



Department of  
Education  
and Training

## Teacher ICT skills

Evaluation of the Information and Communication Technology (ICT) Knowledge and Skills Levels of Western Australian Government School Teachers.

Evaluation and Accountability  
Department of Education and Training  
Western Australia.

# TEACHER ICT SKILLS

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# 1 Executive summary

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This is a summary of the findings of an investigation into the Information and Communication Technology (ICT) knowledge and skill levels among Western Australian (WA) government school teachers.

## 1.1 Why this study was done

- ✧ To provide a valid and reliable assessment of the level and nature of ICT knowledge and skills among WA government school teachers;
- ✧ To establish to what extent teachers are integrating their ICT knowledge and skills in classrooms;
- ✧ To identify factors seen by teachers' as impacting on the development of ICT competence and its integration in teaching and learning; and
- ✧ To determine potential ICT support and development strategies to enhance effectiveness in the future.

## 1.2 How it was done

**ICT teacher survey:** to enable teachers to self-report their levels of ICT knowledge and skill, the ways in which they use ICT and the extent to which they promote the use of ICT in student learning and to identify any factors that impact on each of these.

**Objective online test of teacher ICT competence:** to test the actual ICT knowledge and skills of teachers.

**Statistical validation** of the ICT Teacher Survey results against the outcomes of the objective online test of ICT skill which indicated that responses given to ICT Teacher Survey items provide an accurate measure of teachers' ICT knowledge and skills.

## 1.3 What was found

### Teacher ICT competence

- ✧ The basic suite of ICT applications *ever used* by more than 95% of teachers is comprised of word processing, Internet, email and file navigation.
- ✧ Sixty five percent of teachers have *ever used* both spreadsheets and presentation software, whilst aspects of SIS Curriculum Manager are used by 55% of teachers.
- ✧ Only 30% of teachers have ever used a database.

### Factors impacting on teacher ICT competence

- ✧ It was found that males, younger teachers, teachers with less teaching experience and secondary school teachers are more likely to have higher levels of ICT competence.
- ✧ The extent to which a teacher uses ICT for professional purposes, the ICT capacity of their school and their attitudes and motivation were found to be the three most influential factors on ICT competence.

- ✧ Analysis revealed that limited access to **technical support** and **computers for student use** provided the greatest barriers to the development of teacher ICT competence.

### Teacher application of ICT

- ✧ Only 18% of teachers are regularly integrating ICT within teaching and learning (i.e. on a weekly to daily basis); with 46% of teachers integrating ICT on an occasional basis (i.e. once a term to weekly); and the remaining 36% integrating ICT only once a term or not at all.
- ✧ Eighty two percent of teachers are not regularly using ICT in the classroom. Of those teachers who are using ICT regularly (18%), most are doing so to *improve computer skills* and to *find out about ideas and information*.

### Factors impacting on teacher application of ICT

- ✧ It was found that part-time teachers are less likely to integrate ICT within teaching and learning than full-time teachers.
- ✧ A teacher's level of ICT competence, the ICT capacity of their school, their attitudes and motivation, the planning and leadership of their school and their attendance at training on how to integrate ICT were found to be the most influential factors on a teacher's integration of ICT in the classroom.
- ✧ Analysis revealed that **training on how to integrate ICT in the classroom** had the most positive impact on a teacher's level of ICT integration.

## 1.4 Where to next

- ✧ While the vast majority of teachers were found to be conversant in the use of word processing, Internet, email and file navigation applications, a much smaller proportion of teachers indicated they were integrating ICT in the classroom on a regular basis.
- ✧ Investigation of the relationship between a teacher's level of ICT competence, the extent of their integration of ICT in the classroom and the range of factors that influence each of these revealed five distinct groups within the WA government school teacher population, with each group sharing a demonstrable set of characteristics. The groups are:

- ◆ Those with high ICT competence and high ICT integration
- ◆ Those with moderate ICT competence and moderate ICT integration
- ◆ Those with higher ICT integration than ICT competence
- ◆ Those with higher ICT competence than ICT integration
- ◆ Those with low ICT competence and low ICT integration

Proportion of teachers in each group:	ICT Integration Score:		
	High	Medium	Low
ICT Competence Score:			
Stage 3 (highest)	9%	12%	4%
Stage 2	8%	25%	20%
Stage 1 (lowest)	1%	9%	12%

The characteristics of each group of teachers is shown below, along with the ICT development and support strategies identified in the evaluation as being most appropriate to each group.

Colour	Teacher characteristics	Potential strategies
Green	These teachers are likely to be: <ul style="list-style-type: none"> <li>• Early childhood</li> <li>• Primary specialist</li> <li>• Senior teacher level 1</li> <li>• Permanent teachers</li> <li>• Part-time teachers</li> <li>• 20+ years teaching</li> <li>• 40+ years old</li> </ul>	When both ICT competence and ICT integration are low, attention should be focused on building teacher interest in ICT.  These teachers will benefit from more specialised hands-on training.
Yellow	These teachers are likely to be: <ul style="list-style-type: none"> <li>• In primary schools</li> <li>• Teachers of English &amp; Maths</li> <li>• 20+ years teaching</li> <li>• 40+ years old</li> </ul>	When ICT integration is higher than ICT competence, attention should be focused on providing general ICT training for teachers.  Improving school ICT resources (technical support and computers for students) will facilitate the ICT use and experience of these teachers.
Red	These teachers are likely to be: <ul style="list-style-type: none"> <li>• In secondary schools</li> <li>• &lt; 40 years old</li> </ul>	When ICT competence is higher than ICT integration, attention should be focused on: <ul style="list-style-type: none"> <li>• Improving technical support at schools</li> <li>• Providing computers for student use</li> <li>• Training these teachers to integrate ICT within teaching and learning.</li> </ul>
Purple	These teachers are likely to be: <ul style="list-style-type: none"> <li>• In primary schools</li> <li>• &lt; 40 years old</li> </ul>	When both ICT competence and ICT integration are moderate, teachers will benefit from access to the strategies outlined in both yellow and red above.
Blue	These teachers are likely to be: <ul style="list-style-type: none"> <li>• Heads of departments</li> <li>• In secondary schools</li> <li>• Teachers &amp; administrators</li> <li>• Science &amp; technology</li> <li>• Librarians</li> <li>• Full-time teachers</li> <li>• 2-3 years teaching</li> <li>• &lt; 40 years old</li> </ul>	When both ICT competence and ICT integration are high, consideration could be given to promoting these teachers as best practice examples within schools.

# 2 Introduction

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This is the report of the evaluation of the ICT knowledge and skills of WA government school teachers.

## 2.1 Rationale

Commonwealth and State Governments across Australia provided a unified and formal acknowledgement of the importance of ICT in knowledge development by endorsing the *National Goals for Schooling in the Twenty-First Century* in April, 1999. The Department had recognised the need to integrate technologies with teaching and learning practices in the *Plan for Government School Education 1998-2000*, and was allocated State Government funds to undertake a Learning Technologies Project for Government schools in 1998.

Underlying the aim of integrating and improving the use of ICT by students is an assumption that teachers themselves are competent and confident in the use of ICT in terms of teaching and learning. A report<sup>1</sup> from the Officer of the Auditor General released in 2001 indicated that over 95% of teachers interviewed assessed themselves as having more than a basic level of ICT operational skill. The majority of these teachers were not, however, confident about applying ICT to facilitate student learning. These outcomes were consistent with teacher self-reports collected by the Department in the development of the *Learning Technologies Planning Guide for Schools Using Information Technology to Improve Teaching and Learning, 2000*.

A number of Department initiatives aimed at increasing school access to ICT were undertaken in response to the increasing demands on teachers to apply ICT in their teaching and learning programs in ways that enhance the learning outcomes of students. For example, the *Notebooks for teachers* and the *100 Schools* projects coordinated by the Information and Communication Technologies and Curriculum Directorates supported the implementation and use of ICT in schools.

An apparent focus on provision of ICT infrastructure, hardware and software and teacher access to professional development in the use of the particular ICT being implemented was noted when the Department reaffirmed its commitment to ensuring appropriate access to ICT by both teachers and students in the *Plan for Government Schools 2004-07*, through strategies to:

- ✧ Engage students through Information and Communications Technologies; and
- ✧ Provide a modern on-line service environment.

Subsequent inquiry revealed a lack of system level information on the general nature and level of the ICT knowledge and skill of teachers. To implement appropriate support strategies there is a need for valid and reliable information about the existing ICT competence of teachers, and about the factors that enhance or hinder the development of teacher ICT competence and their application of it.

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<sup>1</sup> *On-line and Length? Provision and use of learning technologies in Government schools; Report of the Office of the Auditor General (WA), May 2001*

## 2.2 Purpose of the evaluation

This evaluation was conducted to provide a valid and reliable assessment of the level and nature of ICT knowledge and skills among WA government school teachers.

The evaluation also aimed to establish to what extent teachers are integrating their ICT knowledge and skills in classrooms; to identify factors seen by teachers as impacting on the development of ICT competence and its integration in teaching and learning; and to determine potential ICT support and development strategies to enhance effectiveness in the future.

## 2.3 Evaluation management and consultation

The Evaluation Unit, working in conjunction with the Curriculum Directorate co-ordinated the evaluation activity on behalf of Education Executive, with the guidance and support of a Reference Group comprised of key stakeholders.

### 2.3.1 Evaluation Management Group

A management group consisting of Evaluation Unit staff and nominated officers from the Curriculum Directorate was convened as an official forum for Department consultation on the evaluation of Teacher ICT Skills during the development of the evaluation proposal.

The Management Group was established as a means of providing the Evaluation Unit with ongoing access to the requirements and expectations of the Curriculum Directorate and as a source of referral to resources and networks relevant to the use of ICT by teachers. The management group also functioned to convene a Reference Group of key stakeholders and to provide preliminary feedback on items prior to discussion with the Reference Group.

### 2.3.2 Evaluation parameters

The Curriculum Directorate expressed a strong interest in attaining a baseline measurement of the ICT knowledge and skill of teachers, as a potential basis for the development of a set of ICT competency standards for teachers in Western Australia. \$21,000 of the \$30,000 allocated to the evaluation was expended in developing the online test of ICT competence in order to ensure the validity of the self-completion survey.

It was agreed that the ICT knowledge and skills to be assessed in this evaluation would match those outlined in *Teaching and Learning with ICT; A self-evaluation Guide* published by the Department in 2003, to the exclusion of other frameworks.

The *100 Schools Professional Learning Program Evaluation* was given preference in developing the methodology to be applied in the current evaluation.

### 2.3.3 Evaluation Reference Group

The Reference Group was formed through invitation early in the research process to provide a forum for consultation and information sharing between the Department and representatives of stakeholder groups. This enabled the Department to provide key stakeholders with ongoing information about the evaluation and its progress, and allowed these stakeholder groups to raise potential sensitivities associated with stakeholder participation in the evaluation. Reference Group meetings facilitated open discussion of issues relating to the evaluation as they arose.

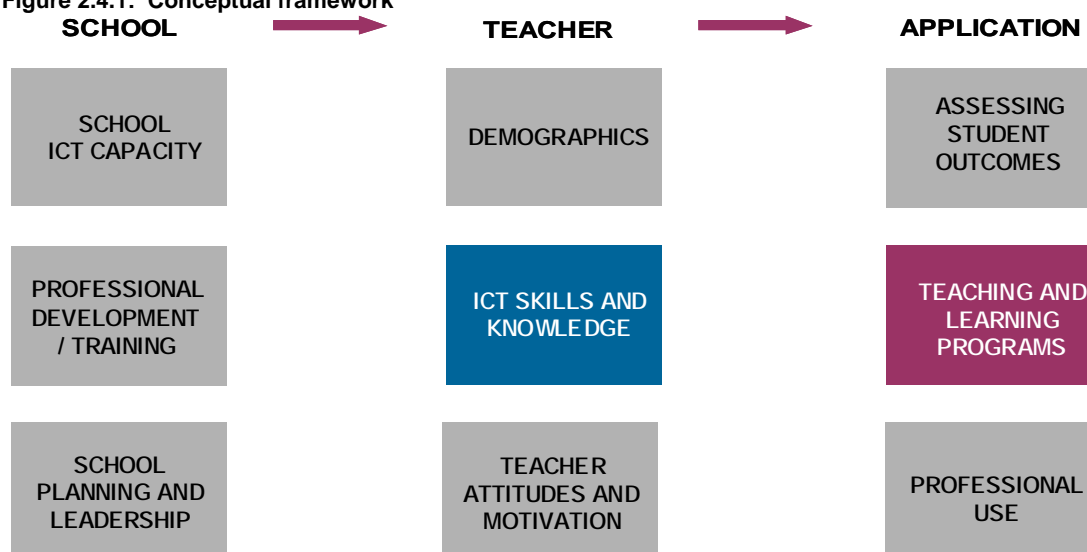
### 2.3.4 Reference Group Membership

The Reference Group was chaired by the Director, Curriculum and included delegates from Curriculum and the Curriculum through ICT project. The Evaluation Unit provided executive support to the Reference Group as part of their role in co-ordinating the evaluation. District Offices, Education Policy and Evaluation and Monitoring Standards in Education (MSE) and Primary and Secondary school teachers were represented on the Reference Group. The State School Teachers' Union of Western Australia and each of the professional associations, Western Australian Secondary School Executives' Association; Western Australian Primary Principals' Association; WA District High School Administrators' Association; WA Education Support Principals' and Administrators' Association also participated as members of the Reference Group.

## 2.4 Conceptual framework for the evaluation

A conceptual framework that represents factors of importance in understanding and measuring the ICT competence of teachers was developed following analysis of existing literature and current research work being undertaken in the area. Key stakeholders and recognised experts in ICT and teaching and learning were consulted as part of this development. The conceptual framework is presented below.

Figure 2.4.1: Conceptual framework<sup>2</sup>



<sup>2</sup> Professional Development / training has been defined as a school based factor rather than a teacher based factor. This allows for the future training of teachers as being a responsibility of the school rather than the person. However it is acknowledged that previous training may have been a person-based factor (especially if training was part of previous employment or education).

## 2.5 Methodology

The evaluation methodology comprised:

**ICT teacher survey:** to enable teachers to self-report their levels of ICT knowledge and skill, the ways in which they use ICT and the extent to which they promote the use of ICT in student learning and to identify any factors that impact on each of these.

**Objective online test of teacher ICT competence:** to test the actual ICT knowledge and skills of teachers.

**Statistical validation** of the ICT Teacher Survey results against the outcomes of the objective online test of ICT skill which indicated that responses given to ICT Teacher Survey items provide an accurate measure of teachers' ICT knowledge and skills.

### 2.5.1 Survey Development

The process used to develop the ICT Teacher Survey is outlined below:

- ✧ Reference to the Department's *Teaching and Learning with ICT; A self-evaluation Guide*, 2003;
- ✧ Reference to *100 Schools Professional Learning Program Evaluation – Teacher Questionnaire*, Edith Cowan University, 2004;
- ✧ A review of other State and Territory literature and questionnaires relating to teacher application of ICT;
- ✧ A review of national and international literature and questionnaires relating to teacher application of ICT;
- ✧ Expert psychometric input regarding the survey development;
- ✧ Consideration by and approval of the Management Group and Reference Group respectively; and
- ✧ Pilot testing with a small group of teachers, with minor amendments to the survey form to ensure comprehension and completeness.

The ICT Teacher Survey was designed to measure the factors outlined in the conceptual framework. More particularly, the ICT Teacher Survey collects information on the key demographics of respondents and asks teachers' views on a range of matters relating to ICT skill and usage, including:

- ✧ Their own ICT skills and knowledge;
- ✧ The extent to which they promote ICT usage in student learning and assessing student outcomes;
- ✧ The extent to which they use ICT for out of classroom professional tasks;
- ✧ Their school's ICT capacity;
- ✧ Their school's planning and leadership in ICT matters;
- ✧ Their attitudes and motivation towards ICT; and
- ✧ Their experience of professional development and training courses provided by the school.

A copy of the ICT Teacher Survey can be found in Appendix A.

## 2.5.2 Survey Administration

### *Sampling procedure and response rate*

ICT Teacher Survey forms were mailed to 2,332 teachers (approximately 12.5% of the total teacher population) working in Western Australian Government schools. Of these 1,500 were returned to the Department by the cut-off date, representing a response rate of 66%.

Subgroups of teachers from (a) metropolitan and country schools and (b) primary and secondary schools were identified using a stratified random sampling technique. The total number of teachers included in each subgroup was adjusted to reflect the actual proportions of the teacher population.

The sub-group sample sizes were sufficient to ensure statistical confidence in the results for each sub-group, with 367 responses from teachers in metropolitan primary schools; 395 responses from teachers in metropolitan secondary schools; 373 responses from teachers in country primary schools and 365 responses from teachers in country secondary schools.

The demographic characteristics of the sample are presented in the table below. Whilst no quotas were applied beyond school type and region, the random nature of teacher selection resulted in a good match between the demographics of the overall teacher population and those of the teachers who returned their survey forms.

**Table 2.5.2: Sample characteristics**

	Respondent Population	Teacher Population
Teacher Sample	1,500	18,225
	%	%
<b>Region</b>		
Metro	66	66 *
Rural	34	34 *
<b>School code (population database):</b>		
Primary Teacher	61	61 *
Secondary Teacher	39	39 *
<b>School type (Survey response)</b>		
Pre-primary	2	N/A
Primary	41	N/A
Middle	3	N/A
Secondary	35	N/A
District High	10	N/A
Other (incl. ed support & senior colleges)	8	N/A
<b>Teaching role:</b>		
Teacher & Admin	8	13
Teacher only	92	87
<b>Teaching mode:</b>		
Full-time	73	71
Part-time/Job-share	27	29
<b>Gender</b>		
Males	28	25
Females	72	75
<b>Status</b>		
Permanent	69	73
Permanent on Probation	6	} 26
Fixed term / Casual	24	
<b>Age</b>		
<24 years	5	4
25-29 years	12	10
30-39 years	22	22
40-49 years	32	31
50+ years	29	33
<b>Years a Government teacher</b>		
0-1 years	8	N/A
2-3 years	9	N/A
4-5 years	1	N/A
6-9 years	14	N/A
10-19 years	27	N/A
20+ years	32	N/A
<b>Teacher level</b>		
Senior Teacher L1	12	6
Senior Teacher L2	28	29
Classroom Teacher L3	8	2

\* Note: A quota variable, therefore an exact match

### *Administration Procedure*

The ICT Teacher Survey was administered in May 2005. Four working weeks were allocated for completion and return of the survey form. Completed survey forms received up to and including three working days after the return date specified on the questionnaire were included in the analysis, to allow adequate time for the return of mail posted on that day.

### 2.5.3 Online Objective Skills Test

To test that the teacher self assessment collected by the ICT Teacher Survey was an accurate measure of the actual ICT competence of teachers, a subgroup of teachers who completed the ICT Teacher Survey also completed an objective test of ICT skills online.

#### *The Test*

Electric Paper were contracted to provide an independent test of the ICT knowledge and skills assessed in questions 16 – 23 of the ICT Teacher Survey. The Online Objective Skills Test comprised 73 questions with tailored Welcome and Closing Screens. Example screens from the Test are provided at Appendix B.

#### *Sampling Procedure and response rate*

Of the 1500 teachers who completed and returned the ICT Teacher Survey, a total of 825 (55%) volunteered to participate in the online skills test.

The Department contacted 380 of the 825 volunteer teachers to complete the Online Objective Skills Test. Of the 380 teachers contacted, 230 undertook the Test, representing a response rate of 61%. The teachers who undertook the Test possessed a broad range of knowledge and skills and were representative of the full range of teacher ICT competence.

### 2.5.4 Independent statistical validation of the ICT Teacher Survey

Statistical analysis compared the teacher responses to questions 16 – 23 of the ICT Teacher Survey to the results of the Objective Online Skills Test to determine the validity of using teacher self-assessments as a measure of teacher ICT ability.

The outcomes indicated that responses given to ICT Teacher Survey items provide an accurate measure of teachers' ICT knowledge and skill. Teacher assessments of their ICT ability can therefore be considered as a valid assessment of their actual ICT ability.

Therefore, the results of the ICT Teacher Survey provide an accurate, baseline measure of the existing ICT competence of teachers working in Western Australian government schools.

For full details of the statistical validation process and results, refer to Appendix C.

# 3 What ICT knowledge and skills do teachers possess?

This section looks at the ICT knowledge and skills of WA government school teachers. Results are presented in detail and an overall ICT Competence Index is calculated to aid in the benchmarking of teacher competence.

## 3.1 Teachers' ICT knowledge and skills

Teachers were asked about their use of the following eight commonly used ICT applications.

- ✧ Word processing;
- ✧ Internet;
- ✧ File navigation;
- ✧ Email;
- ✧ Presentation packages;
- ✧ Spreadsheets;
- ✧ Databases; and
- ✧ SIS Curriculum Manager (SIS).

For each software application a list of skills was provided, with teachers indicating which they had<sup>3</sup>.

Teacher usage of the ICT applications varied widely, as shown in the table below.

**Table 3.1: Teacher usage of ICT applications**

	Usage Rate*
Base: All Respondents	n=1,500
	%
Word processing	98
Internet	97
Email	95
File navigation	93
Presentation packages	65
Spreadsheets	65
SIS Curriculum Manager	55
Databases	30

\* Percentage of teachers who indicated that they could use the application.

<sup>3</sup> The questions only asked the teacher to indicate which skills they had and did not ask how well or how often the teacher did the task. Refer to the ICT Teacher Survey at Appendix A to see how the questions were asked in this survey.

