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**National Trends in the ICTPD
School Clusters Programme
2003-2005**

Vince Ham, Hasan Toubat, Sandra Williamson–Leadley

Report to the Ministry of Education

RESEARCH DIVISION



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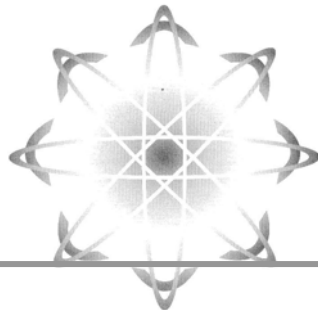
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National Trends in the ICTPD School Clusters Programme 2003-2005



A report to the Ministry of Education

Vince Ham
Hasan Toubat
Sandra Williamson-Leadley



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Report to the Ministry of Education on the Evaluation of the
ICTPD School Cluster Programme 2003-2005, submitted by
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Executive Summary

Background

This research report is submitted to the Ministry of Education as part of an ongoing evaluation of the Information and Communication Technologies Professional Development (ICTPD) teacher professional development initiative announced in the strategy documents *Interactive Education: An Information and Communication Technologies Strategy for Schools* (Ministry of Education, 1998) and *Digital Horizons: Learning Through ICT: A Strategy for Schools* (Ministry of Education, 2001, Revised 2003).

This report on the 2003-2005 cohort of ICTPD cluster teachers supplements, and makes comparisons with, the evaluations of the first three ICTPD School Cluster Programmes submitted to the Ministry in 2002, 2004 and 2005.

As outlined in the performance agreements between the Ministry and the ICTPD clusters, the ICTPD School Cluster programmes in New Zealand are aimed at increasing teachers' ICT skills and pedagogical understandings of ICTs, at increasing the use of ICTs for professional and administrative tasks in schools, and at increasing the frequency and quality of the use of ICTs in schools to support effective classroom teaching and learning.

The research reported here takes these performance criteria as its starting point to provide a national overview of the programme's impact on teachers, teaching and learning in New Zealand, by means of an analysis of the results of a pre- and post- survey of c.1,400 participant teachers

Findings

The overall finding of the study is that the 2003-2005 ICTPD programme had a marked and significant effect on the teachers and students in cluster schools with respect to all of its key goals. There were high levels of goal achievement reported by participants, and marked increases or changes with respect to the Ministry's objectives as outlined in cluster performance agreements. At the national level, the programme seems to have achieved its overall goals of significantly increasing teachers' skills and confidence with ICTs, improving administrative efficiency in schools, improving teachers' understandings of the role of ICTs in teaching and learning, and providing quality ICT-mediated learning experiences for students. The programme for the 2003-2005 cohort seems to have increased teachers' ICT skill, confidence and understandings, and to have increased routine student use of a range of ICTs for learning in classes, in orders of magnitude at least similar to those of earlier cohorts.

While stating these as general effects, we note that overall the ICTPD programme continues to have a greater impact among primary teachers than among secondary teachers.

Specifically, we found that:

- The great majority of teachers expressed high levels of satisfaction and goal achievement at the end of the programme. Participant satisfaction, while high across the board, varied somewhat by sector and length of time in the programme, with primary teachers and those who had been in the PD programme for most of the 3 years stating higher levels of satisfaction and goal achievement than secondary and those who were in the programme for only a few months. The great majority of participants' goals related to the acquisition of technical skills, gaining ideas for ICT-based teaching/learning activities, increasing use of ICTs for school administration, and improved understanding of teaching and learning generally.
- The programmes were seen by the majority of participants as having been a 'significant' event in their overall development as teachers, contributing well beyond any ICT-specific issues of increased technical skill, to encompass improved understandings in relation to teaching and learning more generally. Some 60% of the teachers indicated that the programme had contributed new ideas about teaching and learning, including 8% who felt that the programme had provided them with a whole new approach to teaching and learning. The rest said that the programme had played a more 'confirming' role, consolidating current ideas/understandings about teaching and learning. Primary teachers were rather more likely to see the programme as contributing *new* insights and ideas in this regard than secondary teachers.
- Teachers generally appreciated all of the ways the programmes were delivered and the knowledge and expertise of particular facilitators. The content of the programmes, being for most programmes a mix of skills development, classroom ideas and principles of effective teaching and learning generally, was seen as relevant and effective. Prominent among the most appreciated aspects of the programmes too, were the various opportunities provided to share ideas and problems and reflect together on their use of ICTs, both within clusters and through the various regional and national conferences, suggesting that a learning community focused on critical reflection of classroom ICT practice is continuing to develop.
- At the end of the programme the greatest concerns for teachers with regard to their professional use of ICTs were a lack of student access to equipment, a perceived lack of time to keep up to date, lack of technical support, and some concern about the apparently never-ending need to self-upskill in using new software packages and technologies as they become available.
- There was a marked and significant increase in teachers' ICT skills over the period of the programme. Teachers' reported skill levels on entry to the programme were generally moderate, though still higher than those for previous cohorts, and still variable across different ICTs. There was a distinct tendency for males and secondary teachers to report higher entry skill levels than female or primary teachers, though such differences had reduced by the end of the programme.
- By the end of the programme impressive majorities of teachers were reporting moderate or high skill levels with regard to file management (92%), basic computer operation (95%), word processing (97%), graphics (77%), the Internet (94%) and telecommunications (95%). Lower but still relatively high rates of moderate and high skill were reported with regard to multimedia packages (72%), spreadsheets (72%) and databases (58%), and these still show significant increases compared to entry point proportions. The greatest proportional increase in skills was

reported in relation to spreadsheets, which is most likely a reflection of the significantly higher than usual proportion of secondary teachers in the cohort.

