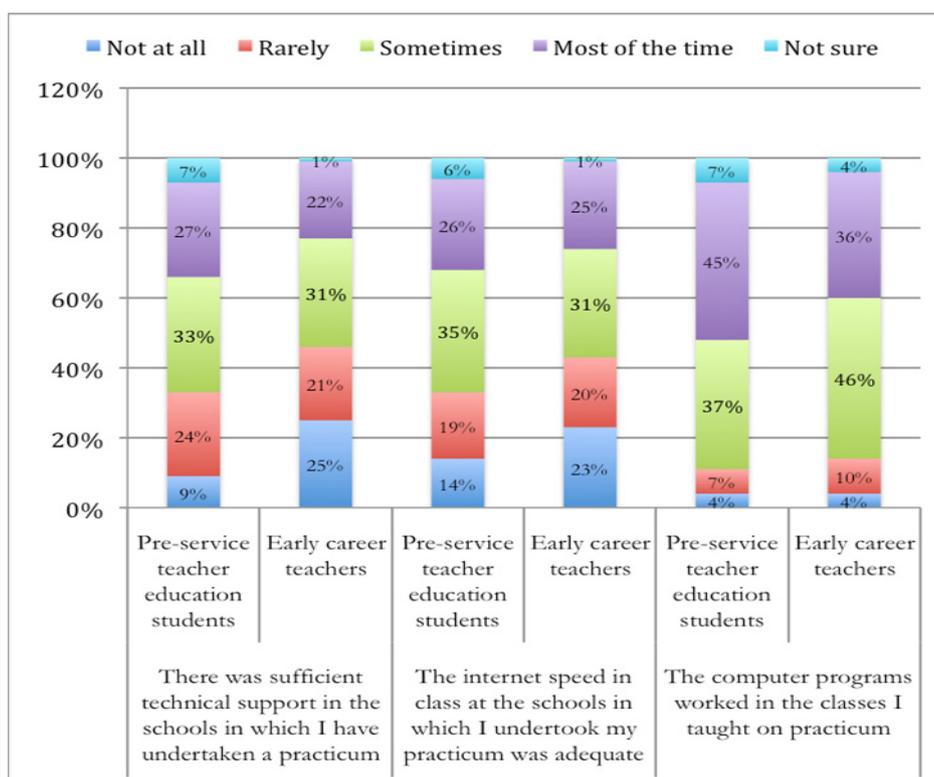
The online surveys also provide insights into the different activities, issues and concerns of the pre-service and early career teachers, which are summarised in Table 25 below. The majority of respondents indicated that ‘sometimes’ or ‘most of the time’ they allowed students to present their work using different media, and that there was suitable online content available for them to use in their lessons. Online bullying however did not appear to be a concern for the majority of these respondents with over half of the early career teachers reporting that online bullying did not occur at all in one or more of the schools in which they did their practicum. A similar response of 47% was reported by pre-service teachers. Concerns about plagiarism were more of a concern to respondents however, as can be seen in the above table.

Table 25: Pre-service teacher education students and early career teacher respondents' views of identified issues for classroom practices

Extent of agreement with the following statements:		Not at all	Rarely	Sometimes	Most of the time	Not sure
I allowed students to present their work using different media	Pre-service	5%	11%	37%	36%	12%
	Early career	9%	7%	22%	61%	0%
There has been suitable online content available for me to include in my practicum lessons	Pre-service	5%	12%	37%	38%	8%
	Early career	12%	24%	36%	25%	3%
Online bullying occurred on the Internet at one or more schools in which I did my practicum	Pre-service	47%	14%	9%	1%	29%
	Early career	55%	17%	15%	2%	12%
I was concerned about plagiarism by the students I taught on practicum	Pre-service	31%	14%	22%	24%	9%
	Early career	15%	13%	39%	27%	6%

While there were concerns expressed about the quality of their practicum experiences by both the pre-service teacher education students and the early career teachers, the views about the infrastructure and information technologies (IT) support facilities in their schools in which they did their practica, were more evenly spread across the range of responses, as the following Figures 18 and 19 illustrate.