- ✧ The basic suite of ICT applications used by more than 95% of teachers is comprised of word processing, Internet, email and file navigation.
- ✧ Sixty five percent of teachers have used both spreadsheets and presentation software.
- ✧ Aspects of SIS Curriculum Manager are used by 55% of teachers.
- ✧ Only 30% of teachers have ever used a database.

Detailed results are provided in Appendix D, with a summary of the findings below.

### **Word Processing**

- ✧ The application that most teachers are familiar with is word-processing. Most word-processing skills can be carried out by the majority of teachers (71% and above can do all tasks except two).
- ✧ *Setting up styles* and *using mail merge* are the two word processing tasks undertaken by the fewest teachers (at 59% and 28% respectively).

### **Internet**

- ✧ Most teachers can *navigate to known websites* and *do basic searches*. Between 48% and 79% can *create favourites or bookmarks*, *save images and text*, *organise favourites or bookmarks*, *use advanced search tools* and *use different browsers*.
- ✧ *Altering browser preferences* (34%), *downloading and installing software and plug-ins* (39%) and *conducting complex searches* (39%) are the Internet tasks carried out by the least number of teachers.

### **Computer File Navigation**

- ✧ Over 84% of teachers can *save files*, *create and name files*, *navigate between existing folders* and *copy, delete and rename files*. Between 60% and 67% of teachers are able to *select and navigate between drives and directories*, *navigate into a network*, *use help files*, *install software* and *recognise different file types*.
- ✧ *Zipping and unzipping files* (28%) and *doing complex searches for files* (34%) are the computer file navigation tasks carried out by the least number of teachers.

### **Email**

- ✧ Nearly all teachers can *access emails* (95%) and *create and send emails* (94%) with between 82% and 64% able to *locate sent and deleted messages*, *access and use address book entries*, *add to address book entries*, *add attachments to emails* and *store messages in folders*.
- ✧ *Creating a mailing list* (38%), *adding a signature to emails* (30%) and *setting up a discussion list* (10%) are the tasks undertaken by the least number of teachers.

## **Presentation Software**

- ✧ Thirty five percent of teachers have never tried any of the presentation software tasks.
- ✧ Half or more of teachers who have used the software can *create new slide shows, edit slide shows, insert images, change fonts & layout* and *navigate a presentation* (ranging from 50% to 62%).
- ✧ *Adding navigation buttons* (19%), *creating an original master* and *using master slide functions* (both 24%) are the tasks the least number of teachers have undertaken.

## **Spreadsheets**

- ✧ Thirty five percent of teachers have never tried any of the spreadsheet tasks.
- ✧ Sixty two percent of teachers have *entered data into an existing spreadsheet*, 60% have *created a spreadsheet* and 56% have *inserted and deleted rows and columns* (56%). Other spreadsheet tasks are used by less than half of teachers.

## **SIS Curriculum Manager<sup>4</sup>**

- ✧ Fifty five percent of teachers have tried SIS Curriculum Manager.
- ✧ *Logging on* is the task most widely used by teachers at 54%. A quarter of teachers, or less, has undertaken the remainder of the listed tasks.

## **Databases**

- ✧ Seventy percent of teachers have never tried any of the tasks associated with databases.

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<sup>4</sup> *At the time the survey took place, four of the eleven skills were not actual functions in the SIS Curriculum Manager Module. The responses to these four questions are therefore misleading and have been ignored. See Appendix D for full details.*

## 3.2 ICT Competence Index

In order to provide an easy to use statistic that summarises the teachers' responses to all of the items shown in section 3.1 an index was calculated.

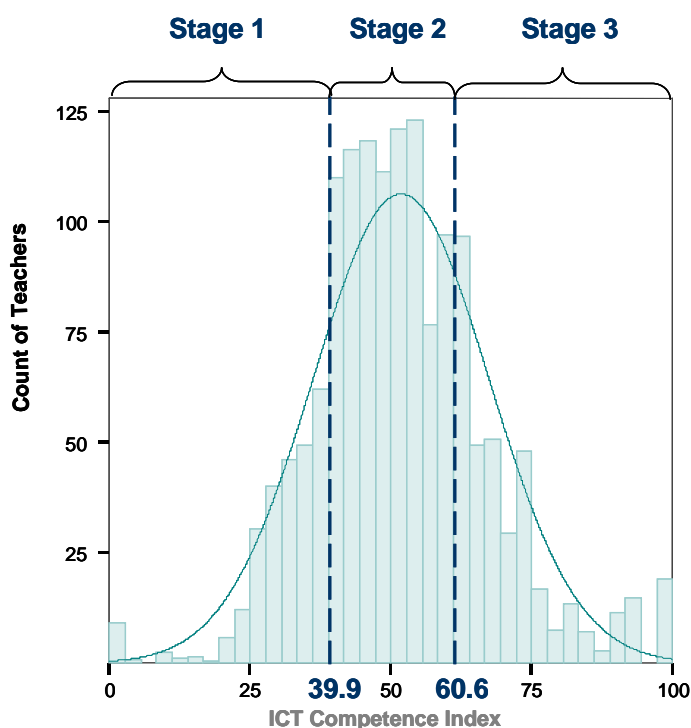
The Rasch model of analysis<sup>5</sup> was used to analyse the responses given by teachers and summarise their usage of seven of the eight<sup>6</sup> applications onto a **single scale**, which, for the remainder of this report, is called the **ICT Competence Index**.

### 3.2.1 The ICT competence index

For each of the 1,500 teachers, Rasch was used to examine the results of the 80 ICT skills listed in Questions 16-23 on the questionnaire and to develop a single index score for each individual teacher.

A frequency distribution of the ICT Competence index is shown in Figure 3.2.1. As can be seen, the frequency follows a normal distribution. For the purposes of benchmarking and to help in the description of the wide range of skills and knowledge of teachers, the ICT Competence Index has been divided into three broad groups, as shown in Figure 3.2.1.

Figure 3.2.1: Frequency Distribution of the ICT Competence Index – In 3 Stages



<sup>5</sup> Rasch Analysis is also used to analyse and present the WALNA data for the Department.

<sup>6</sup> Very early in the analysis it was seen that the responses given to use of SIS Curriculum Manager were out of line with the responses given to the other questions. Further investigation led to the conclusion that usage of SIS Curriculum Manager is not in line with a teachers' general level of ICT competence because its usage is dependent on whether the school uses SIS Curriculum Manager. Because of this, SIS Curriculum Manager was omitted from subsequent analyses.

### 3.2.2 ICT competence item map

By using Rasch Analysis the relative use of each to the 80 ICT skills was calculated.

Table 3.2.2a on the next page shows those items that are used by the most teachers across the top of the scale, whereas the items that are used by the fewest teachers are shown across the bottom of the scale.

The Item Map (Table 3.2.2a) has been divided into the three stages on the ICT Competence Index, thus showing the skills that correspond to each of the stages. The cut-off points for each of the stages were determined by selecting tasks from each of the ICT applications that clustered together in a logical manner, as well as considering the proportion of teachers within each stage to ensure group numbers remained large enough to be meaningful.

- ✧ **Stage 1** is comprised of 22% of teachers who typically have word processing skills and have used some aspects of Internet, email and file navigation. Generally, Stage 1 teachers have not used presentation software, spreadsheets or database applications (i.e. have an ICT competence scores between 0 and 39.9).
- ✧ **Stage 2** is comprised of 53% of teachers who in addition to possessing the ICT skills listed in Stage 1, have typically used Internet, email and file navigation to a greater extent. Stage 2 teachers also tend to have some presentation software and spreadsheet skills (i.e. have an ICT competence scores between 39.9 and 60.6).
- ✧ **Stage 3** is comprised of 25% of teachers who have typically undertaken most of the tasks in each of the listed ICT applications, including databases, extensively (i.e. have an ICT competence score over 60.6).

NOTE: Analysis divided the individual ICT competence levels of teachers into three discrete stages for descriptive purposes only. Development of the ICT Competence Index in no way implies that Stage 3 is the most desirable level for WA government school teachers. While it may be appropriate for some teachers to be at Stage 3, it may be equally appropriate for other teachers (in differing circumstances) to be Stage 2 or Stage 1 users.

The Item Map (Table 3.2.2a) should be used to determine where the desirable level of competence is for teachers and could be used to establish a benchmark.

**Table 3.2.2a: Item map for ICT competence (skills & knowledge)**

	Word Processing	Internet	File Navigation	Email	Presentations	Spreadsheets	Databases
Stage 1							
0	Create a new document						
	Print						
5	Open an existing document						
	Change fonts						
10	Spell check						
		Do basic searches					
		Navigate to known websites		Access emails			
15				Create and send emails			
20	Insert text		Save files in a selected folder				
	Create tables		Create and name new folders				
25	Insert images						
	Change page set up		Copy, delete and rename files				
	Format a document		Navigate between existing folders				
30	Change margins						
	Insert page numbers			Locate Sent and Deleted messages			
		Create Favourites or Bookmarks					
35	Add headers and / or footers			Access and use Address book entries			
				Add to Address book entries			
Stage 2							
40	Use columns and sections	Save images and text		Add attachments to emails			
		Organise Favourites or	Select and navigate between drives and directories				
			Use appropriate help files				
45			Install software	Store messages in folders	Create a new slide show	Enter data into an existing spreadsheet	
			Recognise different file types		Change font and layout	Create a new spreadsheet (enter data)	
	Set up styles		Navigate into a network		Edit an existing slide show		
					Insert images	Insert and delete rows and	
50		Use different browsers					
		Use advanced search tools			Can navigate back and forth during a presentation		
55						Format cells	
						Insert some calculations	
Stage 3							
60		Download and install software		Create a mailing list	Add animation and transitions	Sort cells	
		Conduct complex searches			Print handouts	Create new charts (graphs)	
					Include sound	Modify existing charts (graphs)	
		Alter browser preferences	Do complex searches for files	Add a signature to emails			
65	Use mail merge		Zip and unzip files				Create simple tables
					Insert hyperlinks		
					Can use master slide functions		
70					Create an original master	Refer to multiple worksheets	
						Apply complex formulae	Use simple queries to retrieve data
					Add navigation buttons		Retrieve and enter data in an existing database
75							Use wizards to create reports and forms
						Import and export data	
						Use absolute and relative cell references	
80				Set up a discussion list		Use filtering	
						Use conditional formatting	
85							Create summary reports
							Use wizards to create forms, sub-forms or portals
90							Use relational databases
95							Create and use parameter queries
100							Use more complex form design tools e.g. combo boxes
							Use complex functions in queries

# 4 What factors impact on the development of ICT competence?

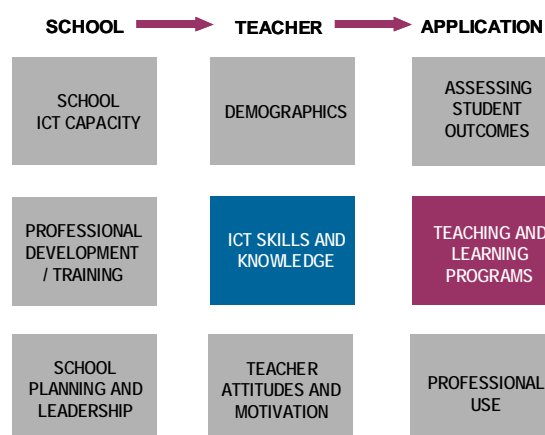
Closer examination of the ICT Competence Index provides us with the **key factors that impact upon ICT skills and knowledge**. This information is useful when making decisions about where to allocate future resources for the development of ICT skills and knowledge.

Returning to the conceptual framework as a basis for analysing and presenting the data, the **school**, **teacher** and **application** factors were examined to determine whether they have any impact on the development of ICT skills and knowledge in teachers.

Findings are presented under the broad headings of:

- ✧ Demographic factors; and
- ✧ Other factors.

## Conceptual Framework



## 4.1 Demographic factors that impact upon ICT competence

The following demographic factors have a statistically significant relationship with a teacher's ICT Competence Score.

- ✧ **Gender:** Males are more likely to have higher ICT Competence scores than females.
- ✧ **Age:** ICT Competence scores decrease as teachers' age increases.
- ✧ **Teaching experience:** ICT Competence scores decrease as the duration a teacher has taught in a WA government school increases; this is no doubt due to the relationship between age and teaching experience.
- ✧ **School type:** Teachers at secondary schools are more likely to have higher ICT Competence scores than primary school teachers.

Factors that are not significantly associated with ICT Competence (i.e. there is no statistically significant relationship between these factors and ICT Competence scores).

- ✧ **School region** (i.e. whether metropolitan, country or remote);
- ✧ **Teacher level;**
- ✧ **Teachers with administrative duties;**

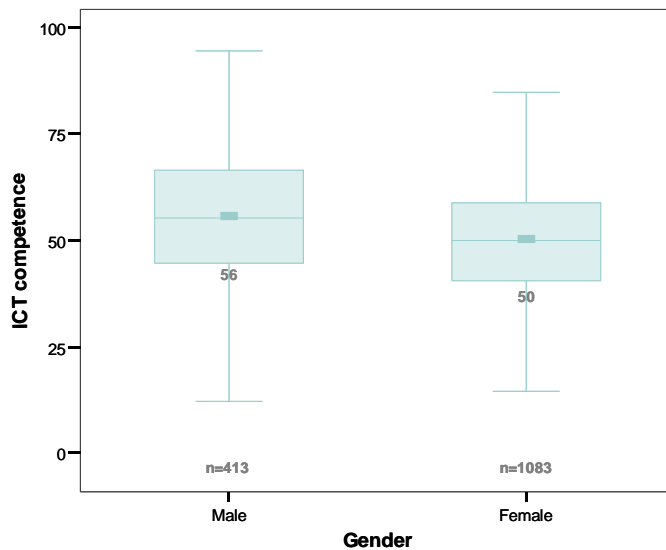
- ❖ **Mode of employment** (i.e. whether full-time or part-time / job share); and
- ❖ **Employment Status** (ie. whether permanent, fixed term or on probation).

Appendix E presents the results for all demographic factors measured, however a few key demographics are discussed next. A note is provided at the beginning of Appendix E on how to interpret the box plot charts.

### Gender

As shown in Figure 4.1a below, gender is directly related to a teacher's ICT Competence Score. The average score for males is 56%, statistically significantly higher than that of females (50%).

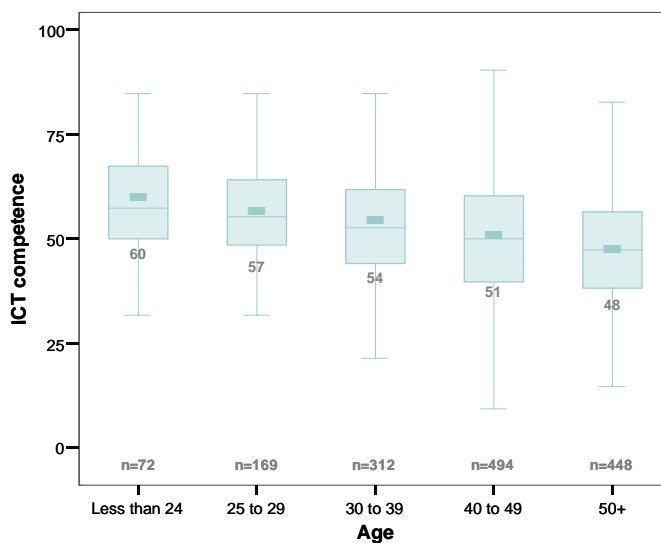
**Figure 4.1a: ICT competence index by gender**



### Age

Figure 4.1b below shows that age is inversely related to teachers' ICT Competence. The average ICT score decreases to a statistically significant degree as teachers' ages increase.

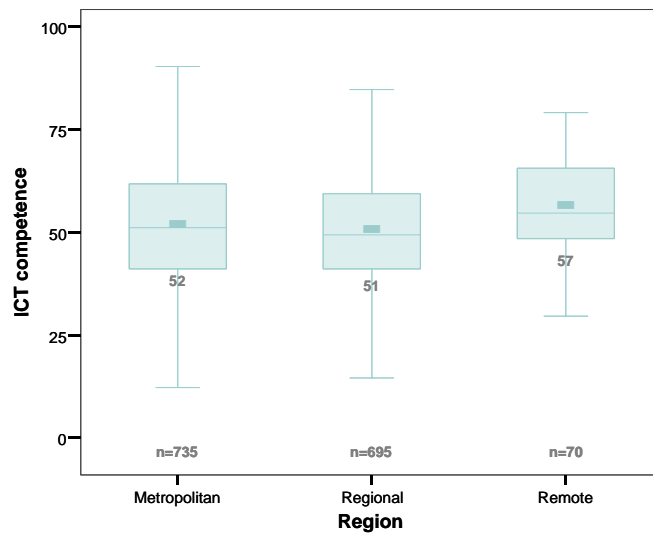
**Figure 4.1b: ICT competence index by age**



## Region

Figure 4.1c below presents the ICT Competence of teachers by broad regional categories. There is no statistically significant difference in the ICT Competence of teachers from the metropolitan or regional areas. Whilst not statistically significant (due to the small sample), a notable difference was found for teachers in remote areas. This may reflect the increased reliance on ICT in general found in the remote areas of western Australia and/or the profile of teachers in remote areas, i.e. Young, just finished training, on probation.

Figure 4.1c: ICT competence index by region



## 4.2 Other factors that impact upon ICT Competence

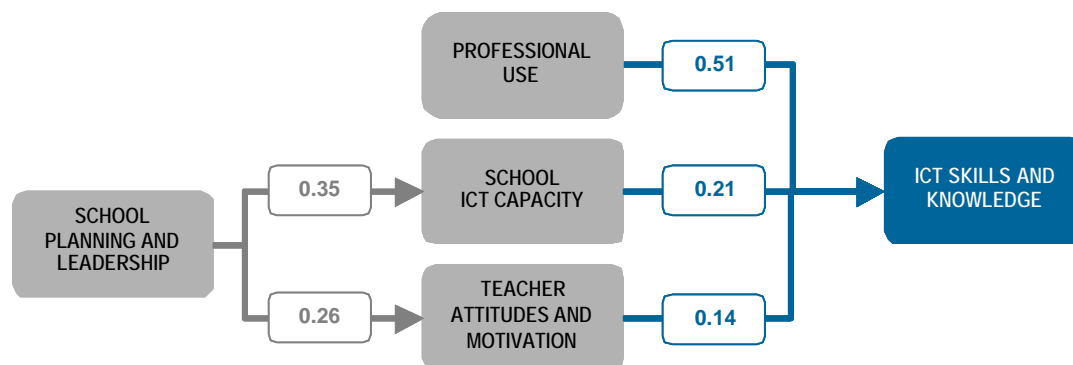
A technique called Structured Equation Modelling was used to analyse the relationships between ICT skills and knowledge and the other factors outlined in the Conceptual Framework. Structured Equation Modelling examines the strength of the relationship between variables and assigns a weight to the relationship, which can be anywhere between 0 and 1.

It was found that the factors with the strongest relationship with ICT skills and knowledge are:

- ✧ Professional use of ICT (sections 4.2.1 to 4.2.2);
- ✧ School ICT capacity (section 4.2.3); and
- ✧ Teacher attitudes and motivation (section 4.2.4).

These relationships are shown diagrammatically below. (Note, the arrows in the diagram can go both ways, however for this purpose are shown towards ICT skills and knowledge.)

Figure 4.2: Relative strength of relationship of factors on ICT competence of teachers



As the weights provide a quantitative measure of relative influence (or strength of the relationship) within the analysis, it can be deduced that **professional use of ICT is the most influential factor** on ICT skills and knowledge with a weight of 0.51, which has over twice the influence as the next factor *school's ICT capacity* at 0.21. The third factor with influence is *teacher attitudes and motivation* with a weight of 0.14<sup>7</sup>.

When combined, the results for the three factors amount to 0.86 (the range is 0 to 1). This means that these factors account for 86% of the variance in ICT skills and knowledge, which indicates that these factors describe the influences on ICT skills and knowledge very well.

<sup>7</sup> *School planning and leadership* was found to have no additional influence over these three factors. However, it was found to have a mediating effect through *school ICT capacity* (0.35) and *teacher attitudes and motivation* (0.26).

## 4.2.1 Professional use of ICT- performance of specific aspects

Because of the strength of the relationship between the professional use of ICT and ICT competence it is important to understand in greater detail what comprises professional use of ICT, and to consider how teachers can be encouraged to use ICT professionally.