- There was also a marked and significant increase in teachers' confidence about their professional use of ICTs over the period of the programme, both in terms of their confidence as personal users and in relation to students using ICTs in their classes. On entry the great majority of participants were either 'not confident' or neutral about their professional use of ICTs, female teachers and primary teachers being less confident than male and secondary teachers. By the end of the programme the great majority of all the demographic groups studied were reporting moderate or even high levels of such confidence. Moreover, the longer teachers were in the programme, the greater was the extent of their gain in confidence, and throughout the programme, levels of confidence as personal users were higher than those related to classroom use of ICTs.
- There was a marked and significant increase in teachers' use of ICTs for lesson planning and preparation and for general school administration over the period of the programme.
- The effect of the ICTPD programme on teachers' classroom practices has been substantial. Over a quarter acknowledged that over the programme period their classroom practices had changed to 'a large extent' or 'completely', while 49% felt their practices had changed to some extent. Female and primary teachers reported greater change in this regard than male or secondary teachers.
- On entry to the programme teachers were already generally positive about the value of using ICTs for teaching and learning, but were perhaps ambivalent or uncertain as to the exact nature of that benefit or value. At the end of the programme they showed a generally more positive disposition towards the value of ICTs in the teaching and learning process, and many stated a clearer conception of how its educational value might be judged. The most frequently reported effects of using ICTs with classes on their *teaching* included: teaching with increased confidence and enthusiasm, expanding their repertoire of teaching techniques, using a wider range of activities and catering for a greater range of student need across a broader range of curriculum objectives. The most prominent effects of the programme in terms of developing teacher understandings about teaching and learning were expressed as: a better understanding of student-centred teaching and learning, getting new ideas about establishing a resource-rich learning environment, increased knowledge of teaching and learning styles or approaches, increased awareness of 'quality' in teaching and learning, challenging pedagogical perspectives through sharing and discussion, and the accumulation of a variety of practical classroom ICT-based activities.
- There was a marked and significant increase in teachers' use of ICTs with their classes as a result of the programme. The great majority of teachers had either never used ICTs with classes prior to the programme, or had only used them once or twice a year. By the final year of the programme the majority of participating teachers reported that their students were using ICTs on a regular basis (i.e.: in most or all units of work over the year).
- While the proportion of units of work involving student use of ICTs increased significantly during the programme, the *range* of ICTs used by students for learning remained fairly limited.

Word Processing (including digital images and pictures), the Internet, and slideshow presentations are by far the most frequently used ICTs in classes.

- Primary teachers reported using ICTs in a greater proportion of their units of work than secondary teachers. The other significant predictors of increased classroom usage of ICTs by teachers in the clusters were their rising levels of confidence with and about the technology, and the length of time they were actively engaged in the PD programme.
- In terms of the downstream effects of the ICTPD programme on enhancing the ‘quality’ of student learning experiences, the surveys provide some proxy evidence through such things as the learning outcomes reported by participating teachers as they observed students engaged in ICT-based activities, the variety of curriculum goals met and Essential Learning Areas covered as students engaged in ICT-based activities, and the range of ICTs used by participating teachers and their students.
- In terms of the impact of using ICTs with classes *on students*, teachers tended to conceive of the benefit potential of ICTs in terms of increased student-centredness in lessons, increased student motivation, coverage of a range of curriculum topics, student acquisition of ICT skills, and increased opportunity for learning activities which promoted communications skills, enquiry skills, high order thinking, creativity and a range of social skills.
- In cluster schools, students used ICTs most often to achieve Language, Mathematics or Science objectives.
- In most respects the effects and trends listed above for the 2003-2005 ICTPD national cohort are similar in both nature and magnitude to those reported for the three earlier cluster cohorts. In general, the same effects, of a similar size, were identified for all cohorts. The only notable exceptions or differences between the 2003 cohort and earlier cohorts in terms of effect or effect size were:
 - The skill levels of teachers in the 2003 cohort on entering the programme, and also on exiting it, were generally higher than those of earlier cohorts. This would imply some personal upskilling effect in New Zealand schools generally, independent of the cluster programme. However, there also seems to have been a significant ‘2003 cohort effect’ in regard to skills in that the gains reported also seem higher than for the previous two cohorts. By contrast, entry levels of the 2003 cohort in terms of classroom *usage* of ICTs were not markedly higher than for earlier cohorts, except in the case of Internet use. For this cohort, as for previous cohorts, any prior upskilling outside the ICTPD programme did not translate into increased use for teaching and learning until well into the ICTPD programme.
 - There were some cohort differences in terms of the learning outcomes of ICT use by students in the 2003 cohort compared to earlier cohorts. Students in the 2003 cohort seemed, for example, to engage in problem solving activities (mostly through spreadsheet use) and information processing activities (mostly through Internet use)

more than in the previous two cohorts, and curriculum practice activities, such as Drill and Practice, less.

- The 2003 cohort also seems to have focused rather more than the previous cohort on generic cognitive skills as identified learning outcomes of students' ICT use, and rather less on the achievement of specific curriculum objectives. However, we still note that the general trend for student use of ICTs to be much greater for some categories of learning outcomes than others, itself remains fairly constant across the cohorts.
- The 2003 cohort had a much higher proportion of secondary teachers and schools in it than earlier clusters. However, the only effect difference this seems to have generated was an increased use of spreadsheets for problem solving activities by comparison with other clusters. The numerous sector-based differences reported for other cohorts remain as sector differences in the 2003 cohort results as well.

Introduction

This research report is submitted to the Ministry of Education as part of an ongoing evaluation of the Information and Communication Technologies Professional Development (ICTPD) teacher professional development initiative announced in the strategy documents *Interactive Education: An Information and Communication Technologies Strategy for Schools* (Ministry of Education, 1998) and *Digital Horizons: Learning Through ICT: A Strategy for Schools* (Ministry of Education, 2001, Revised 2003).

The 2003-2005 ICTPD School Clusters in the National Strategy for ICT in Schools

In 1998 a national 'ICT Strategy for Schools' was announced which established a new, 'national' system of funded professional development school clusters. This programme has become known as the ICTPD School Clusters programme. The main features of the cluster programme, which has become an ongoing feature of the teacher professional development landscape in New Zealand since 1999, are:

- The bulk of the programme funding is devolved directly to schools as both 'producers and consumers' of their own PD programmes.
- The programmes are only available to *groups* of schools, which have committed to a 'clustered' model of professional development for the benefit of teachers in all the participating schools.
- The programmes are funded over three years, for programmes that are to last for three years.
- No particular delivery model is mandated in the contracts themselves. Within very broad parameters, applicants for ICTPD cluster funds are expected to develop and propose their own models of delivery, rather than to implement a variation on a predetermined, Ministry-approved model.
- There is central coordination of the programmes through a team of National Facilitators who manage the cluster monitoring process and provide professional development support, advice and coordination to the clusters as a national community.

The basic framework of the ICTPD cluster programmes is centrally prescribed. The programmes are to focus on the integration of ICTs into a variety of teachers' professional practices. A 'Lead School', often, but not necessarily, one with a reputation for best practice in the area of ICT use, forms a collaborative partnership with other schools for the provision of up to three years of teacher professional development in those schools. Each cluster receives c.\$110,000 per annum in central funding. These funds are to be spent on teacher professional development, and may not be used to defray schools' hardware, software or infrastructure costs.

Beyond that common brief, however, schools are free to group themselves as they wish, and are encouraged to develop and propose their own models and modes of delivering their programmes.