Figure 18: Pre-service teacher education students' and the early career teachers' views of the IT infrastructure and support at the schools in which they undertook their practica



Almost a quarter of the early career teachers indicated there was ‘not sufficient’ technical support in the schools in which they undertook their practica, and a further 21% indicated there was ‘rarely sufficient’ support. These data compared to a third of the pre-service teachers indicating there was ‘insufficient’ or ‘rarely sufficient’ technical support available in their practicum schools. Over half of both the pre-service teacher education students and early career teachers however, considered that ‘sometimes’ or ‘most of the time’ the Internet was fast enough. Similarly, over half of the respondents indicated the computer programs they used in class worked ‘sometimes’ or ‘most of the time’.

SPAM and viruses were not considered a problem by most respondents, although almost a quarter of pre-service teachers were unsure. Filtering was considered to function well, but in the focus groups, respondents indicated a level of frustration with the filtering they encountered, as has been outlined earlier in the report.

Figure 19: Pre-service teacher education students’ and the early career teachers’ views of the ‘backend’ IT infrastructure at the schools in which they undertook their practica



There are a number of challenges for teacher education evident in the pre-service teacher education students and early career teachers views and expectations. These challenges range from the quality and access to the infrastructure available within schools, training institutions and universities; through to the ways in which learning to teach with technologies is handled in teacher education programs.

3.7 Future expectations

Key findings

Participants indicated they expect

- ◆ to have access to technologies within their education and/or training institution, irrespective of the quality of the technologies they have at home
- ◆ to be able to email their lecturers or teachers and for their teachers and lecturers to email them
- ◆ to use a range of technologies in their teaching and learning, appropriate to the learning goals

Through the online surveys and the focus groups, all cohorts showed they have high expectations concerning the availability and use of technologies as part of their studies, and within their respective education and training institutions. It can be seen from Table 26 that all adult groups expect their educational institutions to make available computers and the Internet in libraries, computer labs and in private study areas; and to provide intranet access to the institution from home. Although a majority of respondents agreed they expect access to interactive whiteboards in class, expectations were lower about access to this piece of technology compared to computers, the Internet and access to the intranet.

Table 26: Adult students' expectations of access to technologies in education and training institutions

% responses Agree most or all of time	Extent to which students expect ...				
	Access to computers/Internet in the library for student use	Access To computers/Internet in computer lab for students	Access to computers/Internet in students' private study areas	Access To interactive whiteboard in class	Access to education institution's intranet from home
VET	97	87	82	68	89
International	94	85	88	69	94
Pre service	97	97	84	68	96
Early career	96	95	92	77	93

Apart from the VET students, there was considerable agreement that social networking sites (eg MySpace and Facebook) and media sites (eg YouTube, Flickr) should be included in courses as can be seen from Table 27. There was less strength of agreement to lecturers using MySpace and/or Facebook to communicate with their students.

Table 27: Extent to which adult cohorts agreed that social networking and media sites should be used in their courses and by their lecturers

% responses Agree most or all of time	To what extent do you expect ...		
	Lecturers who can use social sites like MySpace and Facebook to communicate with his or her students	Social sites like MySpace and Facebook are included in courses	Media sites like YouTube and Flickr are included in courses
VET	39	28	28
International	50	44	50
Pre service	32	23	54
Early career	51	51	72

Table 19 (earlier) shows between about a quarter and a half of respondents in all cohorts indicated they believed their teachers' and/or lecturers' skills with technologies could be improved. Half of the pre-service teachers (ie 50%) considered improvements in their lecturers' capabilities necessary. Table 28 illustrates the adult cohorts of students expect their lecturers to be confident in using technologies with their students. Strong agreement was expressed by pre-service teacher education students and early career teachers that they believe teacher education qualifications should include units that specifically assist them to develop their understandings about how to include technologies into their classroom activities.