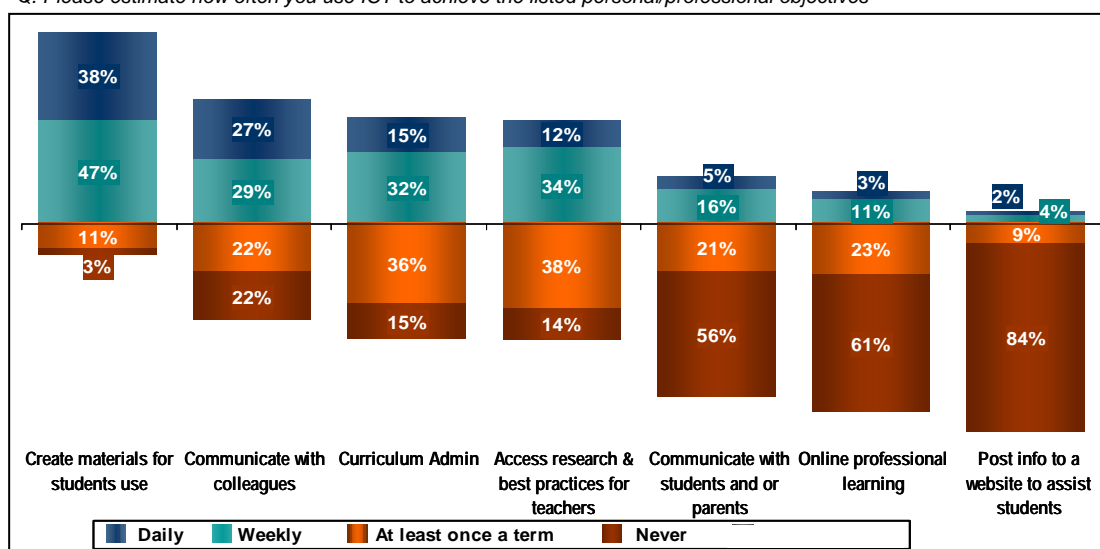
The survey asked teachers to rate the frequency with which they use ICT to achieve seven specific aspects relating to professional use of ICT, those being:

- ✧ Create materials for student use (e.g. Handouts, tests);
- ✧ Access research and best practices for teaching;
- ✧ Curriculum administration (e.g. planning, monitoring, evaluating and reporting);
- ✧ Communicate with colleagues/other professionals;
- ✧ Communicate with student(s) and/or students' parent(s);
- ✧ Post information to a website to assist your students in their work; and
- ✧ Online professional learning.

Figure 4.2.1 below depicts the frequency levels of use with these seven aspects of professional use of ICT.

**Figure 4.2.1 Frequency of professional use of ICT**

Q. Please estimate how often you use ICT to achieve the listed personal/professional objectives



- ✧ There is a large variance in how frequently ICT is used to achieve these tasks by teachers. The most frequently undertaken task using ICT is *creating materials for student use*, which is done by 97% of all teachers, and 85% on a weekly to daily basis.
- ✧ Next, approximately half of the teachers use ICT on a weekly to daily basis to *communicate with colleagues* (56%), *conduct curriculum administration* (47%) and *access research and best practices for teaching* (46%).
- ✧ ICT is least likely to be used to *communicate with students or parents* (56% never), *online professional learning* (61% never) and *post information to a website to assist your students in their work* (84% never).

- ✧ Most of these tasks are based on Internet use (and intranet use for some), hence it is necessary that the supporting infrastructure is in place to encourage professional use of ICT.

#### 4.2.2 Professional use of ICT – Categories of Usage

Further analysis was conducted which examined the responses of all respondents to these questions and reduced the seven items onto a single scale. The single scale has been divided into three broad categories of use, those being low, medium and high. The characteristics of the three categories are described below:

- ✧ In the **low** category are half (49%) of teachers. They regularly use ICT *to create materials for student use* (up to weekly), and even use ICT *to access research & best practice for teaching and conduct curriculum administration* on a less regular basis (at least once a term), however that is the extent of their use of ICT for professional use.
- ✧ In the **medium** category are a third (36%) of teachers. They use ICT *to create materials for student use* on a daily basis, and use *ICT to access research and best practice for teaching and conduct curriculum administration* up to weekly.  
  
On a less regular basis (at least once a term), they conduct *online professional learning and communicate with colleagues*. Teachers who have used ICT *to communicate with students or parents* at least once are in the medium category as are those who *have posted information to a website or assist students in their work*.
- ✧ In the **high** category are only 15% of teachers. They use ICT extremely regularly (up to daily) *to communicate with colleagues, conduct curriculum administration and to access research and best practice for teaching*. Furthermore they conduct *online professional learning* on a weekly basis.

#### *Demographic variations*

The following variations with professional use of ICT are seen:

- ✧ Teachers with a **high** frequency level of professional use of ICT are significantly more likely to have administrative duties than those with a low frequency level of professional use of ICT (16% vs. 4%).
- ✧ Teachers with a **low** frequency level of professional use of ICT are significantly more likely to be teaching at a primary school than are those with a medium or high frequency of professional use of ICT (49% low vs. 34% medium or high).
- ✧ Teachers with a **medium/high** frequency of using ICT for professional reasons are significantly more likely to be full-time teachers, (81% medium/high vs. 64% for low), whereas teachers with a low frequency of professional use of ICT are more likely to be part-time teachers (28% low vs. 16% medium/high).

### 4.2.3 ICT capacity - performance of specific aspects

Because of the strong relationship between a schools' ICT capacity and the ICT skills and knowledge of its teachers, it is important to understand what comprises ICT capacity and how it can be improved.

The survey asked teachers to rate the availability, use and ease of access of 14 different ICT resources at their school, those being:

- ✧ Desktop/laptop computer for personal use;
- ✧ Notebooks for teachers program;
- ✧ SIS curriculum manager;
- ✧ Personal email account;
- ✧ School intranet;
- ✧ Internet;
- ✧ Printer;
- ✧ Digital cameras;
- ✧ Specialist software applications (eg. CAD, HTML editors etc.);
- ✧ Technical support;
- ✧ Digital projectors/interactive whiteboards;
- ✧ Desktop computers for student use in your classroom;
- ✧ Desktop computers for student use elsewhere at school (eg. computer lab); and
- ✧ Laptop computers for student use.

Table 4.2.3a depicts the levels of availability, use and ease of access with each of the ICT resources for all teachers.

**Table 4.2.3a: School ICT capacity – availability, use and ease of access**

*Q. Please indicate which of the ICT resources listed below are available for use at school as a teacher and whether you have used them. If you have used a resource, please also indicate whether you found it to be easily accessible.*

	Availability	Use	Ease of Access
BASE: All Respondents	1,500	1,500	1,500
	%	%	%
Printer	98	95	83
Internet	97	88	80
Digital cameras	96	76	63
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Teacher use: Notebooks for Teachers Program	92	74	71
Teacher use: Desktop/laptop computer for personal use	85	78	72
<b>Sub total: Computers for teacher use</b>	<b>97</b>	<b>90</b>	<b>86</b>
<hr style="border-top: 1px dashed black;"/>			
Student use: Desktop PCs for student use elsewhere (eg. labs)	86	69	49
Student use: Desktop computers for student use in own classroom	66	59	48
Student use: Laptop computers for student use	20	11	9
<b>Sub total: Computers for student use</b>	<b>94</b>	<b>84</b>	<b>66</b>
<hr style="border-top: 1px dashed black;"/>			
Personal email account	89	68	59
Technical support	86	74	45
School intranet	73	59	53
SIS Curriculum Manager	68	42	30
Digital projectors/interactive whiteboards	63	33	26
Specialist software applications (eg. CAD, HTML editors)	40	14	12

## Availability

- ✧ The first three resources on the list (*printers, internet and digital cameras*) are almost universally available to all teachers.
- ✧ Regarding computers for personal use, 92% of teachers indicated that the *Notebooks for Teachers Program* are available, and 85% indicated that *desktop / laptop computers are available for personal use*. When these results are combined a total of 97% of teachers have at least one of these two resources available to them, only 3% of teachers indicated no access to computers for personal use.
- ✧ Regarding computers for student use, the most commonly available are *computers not in the classroom* (86%), followed by *computers in the classroom*, indicated as available by two thirds of teachers. Twenty percent indicated that *laptops are available for student use*. When combined a total of 94% of teachers indicated that computers are available for student use in one form or another.
- ✧ *Personal email accounts* and *technical support* are widely available to teachers, 89%, and 86% respectively. Three quarters (73%) of teachers have the *school intranet* available, and two thirds have *SIS* and *digital projectors / interactive whiteboards* available (68% and 63% respectively).
- ✧ The least available resource is the *specialist software applications*, which only 40% of teachers indicated was available to them.

## Use

- ✧ Most of the resources have been used by the vast majority of teachers who have them available (i.e. used by 75% or more by teachers who have available resources). Resources that have not been widely utilised are *SIS, digital projectors / interactive whiteboards, specialist software* and *laptops for student use*.

## Ease of access

The ease of access results for all teachers are shown in Table 4.2.3a previously, however for interpretation purposes Table 4.2.3b shows the proportion of teachers who had difficulty accessing each resource as a percentage of teachers who used each resource.

$$\text{Difficulty Score} = 100 - \left[ \frac{\% \text{ Ease of Access}}{\% \text{ Use}} \right]$$

**Table 4.2.3b: School ICT capacity – difficulty index**

	Difficulty Score
BASE: Those who have used the resource	%
Technical support	39
SIS Curriculum Manager	29
Student use: Desktop PCs for student use elsewhere (eg. labs)	29
Digital projectors/interactive whiteboards	21
Student use: Desktop computers for student use in own classroom	19
Student use: Laptop computers for student use	18
Digital cameras	17
Specialist software applications (eg. CAD, HTML editors)	14
Printer	13
Personal email account	13
School intranet	10
Internet	9
Teacher use: Desktop/laptop computer for personal use	8
Teacher use: Notebooks for Teachers Program	4

- ✧ *Technical support* stands out as the resource most teachers have difficulty accessing, with 39% of those who have used technical support indicating it is difficult to access.
- ✧ *SIS Curriculum Manager* is second with 29% of teachers who have used it indicating that it is difficult to access.
- ✧ Computers for students to use are rated as difficult to access (especially *computers in labs* at 29%). The average difficulty score for computers for student use is 21%.
- ✧ Also of note is the difficulty teachers have in accessing *digital projectors / interactive whiteboards*, with 21% of teachers who had used them indicating they found them difficult to access.
- ✧ Availability and ease of access to these key resources need to be improved if school ICT capacity is to be improved.

### *Demographic variations*

Further analysis was undertaken which examined the demographics by resource capacity. The only demographic variation by capacity was found to be school type, where it was found that:

- ✧ Schools with a **high level of ICT capacity** are more likely to be **secondary schools** than primary schools.
- ✧ Schools with a **low level of ICT capacity** are more likely to be **primary schools** than secondary schools.
- ✧ There are no variations in school ICT capacity by region (i.e. metro, rural or remote).

## 4.2.4 Teachers' attitudes & motivation - performance of specific aspects

Because of the relationship between teachers' attitudes and motivation and their ICT competence it is important to understand what comprises attitudes and motivation, and consider how they can be improved, so that the relationship can be made stronger and teachers ICT skills and knowledge improve too.

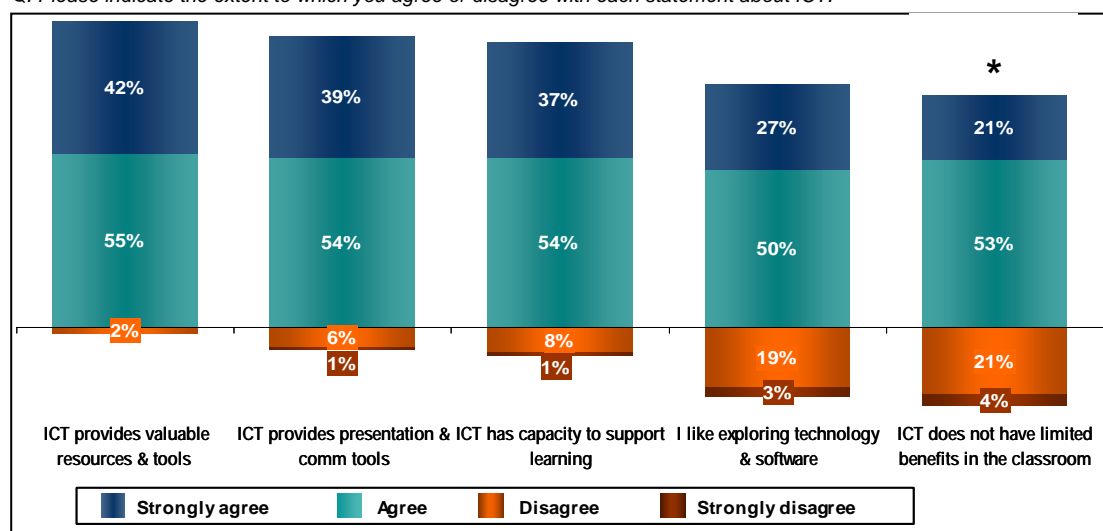
Teachers were asked to indicate the extent they agreed with five attitudinal statements relating to their use of ICT, those being:

- ✧ Student use of ICT has the capacity to strongly support student-centred, inquiry based learning;
- ✧ ICT provides valuable resources and tools to support student learning;
- ✧ ICT provides students with efficient presentation and communication tools;
- ✧ ICT has limited capacity to provide benefits in the classroom; and
- ✧ I like the challenge of exploring technology and new software and its possibilities.

Figure 4.2.4 depicts the responses to the five aspects of attitudes and motivation.

**Figure 4.2.4: Teachers' attitudes and motivation towards ICT**

Q. Please indicate the extent to which you agree or disagree with each statement about ICT.



\* Question and response scale reversed for ease of interpretation

- ✧ On the whole, teachers' attitudes and motivation are extremely positive, with the three most positive statements attracting less than 10% disagreement and negligible levels of strong disagreement.
- ✧ The two least positive statements (*I like exploring technology and software* and *ICT does not have limited benefits in the classroom*) attract agreement by three quarters of teachers and strong disagreement is also negligible.

### Demographic variations

Further analysis was undertaken which examined attitudes by key demographics. It was found that the teachers who are **most likely** to express negative attitudes to these statements are:

- ✧ Secondary school teachers as opposed to teachers at other school types;
- ✧ Part-time teachers as opposed to full-time teachers; and
- ✧ Teachers aged over 50 years old as opposed to teachers less than 50 years old.

## 4.3 Training and ICT competence

### 4.3.1 Training courses

This section takes a closer look at the measures related to professional development used in the survey in order to gain a greater understanding of how training can be used to improve the ICT knowledge and skill and teachers.

Teachers were asked to indicate whether they had undertaken professional development in any of seven areas of ICT; who had arranged the training and whether it was effective. The seven areas were:

- ✧ Training in the use of computers / basic computer;
- ✧ SIS Curriculum Manager;
- ✧ Word processing (e.g. MSWord);
- ✧ Spreadsheets (e.g. Excel);
- ✧ Presentation software (e.g. PowerPoint);
- ✧ Databases (e.g. Access); and
- ✧ Training on how to integrate technology within the curriculum.

The table below depicts the responses to the seven areas.

**Table 4.3.1a: Access to Training**

*Q. Please indicate whether you have undertaken professional development in any of the ICT areas listed below? If so, please also indicate whether the professional development was arranged **through your school**?*

	Undertaken training	Arranged through school
BASE: All Respondents	1,500	1,500
	%	%
Training in the use of computers / basic computer	59	37
SIS Curriculum Manager	51	48
Word processing	40	17
Presentation software	40	26
Training on how to integrate technology within the curriculum	35	26
Spreadsheets	30	13
Databases	13	6

#### *Undertaken Training*

- ✧ The professional development most frequently undertaken was training in *the use of computers / basic computers* and *SIS Curriculum Manager*, with over half of the teachers having been on such a course (59% and 51% respectively).
- ✧ Professional development in the areas of *word processing*, *presentations*, *integrating ICT within the curriculum* and *spreadsheets* had been undertaken by between 30 and 40% of teachers.
- ✧ Training in *databases* had been carried out by the fewest number of teachers (13%).

### *Training arranged through your school*

- ✧ The courses that are most likely to be arranged by the schools are (in descending order): *SIS Curriculum Manager* (48%); *the use of computers / basic computers* (37%); *integrating ICT within the curriculum*; and *presentation software* (both 26%).
- ✧ The courses that are least likely to be arranged through the school are in *word processing*, *spreadsheets* and *databases* at 17%; 13% and 6% respectively.
- ✧ Note the survey did not ascertain who arranged the training if it was not arranged via the school. Training may have been arranged by District, Head Office, personal, previous employer, etc.

### *Effectiveness of Training*

Table 4.3.1b below shows training effectiveness results as a proportion of trained teachers.

**Table 4.3.1b Effectiveness of Training**

Q. Please indicate if you found it to be effective?

	Effectiveness of Course
BASE: Those who have been on course	%
SIS Curriculum Manager	61
Training on how to integrate technology within the curriculum	60
Training in the use of computers / basic computer	58
Presentation software	50
Word processing	40
Spreadsheets	33
Databases	31

- ✧ *SIS Curriculum Manager* (61%), *integrating technology* (60%), *use of computers* (58%) and *presentation software* (50%) are the courses considered most effective by teachers. At least half of the teachers who had undertaken training in these areas rated their training as effective.
- ✧ The courses rated by teachers as least effective are *word processing* (40% effective), *spreadsheets* (33% effective) and *databases* (31% effective). Interestingly, these courses are also the ones that are most likely to have not been organised through the school.

### 4.3.2 The impact of training courses on ICT skills and knowledge

The software applications listed in the survey included:

- ✧ Word processing;
- ✧ Presentations;
- ✧ Spreadsheets;
- ✧ Databases;
- ✧ SIS Curriculum Manager; and
- ✧ Email, Internet and file management (basic computing skills).

From the information provided on the skills and knowledge of each teacher, competence scores were calculated. In order to determine the impact of training, the competence scores for each specific application were analysed by whether the teachers had undertaken training or not. The results were as follows:

**Table 4.3.2a: ICT Competence Scores vs. Training Received**

	Average scores for teachers with no training	Average scores for teachers who have undertaken training
<b>Base: All Respondents</b>		
SIS Curriculum Manager competence score	12	52
Spreadsheets competence score	30	46
Presentation software competence score	37	53
Databases competence score	9	35

- ✧ For the applications shown in the table above, teachers who have received training in the application are significantly more likely to have a higher competence score for that application than those who have had no training. For example: A score of 52 for teachers who have attended a course on SIS Curriculum Manager versus a score of 12 for those with no training.

Teachers who had received training were then asked to rate whether they found their training course to be effective or ineffective. The results are as follows:

**Table 4.3.2b: ICT Competence Scores vs. Effectiveness of Training Received**

	Effective Training	Ineffective training	Effectiveness not specified
<b>Base: Respondents who received training</b>			
SIS Curriculum Manager competence score	60	36	53
Spreadsheets competence score	41	27	52
Presentation software competence score	50	22	68
Databases competence score	24	5*	44

- ✧ The competence scores for teachers who rated their training as “effective” are significantly higher than for those who rated their training as “ineffective”.
- ✧ **The conclusion is clear: Effective training courses in these four applications are having a positive effect on teachers’ skills and knowledge.**

The table below details the competence score for word processing and basic computing against the type of training received.

**Table 4.3.2b ICT Competence vs. Training Received**

	Average scores for teachers with no training	Average scores for teachers who have undertaken training
<b>Base: All Respondents</b>		
Word processing competence score	72	73
Basic computing competence score	60	59

*\* very small sample size*

- ✧ There is **no difference** in the competence scores of teachers who have received training in word processing or basic computing and those who have not. This finding indicates that many teachers acquire their word processing or basic computing skills from sources other than training courses (sources such as online help and asking others).
- ✧ This does not mean that training courses for word processing and basic computing are not useful. What it does mean is that an alternative method of measuring the impact of the training course is required (pre post rather than snapshot).
- ✧ The numbers are too small for any conclusions to be drawn from whether the training was rated effective or ineffective.

# 5 How do teachers apply their ICT knowledge and skill?

The previous sections have explored teachers' ICT skills and knowledge, the following discussion examines the extent to which those skills and knowledge are being applied within teaching and learning by teachers.

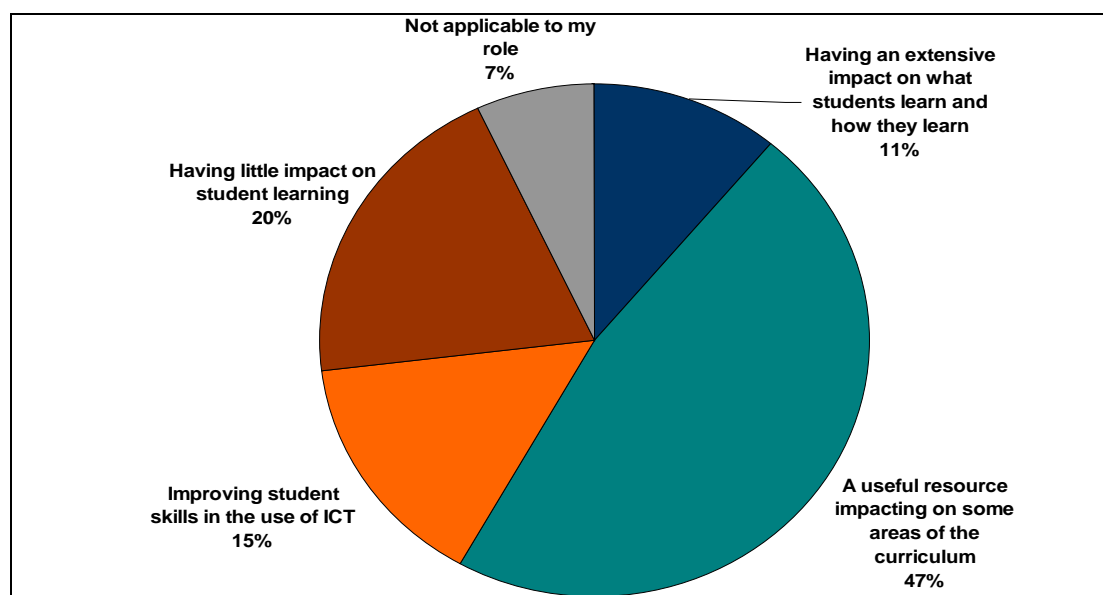
## 5.1 Overall integration within the classroom

As shown in figure 5.1a below, when asked to what extent they applied ICT within their teaching practice the following responses were given.