Early in 1999, 23 such ICTPD School Clusters in various parts of the country were selected as the first cohort under the scheme. There were no cluster programmes started in 2000, but, based on the apparent success of the first cohort, it was decided to continue the programmes on a rolling basis from 2001 on. The cohort which is the subject of this report was thus the fourth intake or cohort of clusters. They began their programmes in January 2003 and completed at the end of 2005. This report on the 2003 cohort of ICTPD cluster teachers thus supplements, and makes comparisons with, the evaluations of the first three ICTPD School Cluster Programmes submitted to the Ministry in 2002, 2004 and 2005. These earlier programmes are referred to herein as the '1999 cohort', the '2001 cohort', and the '2002 cohort' respectively.

Programme goals

The ICTPD School Cluster programmes in New Zealand have been generally aimed at increasing teachers' ICT skills and pedagogical understandings around ICTs, at increasing the use of ICTs for professional and administrative tasks in schools, and at increasing the frequency and quality of the use of ICTs in schools to support classroom teaching and student learning.

From the Ministry of Education's perspective, the major goals of the ICTPD programmes were stated in contracts to 2003 as to:

- “• *Provide professional development for teachers in participating schools on the use of ICT for teaching and learning and administration;*
- *Trial and develop activities that integrate ICT into the teaching and learning process and meet important learning outcomes of the New Zealand Curriculum;*
- *Explore innovative ways of using ICT in the provision of educational activities for students, teachers and their communities;*
- *Develop printed and digital resources for dissemination that reflect good practice in the use of ICT in teaching and learning;*
- *Utilise ICTs to meet a variety of administrative needs;*
- *Develop systems and strategies for technical support of ICTs;*
- *Develop integrated policies and sustainable development plans for ICT”*
(Cluster Contracts, Schedule A. p.1)

These broad goals were rearticulated as a number of specific Performance Measures and expected outcomes included in the various cluster contracts. In the case of the 2003 cohort the precise wording of these Performance Measures changed for the final year of the programme, although the general spirit of them retained a focus on the same core elements. The Performance Measures which particularly guide this study were those applicable and common to all three years of the programme, namely:

- “• Increased skills and confidence of teachers in using ICT.”
- “• Increased classroom or student use of ICT.”

- “• Improved understanding about the roles of ICT in teaching and learning to meet important learning outcomes of the curriculum.”
- “• ICTs are used for quality learning experiences in classrooms.”
- “• Appropriate advice, professional development and support is provided to schools.”

In the final year of the contracts the Performance Measure around “Increased administrative efficiencies achieved within cluster schools.” was taken out of the list of measures to be reported in Milestones. We report trends in this regard in this study in order to retain consistency with previous Reports and because it remained a reportable measure for milestones, and therefore a focus of many programmes, for most of the cohort’s time of operation.

Structure of the Report

The research for the 2003-2005 cluster programme takes these performance criteria as its starting point and provides a national overview of the programme’s impact on teachers, teaching and learning in New Zealand, through an analysis of the results of a pre-post survey study of teachers from all clusters. The report begins with an overview of the profile of the ICT goals, skills, and classroom usage of the 2003 cohort of teachers at the point of entry into the ICTPD programme. This is followed by an analysis of the relative impacts of the programme over time in terms of the performance measures listed above. For convenience we group the performance measures into four main areas, each of which is reported as a separate section:

- The effects of the PD programmes on **teachers themselves**, as indicated by the effects on teacher skills, confidence, and understandings in relation to ICTs in teaching and learning.
- The effects of the PD programmes on **administrative usage of ICTs by teachers**.
- The effects of the PD programmes on **usage of ICTs by students**, as indicated by rates of classroom usage, curriculum coverage, and the provision of ‘quality learning experiences’.
- The provision of **appropriate advice, PD and support** by the various cluster programmes, as indicated by reported levels of participant satisfaction and goal achievement.

The report finishes with a comparison of the key findings for the 2003-2005 cohort with those for the three earlier cohorts, 1999-2001, 2001-2003 and 2002-2004.

Methodology

Research questions

The brief for the research on the 2003 cohort of ICTPD clusters is to provide a broad national profile of the impact of the programme across the country as a whole. It has not been our role to evaluate specific clusters or their particular PD models. To this end the core research question being addressed is not so much to identify which particular models of PD are most effective, but rather to conduct a survey-based study to evaluate how well, and in what respects, the national ICTPD School Cluster initiative met the objectives of stakeholders and participants for the 2003-2005 cohort.

In doing this we addressed the following core research questions:

1. How effective overall was the ICTPD programme in meeting stakeholder and participant goals?
2. How effective was the ICTPD programme overall in terms of promoting effective teacher use of ICTs for lesson preparation and planning, and school administration?
3. How effective was the ICTPD programme overall in increasing teachers' ICT skills, confidence and knowledge related to the educational applications of ICTs?
4. How effective was the ICTPD programme overall in promoting quality classroom learning experiences for students?
5. How much, and in what respects, have these effects changed as the model has rolled out over time to new cohorts?

Research strategy and data collection

Survey data were gathered from all of the 2003 cohort clusters. These comprised responses from both pre- (Baseline) and post- (End of Project) programme postal surveys of all participants. In order to maximise validity of comparison across cohorts, the Baseline and End of Project instruments were based on the equivalent questionnaires developed for the previous cohorts in 1999, 2001 and 2002.

In between the Baseline and End of Project surveys, intermediary online Monitoring surveys (OL1 etc) were conducted to assist clusters with Milestone reporting. Findings from these intermediary surveys, which are of a formative nature, were reported to the clusters concerned as the programme progressed.

In order to further increase the points of comparison, the End of Project survey asked participants to identify both their pre- and post-project skill levels and classroom ICT experiences, so that these could then be compared with parallel questions in the baseline survey.

Table 1. Timetable of research surveys in ICTPD cluster cohorts, 1999-2007
(Shaded surveys are those relevant to this report)

	1999	2001	2002	2003	2003	2004	2004	2005	2005	2006	2006	2007
1999 cohort	BL		EOP									
2001 cohort		BL			EOP							
2002 cohort			BL	(OL1)	(OL2)	(OL3)	EOP					
2003 cohort				BL	(OL1)	(OL2)	(OL3)	(OL4)	EOP			
2004 cohort						BL	(OL1)	(OL2)	(OL3)	(OL4)	EOP	
2005 cohort								BL	(OL1)			EOP
2006 cohort										BL		

Key: BL=Baseline survey; OL1, 2,3,4 = Online surveys; EOP = End of Project survey

Respondent demographics

In all, 2,502 baseline survey responses were received from teachers from all of the clusters in the 2003 cohort. 1,679 responses to the End of Project survey were received from teachers from all 21 clusters. This represents an estimated response rate of well over 90% for the baseline survey and c.65% for the End of Project survey. One cluster has been granted an extension of time to mid 2006 in order to complete their programme and is not counted in the End of Project figures. Since the surveys were an 'expected' part of what clusters did as part of the PD programme response rates were high, though they were rather lower for the End of Project than for the baseline survey. In both instances, however, the response rates for this cohort's surveys were comparable to those attained from previous cohorts.