Table 28: Extent to which adult cohorts agree about lecturers' skills with technologies in their courses

% responses Agree most or all of time	To what extent do you expect ...			
	Lecturer confidence in using technologies	Lecturers using email to communicate with students	Courses building student skills using technologies	Courses incorporating technologies in teaching & learning to build skills educators ability to include technologies in their own teaching and learning in the future
VET	82	97	92	
International	93	93	67	81
Pre service	91	99	88	88
Early career	88	93	92	89

All participant cohort groups indicated they expect to use a range of technologies to communicate with their peers, their teachers and/or lecturers, or in the case of the early career teachers, to communicate with their students. All cohorts expect their teachers or lecturers to be able to email their students.

Tables 29 and 30 summarise the different types of activities with technologies, participants indicated they expect to use in the next year. It is apparent that there are high expectations across all cohorts to use a range of technologies as part of their studies.

Table 29: Extent to which all cohorts agree about their predicted uses of technologies in the next year

% yes response	In the next year I expect I will ...							
	Email a teacher	Email another student about my studies	Create a presentation	Use interactive white board	Use a digital camera for studies	Access a podcast for studies	Take part in online class	Text message other students about studies
Primary	32	66	68	65	56	27	19	38
Secondary	72	82	86	56	69	44	20	58
VET	44	82	68	45	51	32	66	54
Pre-service	73	39	88	67	80	59	75	67
International		75	88	56	69	50	62	62
Early career	91	63	91	66	90	62	77	73

It can be seen from Table 29 (above) that over two thirds of all participants (68%-91%) indicated they expect to create a presentation (eg using Powerpoint™) in the next year. Between a third to over a half of the respondents in each cohort of participants also indicated they expect to use technologies for various purposes in the next 12 months including to:

- use a digital camera in their studies (51%-90%);
- use an interactive whiteboard (45%-67%);
- email other students (39%-82%);
- email a teacher (32%-91%); and
- text message other students about their studies (38%-73%).

While the adult students indicated they expect to take part in an online class in the next 12 months, only about a fifth of the school students expected this to be the case. It can be seen from Table 30 that the respondents in each cohort of participants, in the next 12 months, expect to use technologies for various purposes including to:

- be part of chatroom discussions about their studies (37%-69%);
- check study requirements online (38%-79%); and
- use social networking sites (31%-61%).

Table 30: Extent to which cohorts agree about their predicted uses of online technologies in the next year

% responses most or all of time	In the next year I expect I will ...						
	Take an online test	Be part of chatroom discussion about my studies	Contribute to a wiki	Check grades online	Check study requirements online	Access an expert online	Use social networking sites
Primary	48	43	22	29	38	21	36
Secondary	61	56	24	29	52	21	61
VET	41	51	38	76	79	54	31
International	56	37	44			50	
Pre service	29	69	16	43	32	48	41
Early career	48	51	37	63	52	57	49

Further to the activities with technologies summarised in Table 30, in the next 12 months, participants also expect to use technologies to assist in their studies. While only about a fifth of the school students indicated they expect to access an expert online, about a half of the adult students indicated they expect to do so. In addition to their own personal use of technologies, the early career educators and pre-service teacher participants indicated 16% and 10% respectively, they expect to use social networking sites with their students.

In the focus groups, participants were asked about what would be their 'ideal world' use of technologies in education and/or training settings. Their responses tended to focus upon the equipment more than the processes of learning, as the following compilation of suggestions illustrates. Suggestions for 'ideal world' use of technologies included:

- A laptop per student and more time spent on computers;
- Interactive whiteboards in each teaching space;
- Reliable wireless in each classroom;
- Faster more reliable Internet in every teaching space;
- Quality educational games;
- Less filtering and blocking of Internet sites;
- More podcasts;
- Home access to resources including through schools/training/universities' intranets;
- More technical support and well maintained equipment and networks;
- Additional teacher/lecturer practically-based professional development;
- Skilled student groups to support teachers with technologies;
- Simulated workplace environments and more use of virtual environments (eg Second Life);
- More online assessments;
- More ability to share documents; and
- Video taping of lessons.