- ✧ In total, just over half (58%) selected the two responses showing a high level of integration, with 47% reporting ICT is *impacting on some areas* of the curriculum and 11% reporting that ICT is having an *extensive impact* on what students learn and how they learn.
- ✧ However, for over a quarter of teachers (27%), results show that ICT is having *little* (20%) or *no impact* (7%) in their classroom.

**Figure 5.1a: Frequency of professional use of ICT**

Q. Below is a list of statements about the extent to which you apply ICT within your teaching practice, please choose the one that best describes your situation? In my current teaching, ICT is...



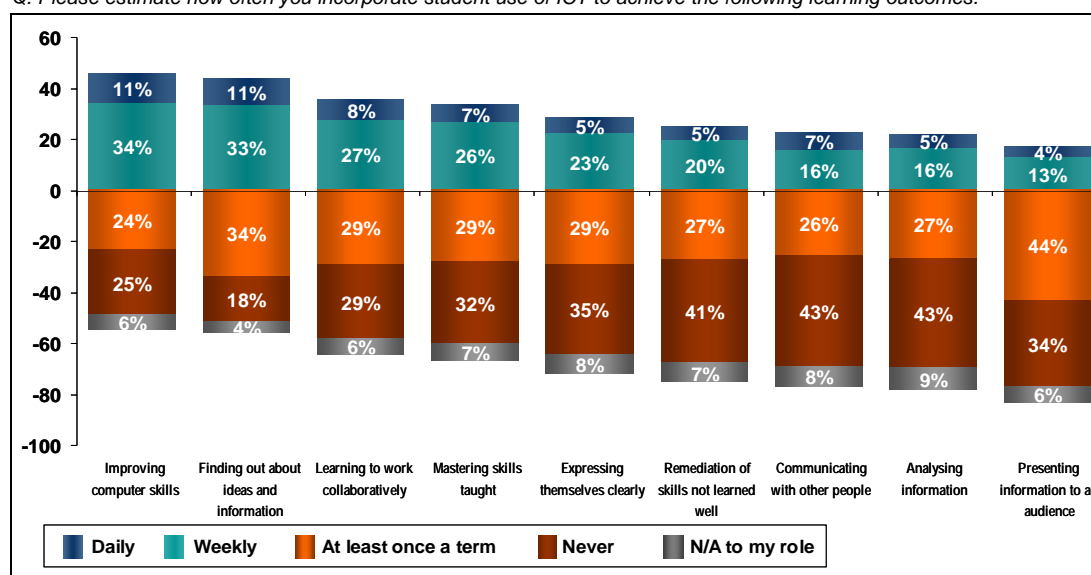
Teachers were then asked to rate the extent to which they incorporated ICT into learning to achieve the following nine learning outcomes:

- ✧ Mastering skills just taught
- ✧ Remediation of skills not learned well
- ✧ Expressing themselves clearly
- ✧ Communicating with other people
- ✧ Finding out about ideas and information
- ✧ Analysing information
- ✧ Presenting information to an audience
- ✧ Improving computer skills
- ✧ Learning to work collaboratively

Figure 5.1b below depicts the levels of ICT integration reported for the nine learning outcomes.

**Figure 5.1b: ICT Integration within learning**

Q. Please estimate how often you incorporate student use of ICT to achieve the following learning outcomes.



- ✧ The proportion of teachers who use ICT to carry out any of the nine learning outcomes on a weekly or daily basis range from only 17% to 45%.
- ✧ Of those who are using ICT regularly, most are doing so to *improve computer skills* and to *find out about ideas and information*.
- ✧ The majority of teachers are not regularly incorporating student use of ICT to achieve these learning outcomes.

## 5.2 ICT Integration Index

Rasch Analysis was used to summarise teacher responses to the above set of questions onto a **single scale**, which, for the remainder of this report, is called the **ICT Integration Index**.

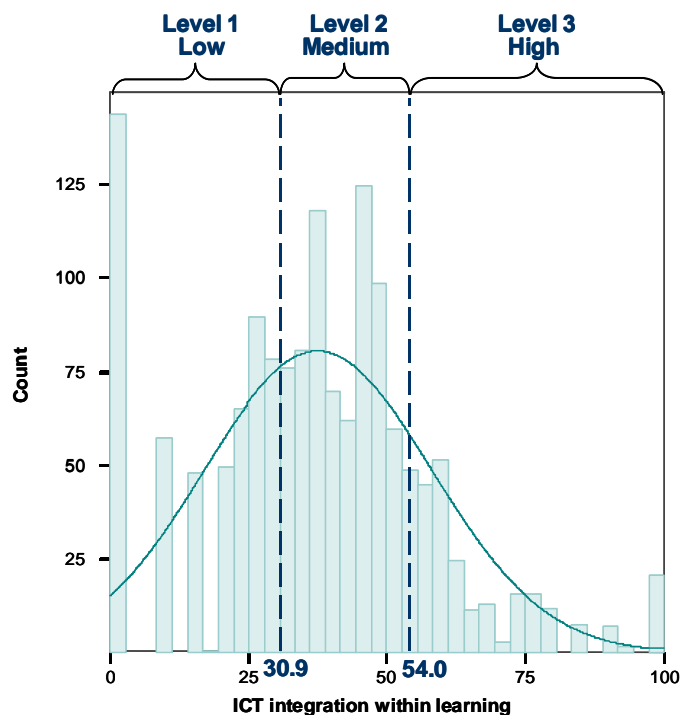
### 5.2.1 The ICT Integration Index

The Rasch analysis examined all teacher responses for each of nine learning outcomes, providing each teacher with an overall score of integration.

As can be seen in figure 5.2.1 below the frequency follows a skewed distribution, with a high proportion of teachers with low ICT Integration Indices (ie. Less than 50%). Indeed over 140 teachers (nearly 10% of the sample) scored 0 on the index, indicating that they currently do not integrate ICT within learning at all.

The ICT Integration Index has been divided into three broad levels, which describe the achievements of each group of teachers, as shown below.

Figure 5.2.1: Frequency Distribution of the ICT Integration Index – In 3 Levels



## 5.2.2 ICT Integration Item Map

Rasch Analysis produced an ICT Integration Item Map, which indicates the relative use of ICT to achieve each of the nine learning outcomes.

Table 5.2.2: Item Map for ICT Integration within learning

	Frequency			
	Never	Up to 1+ times a term (infrequent)	Once or more a term up to Weekly (often)	Weekly up to Daily (regularly)
<b>Low</b>	Re-teach skills not learned well Communicate with other people Analyse information	Find out about ideas & information Improve computer skills Learn to work collaboratively Master skills taught Express themselves clearly Present info to an audience		
<b>Medium</b>		Present info to an audience Re-teach skills not learned well Communicate with other people Analyse information	Find out about ideas & information Improve computer skills Learn to work collaboratively Master skills taught Express themselves clearly	
<b>High</b>			Present info to an audience	Find out about ideas & information Improve computer skills Learn to work collaboratively Master skills taught Express themselves clearly Re-teach skills not learned well Communicate with other people Analyse information

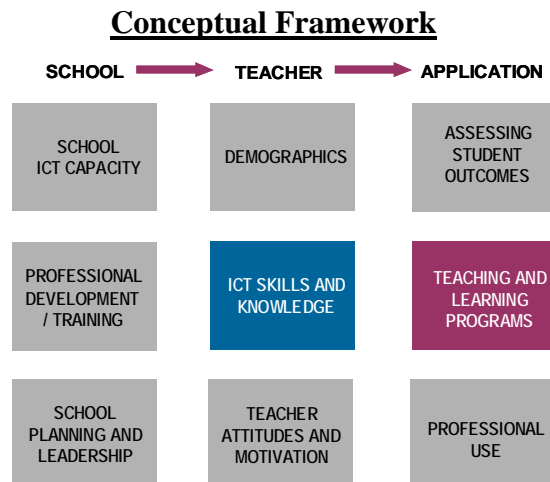
The Item Map has been divided into the three levels of the ICT Integration Index, and shows the skills that correspond to each of the levels. By reading across each level the table indicates the frequency at which each of the learning outcomes are achieved.

- ✧ **36% of teachers have a low ICT Integration score.** These teachers typically achieve six of the learning outcomes infrequently (ie. Up to 1+ times a term). Whilst three of the learning outcomes are not achieved via ICT at all.
- ✧ **46% of teachers have a medium ICT integration score.** These teachers typically achieve five of the learning outcomes via ICT often (1+ times a term to weekly). In addition they achieved three (*re-teach skills not learned well, communicate with other people and analyse information*) infrequently.
- ✧ **Only 18% of teachers have a high ICT integration score.** These teachers typically achieve eight of the learning outcomes via ICT on a regular basis, and achieve the last one (*presenting information to an audience*) often.

# 6 What factors impact on the application of ICT in the classroom?

In this section we take a closer look at what factors impact on teacher integration of ICT within learning. The outcome of this analysis will essentially provide us with the **key drivers of ICT Integration within learning**.

Returning to the conceptual framework, the **school**, **teacher** and **application** factors were examined to determine if they have any impact upon the level of integration of ICT within the classrooms.



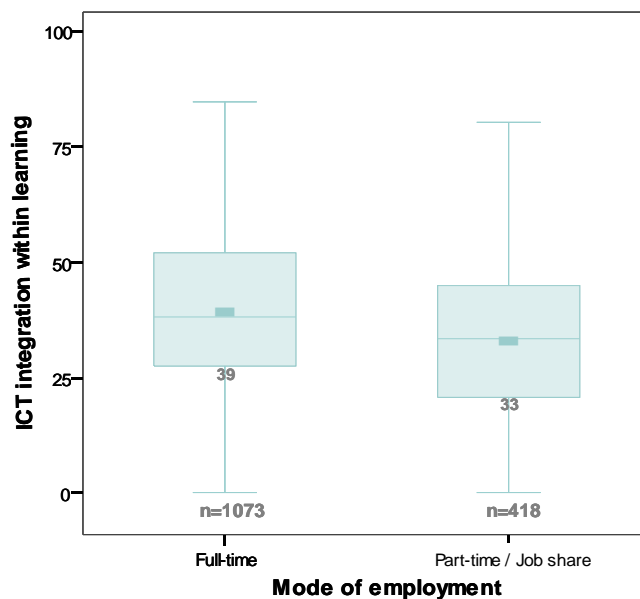
These are discussed in turn in the following section of the report.

## 6.1 Demographic factors that impact on the extent teachers integrate ICT within learning.

There is only one demographic factor that displays a statistically significant relationship with the extent to which a teacher integrates ICT within learning in their classroom, that is their mode of employment.

- ✧ As shown in figure 6.1 below, full-time teachers are statistically significantly more likely to integrate ICT within learning than are part-time/job share teachers (39% and 33%).

Figure 6.1: ICT Integration by Mode of Employment



Analysis of all other demographic factors measured, such as gender, age, experience, school type, duties, employment status, region or teacher level, showed no statistically significant relationship with ICT integration in the classroom.

The detailed results and box plot charts for all these demographic factors can be found in Appendix F.

## 6.2 Other factors that impact on the extent teachers integrate ICT within learning

Again, Structured Equation Modelling was used to analyse the relationships between ICT integration within learning and the other factors outlined in the Conceptual Framework.

✧ The following factors, in order of the strength of their relationship with ICT integration are presented in figure 6.2 below.

Figure 6.2: Relative Influence of ICT competence and ICT integration.

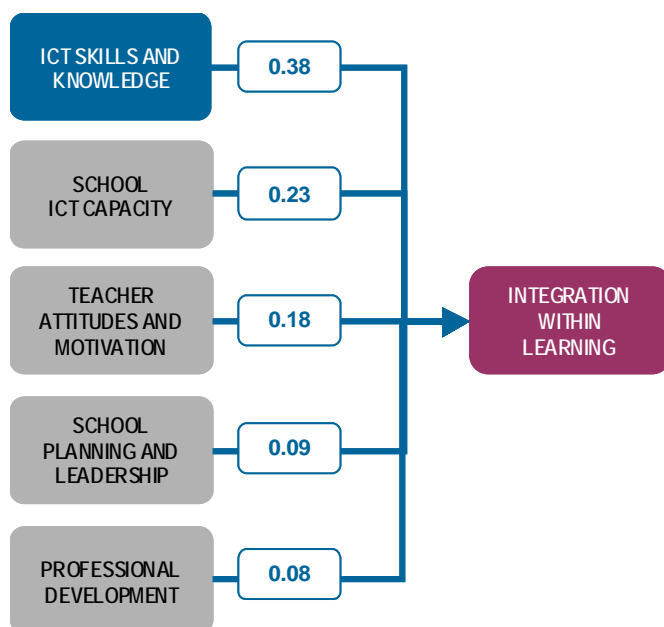


Figure 6.2 clearly shows the very strong relationship (0.38) between the extent ICT is integrated into the classroom to achieve learning outcomes and the *ICT skills and knowledge* of the teacher. This can be interpreted to mean that teachers with high levels of ICT skills and knowledge are more likely to integrate ICT within learning than teachers with lower levels of skills.

The next most influential factor is *school ICT capacity* at 0.23, followed by *teacher attitudes and motivation* (0.18). Of lesser, but still significant influence are *school planning and leadership* (0.09) and *professional development* (0.08)<sup>8</sup>.

What comprises and influences *ICT skills and knowledge* has been discussed in section 3, as has *school ICT capacity* and *teachers' attitudes and motivation* (see sections 4.2.3 and 4.2.4).

<sup>8</sup> When the weights of these five factors are combined, the aggregated weight comes to 0.96 (the range is 0 to 1), which indicates that 96% of the variance in the responses for **ICT integration within learning** are explained by these factors. This is a very high proportion, and indicates that through understanding these factors we can understand almost all that influences ICT integration within learning.

## 6.2.1 School planning and leadership - performance of specific aspects

As outlined in section 6.2, school planning and leadership has a statistically significant relationship with ICT integration within learning.

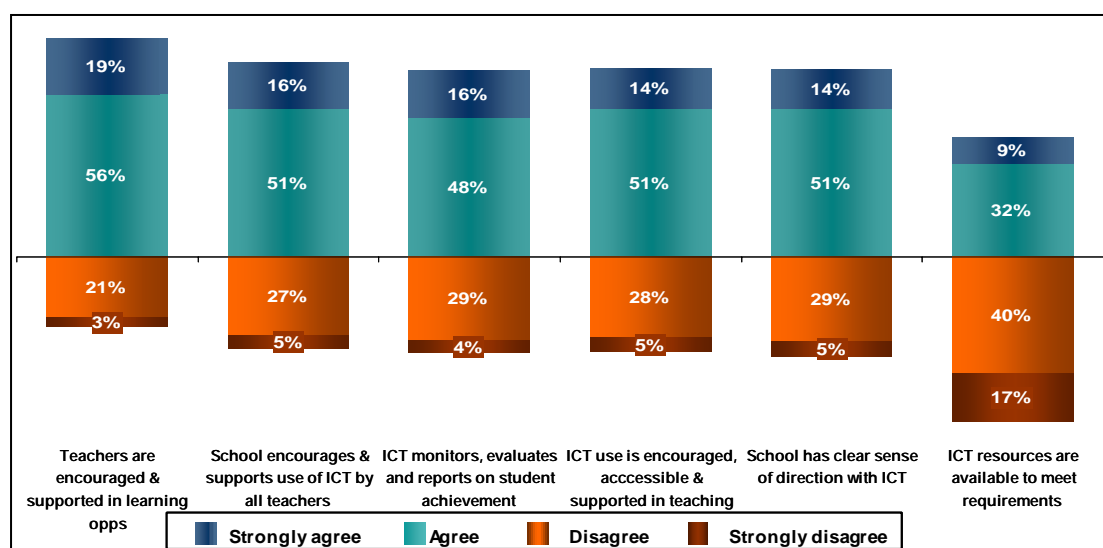
Teachers were asked to indicate the extent to which they agreed with six statements about their school's planning and leadership in relation to the use of ICT at their school. The six statements were:

- ✧ My school has a clear sense of direction in how to use ICT to enhance the learning of students;
- ✧ My school encourages the use of ICT by all teachers and puts support strategies in place for everyone;
- ✧ The use of ICT is encouraged in the teaching and learning of students at my school and appropriate access and support is provided;
- ✧ Teachers at my school are encouraged and supported in participating in professional learning opportunities;
- ✧ ICT is used to monitor, evaluate and report on student achievement at my school; and
- ✧ Sufficient ICT resources are available to meet the ICT requirements of teachers and students.

Figure 6.2.1 below depicts the teacher responses to the six statements.

**Figure 6.2.1: School Planning and Leadership**

Q. Please indicate the extent to which you agree or disagree with each statement.



- ✧ It is encouraging to see that the statement that attracts the highest level of agreement (75%) relates to professional development, i.e. *teachers are encouraged and supported in participating in professional learning opportunities*, however there are a quarter (24%) of teachers who disagree with this statement.
- ✧ The next four statements attract similar levels of agreement, with around 65% of teachers in agreement, and 35% disagreeing.
- ✧ The statement that attracted the lowest level of agreement was *sufficient ICT resources are available to meet the ICT requirements of teachers and students*. Indeed, more teachers disagreed with the statement (57%) than agreed (41%).

This result highlights teachers' perception of the shortage of ICT resources as outlined in section 4.2.3: ICT capacity– performance specific aspects.

Further analysis was conducted which examined the responses of all respondents and looked at the key differences between low, medium and high levels of planning and leadership. These three categories are summarised below.

- ✧ Nearly half (43%) of teachers are in the **low** category. They typically disagree with all of the statements for their school, except the most positive statement, *teachers are encouraged and supported in participating in professional learning opportunities*.
- ✧ A third of teachers (36%) are in the **medium** category. This group of teachers typically agree with all six statements for their school.
- ✧ In the **high** category are 22% of teachers. This group of teachers typically strongly agree with all six statements for their school.

### Demographic variations

- ✧ Teachers who are at schools with high scores for planning and leadership (rather than medium or low scores), are more likely to be the older teachers, ie. over 40 years old and have been a teacher for over 20 years.

## 6.2.2 Professional development - the impact of training on ICT integration within learning

In Section 6.2 the Structured Equation Modelling found that professional development<sup>9</sup> significantly impacts on the degree to which teachers integrate ICT within the classroom.

One of the questions in the professional development section of the survey was about the training course *on how to integrate technology within the curriculum*. The results for this question have been examined by the extent to which teachers have integrated ICT within their classroom. The results are shown below.

Table 6.2.2 ICT Integration scores by training received

	Average scores for teachers with no training	Average scores for teachers who have undertaken training
Base: All Respondents	924	523
ICT Integration within training score	34	44

- ✧ **This type of training course positively impacts on teachers' likelihood to integrate ICT within their classroom.** Teachers who have received training *on how to integrate ICT within the classroom* are significantly more likely to be integrating ICT within their classroom (44%) than those who had not undertaken such training (34%).

<sup>9</sup> That is professional development as measured in the questionnaire. When measuring professional development, the questionnaire focused on training courses that teachers may have attended, rather than providing a holistic view of professional development which encompasses the many and various ways teachers learn new skills (eg. Online help, asking colleagues, etc). For the purposes of this study training is viewed as a school based factor – see conceptual framework in section 2.

## 6.3 Frequency of barriers to ICT integration

Teachers were asked in the survey how often factors outside their control restrict their use of ICT. The results are shown in Table 6.3 below.

**Table 6.3: Frequency of factors restricting use of ICT.**

*Q26 Please indicate how frequently factors outside your control restrict your use of ICT. Factors include things like condition of equipment, access to equipment, technical support etc.*

	Total
BASE: All Respondents	1,500
	%
Daily	28
Weekly	35
At least once a term	26
Never	4
Not applicable to my role	6

These results show that barriers to the use of ICT in the classroom occur extremely regularly. Just over a quarter of teachers (28%) face factors outside their control that restrict their use of ICT on a daily basis; while a further 35% experience barriers on a weekly basis; and a further 26% experience barriers at least once a term. Only 4% of teachers responded that their use of ICT was never restricted by outside factors.

# 7 What future support would teachers find useful?

This section discusses the types of support teachers' told us they would find useful to assist them to further develop their ICT knowledge and skills and apply them in the classroom.

## 7.1 Types of Support

At the end of the survey, teachers were asked the following open-ended question:

*Q30. Please describe any factors that would increase your use of ICT in the classroom?*

Seventy eight percent of teachers surveyed described factors that would increase their use of ICT in the classroom in response to this question. This is an extremely high response rate for this style of question (usually an open-ended question at the end of a questionnaire attracts response rates between 30% and 50%), and indicates the high level of involvement teachers have with the issue.

Analysis of the nature and frequency of the comments made by teachers in response to this open-ended provides an indication of "teacher engagement" with issues of relevance to ICT and its application in the classroom. Table 7.2 below outlines the key types of support identified by teachers.