It appears that the demographic distribution of the respondent group was similar to that of the broader teacher population in the ICTPD programmes in most respects. About 69% of respondents were females and 31% were males, which, when broken down by sector represents a ratio of female to male teachers within the primary sector of 5.5:1 (85%:15%) and in the secondary sector of 11:9 (56%:44%). In these respects the gender distribution in the cluster surveys roughly reflects gender distributions in their respective populations generally.

However, it is noted that about 44% of responding teachers taught at primary school level, 50% at secondary, and 6% taught both primary and secondary students. This represents a significant change in the cohort profile compared to previous cohorts in which the proportion of primary participants has been significantly larger than that of secondary. In this cohort there is more or less equal representation of sectors.

Table 2. Respondents by school sector

School Sector	Total	%
Primary	716	44%
Secondary	816	50%
Both	100	6%
N	1632	

A strong correlation was evident in studies of previous ICTPD cohorts between the length of time that individual teachers were actively engaged in the programme and their subsequent levels of confidence and classroom usage of ICTs. This may account for the tendency for respondents in the cohort to have been actively engaged in their programmes for long rather than short lengths of time. In the 2003 cohort some 41% of teachers' were actively engaged in the ICTPD programme for the full 31-36 months of the programme, and the great majority had engaged for two or more years. Only 10% of teachers had been in a programme for short-term periods of less than six months (Table 3). These proportions are comparable with those for the prior 2002 cohorts.

Table 3. Respondents by length of time actively involved in the ICTPD programme

Length of Involvement (Months)	Total	Percentage
0-6	150	10%
7-12	257	17%
13-18	173	11%
19-24	220	14%
25-30	95	6%
31-36	634	41%
N	1529	

Cohort Profile on Entry to the Programme

Teacher goals on entry

In the baseline surveys, and again at the end of the programme, teachers were asked about their goals in undertaking the programme. In the Baseline surveys, by far the most frequently identified goals related to improving their own technical skills with ICTs. About half (48%) of the stated goals related to this. As was the case for previous cohorts, sometimes these were expressed as a general desire to upskill themselves, but more often they were stated as quite specific objectives, identifying particular skills or particular pieces of software with which they wanted to become competent or familiar.

The next most frequently identified set of goals on entry related to gaining practical ideas for uses and applications of ICTs in their classroom teaching programmes. Again, these were expressed either as general statements of intent to 'use' or 'integrate' ICTs more, or as specific requests for ideas on how to use particular applications with particular classes or in certain subjects. A quarter of the stated goals (25%) related to getting practical classroom ideas for the use of ICTs, or to applying practical skills through classroom activities involving ICTs.

Some 8% of teachers' stated entry goals related directly to general pedagogical quality measures such as enhanced learning outcomes or 'better teaching'.

About 15% had entry goals related to increased administrative efficiencies, to improving their school's infrastructure, developing school policy, and the like. (Table 4).

Exemplary goal statements coded as Technical Skills:

"Ability to access websites related to my subject in the classroom", "I am familiar with operating systems of Apple/Macs, but would like some tutoring/troubleshooting in IBM's", "Able to use / make powerpoint presentations quickly and easily", "To learn about digital music to learn how to use software such as sibelius, encore, cool edit", "Designing web pages", "Be very confident in the use of Word, Publisher, PowerPoint, Excel, Access, and other learning software programmes for students in the school (eg mindkind)", "Have little confidence - very slow on typing keyboard skills", "An ability to email fluently", "Gain further general ICT skills - many basic skills still needed", "Use/set up email accounts", "To feel confident using my new laptop re. use the programmes confidently and effectively", "To be a proficient user of a multimedia package such as 'office'

Exemplary goal statements coded as Classroom Ideas

"To incorporate programmes in my subject area", "Safe internet use for children. Lists of websites for classroom", "Increased use of powerpoint for teaching", "Be able to conduct a webquest in my classroom, involving the majority of the students successfully", "Be competent in using ICT within the curriculum with my classes e.g. Autograph, internet etc.", "Like to be able to incorporate maths games on computer to my less able groups- integrate into curriculum", "Children to be more independent at finding relevant info on the computer for research/homework projects", "Introduce use of simulation/teaching programs for physics and electronics", "Incorporate ICT into the programme (English) as a regular occurrence", "Set up interactive ICT lessons", "Students in English classes using PowerPoint presentations including scanned material and voice".

Exemplary goal statements coded as Better Teaching and Learning:

"To find pathways between ICT expertise and effective units of learning in the classroom", "To be able to plan the best development for the children I teach", "To integrate visual art and literacy so as to enhance students' skills and knowledge", "To extend the children learning with ICT", "To take a team approach to creating scenarios that involve the philosophy of learning and foster the development of learning for children", "To integrate computer into more of the curriculum meaningfully", "To develop an understanding as to how IT tools can change the way students learn", "to identify important ICT pathways for my students and ways to implement these effectively", "To be better able to meet students needs in ICT", "To create a successful integration of search tools on the internet into topic studies and other specific learning areas. E.g. reading / writing in the junior schools", "To start to implement an effective ICT programme within my classroom", "To use ICT in order to improve the delivery of learning e.g. mathematics in my class", "To integrate ICT into all curriculum areas in a meaningful way to enhance student learning", "To be able to incorporate these [ICT] with classroom teaching and enhancing learning".

Table 4. Stated teacher goals on entry to the ICTPD programme

Categories of Goals	%
Technical ICT skills	48%
Increased practical classroom use	25%
Use for administration	12%
Better teaching and learning	8%
Infrastructure	<3%
School-wide policy and planning	<1%
N	2422

Teachers' ICT skills on entry

The continued preponderance of technical skill acquisition among teachers' goals for the programme is perhaps reflective of the variable but generally moderate to low levels of perceived ICT skills on entry to the programme. Few teachers on entry said that they were skilled across a wide range of ICTs, though most were comfortable about their word processing, telecommunications (email and internet use) and basic file management abilities. Around three quarters of teachers, for example, reported that they already had moderate or high level word processing and/or telecommunications skills on entry into the programme. Teachers' entry point skills with ICTs other than word processing and telecommunications, however, were on the whole quite low, with the great majority stating that their abilities with databases, multimedia presentation packages, graphics and to a lesser extent spreadsheets, were either low or non-existent. Overall, teachers' reported Internet skills were moderate.