Some participants also commented on the value of Zing for teaching and learning purposes.

4. Conclusion

The overarching question for this research was: ‘what are the views of students and early career educators, about learning with technologies in Australian education and training?’ Over the past two decades, policies and conjecture have been evident about the importance to individuals and societies of including technologies into education and training at all levels. The purposes, theories and ways in which learning with technologies ought to be conceptualised and operationalised is generating an increasing body of literature. With the arrival of Web 2.0 and the semantic web⁹ however, not enough is known about the ways in which these technologies interact, or may interact, with teaching and learning. There are gaps in our knowledge. Students are at the centre of the work of Australian education and training institutions, yet there has been little research listening to the student voice in relation to learning with technologies. The findings from this Australian research may go some way to filling these gaps.

Students in primary and secondary schools, VET institutions, international students studying education in universities, pre-service and early career teachers contributed their views to this research, during 2008. The findings outlined in this report summarise data gathered from a set of online surveys and focus groups. The findings from the respective cohorts of participants have been presented within the following themes:

1. Access and use of technologies;
2. Online and computer games;
3. Social networking;
4. Learning styles and educational value of technologies;
5. Support for learning with technologies;
6. Practicum and becoming a teacher; and
7. Future expectations.

Participants in this research identified a range of issues and suggested strategies for improving the quality of teaching and learning with technologies. Suggestions for improvement included proposals for more, faster and different technologies. Views about the quality of infrastructure however, varied depending on location. All cohorts of participants also made specific suggestions about the ways in which teachers and/or lecturers could improve their skills with technologies, but reiterated that good educators are those who have the interpersonal skills that allow them to establish and maintain productive relationships with students both on an individual and at the whole class level, and at the same time have sufficiently good technical skills for including technologies appropriately into their teaching and learning.

Reflecting on the findings of this research and comparing them with the literature review¹⁰ that informed this research, the following observations are offered.

⁹ The semantic web refers to the online environments that use common formats for the combination of data drawn from different sources. These arrangements allow more complex online interactions than earlier versions of the Internet. The original Internet was used mainly for the exchange of documents.

¹⁰ The literature review is available at <http://www.aictec.edu.au/aictec/go/home/priorities/pid/233>.

4.1 Access and use of technologies

The literature review included 2003 to 2006 Australian data about technology access and use, collected through national statistical data collections such as the Australian Bureau of Statistics (ABS); Programme for International Student Assessment (PISA); and the Trends in International Mathematics and Science Study (TIMSS) surveys. PISA and TIMSS provide data about primary and secondary students, and the ABS provides data about Australian households (cf ABS 2008; Organisation for Economic Cooperation & Development (OECD 2007; Thomson & Fleming 2004). These respective national reports indicate high student access to computers and the Internet. Considerable daily computer and Internet use is reported at home and in educational institutions, but with little access occurring in other locations. These reports also indicated access to technologies in education and training institutions was generally provided in computer labs and the Internet was considered by students to be slow.

In the PISA (OECD 2006) research of Australian 15 year olds, students generally indicated frequent use and confidence in using technologies for browsing the Internet, playing games, word-processing, downloading music from the Internet and communicating through email and chatroom. Less use of spreadsheets, graphics programs, and of writing computer programs was reported. The research findings in this study also show that usage by students of the Internet and word-processing is high (daily, several times weekly), especially within educational institutions. In addition, this research shows that downloading of music, games, and the use of email and chatroom facilities, are functions of high use, accessed from home computers.

This new Australian research has collected common data from all student cohorts: primary, secondary, VET, international, pre-service teacher education students as well as early career teachers. All cohorts reported having high, regular access to computers and the Internet at home, and less so within educational institutions. Adult students and early career educators however, reported limited use of the Internet in lecture theatres. The degree of home usage reported by adult students in this research, is higher for these students than that for school students. Adult students also reported their regular use of the computer and the Internet is lower in other locations such as public libraries.