**Table 7.2 Support required to increase the use of ICT in the classroom**

	Total
BASE: All Respondents	1,500
	%
<b>More computers / better access to computers:</b>	<b>74</b>
Need more computers	15
Easier/ better access to labs	15
Need more computers in classroom	13
More money/ bigger budget	6
Laptop for students/ teachers	5
Printer comments/ scanner comments	5
Need digital projector/ screen	5
Whole class access to computers	5
<b>Quality of computers / connections :</b>	<b>34</b>
Need reliable computers	14
Up to date computers/ software	8
Reliable internet access	6
Network/ intranet reliability	6
<b>Training comments:</b>	<b>31</b>
More PD/ PD about using ICT in classroom/ Relevant PD	25
I need more confidence	3
More sharing of initiatives	2
<b>Improved technical support:</b>	<b>16</b>
More/ full time professional technician	14
Quick response support	2
<b>More time to develop lessons</b>	<b>13</b>
<b>More teaching resources:</b>	<b>9</b>
Need more suitable software	6
More access to learning related sites	2
<b>More teacher support:</b>	<b>8</b>
ICT specialist to help teachers	5
Classroom support with teaching ICT	4
<b>SIS comments</b>	<b>5</b>
No response	22

*Note more than one answer was allowed, hence totals add up to more than 100%*

*Responses given by less than 2% of teachers are not shown*

- ✧ Seventy four percent of teachers made comments about needing **more computers** or **better access** to existing computers. Teachers specifically mentioned *more computers* (15%), *more computers in the classroom* (13%) and *whole of class access to computers* (5%). *Better access to existing computer labs* was mentioned by 15%.
- ✧ Apart from computers, some teachers mentioned *more money* in general (6%), whilst some made specific mention of *printers / scanners* (5%), or *digital projectors / screens* (5%).
- ✧ Thirty four percent of teachers mentioned the **quality of the computers and /or connections**. *Reliability* was mentioned by 14%, with *modernity (up to date)* mentioned by 8%. *Internet access* and *intranet access* were both mentioned by 6%.
- ✧ The third most commonly mentioned group of factors was **training** (mentioned by 31% of teachers).
- ✧ The single most frequently mentioned factor that would increase teachers use of ICT in the classroom was *PD / PD about using ICT in classroom /relevant PD* which was mentioned by a quarter of all teachers.
- ✧ **Improved technical support** was mentioned by 16% of teachers. 14% of teachers want *more technical support* available within their school, and 2% want *quick response* to technical problems.
- ✧ **More time to develop lessons** was mentioned by 13% of all teachers.
- ✧ **Access to more teaching resources** was mentioned by 9% of teachers.
- ✧ **Teacher support** was mentioned by 8% of teachers. With teachers wanting *ICT specialists to help them*, and *classroom support with teaching ICT*. This comment was made mainly by primary school teachers, who requested support with class management.
- ✧ Comments relating to **SIS** were made by 5% of teachers.
- ✧ The different means of supporting teacher application of ICT in the future as outlined above bear out the results of the formal analysis of the survey questions related to increasing the ICT capacity of schools (i.e. increased access to better quality resources, technical support and professional development).

# 8 Discussion, Conclusions & Recommendations

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## 8.1 Discussion of factors that impact upon ICT competence of teachers

If the aim of the department is to achieve a higher level of teacher ICT competence, then attending to the following factors provides a way forward.

- ✧ **ICT for professional use:** increasing the use of ICT for professional purposes will positively influence a teacher's ICT knowledge and skill level. The key areas are:
  - ◆ Contacting colleagues – via internet (and intranet).
  - ◆ Creating materials for class – via printers, consumables, data projectors, etc.
  - ◆ Curriculum administration – via SIS Curriculum Manager.
  
- ✧ **School ICT capacity:** continuing to improve the infrastructure at schools will impact positively upon teachers' use of ICT. Access to technical support and computers for student use provided the greatest barriers to the development of teacher ICT competence and are therefore recommended for particular attention.
  
- ✧ **Teachers' attitudes and motivation:** overall teachers' attitudes are extremely positive and show little need for improvement. Two areas that could be focused on to improve teacher ICT competence are:
  - ◆ *ICT has limited benefits in the classroom* – this could be addressed by providing training on using ICT for teaching and learning.
  - ◆ *I like exploring technology & software* – this could be addressed by providing more access to online relevant ICT teaching aids.
  
- ✧ **Training courses** in SIS Curriculum Manager, spreadsheets, presentation packages and databases were all shown to have a positive impact upon teachers' knowledge and skills in those areas.

## 8.2 Discussion of factors that impact on teacher integration of ICT within the classroom

If the aim of the department is to achieve a higher level of teacher integration of ICT within teaching and learning, then attending to the following factors provides a way forward.

- ✧ **ICT knowledge and skills:** improving the ICT competence levels of teachers will increase teacher integration of ICT within the classroom.
  
- ✧ **School ICT capacity:** continuing improvement of the ICT infrastructure available in schools will diminish the barriers to teacher use of ICT in the classroom. Two key areas identified are:
  - ◆ Technical support for teachers; and
  - ◆ Access to working computers for students.
  
- ✧ **Teachers' attitudes and motivation:** teacher integration of ICT within the classroom can be increased by:
  - ◆ Training on how to integrate ICT within their learning area;
  - ◆ Lesson plan development time (especially for part-time teachers); and
  - ◆ Encouraging teacher interest in ICT (especially online learning).
  
- ✧ **School planning and leadership:** aspects of planning and leadership that could lead to increased ICT integration are:
  - ◆ Resources for teachers to use ICT within the classroom;
  - ◆ Having a clear sense of direction for ICT; and
  - ◆ Using ICT to monitor, evaluate and report within the school.
  
- ✧ **Teacher attendance at training on how to integrate ICT in the classroom** had the most positive impact on a teacher's level of ICT integration. With only 34% of teachers having been on such a course, provision of this training to all teachers is highly recommended.

## 8.3 Implications of evaluation outcomes

Figure 8.3 below presents the proportion of WA government school teachers who are classified in each of the nine boxes of the matrix based on their ICT competence and ICT integration scores.

**ICT Competence:** by summing across the rows, it can be seen that 25% of teachers have a Stage 3 score, 53% have a Stage 2 score and 22% have a Stage 1 score.

**ICT Integration:** by summing down the columns, it can be seen that 18% of teachers have a High score, 46% have a Medium score and 36% have a Low score.

**Figure 8.3: ICT Competence and Integration Matrix**

	ICT Integration Score:		
	High	Medium	Low
ICT Competence Score:			
Stage 3 (highest)	9%	12%	4%
Stage 2	8%	25%	20%
Stage 1 (lowest)	1%	9%	12%

Different sections of the grid have been colour coded thus:

- ✧ **Green:** Teachers who have a low ICT competence score and a low ICT integration score (12%).
- ✧ **Yellow:** Teachers who have a higher ICT integration score than their ICT competence score (18%).
- ✧ **Purple:** Teachers who have moderate ICT competence and ICT integration scores (25%).
- ✧ **Red:** Teachers who have a higher ICT competence score than their ICT integration score (36%).
- ✧ **Blue:** Teachers who have high ICT competence and high ICT integration scores (9%).

The characteristics of each group of teachers is shown overleaf, along with the ICT development and support strategies identified in the evaluation as being most appropriate to each group.

The potential strategies for changing the ICT competence and integration levels of WA government school teachers provided in Table 8.4 provides the department with a guide for strategic action, following determination of the desirable minimum levels or standards of competence and integration.

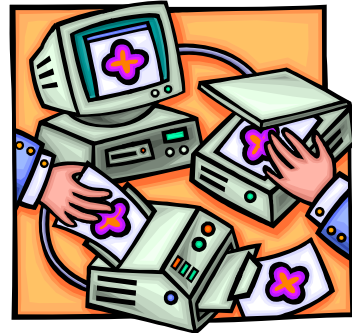
## 8.4 Strategic Directions

Colour	Teacher characteristics	Potential strategies
Green	<p>These teachers are likely to be:</p> <ul style="list-style-type: none"> <li>• Early childhood</li> <li>• Primary specialist</li> <li>• Senior teacher level 1</li> <li>• Permanent teachers</li> <li>• Part-time teachers</li> <li>• 20+ years teaching</li> <li>• 40+ years old</li> </ul>	<p>When both ICT competence and ICT integration are low, attention should be focussed on building the confidence of teachers with ICT.</p> <p>These teachers benefit from personal, hands on training.</p>
Yellow	<p>These teachers are likely to be:</p> <ul style="list-style-type: none"> <li>• In primary schools</li> <li>• Teachers of English &amp; Math (core subjects)</li> <li>• 20+ years teaching</li> <li>• 40+ years old</li> </ul>	<p>When ICT integration is higher than ICT competence, attention should be focused on providing general ICT training for teachers.</p> <p>Improving school ICT resources will facilitate the ICT use and experience of these teachers.</p>
Red	<p>These teachers are likely to be:</p> <ul style="list-style-type: none"> <li>• In secondary schools</li> <li>• &lt; 40 years old</li> </ul>	<p>When ICT competence is higher than ICT integration, attention should be focused on:</p> <ul style="list-style-type: none"> <li>• Improving technical support at schools</li> <li>• Providing computers for student use</li> <li>• Training these teachers to integrate ICT within teaching and learning.</li> </ul>
Purple	<p>These teachers are likely to be:</p> <ul style="list-style-type: none"> <li>• In primary schools</li> <li>• &lt; 40 years old</li> </ul>	<p>When both ICT competence and ICT integration are moderate, teachers will benefit from access to the strategies outlined in both yellow and red above.</p>
Blue	<p>These teachers are likely to be:</p> <ul style="list-style-type: none"> <li>• Heads of departments</li> <li>• In secondary schools</li> <li>• Teachers &amp; administrators</li> <li>• Science &amp; technology</li> <li>• Librarians</li> <li>• Full-time teachers</li> <li>• 2-3 years teaching</li> <li>• &lt; 40 years old</li> </ul>	<p>When both ICT competence and ICT integration are high, consideration could be given to promoting these teachers as best practice examples within schools.</p>

**Appendix A**  
**ICT Teacher Survey**

## QUESTIONNAIRE

### Welcome to the ICT Skills Survey



Dear Teacher

We thank you for taking the time to answer this survey. Your comments are very important.

**Please take 15 -20 minutes now to fill this out**

#### **Why should I fill in this survey?**

Because this is your chance to be part of the special project that will be used by the Department to better focus ICT resourcing, including professional development, across the education system.

#### **Who should answer the questions?**

Only the person to whom the envelope was addressed.

#### **What if I need help?**

Other teachers can help you in understanding the survey, or you can ring Jasmine from Education Policy and Evaluation on 9264 4687.

#### **Are my answers confidential?**

The survey is being carried out among many teachers across the State and you have been selected at random. Your answers will be kept completely confidential. The results will be aggregated and will not identify any individual, or schools.

#### **How do I answer the questions?**

For most questions, all you need to do is tick the box which most applies to you. Please read all the questions carefully and follow the instructions after each question.

**Please use the reply paid envelope (it doesn't need a stamp)  
to return this to us by 3<sup>rd</sup> June 2005**

**Thank you very much**

**Q1 Which of the following best describes your role? YOU MAY TICK MORE THAN ONE BOX**

<b>ADMINISTRATOR</b>		}	<b>GO TO QUESTION 2</b>
Principal	<input type="checkbox"/> <sub>01</sub>		
Deputy Principal (Primary)	<input type="checkbox"/> <sub>02</sub>		
Deputy Principal (Secondary)	<input type="checkbox"/> <sub>03</sub>		
Head of Department/Head of Learning Area/Program Coordinator	<input type="checkbox"/> <sub>04</sub>	}	<b>GO TO QUESTION 3</b>
<b>TEACHER</b>			
Early Childhood Teacher	<input type="checkbox"/> <sub>05</sub>		
Lower Primary Teacher	<input type="checkbox"/> <sub>06</sub>		
Upper Primary Teacher	<input type="checkbox"/> <sub>07</sub>		
Primary Teacher Specialist (e.g. Music or Languages)	<input type="checkbox"/> <sub>08</sub>		
Middle School Teacher	<input type="checkbox"/> <sub>09</sub>		
Secondary Teacher	<input type="checkbox"/> <sub>10</sub>		
Education Support Teacher	<input type="checkbox"/> <sub>11</sub>		
Other, please specify _____	<input type="checkbox"/> <sub>12</sub>		

**Q2 As an Administrator do you have a teaching role?**

Yes	<input type="checkbox"/> <sub>1</sub>
No	<input type="checkbox"/> <sub>2</sub>

**Q3 Which learning areas do you cover in your teaching programs? TICK AS MANY AS APPLY.**

English	<input type="checkbox"/> <sub>01</sub>
Mathematics	<input type="checkbox"/> <sub>02</sub>
Science	<input type="checkbox"/> <sub>03</sub>
Society and Environment	<input type="checkbox"/> <sub>04</sub>
Health and Physical Education	<input type="checkbox"/> <sub>05</sub>
The Arts	<input type="checkbox"/> <sub>06</sub>
Technology and Enterprise	<input type="checkbox"/> <sub>07</sub>
Languages other than English	<input type="checkbox"/> <sub>08</sub>
Other (specify)_____	<input type="checkbox"/> <sub>09</sub>
Not applicable	<input type="checkbox"/> <sub>10</sub>

**Q4 Please indicate if any of the following levels apply to you:**

Senior Teacher Level 1	<input type="checkbox"/> <sub>1</sub>
Senior Teacher Level 2	<input type="checkbox"/> <sub>2</sub>
Classroom Teacher Level 3	<input type="checkbox"/> <sub>3</sub>

(13)

(14-33)

(34)

**Q5 In what type of school do you work?**

(35)

Pre-primary (Community)	<input type="checkbox"/>	1
Primary	<input type="checkbox"/>	2
Middle	<input type="checkbox"/>	3
Secondary	<input type="checkbox"/>	4
District High	<input type="checkbox"/>	5
Education Support Schools/Centre	<input type="checkbox"/>	6
Senior College	<input type="checkbox"/>	7
Other, please specify	<input type="checkbox"/>	8
<hr/>		

**Q6 What is your employment status?**

(36)

Permanent	<input type="checkbox"/>	1
Permanent on Probation	<input type="checkbox"/>	2
Fixed-term	<input type="checkbox"/>	3
Casual	<input type="checkbox"/>	4

**Q7 What is your mode of employment?**

(37)

Full-time	<input type="checkbox"/>	1
Part-time	<input type="checkbox"/>	2
Job-share	<input type="checkbox"/>	3
Other	<input type="checkbox"/>	4

**Q8 How many years have you been working in schools in the WA Government system?**

(38)

0 to 1 year	<input type="checkbox"/>	1
2 to 3 years	<input type="checkbox"/>	2
4 to 5 years	<input type="checkbox"/>	3
6 to 9 years	<input type="checkbox"/>	4
10 to 19 years	<input type="checkbox"/>	5
20 years or more	<input type="checkbox"/>	6

**Q9 In which Education District is your school located?**

(39-40)

Albany	<input type="checkbox"/>	01	Mid West	<input type="checkbox"/>	08
Bunbury	<input type="checkbox"/>	02	Midlands	<input type="checkbox"/>	09
Canning	<input type="checkbox"/>	03	Narrogin	<input type="checkbox"/>	10
Esperance	<input type="checkbox"/>	04	Pilbara	<input type="checkbox"/>	11
Fremantle-Peel	<input type="checkbox"/>	05	Swan	<input type="checkbox"/>	12
Goldfields	<input type="checkbox"/>	06	Warren-Blackwood	<input type="checkbox"/>	13
Kimberley	<input type="checkbox"/>	07	West Coast	<input type="checkbox"/>	14



#### Q14 ACCESS TO PROFESSIONAL DEVELOPMENT

Please indicate whether you have undertaken professional development in any of the ICT areas listed below?

(86-92)

If so, please also indicate whether the professional development was arranged **through your school** and if you found it to be effective?

(93-99)  
(100-105)

Professional Development	Have you <u>undertaken</u> it?		If so, was it <u>arranged</u> through your school?		Was it <u>effective</u> ?	
	YES	NO	YES	NO	YES	NO
Training in the use of computers / basic computer	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>
SIS Curriculum Manager	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>
Word processing (eg. MSWord)	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>
Spreadsheets (eg. Excel)	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>
Presentation software (eg. PowerPoint)	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>
Databases (eg. Access)	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>
Training on how to integrate technology within the curriculum	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>

#### Q15 SCHOOL PLANNING AND LEADERSHIP

QNA (1-5)  
CARD 6=2

Please indicate the extent to which you agree or disagree with each statement.

Use of ICT at School	Strongly agree	Agree	Disagree	Strongly disagree	
My school has a clear sense of direction in how to use ICT to enhance the learning of students	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(7)
My school encourages the use of ICT by all teachers and puts support strategies in place for everyone	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(8)
The use of ICT is encouraged in the teaching and learning of students at my school and appropriate access and support is provided	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(9)
Teachers at my school are encouraged and supported in participating in professional learning opportunities	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(10)
ICT is used to monitor, evaluate and report on student achievement at my school	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(11)
Sufficient ICT resources are available to meet the ICT requirements of teachers and students	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(12)

## ICT KNOWLEDGE AND SKILL

Listed in this section are various ICT skills relating to different software applications. The skills range from basic to advance ICT skills. You are not expected to have the full range of skills listed.

For each type of software, please indicate which of the skills you have, or if applicable, tick the "I have never used" box on the right hand side.

Q16 With **Computer File Navigation** (e.g. Windows Explorer) I can: (13-34)

- |                                                    |                             |   |           |                             |                   |
|----------------------------------------------------|-----------------------------|---|-----------|-----------------------------|-------------------|
| Save files in a selected folder                    | <input type="checkbox"/> 01 | } | <b>OR</b> | <input type="checkbox"/> 95 | I have never used |
| Create and name new folders                        | <input type="checkbox"/> 02 |   |           |                             |                   |
| Navigate between existing folders                  | <input type="checkbox"/> 03 |   |           |                             |                   |
| Copy, delete and rename files                      | <input type="checkbox"/> 04 |   |           |                             |                   |
| Select and navigate between Drives and Directories | <input type="checkbox"/> 05 |   |           |                             |                   |
| Navigate into a network                            | <input type="checkbox"/> 06 |   |           |                             |                   |
| Use appropriate Help files                         | <input type="checkbox"/> 07 |   |           |                             |                   |
| Install software                                   | <input type="checkbox"/> 08 |   |           |                             |                   |
| Recognise different file types                     | <input type="checkbox"/> 09 |   |           |                             |                   |
| Zip and unzip files                                | <input type="checkbox"/> 10 |   |           |                             |                   |
| Do complex searches for files                      | <input type="checkbox"/> 11 |   |           |                             |                   |

Q17 With **Email** I can: (35-54)

- |                                     |                             |   |           |                             |                   |
|-------------------------------------|-----------------------------|---|-----------|-----------------------------|-------------------|
| Access emails                       | <input type="checkbox"/> 01 | } | <b>OR</b> | <input type="checkbox"/> 95 | I have never used |
| Create and send emails              | <input type="checkbox"/> 02 |   |           |                             |                   |
| Access and use Address book entries | <input type="checkbox"/> 03 |   |           |                             |                   |
| Add to Address book entries         | <input type="checkbox"/> 04 |   |           |                             |                   |
| Locate Sent and Deleted messages    | <input type="checkbox"/> 05 |   |           |                             |                   |
| Store messages in folders           | <input type="checkbox"/> 06 |   |           |                             |                   |
| Add attachments to emails           | <input type="checkbox"/> 07 |   |           |                             |                   |
| Add a signature to emails           | <input type="checkbox"/> 08 |   |           |                             |                   |
| Create a mailing list               | <input type="checkbox"/> 09 |   |           |                             |                   |
| Set up a discussion list            | <input type="checkbox"/> 10 |   |           |                             |                   |

Q18 With the **World Wide Web / Internet** I can: (55-74)

- |                                            |                             |   |           |                             |                   |
|--------------------------------------------|-----------------------------|---|-----------|-----------------------------|-------------------|
| Navigate to known websites                 | <input type="checkbox"/> 01 | } | <b>OR</b> | <input type="checkbox"/> 95 | I have never used |
| Create Favourites or Bookmarks             | <input type="checkbox"/> 02 |   |           |                             |                   |
| Do basic searches                          | <input type="checkbox"/> 03 |   |           |                             |                   |
| Use advanced search tools                  | <input type="checkbox"/> 04 |   |           |                             |                   |
| Organise Favourites or Bookmarks           | <input type="checkbox"/> 05 |   |           |                             |                   |
| Alter browser preferences                  | <input type="checkbox"/> 06 |   |           |                             |                   |
| Save images and text                       | <input type="checkbox"/> 07 |   |           |                             |                   |
| Conduct complex searches                   | <input type="checkbox"/> 08 |   |           |                             |                   |
| Download and install software and plug-ins | <input type="checkbox"/> 09 |   |           |                             |                   |
| Use different browsers                     | <input type="checkbox"/> 10 |   |           |                             |                   |

Q19 With **SIS Curriculum Manager** I can: (7-28)

- |                                      |                             |   |           |                             |                   |
|--------------------------------------|-----------------------------|---|-----------|-----------------------------|-------------------|
| Log on                               | <input type="checkbox"/> 01 | } | <b>OR</b> | <input type="checkbox"/> 95 | I have never used |
| Record lesson attendance             | <input type="checkbox"/> 02 |   |           |                             |                   |
| Locate student records               | <input type="checkbox"/> 03 |   |           |                             |                   |
| Add 'Ds' to monitor student progress | <input type="checkbox"/> 04 |   |           |                             |                   |
| Mark as achieved to record levels    | <input type="checkbox"/> 05 |   |           |                             |                   |
| Add notes                            | <input type="checkbox"/> 06 |   |           |                             |                   |
| Save evidence/proof                  | <input type="checkbox"/> 07 |   |           |                             |                   |
| Create a plan                        | <input type="checkbox"/> 08 |   |           |                             |                   |
| Create a checklist                   | <input type="checkbox"/> 09 |   |           |                             |                   |
| Generate student reports             | <input type="checkbox"/> 10 |   |           |                             |                   |
| Analyse student data                 | <input type="checkbox"/> 11 |   |           |                             |                   |