Having said that, however, it is important to note that entry point skill levels for the respective cluster cohorts have been steadily increasing across cohorts, and that in a number of respects the 2003 cohort's skill levels, though low overall in a number of areas, were generally higher than those reported by previous clusters. (See section below. 'Comparisons with Previous Cohorts')

Table 5. Teachers' ICT skills on entry to the ICTPD programme

Skill level	File Management	Basic Operation	Word Processing	Spreadsheet use	Database use	Graphics use	Internet use	Telecoms	Multimedia Presentation
None	12%	10%	6%	21%	28%	24%	10%	8%	29%
Low	25%	25%	17%	32%	35%	36%	27%	23%	35%
Moderate	27%	33%	28%	25%	24%	24%	30%	28%	22%
High	36%	32%	50%	22%	13%	16%	31%	40%	13%
Total	1631	1626	1631	1620	1600	1600	1600	1627	1608

As has been the case in previous entry cohorts, there was a clear and significant tendency for both males and secondary teachers to report higher entry point skills compared to female and primary teachers respectively. This applied to all of the skill sets listed.

Teachers' confidence about the use of ICTs on entry

Previous studies of ICTPD clusters found that how teachers felt about ICTs, their level of confidence both as personal users and about using ICTs with learners, was a stronger predictor of classroom usage than technical competence or skill. Perhaps for this reason increases in teacher confidence about ICTs was stated as a Ministry goal for the programme and all surveys contain questions about teacher's confidence with ICTs.

The often moderate to high personal skill levels reported by teachers were not matched by moderate or high levels of confidence, especially about using ICTs in classrooms.

When teachers were asked about their entry point confidence in personal use of ICTs, they more or less divided into three equal groups: a third who were confident or very confident, a third neutral and a third not confident or anxious. Confidence levels were notably lower when it came to ICT use with classes. In that regard about half rated themselves as 'anxious', or 'not confident' about the use of ICTs with classes (Table 6), while 21% rated themselves as confident or very confident.

Table 6. Teachers' confidence about ICT usage on entry

Confidence level	Use with classes	Personal use
Very confident	5%	7%
Confident	16%	31%
Neutral	29%	31%
Not confident	38%	26%
Anxious	11%	4%
N	1034	1040

It is noted that there was a statistically significant correlation between teachers' confidence levels and both gender and school sector. As had been the case in previous clusters, male teachers and secondary teachers reported higher levels of confidence than female and primary teachers respectively (Table 7).

Table 7: Teachers' confidence about ICT usage on entry, by gender and school sector

Confidence Level	Personal Use		Use with classes		Personal Use		Use with classes	
	Female	Male	Female	Male	Primary	Secondary	Primary	Secondary
Very confident	5%	11%	13%	22%	4%	10%	17%	15%
Confident	27%	39%	55%	48%	29%	31%	60%	47%
Neutral	34%	26%	25%	23%	32%	30%	20%	28%
Not confident	28%	23%	7%	6%	28%	25%	3%	9%
Anxious	6%	1%	1%	1%	6%	3%	0%	1%
Grand Total (N)	715	341	686	328	447	533	424	525

(Personal use: Gender: $X^2 > 10$, $df=4$, $p < .05$; Sector $X^2 = 16.36$, $df=4$, $p < 0.05$)

(Classroom use: Gender: $X^2 = 13.751$, $df=4$, $p < .05$; Sector $X^2 = 29.939$, $df=4$, $p < 0.05$)

Teachers' usage of ICTs for administration on entry

On entry to the programme teachers tended to use ICTs more for general administrative purposes than for finding or producing lesson resources. About 40% of the teachers were regular users of ICTs for general school administration on entry, compared with 32% who were regular users of ICTs for lesson planning and preparation. In both cases there was a significant minority of about a third who indicated they had "never" or "rarely" used ICTs for either administrative use (Tables 8, 9).

Table 8. Teachers' use of ICT for administrative purposes before the programme

Frequency of use	Percentage of teachers
Always	13%
Often	28%
Sometimes	29%
Rarely	19%
Never	11%
Total	1610

Table 9. Teachers' use of ICT for finding or producing lesson resources before the programme

Frequency of use	Percentage of teachers
Always	7%
Often	25%
Sometimes	34%
Rarely	25%
Never	8%
Total	1610

We note that the proportion of teachers reporting low usage of ICTs for administration and planning overall was about a third in this cohort, compared with about half in the previous (2002-2004) cohort. So the trend over time and over cohorts seems to be for overall administrative usage of ICTs on entry to ICTPD to be increasing, but with rates of usage for general administration to remain consistently higher than usage for classroom preparation and planning.

Teachers' usage of ICTs for teaching and learning on entry

Baseline data for this cohort shows a low level of usage of ICTs for teaching and learning prior to the programme. On entry to the programme some two thirds (66%) of teachers said that either "no units" or only "one or two units" had contained ICT based activities in the year prior to the programme. A small group of 14% of teachers said they had used ICT based activities in all/almost all or most units of work (Table 10).

Table 10. Units of work containing ICT based activities prior to the programme

Units of work containing ICT based activities	Percentage of teachers
All or almost all units	7%
Most units	7%
Several units	19%
One or two units	42%
No units	24%
Total	2239

In this regard primary teachers reported slightly higher rates of ICT based activity than secondary teachers ($\chi^2 > 8$, $df=3$, $p < 0.05$) (Table 11).

Table 11. Units of work containing ICT based activities by school sector prior to the programme

Units of work containing ICT based activities	Primary	Secondary
All or almost all units	6%	7%
Most units	10%	6%
Several units	20%	18%
One or two units	41%	43%
No units	23%	25%
Total	941	1133

The frequency of student engagement in these ICT-based activities was also fairly low. Over 60% of teachers reported that their students had engaged in ICT activities “once or twice a year” or had not engaged in them at all prior to the programme.

There were also some interesting differences in the particular types of ICT activity engaged in by students. While around half of teachers reported some use of computers for static print production, multimedia presentation and information gathering, few reported use of ICTs for creativity, problem solving, online interaction and collaborative learning (Table 12).

Table 12. Frequency and the main purpose of students’ engagement in ICT based activities.

Main activity purpose	Frequency					Grand Total
	Daily / Almost daily	Once or twice a week	Once or twice a term	Once or twice a year	Not at all	
Static print	3%	11%	26%	30%	30%	1336
Multimedia presentation	1%	3%	11%	25%	60%	1318
Online interaction	1%	3%	7%	16%	72%	1296
Creativity	2%	3%	10%	23%	62%	1338
Information gathering/ processing	3%	11%	26%	31%	29%	1397
Problem solving	1%	3%	10%	18%	68%	1331
Curriculum practice	2%	8%	14%	22%	53%	1331
Technical skills	4%	8%	18%	24%	46%	1348
Collaborative learning	1%	2%	9%	18%	70%	1298
Motivation	3%	9%	15%	17%	56%	1317

The overall picture provided of the 2003-2005 cohort on entry to the ICTPD programme, therefore, is that they were demographically typical to previous cohorts except on one important respect; that being the significantly higher proportion of secondary teachers in the cohort compared to earlier cohorts. In terms of their ICT skill levels their skill levels overall would best be described as moderate and occasionally high, and generally higher than previous cohorts. Similarly their confidence levels, though low to moderate especially with regard to classroom use of ICTs were slightly higher than previous cohorts. Both reported skill and confidence levels tended to be higher among secondary than among primary teachers. In terms of usage, the cohort's use of ICTs for various administrative activities was also moderate or better for most and again slightly higher than previous cohorts.