This research has also found that Australian students from all cohorts use mobile phones extensively. Participants indicated they use mobile phones for a range of purposes including phone calls, photos and text messaging. Between 50% and 70% of primary and secondary students indicated they use mobile phones for games, video and listening to music. These Australian findings are consistent with overseas research such as that in the US undertaken using annual surveys of upper primary and secondary school students, through their *Speak Up* days (previously *Netdays*) (Project Tomorrow 2006). Similarly, in the UK, Livingstone & Bober's (2005) research of upper primary and secondary age cohorts showed generally high computer access at school.

4.2 Online and computer games

The literature review prepared at the outset of this project showed there is little Australian research about Australian students' views of the value of online and computer games for learning. This research then, set out to gain some insights into the educational value of playing games on computers, online and on mobile phones. All cohorts in this research reported a level of interest in playing games online including on mobile phones. School students showed the most interest in playing online games. Over a third of all respondents indicated they had played an online game with over 95% of school students indicating they had done so.

A majority of school students indicated that playing computer games assists them to learn how to solve problems and to keeps their interest. They also reported they learnt how to make decisions and to develop fine motor skills. Dexterity (learning to be quick with their fingers) was reported by over 40% of all cohorts as a benefit of playing computer games. About third of all response groups however, 'agreed' or 'strongly agreed' that games could be a distraction in class.

Some lack of surety was identified by the adult cohorts about the value of online and computing games for educational purposes. While school students identified online and computer games as valuable for their learning, less than 50% of adult cohorts believed educational institutions should use more computing games to assist student learning. All cohort groups were less convinced about the value of computer games for building interpersonal skills. Pre-service and early career educators however indicated, that improving their lecturers understandings of online games would improve their teacher education courses.

4.3 Social networking

Research specifically addressing the educational value of social networking sites is currently lacking. Little Australian or overseas research has been undertaken on this topic to date. The literature review that informed this research showed that students overseas make use of email, chatroom and messaging, and more recently social networking sites in their private lives, rather than in their education or training (cf Choy, McNickle & Clayton, 2002; Livingstone & Bober, 2005). Students in these studies commented however, that the potential value of social networking technologies rested in their communication functions. In more recent years, research has investigated the use by students of wikis and blogs, Facebook, YouTube and simulated environments such as Second Life (Project Tomorrow 2006; Wijngaards 2007).

Given there is little Australian research about the educational value of social networking sites, this research set out to investigate the potential educational value of social networking sites, across all the identified student cohorts. This research shows that there were differing views expressed by the respective participant cohorts about the value of social networking and online sites for students' learning. This research shows the common functions used in Australian educational institutions are word-processing and Internet use. Lower use for educational purposes was reported being made of email, chatrooms and social networking sites, especially with primary and secondary students.

This research also shows a 'medium' to 'high' use of technologies for communication purposes. Online sites were considered useful for finding information of interest, and for helping with study requirements. Different cohort groups had different preferences of specific social networking tools. For example YouTube and Flickr with primary students showed negative responses for learning value, but around half of secondary students valued YouTube and Flickr for learning. MSN was commonly identified as being used across all cohorts; Facebook was especially used by preservice teacher education students and early career teachers; and Myspace was preferred by secondary students. Accessing these sites mostly occurred at home. Secondary students indicated they are especially involved in chatting online with other students regarding their studies. Future expectations of Australian students suggest they expect to increasingly use social networking sites for learning purposes in the future.

4.4 Learning styles and educational value of technologies

Several studies have highlighted that students enjoy learning with technologies (cf I & J Management Services 2008; Markauskaite, Goodwin, Reid & Reimann 2006; Li 2007; Livingstone & Bober 2005; Neal, 2005; Project Tomorrow 2006). The literature review that informed this research concluded that students value and enjoy using technologies on a regular basis to build research skills, gain motivation to learn, and to connect with real life experiences. Neal's (2005) research highlighted school student preferences for active learning and that the inclusion of technologies in their learning provided opportunities for school students to have more control over their learning; to collaborate with other students; and to use the teacher as a facilitator rather than a transmitter of knowledge.