Q20 With a **Word Processor** (e.g. Microsoft Word, Microsoft Publisher) I can:

(29-61)

- |                              |                             |   |           |                             |                   |
|------------------------------|-----------------------------|---|-----------|-----------------------------|-------------------|
| Create a new document        | <input type="checkbox"/> 01 | } | <b>OR</b> | <input type="checkbox"/> 95 | I have never used |
| Open an existing document    | <input type="checkbox"/> 02 |   |           |                             |                   |
| Format a document            | <input type="checkbox"/> 03 |   |           |                             |                   |
| Change fonts                 | <input type="checkbox"/> 04 |   |           |                             |                   |
| Spell check                  | <input type="checkbox"/> 05 |   |           |                             |                   |
| Insert text                  | <input type="checkbox"/> 06 |   |           |                             |                   |
| Insert page numbers          | <input type="checkbox"/> 07 |   |           |                             |                   |
| Add headers and / or footers | <input type="checkbox"/> 08 |   |           |                             |                   |
| Print                        | <input type="checkbox"/> 09 |   |           |                             |                   |
| Insert images                | <input type="checkbox"/> 10 |   |           |                             |                   |
| Create tables                | <input type="checkbox"/> 11 |   |           |                             |                   |
| Change page set up           | <input type="checkbox"/> 12 |   |           |                             |                   |
| Change margins               | <input type="checkbox"/> 13 |   |           |                             |                   |
| Use columns and sections     | <input type="checkbox"/> 14 |   |           |                             |                   |
| Set up styles                | <input type="checkbox"/> 15 |   |           |                             |                   |
| Use mail merge               | <input type="checkbox"/> 16 |   |           |                             |                   |

Q21 With **Presentations** (e.g. Microsoft PowerPoint) I can:

(62-87)

- |                                                   |                             |   |           |                             |                   |
|---------------------------------------------------|-----------------------------|---|-----------|-----------------------------|-------------------|
| Create a new slide show                           | <input type="checkbox"/> 01 | } | <b>OR</b> | <input type="checkbox"/> 95 | I have never used |
| Edit an existing slide show                       | <input type="checkbox"/> 02 |   |           |                             |                   |
| Insert images                                     | <input type="checkbox"/> 03 |   |           |                             |                   |
| Change font and layout                            | <input type="checkbox"/> 04 |   |           |                             |                   |
| Can navigate back and forth during a presentation | <input type="checkbox"/> 05 |   |           |                             |                   |
| Add animation and transitions                     | <input type="checkbox"/> 06 |   |           |                             |                   |
| Insert hyperlinks                                 | <input type="checkbox"/> 07 |   |           |                             |                   |
| Create an original master                         | <input type="checkbox"/> 08 |   |           |                             |                   |
| Can use master slide functions                    | <input type="checkbox"/> 09 |   |           |                             |                   |
| Include sound                                     | <input type="checkbox"/> 10 |   |           |                             |                   |
| Print handouts                                    | <input type="checkbox"/> 11 |   |           |                             |                   |
| Add navigation buttons                            | <input type="checkbox"/> 12 |   |           |                             |                   |

QNA (1-5)  
CARD 6=4

Q22 With **Spreadsheets** (e.g. Microsoft Excel) I can:

(7-34)

- |                                           |                             |   |           |                             |                   |
|-------------------------------------------|-----------------------------|---|-----------|-----------------------------|-------------------|
| Create a new spreadsheet (enter data)     | <input type="checkbox"/> 01 | } | <b>OR</b> | <input type="checkbox"/> 95 | I have never used |
| Enter data into an existing spreadsheet   | <input type="checkbox"/> 02 |   |           |                             |                   |
| Insert some calculations                  | <input type="checkbox"/> 03 |   |           |                             |                   |
| Format cells                              | <input type="checkbox"/> 04 |   |           |                             |                   |
| Sort cells                                | <input type="checkbox"/> 05 |   |           |                             |                   |
| Insert and delete rows and columns        | <input type="checkbox"/> 06 |   |           |                             |                   |
| Create new charts (graphs)                | <input type="checkbox"/> 07 |   |           |                             |                   |
| Modify existing charts (graphs)           | <input type="checkbox"/> 08 |   |           |                             |                   |
| Apply complex formulae                    | <input type="checkbox"/> 09 |   |           |                             |                   |
| Use absolute and relative cell references | <input type="checkbox"/> 10 |   |           |                             |                   |
| Refer to multiple worksheets              | <input type="checkbox"/> 11 |   |           |                             |                   |
| Use filtering                             | <input type="checkbox"/> 12 |   |           |                             |                   |
| Use conditional formatting                | <input type="checkbox"/> 13 |   |           |                             |                   |
| Import and /or export data                | <input type="checkbox"/> 14 |   |           |                             |                   |

Q23 With **Databases** (e.g. Microsoft Access) I can:

(35-54)

- |                                                     |                                        |   |           |                                        |                   |
|-----------------------------------------------------|----------------------------------------|---|-----------|----------------------------------------|-------------------|
| Create simple tables                                | <input type="checkbox"/> <sub>01</sub> | } | <b>OR</b> | <input type="checkbox"/> <sub>05</sub> | I have never used |
| Use simple queries to retrieve data                 | <input type="checkbox"/> <sub>02</sub> |   |           |                                        |                   |
| Use wizards to create reports and forms             | <input type="checkbox"/> <sub>03</sub> |   |           |                                        |                   |
| Retrieve and enter data in an existing database     | <input type="checkbox"/> <sub>04</sub> |   |           |                                        |                   |
| Use relational databases                            | <input type="checkbox"/> <sub>05</sub> |   |           |                                        |                   |
| Use wizards to create forms, sub-forms or portals   | <input type="checkbox"/> <sub>06</sub> |   |           |                                        |                   |
| Use more complex form design tools e.g. combo boxes | <input type="checkbox"/> <sub>07</sub> |   |           |                                        |                   |
| Create and use parameter queries                    | <input type="checkbox"/> <sub>08</sub> |   |           |                                        |                   |
| Create summary reports                              | <input type="checkbox"/> <sub>09</sub> |   |           |                                        |                   |
| Use complex functions in queries                    | <input type="checkbox"/> <sub>10</sub> |   |           |                                        |                   |

**Q24 ATTITUDES TO ICT**

Please indicate the extent to which you agree or disagree with each statement about ICT.

Statement about ICT	Strongly agree	Agree	Disagree	Strongly disagree	
Student use of ICT has the capacity to <u>strongly</u> support student-centred, inquiry based learning	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(55)
ICT provides valuable resources and tools to support student learning	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(56)
ICT provides students with efficient presentation and communication tools	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(57)
ICT has <u>limited</u> capacity to provide benefits in the classroom	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(58)
I like the challenge of exploring technology and new software and its possibilities	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(59)

**APPLICATION OF ICT IN THE CLASSROOM**

Q25 Below is a list of statements about the extent to which you apply ICT within your teaching practice, please choose the one description that best describes your situation.

In my current teaching, ICT is:

(60)

<input type="checkbox"/> <sub>1</sub>	Having an <u>extensive</u> impact on what students learn and how they learn
<input type="checkbox"/> <sub>2</sub>	A useful resource impacting on some areas of the curriculum
<input type="checkbox"/> <sub>3</sub>	Improving student skills in the use of ICT
<input type="checkbox"/> <sub>4</sub>	Having little impact on student learning
<input type="checkbox"/> <sub>5</sub>	Not applicable to my role

Q26 Please indicate how frequently factors outside your control restrict your use of ICT. Factors include things like condition of equipment, access to equipment, technical support etc.

(61)

<input type="checkbox"/> <sub>1</sub>	Daily
<input type="checkbox"/> <sub>2</sub>	Weekly
<input type="checkbox"/> <sub>3</sub>	At least once a term
<input type="checkbox"/> <sub>4</sub>	Never
<input type="checkbox"/> <sub>5</sub>	Not applicable to my role

Q27 Please estimate how often you incorporate student use of ICT to achieve the following learning outcomes.

Learning Outcomes	Daily	Weekly	At least once per term	Never	
Mastering skills just taught	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(62)
Remediation of skills not learned well	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(63)
Expressing themselves clearly	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(64)
Communicating with other people	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(65)
Finding out about ideas and information	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(66)
Analysing information	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(67)
Presenting information to an audience	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(68)
Improving computer skills	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(69)
Learning to work collaboratively	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(70)

### Q28 ASSESSING STUDENT OUTCOMES USING ICT

Please estimate how often you use the listed ICT activities when assessing student outcomes.

	Daily	Weekly	At least once per term	Never	
Student assignments that incorporate a learning experience involving use of an ICT application	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(71)
Digital artefacts, from student assignments, as evidence towards student achievement	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(72)
ICT programs, materials and applications that enable assessment to be customised towards specific learning needs	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(73)
SIS Curriculum Manager to monitor, evaluate and report on student achievement	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(74)
Other ICT applications to monitor, evaluate and report on student achievement	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(75)

### Q29 PERSONAL/PROFESSIONAL USE OF ICT

Please estimate how often you use ICT to achieve the listed personal/professional objectives.

Personal/Professional Objective	Daily	Weekly	At least once per term	Never	
Create materials for students use (e.g. handouts, tests)	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(76)
Access research and best practices for teaching	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(77)
Curriculum administration (e.g. planning, monitoring, evaluating and reporting)	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(80)
Communicate with colleagues/other professionals	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(81)
Communicate with student(s) and/or students' parent(s)	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(82)
Post information to a website to assist your students in their work	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(83)
Online professional learning	<input type="checkbox"/> <sub>1</sub>	<input type="checkbox"/> <sub>2</sub>	<input type="checkbox"/> <sub>3</sub>	<input type="checkbox"/> <sub>4</sub>	(84)

## COMMENTS

Please describe any factors that would increase your use of ICT in the classroom?  
(94)

(85 -

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Thank you very much for your time in completing this survey.  
Please return in the reply paid envelope provided by 3<sup>rd</sup> June 2005,

### The Next Stage....

As explained in the cover letter, this survey is the first of two stages that will assess the ICT skills of teachers. The project's next stage will be starting in a fortnight and will involve a practical assessment of some teachers computing skills, which will take an hour to complete. It is very important that we get teachers of **all skills** levels to participate.

You don't have to be a computer whiz to take part; in fact we would prefer to have a broad range of skills.

Participants will be reimbursed, and can choose to be either **paid for their time or to be provided with teacher relief time**, and will in addition have access to world-class online ICT training.

Please tick the box below if you are interested in taking part.

Yes, I am interested .....

The practical assessment will require getting access to the internet, which may be at school, at home or elsewhere.

Q. Which of the following best describes your access to the internet?

- Both Broadband and Dialup access
- Broadband only
- Dialup only
- No access to internet

## **Appendix B**

### **Sample Questions from the Online Skills Test**

## Welcome Screen 1



### Welcome to the ICT Skills Test for WA Teachers

- You have 1 hour to complete 73 questions, which cover a range of computing skills from word processing and using the internet to spreadsheets and emails.
- It is not expected for you to know the answers to all the questions. Because of the wide range of the questions, some will be about things you have never done.
- Work through all of the questions in the test and remember you have plenty of time.

Good luck!

**Click anywhere on screen to continue.**

## Welcome Screen 2

Module 1

### Points to remember when using this test

- As in any test, read the instructions for an item carefully before attempting to answer.
- Skipped items are offered again at the end of the test if there is sufficient time.

**Performance testing exercises**

- Unless otherwise specified this test accepts most common methods for performing a task.
- Follow instructions accurately. **DO NOT** make any changes other than those that are specifically requested as this could result in the loss of marks.

**Knowledge based questions**

- With multiple choice questions and click and drag exercises, a SUBMIT button appears on the screen with the question. You can change your original response as many times as you like but once you click on the SUBMIT button your final choice is evaluated and cannot be changed.

You have 80 minutes to complete each test and a warning is given five minutes before the end of the time limit. Good Luck!

**Loading complete.**

**Click anywhere on screen to continue.**  
**(Note: Your test time does not start until after you click on this screen.)**

## Email Question

Module 1

Click to indicate your answer.

**Inbox - Microsoft Outlook**

File Edit View Favorites Tools Actions Help

New Reply Reply to All Send/Receive

**Inbox**

Folder List

- Outlook Today - [F
- Calendar
- Contacts
- Deleted Items
- Drafts
- Inbox (2)
- Journal
- Notes
- Outbox
- Sent Items
- Tasks

From	Subject	R.
Rob Brown	Lunch	T
Michelle Majeau	Test results	F
Graham Bateman	Sales meeting	F

To: Joe Bloggs  
Cc:

Just to confirm about lunch on Thursday. See you then!

Where would you click to open the Address Book?

Quit 14 of 73 ITEM NUMBER Submit 79 mins TIME REMAINING Skip Item

### Internet Question

Module 1

Click to indicate your answer.

**Welcome to the daffodil destination - Microsoft Internet Explorer**

File Edit View Favorites Tools Help

Back Forward Stop Home Search Favorites Media Print

Address http://www.daffodilovers.com Go

Favorites

- Add... Organize...
- Links
- Media
- Electric Paper.ie
- MSN.com
- Flowers 'n Grass.com
- Garden Factory.com
- Soilnet Green.com

See photos from our 5th Annual

Use the Favorites Bar to put this web site into the Favorites list.

Daffodil Lovers.com

Quit 20 of 73 ITEM NUMBER Submit 79 mins TIME REMAINING Skip Item

## Word Processing Question

Module 1

Press the appropriate key(s) on your keyboard.

Document1 - Microsoft Word

File Edit View Insert Format Tools Table

Normal Arial 12

Some Useful Desktop Applications

- Word Processing
- Spreadsheets
- Presentations

Use the mouse and keyboard to complete this exercise. Insert two blank lines between the main title and the list of applications in this document.

Quit 29 of 73 ITEM NUMBER Submit 77 mins TIME REMAINING Skip Item

## Presentation Package

Module 1

Click to indicate your answer.

Microsoft PowerPoint - [Business Plan.ppt]

File Edit View Insert Format Tools Slide Show Window Help

Goals & Objectives

- Five-year goals
  - State specific measurable objectives
  - State market share objectives
  - State revenue/profitability objectives
  - Chart

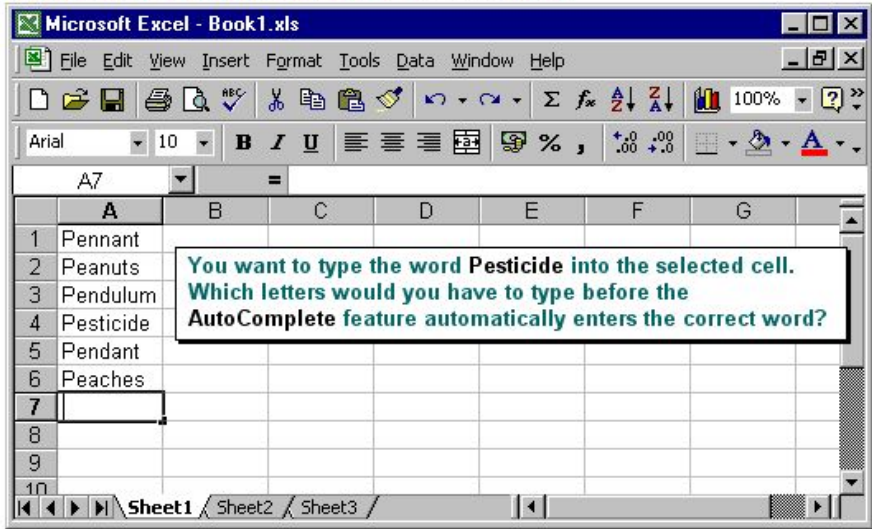
Which toolbar button would enable you to create a link to another slide or presentation?

Quit 45 of 73 ITEM NUMBER Submit 75 mins TIME REMAINING Skip Item

## Spreadsheet Question

Module 1

Type your answer and then click on the Submit button.

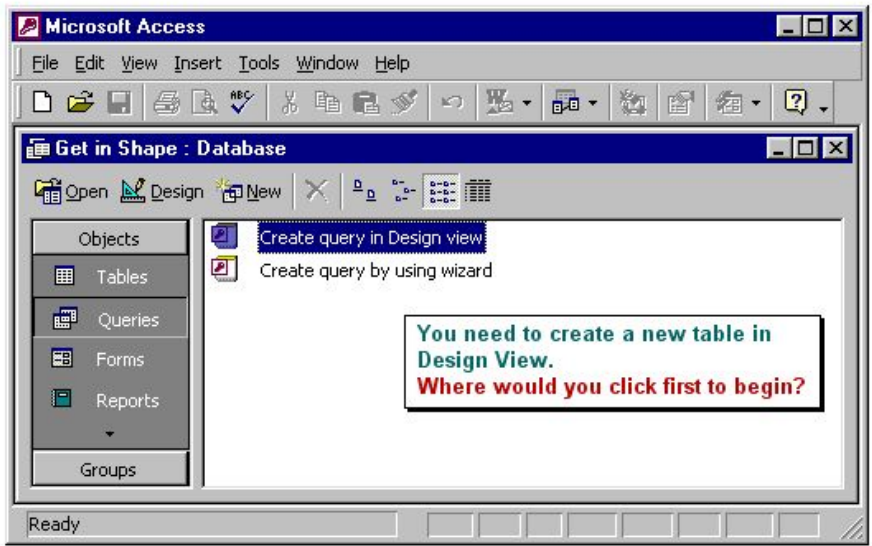


The screenshot shows a Microsoft Excel window titled "Microsoft Excel - Book1.xls". The spreadsheet has a list of words in column A: Pennant, Peanuts, Pendulum, Pesticide, Pendant, Peaches, and an empty cell in row 7. A text box is overlaid on the spreadsheet with the following text: "You want to type the word Pesticide into the selected cell. Which letters would you have to type before the AutoComplete feature automatically enters the correct word?". The status bar at the bottom of the Excel window shows "Sheet1 / Sheet2 / Sheet3".

Quit 51 of 73 ITEM NUMBER Submit 74 mins TIME REMAINING Skip Item

## Database Question

Module 1



The screenshot shows a Microsoft Access window titled "Microsoft Access". The main window is titled "Get in Shape : Database". The "Objects" pane on the left shows "Tables", "Queries", "Forms", "Reports", and "Groups". The main area shows two options: "Create query in Design view" and "Create query by using wizard". A text box is overlaid on the main area with the following text: "You need to create a new table in Design View. Where would you click first to begin?". The status bar at the bottom of the Access window shows "Ready".

Quit 61 of 73 ITEM NUMBER Submit 72 mins TIME REMAINING Skip Item

## Closing Screen



Department of  
Education  
and Training



**THE TEST IS NOW FINISHED**

**Your score for the test is 0%**

**Thank you for all of the time and effort  
you have given to the ICT Skills Project.**

**Please contact DET on 9264 4687 if you have any further queries**

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**[www.electricpaper.com.au](http://www.electricpaper.com.au)** or call **1300 308 826**.

EXIT

## Appendix C: Conclusions from the independent statistical validation of the ICT Teacher Survey

The analysis produced the following conclusions:

1. **VALIDITY:** There is a moderate correlation between the Objective Skills Test and the Teacher Survey (73%) suggesting that the Teacher Survey has a sufficient degree of content validity, when validated against the Objective Skills Test.
2. **RELIABILITY/ROBUSTNESS:** Analysis of the results of the Objective Skills Test provides a strong reliability coefficient (Cronbach Alpha of 0.89), suggesting that it is a statistically reliable measure of ICT skills and knowledge.
3. **RELIABILITY/ROBUSTNESS:** Analysis of the results of the Teacher Survey provides a very strong reliability coefficient (Cronbach Alpha of 0.98). Thus the survey has a higher level of internal consistent validity, ie. Respondents are more likely to show consistency in responding to the survey than they are when responding to the Objective Skills Test.
4. **ACCURACY:** A person score on the Teacher Survey is highly likely to be equal to their score on the Objective Skills Test suggesting that teachers are **not overestimating or underestimating their abilities** in the Teacher Survey, and that under the same testing conditions the Teacher Survey is a highly accurate measure of Teachers' ICT ability.