With regard to classroom usage, however, the reported rates of ICT use by students in this cohort prior to the ICTPD programme were both relatively low and less noticeably increasing in some respects compared to previous cohorts. General skill levels, usage for administration, and to a lesser extent confidence levels of teachers entering the ICTPD programme seem to be increasing over time and across cohorts. However, this increasing skill and administrative usage are not significantly translating into increased entry rates of usage for classroom teaching and learning across cohorts.

Effects of the ICTPD Programme on Teachers

As expressed in clusters' performance agreements, the three main goals of the ICTPD programme with regard to the effects on teachers themselves were:

- Increased skills among teachers across a range of educationally useful ICTs.
- Increased confidence about their personal use of ICTs and about the use of ICTs with classes.
- Improved understandings of the roles that ICTs can play in improving classroom teaching and learning.

Nationally, there was a clear and significant increase/improvement in relation to all three of these indicators over the period of the programme.

Teachers' ICT skills

Over the period of the programme teachers' skills in using ICTs increased significantly, especially, but not exclusively, for those who at the beginning of the programme had rated their skill levels as either very low or non-existent. As can be seen in Table 13 below, there were significant reductions across the board in the proportions of teachers who rated their skills as low or non-existent, and significant increases in the proportion who rated their skill level as moderate or high. This was the case even with regard to ICTs such as word processing where the majority of teachers entered the programme with reasonable levels of competence. By the end of the programme solid majorities of teachers felt they had moderate or high skills with regard to file management (92%), basic computer operation (95%), word processing (97%), graphics (77%), Internet (94%) and telecommunications (95%). Lower but still relatively high levels of end of programme competence were reported with regard to spreadsheets (72%), databases (58%) and multimedia packages (72%), and these still show significant increases compared to entry point proportions. The increase in teachers' skill levels during the programme was considerable across all ICTs, but it was most notable in relation to Internet, graphics and multimedia applications.

Table 13. Teachers' skill levels with various ICTs before and after the programme

Skill level	File Management		Basic Operation		Word Processing		Spreadsheet use		Database	
	Before	After	Before	After	Before	After	Before	After	Before	After
None	12%	1%	10%	1%	6%	1%	21%	8%	28%	15%
Low	25%	6%	25%	5%	17%	3%	32%	20%	35%	27%
Moderate	27%	26%	33%	31%	28%	16%	25%	34%	24%	33%
High	36%	66%	32%	64%	50%	81%	22%	38%	13%	25%
Total	1631	1596	1626	1596	1631	1596	1620	1594	1600	1569

Skill level	Graphics use		Internet use		Telecommunications		Multimedia presentation	
	Before	After	Before	After	Before	After	Before	After
None	24%	8%	10%	1%	8%	1%	29%	10%
Low	36%	14%	27%	4%	23%	4%	35%	19%
Moderate	24%	32%	30%	24%	28%	23%	22%	31%
High	16%	45%	31%	70%	40%	72%	13%	41%
Teachers' Total	1600	1569	1600	1569	1627	1600	1608	1581

Demographic analysis of these results show some continued relationship between gender and teachers' skill levels in favour of male and secondary teachers at the start and the end of the programme. However these differences were greatly reduced over the period of the programme. At the end of the three years the most notable remaining differences were that secondary teachers reported higher skill levels in spreadsheet and multimedia use and primary teachers reported higher skill levels in the use of graphics.

The higher reported multimedia skill levels among secondary teachers is an interesting result as it contrasts with previous programmes where primary teachers consistently showed greater skill increases this type of application. We attribute the difference to the much higher proportion of secondary schools in the 2003-2005 cohort and a probably greater focus in the skills components of those programmes on multimedia tools such as Powerpoint and movie editing.

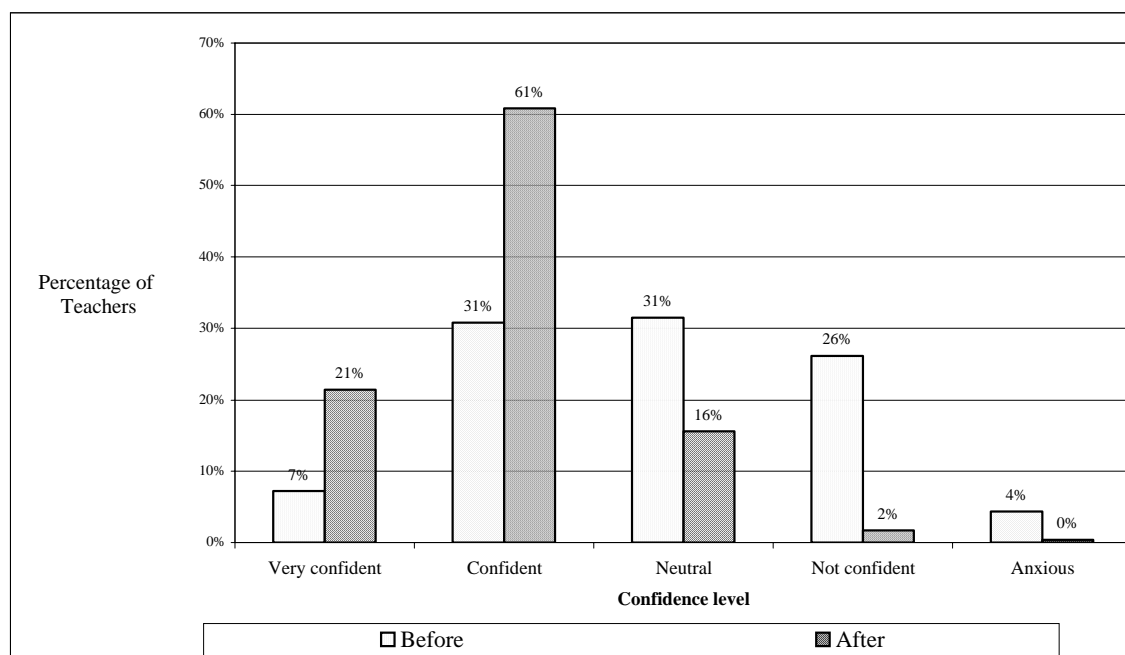
An analysis was also done of the connection, if any, between the length of time teachers were active in the programme and the extent of skill acquisition (measured as high, moderate or low/no *gains or change* compared to their entry point skills). The length of time teachers spent in the programme seemed to be positively related to high *gains* in skill levels for a number of skill areas, but not all. Taken as a group, the connection between length of time in the programme and gains made in skills was therefore variable. It was strong for certain ICTs but not strong for most. This would support the conclusion of the studies of previous clusters that the impact of the PD being spread out over three years was greater for other goals than for skill acquisition per se.