In this Australian research, the overwhelming response from the adult students (ie VET, international and pre-service teacher education students, and early career teachers) was that computers and the Internet were helpful in their studies in educational institutions and at home, with over 70% of all cohort groups agreeing the use of computers and Internet assists them with their studies 'most' or 'all of the time'. The value of learning using technologies was identified in regards to research, skills building, motivation, presentation and for personalised learning. Despite students' preferences for learning using technologies, the institutional learning culture for many students involved considerable teacher/lecturer information giving, with some group work and problem solving work involved.

4.5 Support for learning with technologies

A small amount of the literature reviewed pointed to concerns about the quality of teachers' and lecturers' skills with including technologies in their teaching and learning (Jones 2002; Neal 2005). Concerns about the speed of the Internet were also expressed in the literature. Little research at the outset of this research project was available about emerging issues such as online or cyberbullying and unwanted emails. The study by Wijngaards, Fransen & Swager (2006) is an exception.

This new Australian research shows that the speed of the Internet remains a concern for students in most cohorts. Views varied across all cohorts about the ability of teachers and lecturers to support students in their learning with technologies. Only a third of the pre-service and early career teachers agreed 'most' or 'all of the time' their lecturers' skills with technologies are 'good'. This research also indicated however, that students not only want technology-savvy teachers and lecturers, they also want high quality teachers who are able to form relationships, give simple explanations, structure relevant learning experiences and ensure that different learning styles are accommodated, with technology being appropriately incorporated into classroom activities.

4.6 Practicum and becoming a teacher

The research reviewed at the outset of this study showed that pre-service teachers when on practicum, used technologies in the classroom more than their supervising teachers. Jones (2002) research conducted during pre-service teachers' practicum showed little ICT use was made by students' supervising teachers. Lack of computer and Internet access, workload issues, lack of technical support and behaviour management issues were the major concerns. Other research with pre-service teachers showed that students were prepared with basic technology skills such as word processing, Internet and presentation skills (cf Albion 2003; Markauskaite et al. 2006), but not in how to meaningfully include technologies into their classroom activities and teaching and learning.

The results from this new research are consistent with those found by Jones in 2002. Many pre-service teacher education students and early career teachers in this Australian study indicated that their practicum supervising teachers and university lecturers had insufficient technology skills to support them during their practica, and were not using technologies to support student-centred, inquiry based learning that fostered high level thinking skills within their teaching. This new research also points to pre-service teacher education students gaining basic computer skills from their educational institutions but are not developing more sophisticated understandings about the teaching and learning with technologies.

In this Australian research, while at least half of primary or secondary students indicated their teachers' skills with technologies were 'good', this view was not so strong among the pre-service and early career teachers in regard to their lecturer skills. Reasons why pre-service teacher education students did not include technologies in their practicum classes included insufficient computer access, poor supervisory-teacher role-modelling, and not having sufficient confidence or strategies to overcome obstacles including behaviour management issues.

4.7 Future expectations

The future expectations highlighted in the literature review that informed this research included improvements in the infrastructure required to enable technologies to be seamlessly deployed in classrooms and lecture theatres; and the necessity for building the capacity of educators in all levels of education and training.

In this study, participants identified a range of issues and suggested strategies for improving the quality of teaching and learning with technologies. Suggestions included proposals for more, faster and different technologies. Only about a third of primary and VET students and about half of pre-service teachers were satisfied with the Internet speed at their education institutions for learning requirements. All participant cohorts were also concerned about the level of filtering and blocking of websites they would like to access for their studies. Some participants indicated a preference for accessing the Internet from home rather than from their education or training institution in order to avoid problems with filtering of content.