# Appendix D

Figure 1: Self Reported Teacher Competency in Computer File Navigation

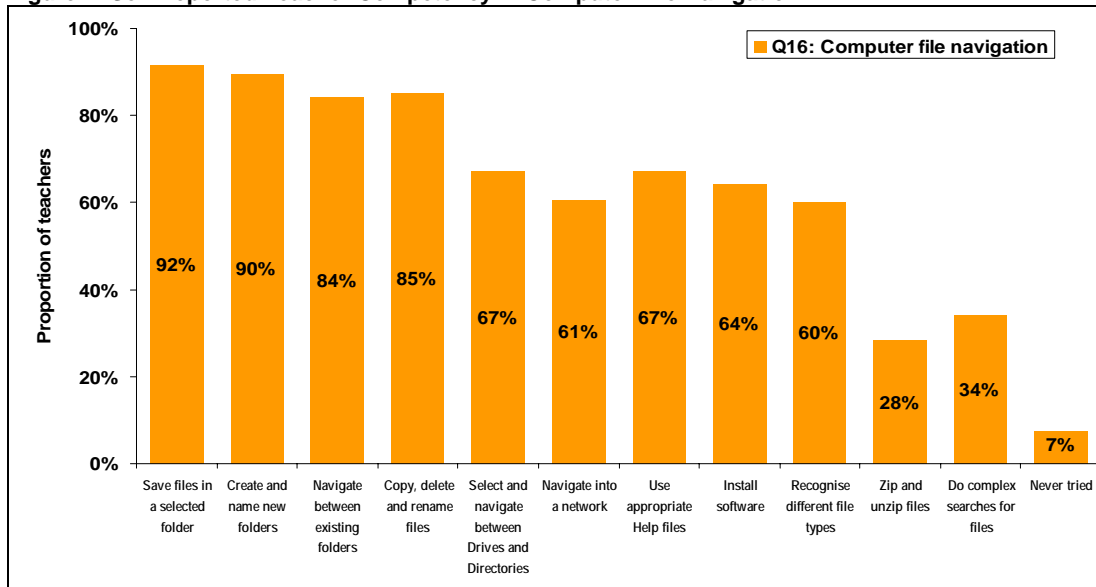


Figure 2: Self Reported Teacher Competency in Email

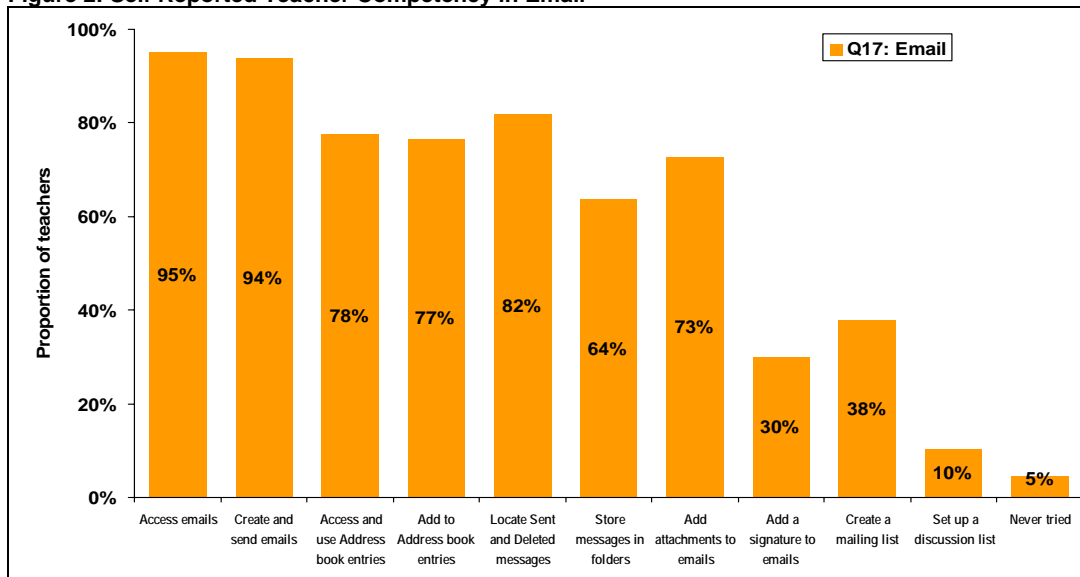
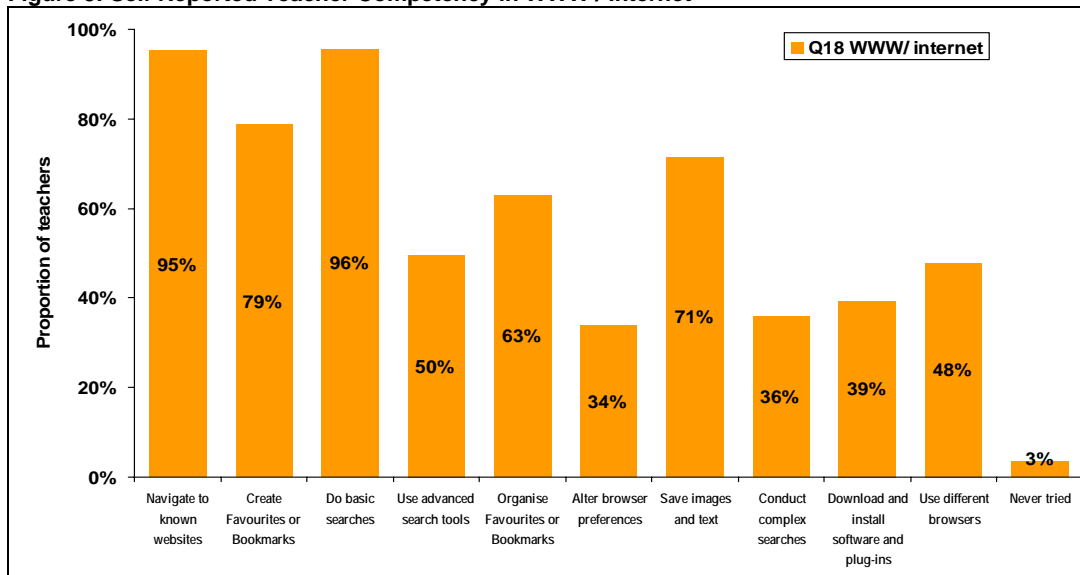
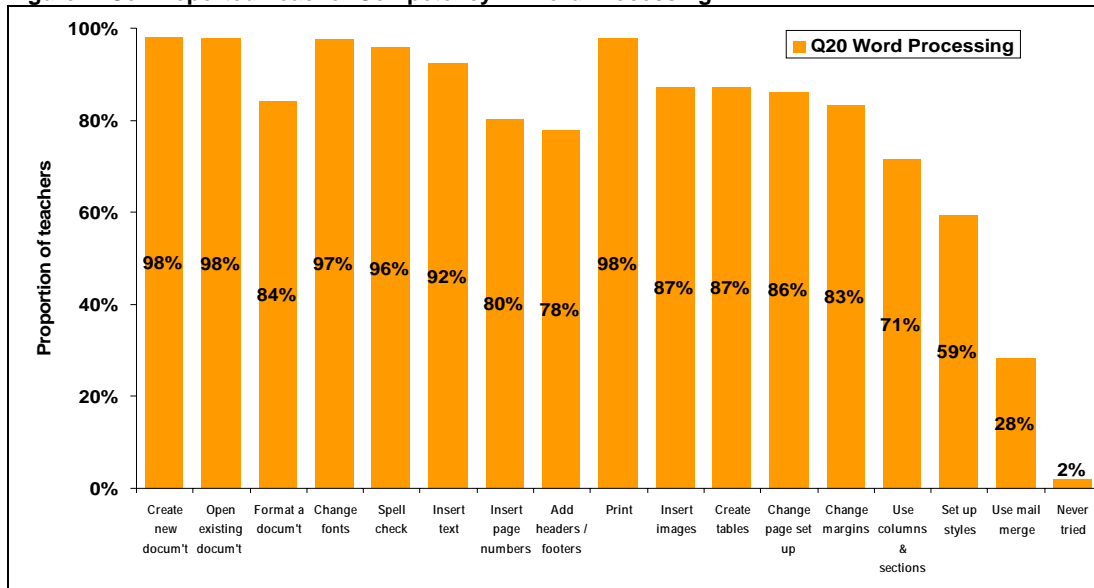


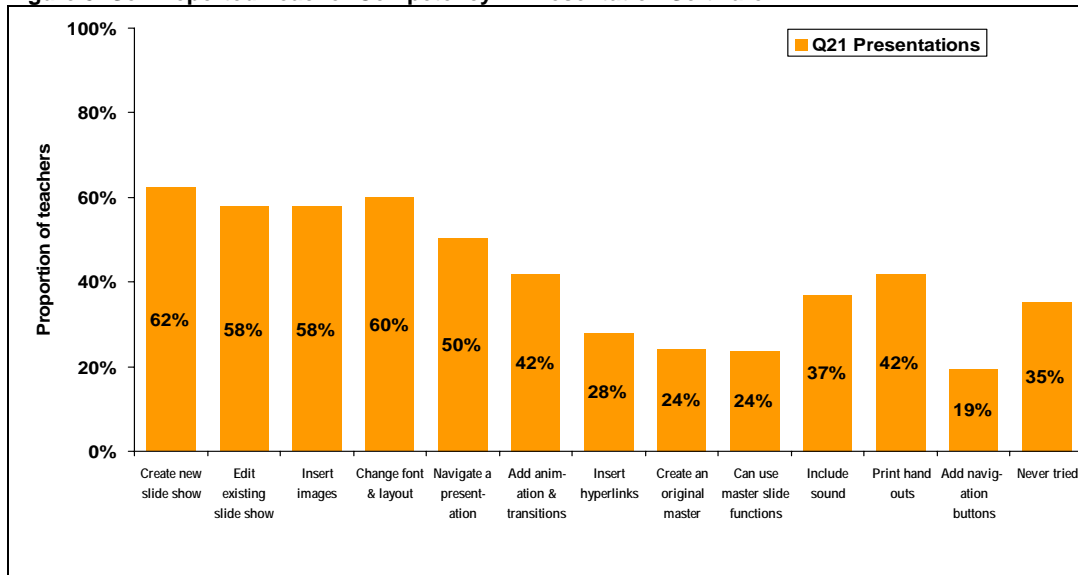
Figure 3: Self Reported Teacher Competency in WWW / Internet



**Figure 4: Self Reported Teacher Competency in Word Processing**



**Figure 5: Self Reported Teacher Competency in Presentation Software**



**Figure 6: Self Reported Teacher Competency in Spreadsheets**

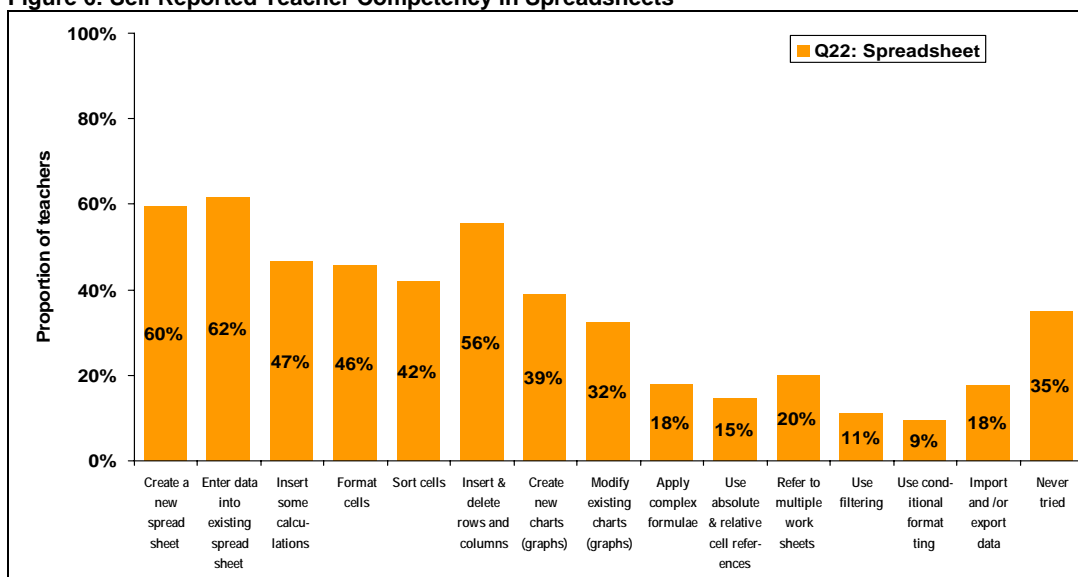


Figure 7: Self Reported Teacher Competency in SIS Curriculum Manager<sup>1</sup>

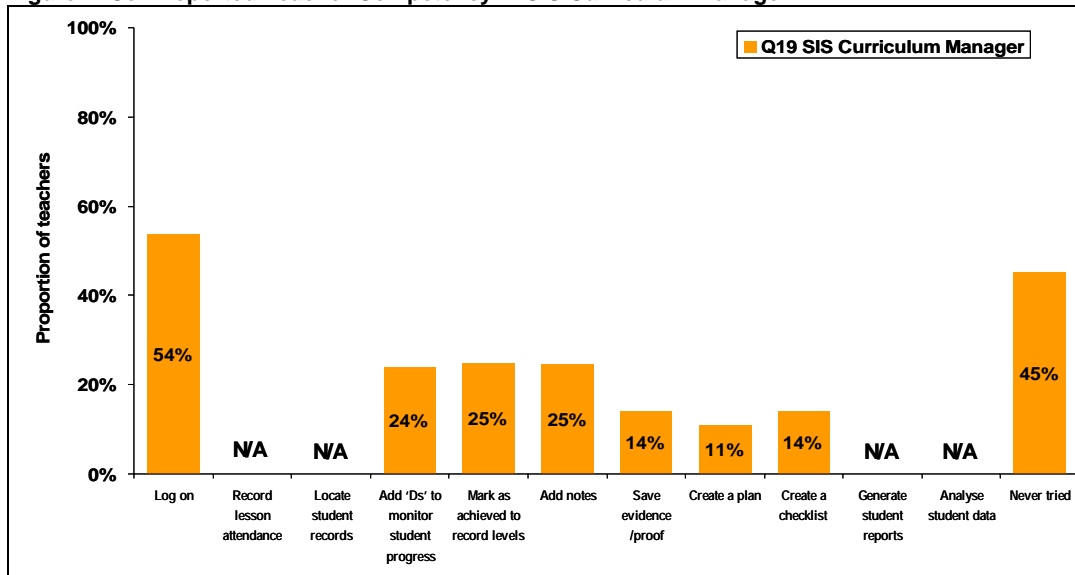
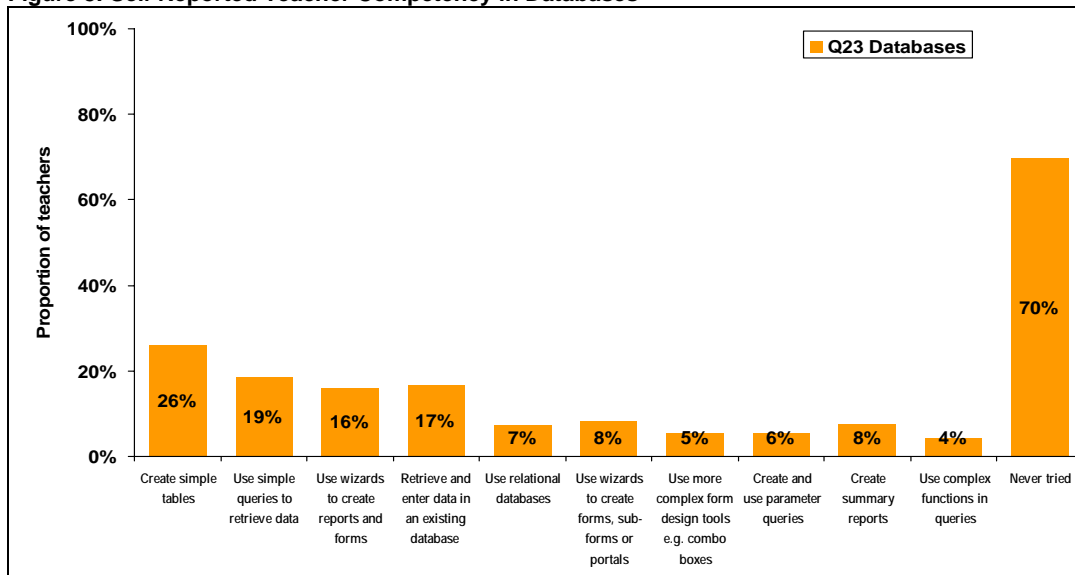


Figure 8: Self Reported Teacher Competency in Databases



<sup>1</sup> At the time the survey took place, four of the eleven skills were not actual functions in the SIS Curriculum Manager Module. Two were functions of SIS Lesson Attendance and two were functions of SIS Assessment Manager, with the generation of student reports not rolled out until term 3 2005. These questions are therefore misleading and the responses have been ignored.

# Appendix E: Demographic sub-group differences of the ICT competence index

The sub-group analyses of the ICT competence index scores are presented below in box plot format.

## **How to read the box plot charts:**

The horizontal line in the centre of the box denotes the **median** score. The dark blue marker denotes the **mean** score (also provided numerically). Often the mean and the median score are the same or very similar for this data set.

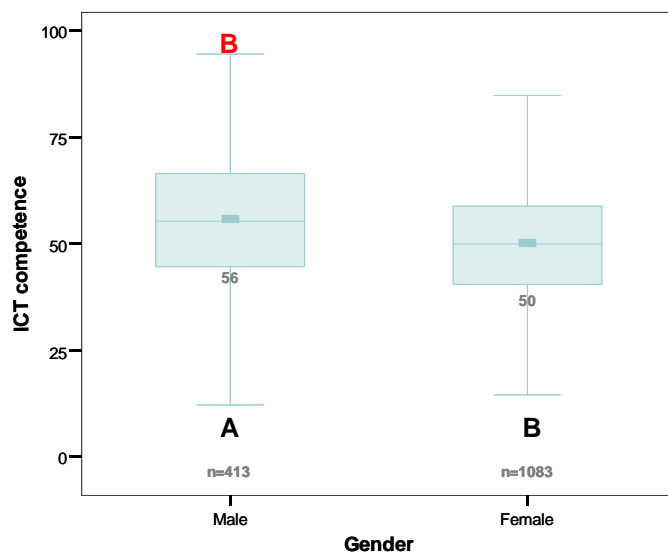
The **spread of the scores** is denoted in two ways: the upper and lower limits of the box denote the values of the 25% and 75% quartiles of the data; and the whiskers denote the 10% and 90% values of the data.

Thus using gender as an example, it is possible to see that the mean score for males is 56, which is very similar to the median score. The score range for males has a wider spread than that of females, indicating that at the extremes some males are likely to have lower scores than females, and some males are likely to have higher scores than females.

## E.1 Gender

As shown below, gender is related to a teacher's ICT Competence Index Score. The average score for males is 56, significantly higher than that of females (50).

Figure E.1: ICT Competence Index Score by Gender

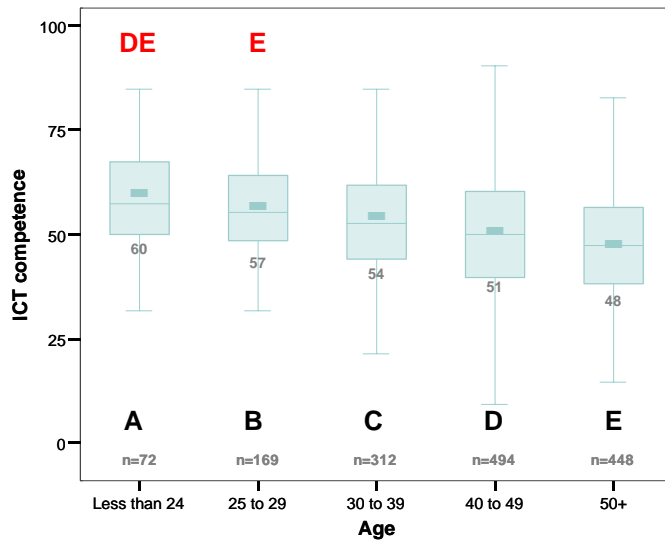


A/B in red denote a statistically significant difference at a 95% confidence level between subgroups A (males) and B (females)

## E.2 Age

The chart below shows that age is inversely related to a teachers' ICT competence index score; ie. As age increases the average ICT competence index score decreases, from 60 for teachers aged less than 24 to 48 for teachers 50 years and over.

Figure E.2: ICT Competence Index Score by Age

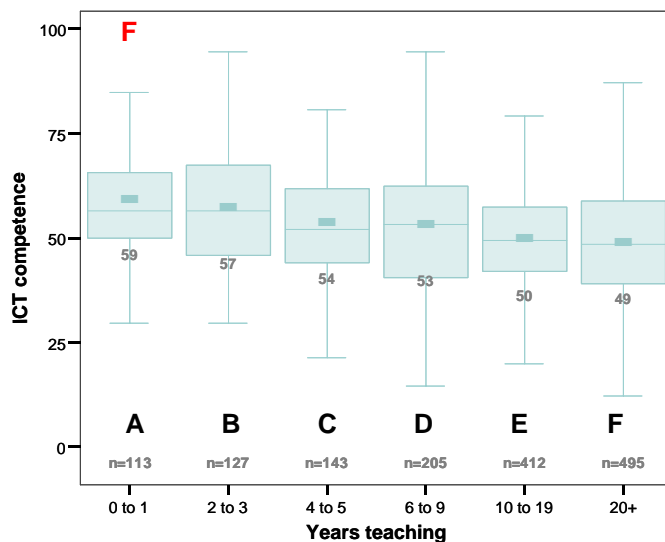


A/B/C/D/E in red denote a statistically significant difference at a 95% confidence level between the specified subgroups

## E.3 Teaching Experience in WA government schools

Reference to Figure E.3 below, shows that teaching experience is related to teachers' ICT Competence index score. As teaching experience increases the average ICT competence index score decreases, from a score of 59 for teachers with less than 1 year teaching experience to 49 for teachers with 20 plus years experience. The newer and younger teachers are bringing ICT skills and knowledge to the profession, whereas the more experienced, and older, teachers are less likely to have ICT skills.