Teacher confidence about the use of ICTs

The confidence of teachers about using ICTs was investigated with regard to two elements: their confidence as personal users, and their confidence about using ICTs with classes of learners. Both of these increased significantly over the period of the programme from moderate and low levels respectively on entry.

On entry to the programme many teachers stated that they were less than confident as personal users of ICTs. Four percent of teachers classified themselves as 'anxious' and 26% of them were 'not confident' in this regard. By the end of the programme none of the teachers said they were 'anxious' and only 2% were still 'not confident' about the personal use of ICTs. By the end of the programme about four fifths (82%) of teachers stated that they had become either 'confident' or 'very confident' about the personal use of ICTs. Figure 1 illustrates this shift in confidence levels of teachers before and after the programme.

Figure 1. Teachers' confidence about their personal use of ICTs before and after the ICTPD programme



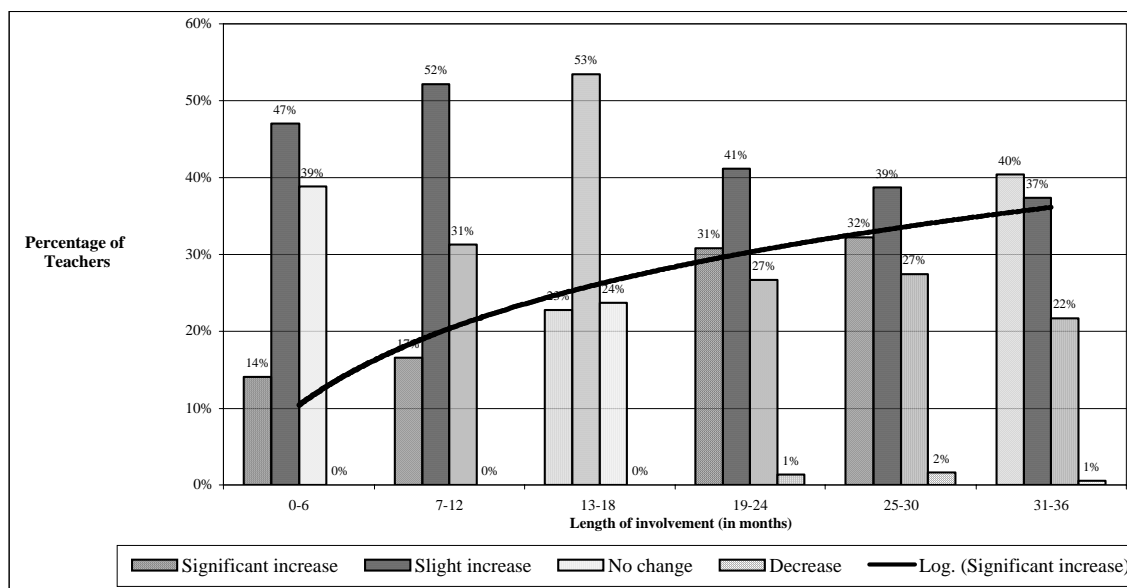
An analysis of the change in *individuals'* confidence levels over time confirmed this overall trend. Just under a third of teachers, mostly those with higher confidence levels at the start, did not change their confidence level over time. Some 43% reported a moderate increase in confidence, and 23% reported a significant increase (i.e. they rated themselves at least two points higher on the 5 point confidence scale at the end compared to the beginning). As we have seen was the case with increases in ICT skills, female teachers and primary teachers reported the greater increases in confidence than their male and secondary counterparts, largely because these groups reported lower confidence levels at the start (Gender: $X^2=27.31$; $df=3$; $p<.01$. Sector: $X^2>30.48$; $df=3$; $p<.01$).

Table 14. Increases in teachers' confidence about personal ICT use during the programme, by gender and sector

Change in confidence	Female	Male	Primary	Secondary
Significant increase	27%	14%	30%	18%
Moderate increase	43%	42%	44%	40%
No change	30%	43%	26%	41%
Decrease	0%	1%	0%	1%
N	679	334	434	523

There was also a statistically significant relationship between the length of time teachers were active in the PD programme and the increase in their confidence levels about personal use of ICTs ($X^2>57.983$; $df=15$; $p<.001$). The longer they were in the programme, the greater was the increase in confidence.

Figure 2. Increases in teachers' confidence about personal ICT use during the programme, by length of active involvement



Teachers' confidence about ICT use **with classes** also increased significantly during the programme. On entry teachers were even *less* confident about using ICTs with classes than they had been about personal use. At that point 11% of them self-identified as 'anxious' about this, and 38% identified themselves as 'not confident'. By the end of the programme, however, the percentage of 'anxious' or 'not confident' teachers had dropped from 49% to 7%. Correspondingly, the percentage of 'confident' or 'very confident' teachers had increased from 21% to 69%. Figure 3 illustrates the change in teachers' confidence about the use of ICTs with classes.

As was the case for confidence gains in relation to personal use, confidence gains in relation to classroom use were related to all of gender, sector and length of involvement demographics. Primary teachers made significantly more gains in confidence about classroom use than secondary teachers ($X^2 > 27.31$; $df=3$; $p < .001$). Female teachers made significantly more confidence gains than male teachers ($X^2 = 30.48$; $df=3$; $p < .001$). Confidence gains were also positively correlated with the length of time teachers had actively participated in the programme ($X^2 = 57.983$; $df=15$; $p < .001$) (See Figure 4).