Between a quarter and a half of respondents in all cohorts indicated their teachers' and lecturers' skills with technologies should be improved in the future. All cohorts of participants reiterated that good educators with appropriate interpersonal skills were crucial to their learning. Participants emphasised that 'good' educators are those that establish and maintain productive relations with their students both on an individual and at the whole class level, and at the same time have sufficiently good technical skills with technologies in educational settings.

4.8 Finally

Listening to the student voice has been important because they are the main stakeholders in their education or training. This research has highlighted that including technologies into education and training represents change at multiple levels. The students across all cohorts in this study have highlighted that teaching and learning with technologies involves more than simply adding technologies to the existing suite of classroom practices: it is more than an add-on. To meaningfully include technologies into teaching and learning at all levels within the Australian education and training sectors requires educators to fundamentally re-think what they do and how they do it.

Reflecting upon current practices and research findings such as those outlined in this report is necessary

- to gain an improved and contemporary understanding of the expectations and experiences of learners and early career educators, of how technologies may be utilized to improve learning outcomes; and
- to develop a better understanding of students' and educators' requirements regarding technologies in education and training.

Participants in this study have indicated through their responses to survey and focus group questions that including technologies in education and training has the following benefits. Technologies enable them to

- Access easily, detailed information;
- Build skills through problem-solving;
- Develop maths, informational and other literacies;
- Practice tasks;
- Increase their's and others' motivation to learn through interest-focused and self-directed work;
- Improve the presentation of work including through the use of office productivity and multi-media software applications;
- Personalize learning that supports different learning styles and levels; and
- Increase their control over their learning.

Interpretations of the findings from this research may enable the development of recommendations for further actions at the individual, local, system and jurisdictional levels. Future directions could include gathering similar data over time, through survey and focus groups. Longitudinal data collection has been initiated in the Australian VET sector through the national *E-Learning Benchmarking Survey*. The collection of cross-sectoral 'student voice' data in Australia would provide new perspectives to our understandings of teaching and learning with technologies, and would also be consistent with work occurring in the US. The not-for-profit *Project Tomorrow*, annually administers surveys across the US on *Speak Up* days. Students across school levels in the US complete these surveys which ask about their use of technologies for learning. Collecting data over time in Australia does not have a long history, however it would allow policymakers to identify developments and changes. Such an approach is particularly pertinent now, given the roll-out of computers to schools as part of the recent Australian Government *Digital Education Revolution*¹¹.

¹¹ For more information about the Digital Education Revolution see <http://www.digitaleducationrevolution.gov.au>

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Appendices

6. Appendix One

Participants

Participants in this research involved students and early career educators in the schools, VET and higher education sectors. Data was collected from 1082 surveys and from 40 focus groups that involved 299 participants. Table 31 provides a summary of the cohorts from whom data was collected.

Table 31: Combined numbers of participant numbers for surveys and focus groups

Participant cohort	Number of survey responses	Focus group participant number	Totals
Primary students	502	148	650
Secondary students	152	61	213
VET students	70	32	102
Pre-service teacher education students	235	25	260
International students	23	6	29
Early career teachers	100	27	127
Total responses	1082	299	1381

Table 32 indicates the gender of participants in each of the respondent groups and provides information about the sector in which the respondents were enrolled or working.

Table 32: Gender and sector profile of survey completers

Respondent Class	Gender		Educational institution		
	Male %	Female %	Govt %	Catholic %	Independent %
Primary	44	56	84	2	12
Secondary	50	50	18	0	81
VET	38	64	100		
International	41	59			
Pre-service	21	79			
Early career	34	66	55	10	12

Table 33 provides information of the percentage of pre-service teacher education student respondents and early career teachers who indicated the type or year level of teacher for which they were preparing to become. It can be seen that most students indicated they were prepared to become with a primary or secondary school teacher.