Figure E.3: ICT Competence Index Score by Teaching Experience

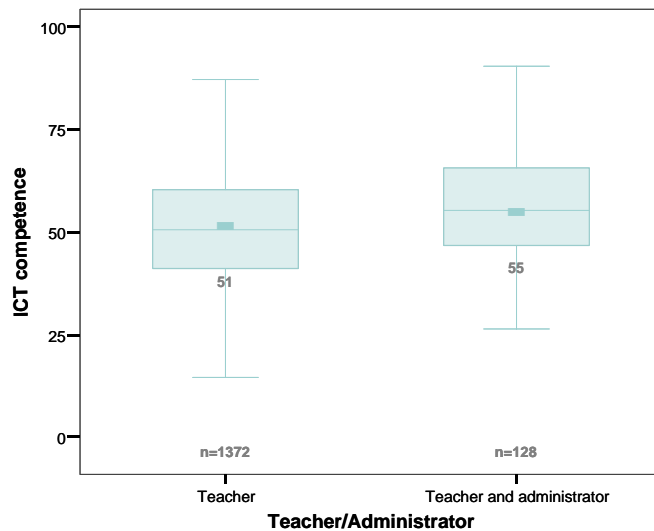


A/B/C/D/E/F in red denote a statistically significant difference at a 95% confidence level between the specified subgroups

## E.4 Teaching and Administrative Duties

The chart below shows a non-significant difference between the mean scores of teachers who have administrative duties as part of their job and those who don't (administrative duties includes deputies, heads of year and departments).

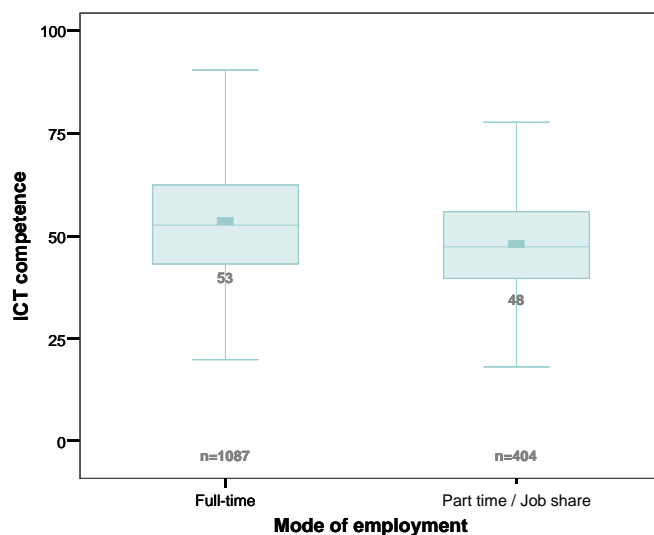
Figure E.4: ICT Competence Index Score by Teaching and Administrative Duties



## E.5 Mode of Employment

Figure E.5 below shows the ICT competence index scores by mode of employment. There is a no significant difference between the scores of full-time and part-time / job share teachers. However, some part-time teachers mentioned their mode of employment as being a barrier to acquiring and applying ICT skills.

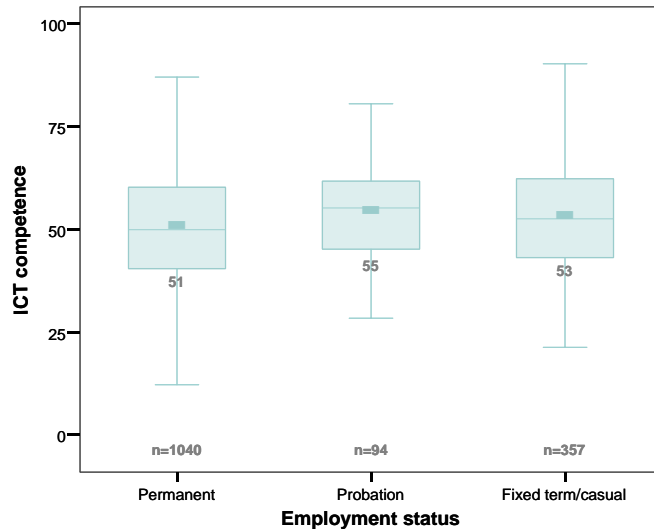
Figure E.5: ICT Competence Index Score by Mode of Employment



## E.6 Employment Status

The chart below presents the ICT competence index scores for teachers by their employment status. There are no statistically significant differences in the scores by employment status.

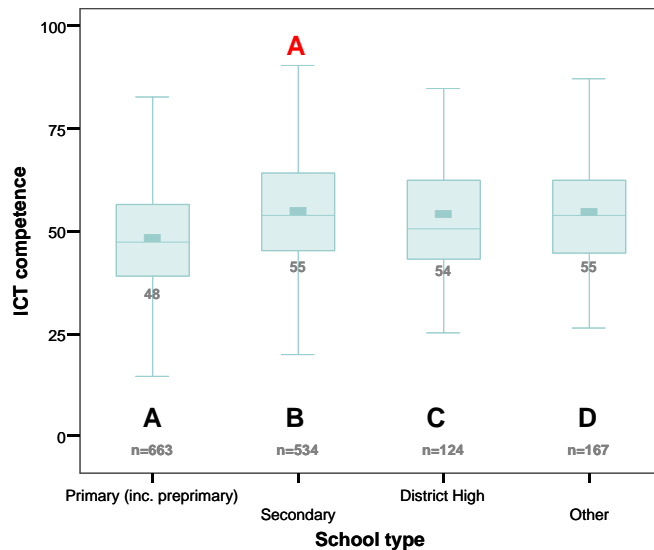
Figure E.6: ICT Competence Index Score by Employment Status



## E.7 School Type

Figure E.7 below shows the ICT competence index scores for teachers by the various school types. There is a statistically significant difference in the scores of primary and secondary school teachers; with primary school teachers scoring on average 48 and secondary school teachers scoring on average 55.

Figure E.7: ICT Competence Index Score by School Type



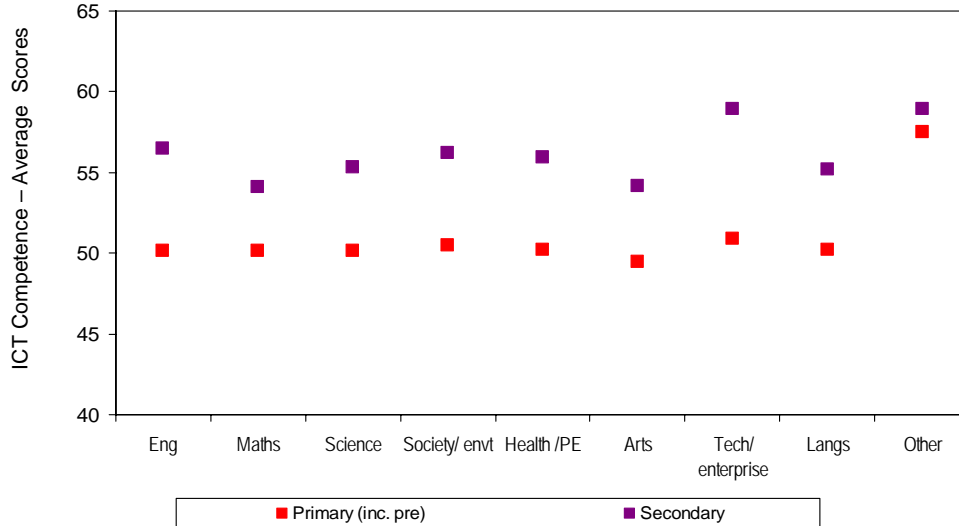
A/B/C/D/E denotes statistically significant differences at a 95% confidence level

Note: "Other" comprises middle schools (n=49), education support (n=38) and senior colleges (n=59)

## E.8 Learning Area

Figure E.8 below presents the ICT competence index scores for WA teachers by school type AND learning area. Among secondary school teachers, those with the highest scores are *Technology and Enterprise* and *Other*. Among primary school teachers, those in the *Other* category have the highest scores. “Other” includes Tourism, Ed support, Librarian, Vocational, Careers, Outdoor education, ESL, Work studies. These courses tend to be the innovative, new courses that are generally more ICT friendly.

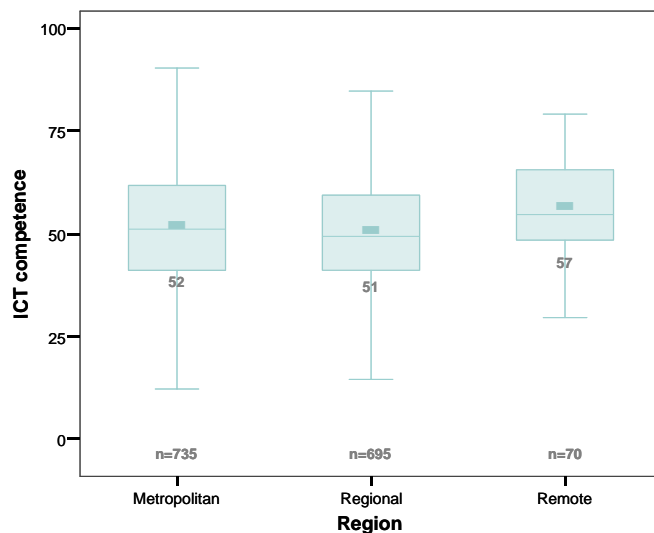
Figure E.8: ICT Competence Index Score by Learning Area



## E.9 Region

The chart below presents the ICT competence index scores of teachers by broad regional categories. There is no statistically significant difference in the ICT Competence of teachers from the three different regions.

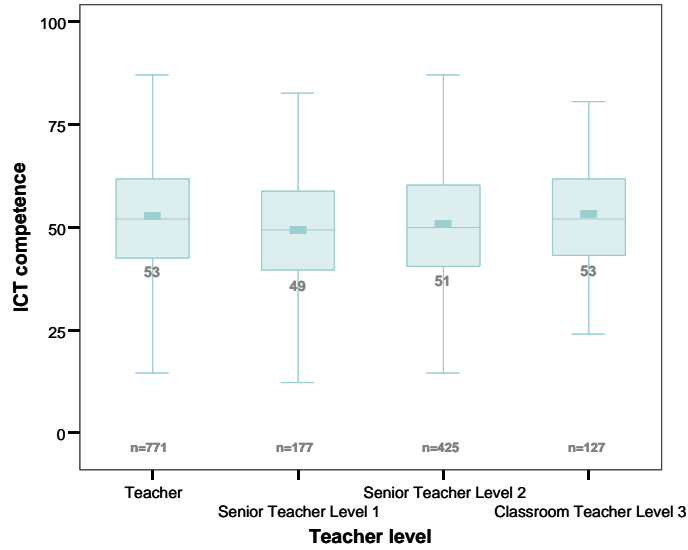
Figure E.9: ICT Competence Index Scores by Region



## E.10 Level of Teacher

Figure E.10 presents the ICT competence index score by teacher level. As can be seen, there is no statistically significant variances between scores by the various teacher levels.

Figure E.10: ICT Competence Index Scores by Teacher Level



# Appendix F: Demographic sub-group differences of the ICT Integration index

The sub-group analyses of the ICT integration index scores are presented below in box plot format.

## How to read the box plot charts:

The horizontal line in the centre of the box denotes the **median** score. The dark blue marker denotes the **mean** score (also provided numerically). Often the mean and the median score are the same or very similar for this data set.

The **spread of the scores** is denoted in two ways: the upper and lower limits of the box denote the values of the 25% and 75% quartiles of the data; and the whiskers denote the 10% and 90% values of the data.

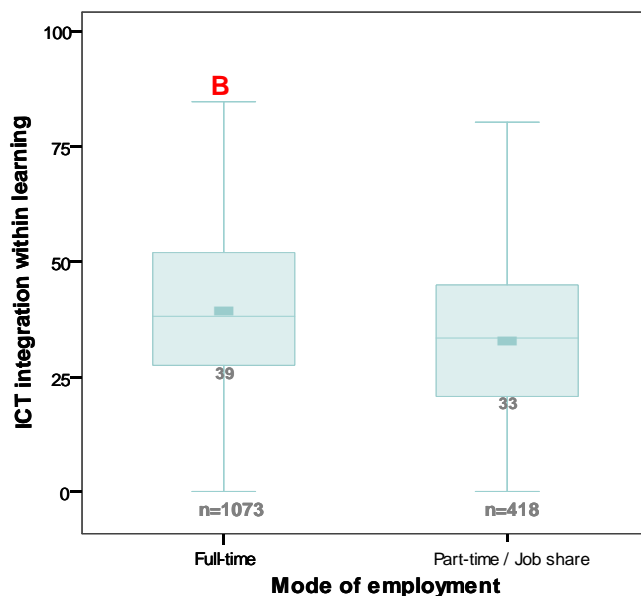
Example: Mode of Employment

Below it is possible to see that the mean score for full-time teachers is 39, which is slightly higher than the median score, whereas the score for part-time / job share teachers is 33, the same as the median. The score range for full-time teachers has a wider spread than that of part-time / job share teachers. Mode of Employment

## F.1 Mode of Employment

Figure F.1 below shows that full-time teachers are significantly more likely to integrate ICT within learning than part-time / job share teachers (39% vs. 33%).

Figure F.1: ICT Integration Index Scores by Mode of Employment

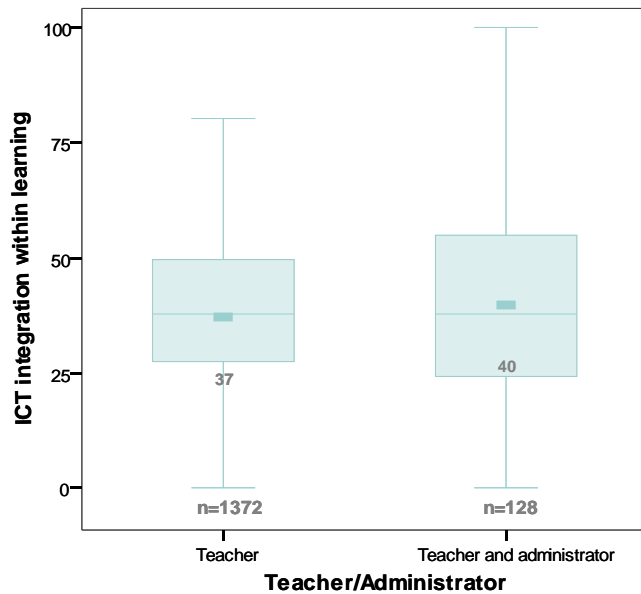


A/B in red denotes a statistically significant difference at a 95% confidence level between the subgroups A (full time teachers) and B (part-time or job share teachers)

## F.2 Teaching and Administrative Duties

Figure F.2 below shows that there are no significant differences between teachers with administrative duties (eg. Deputies, heads of year or heads of departments) than those who do not have administrative duties.

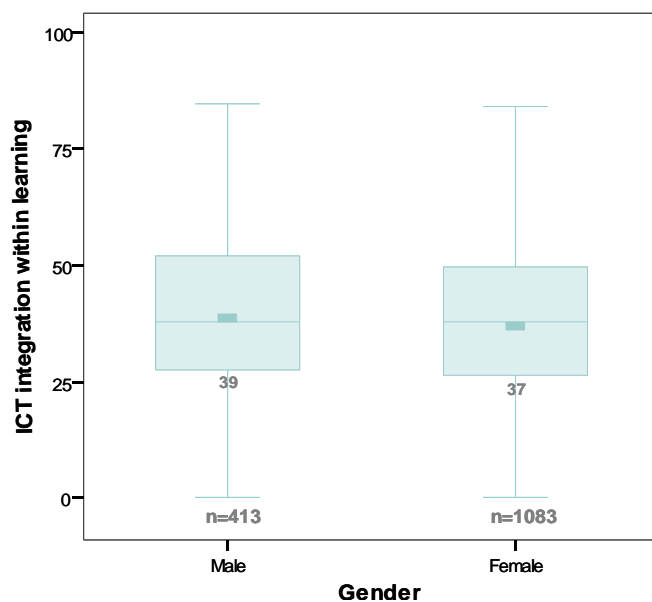
Figure F.2: ICT Integration Index Scores by Teaching and Administrative Duties



## F.3 Gender

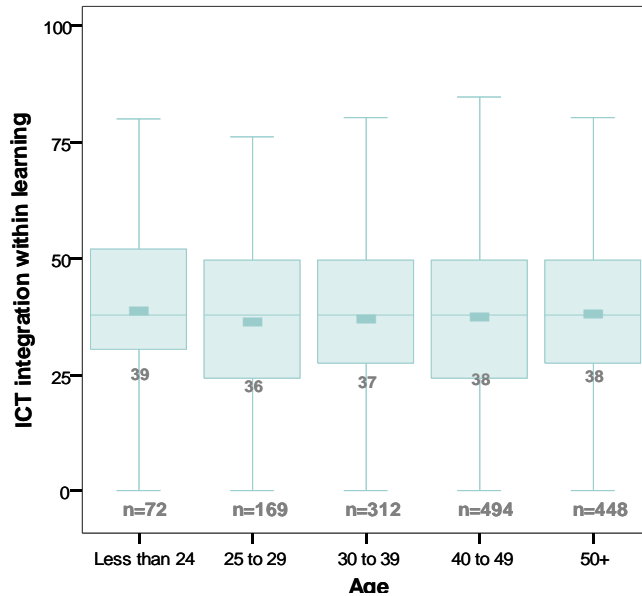
Whilst there was a strong relationship between gender and the ICT competence index scores (shown in Appendix E.1), the relationship between gender and integrating ICT into the classroom is not significant, i.e. males are **not** more likely to integrate ICT into the classroom than females (39% vs. 37%).

Figure F.3: ICT Integration Index Scores by Gender



## F.4 Age

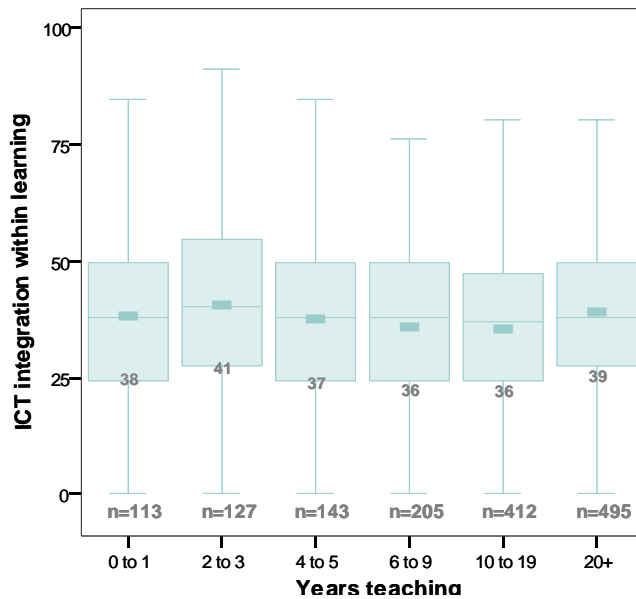
In Appendix E.2 it was shown that age has a significant relationship with ICT competence index scores, however such a relationship is not evident between age and integrating ICT into the classroom. Younger teachers are just as likely to integrate ICT within learning as older teachers. **Figure F.4: ICT Integration Index Scores by Age**



## F.5 Teaching Experience

Teaching experience shows no relationship with teachers' likelihood to integrate ICT within learning.

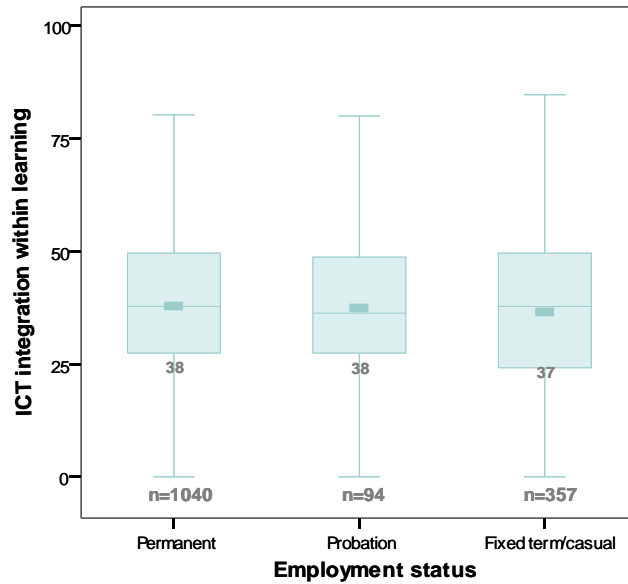
**Figure F.5: ICT Integration Index Scores by Teaching Experience**



## F.6 Employment Status

Employment status has no bearing on a teachers' likelihood of integrating ICT within learning.

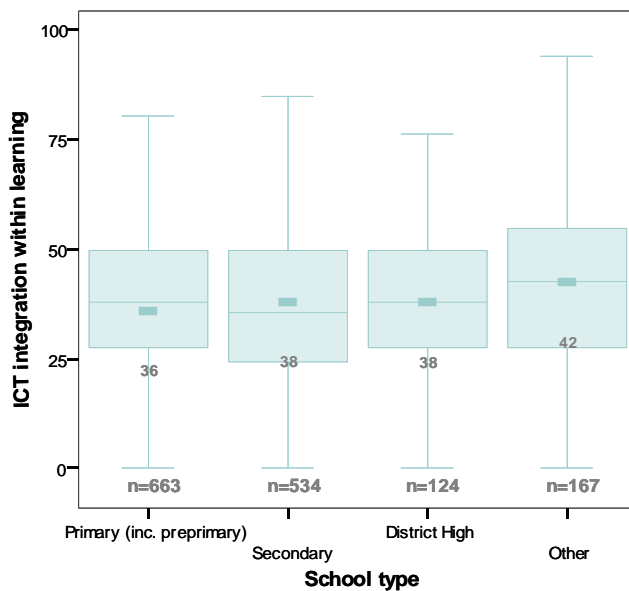
Figure F.6: ICT Integration Index Scores by Employment Status



## F.7 School Type

School type shows no significant relationship with the extent to which ICT is integrated within learning.

Figure F.7: ICT Integration Index Scores by School Type



## F.8 Region

A school's location does not have any bearing on the extent to which ICT is integrated within learning.

Figure F.8: ICT Integration Index Scores by Region