Table 33: Year levels of preparation to teach undertaken by preservice teacher education students and early career teachers

Year level	% of respondents	
	Pre-service teacher education students	Early career teachers
Early childhood	14%	5%
Junior primary	16%	3%
Upper primary	16%	4%
All primary levels	44%	28%
Middle years (eg 5-9)	12%	11%
Junior secondary	8%	7%
Upper secondary	6%	5%
All secondary levels	35%	43%
All school levels	1%	4%
Training	0%	12%
Adult education	3%	26%
Higher education	0%	3%

Tables 34 and 35 provide information regarding the respective cohorts involvement in flexible/distance education study and the amount of time per week they spent studying by distance.

Table 34: Flexible delivery profile of the participants

Respondent cohort	Flexible/distance education study		
	Yes %	No %	Not sure
Primary	24	64	14
Secondary	29	65	7
International	31	50	19
VET	74	31	2
Pre-service	52	43	7
Early career	49	49	3

Table 34 is of interest in terms of the pre service, early career and VET responses.

Around 50% of preservice and early career teachers indicated their program included some flexible delivery. VET student responses are even higher at 74%. This VET response matches the 2008 *E-Learning Benchmarking Project* data indicating 71% of student responses that their course included a lot or some e-learning.

Table 35: Hours per week of distance education/flexible delivery

Respondent Class	<1 %	1-2 %	2-3 %	3-4 %	4-5 %	5-6 %	6-7 %	7-10 %	10-15 %	15-20 %	20-25 %	>25 %
VET	23	14	14	11	3	0	0	9	3	14	3	6
Pre-service	34	25	9	5	5	7	3	6	2	1	0	4
International	58	8	17	0	8	0	8	8	8	0	0	0
Early career	24	11	24	9	2	4	2	7	11	4	2	0

Table 36 provides further detail regarding the study programs being undertaken by the pre-service, international students and early career teachers. Participant data was collected concerning whether they were enrolled in an undergraduate degree, Diploma of Education or postgraduate teacher education qualification, and identifies the year of study in which respondents were enrolled. Details about early career teacher current studies and the number of years of teaching experience are also provided.

Table 36: Student Teacher/Early Career/International Student Teacher Profiles

Respondent Cohort	Under grad Teacher Education Qualification %	Dip Ed Teacher Ed Qualification %	Post graduate Teacher Ed Qualification %	F/T %	P/T %	Early Career Post Grad Studies % Yes	Early Career Post Grad Studies % No	% :year of current teacher education studies or no. of years as a teacher					
								1	2	3	4	5	
International	19	31	50										
Pre-service	73	13	4	85	15			34	13	21	30	2	
Early career	57	13	30	80	20	26	74	28	17	28	11	15	

Around 50% of pre-service and early career teachers had experienced a practicum in two to three schools, at the time of participating in this research. Around 60% of early career teachers indicated they completed over 60 days of practicum during their studies.

7. Appendix Two

Access and use of technologies

Home access

Table 37: Frequency of students' access and use of the Internet from home

	Everyday	1-2 times a week	1-2 times a month	Not often	Never
Primary	40%	36%	4%	10%	10%
Secondary	70%	17%	12%	1%	0%
VET	83%	14%	0%	0%	3%
Pre-service	95%	4%	1%	0%	0%
International	93%	0%	0%	7%	0%

Frequency of access from education and training institution

Table 38: Frequency of Internet access in computer labs by the different student cohorts

	Everyday	1-2 times a week	1-2 times a month	Not often	Never
Primary	15%	55%	8%	10%	12%
Secondary	19%	40%	11%	12%	18%
VET	25%	31%	2%	17%	25%
Pre-service	1%	9%	7%	22%	61%
International	10%	10%	0%	20%	60%

Table 39: Frequency of access and use of the Internet in classrooms or lecture theatres by the different student cohorts

	Everyday	1-2 times a week	1-2 times a month	Not often	Never
Primary	6%	58%	12%	12%	12%
Secondary	22%	56%	11%	5%	6%
VET	24%	15%	3%	20%	38%
Pre-service	9%	31%	16%	23%	21%
International	20%	30%	10%	20%	20%