Figure 3. Teachers' confidence about using ICTs with classes before and after the ICTPD programme

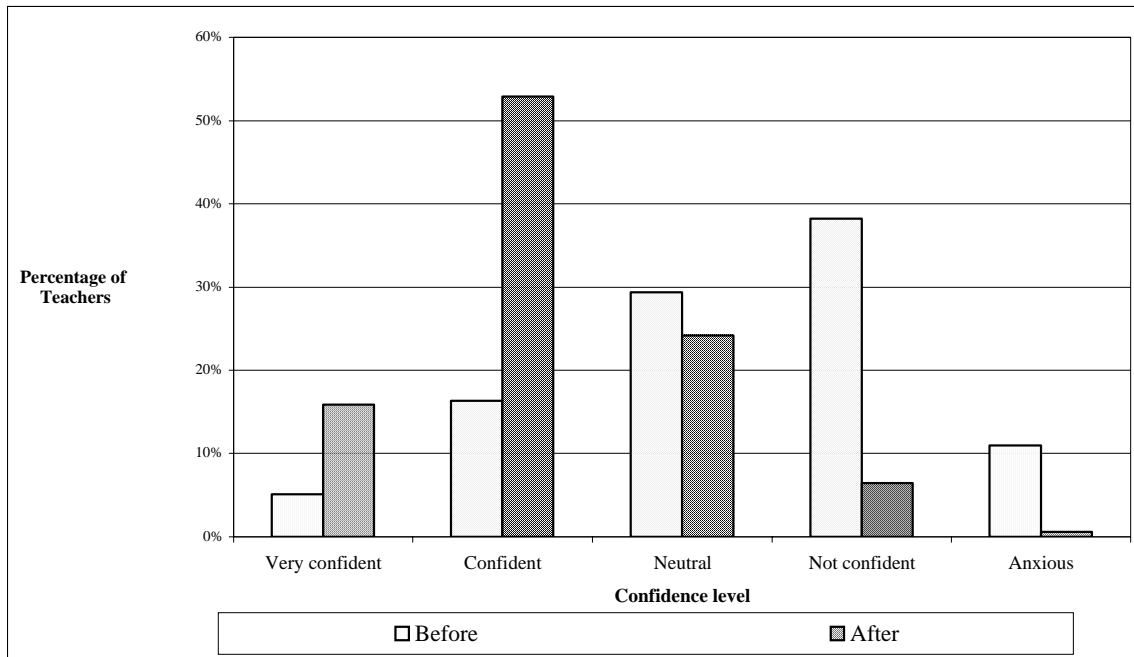
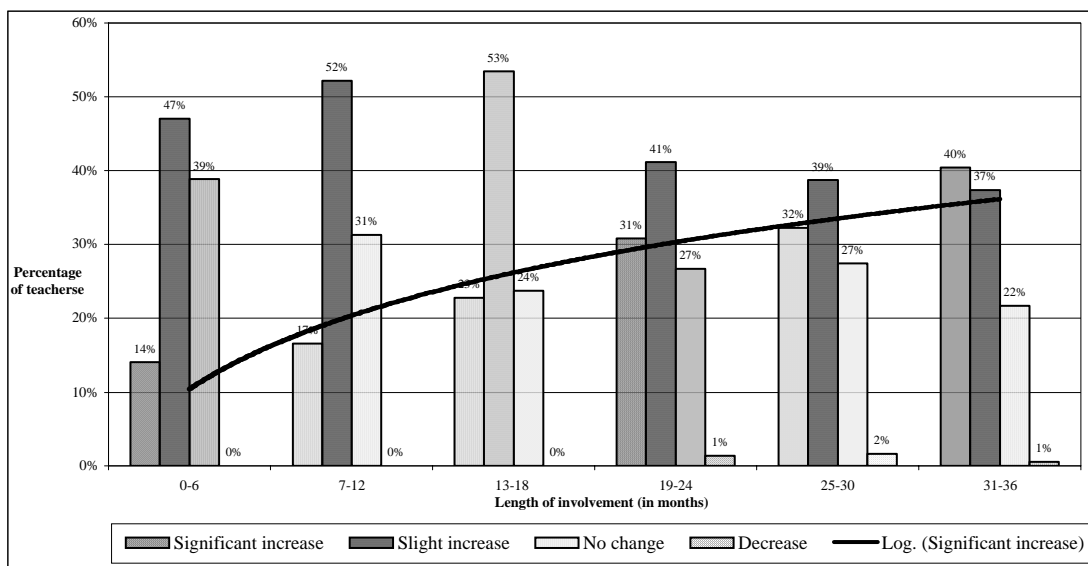


Figure 4. Increases in teachers' confidence about use of ICTs with classes, by length of active involvement



Teachers' understanding of the role of ICTs in teaching and learning

To address this performance indicator we asked teachers what, on the basis of their experience with ICTs during the programme, did they see as the benefits of ICTs in teaching and learning; what concerns did they have about the incorporation of ICTs into their teaching programmes; how, if at all, ICTs had changed their teaching; and what student learning outcomes they had observed in their own students as a result of their (students') use of ICTs? Their responses to these questions give some

overview of what the teachers' own understandings in relation to the role of ICTs in education were at the end of the programme and how widely spread such views were among them.

Teachers in this cohort generally had positive views on the role of ICTs in education. When asked in the Baseline survey about the effectiveness of ICTs in teaching, the majority of them agreed or strongly agreed that ICTs could help improve the effectiveness of lesson planning and preparation, and the efficiency and quality of curriculum delivery, (although a largish minority of 32% were neutral about the latter). The vast majority agreed or strongly agreed that the use of ICTs could improve the effectiveness of school administration.

By the end of the programme the teachers' still felt there were a number of constraints on the effective implementation of ICTs into teaching and learning, but their views had, if anything, become even more positive about their potential in other respects.

Table 15. Teachers' views on ICTs in education at the start of the programme

	Effective plan/prep	Effective admin	Efficient curriculum delivery	Quality curriculum delivery	Investment justified
Strongly agree	30%	52%	19%	18%	23%
Agree	42%	39%	41%	39%	47%
Not sure / Neutral	22%	8%	32%	32%	25%
Disagree	5%	1%	8%	10%	5%
Strongly disagree	1%	0%	1%	1%	1%
Grand Total	2393	2422	2376	2393	2381

When asked directly to what extent the ICTPD programme had contributed to their understanding of teaching and learning generally, some 60% of the teachers indicated that the programme contributed new ideas about teaching and learning, including 8% who felt that the programme had provided them with a whole new approach to teaching and learning. Some 29% of teachers said that the programme had played a more 'confirming' role, consolidating current ideas/understandings about teaching and learning. It would seem also that primary teachers were rather more likely to see the programme as contributing *new* insights and ideas in this regard than secondary teachers (Table 16).

Table 16. Contribution of ICTPD to general understandings of teaching and learning

	Total	Primary	Secondary
Provided a new whole approach to teaching and learning	8%	13%	4%
Contributed some new ideas about teaching and learning	52%	56%	48%
Confirmed current ideas/understandings about teaching and learning	29%	24%	32%
Not at all	12%	6%	16%
Total	1679	668	745

When teachers were asked *how* and in *what respects* the ICTPD programme had contributed to their understanding of teaching and learning, the common themes that emerged ranged from the acquisition of practical ideas to deeper understandings of pedagogy in general. These main themes are summarised below:

Realising what they saw as the positive role ICT integration can play in the teaching and learning process.

Examples of statements on the positive role of ICTs

- “It [ICT] supports learning”
- “ICT needs to be incorporated regularly across curriculum areas”
- “I realise that as ICT plays such an important and integral part of modern daily life it is important that it is also an integral component of a child’s learning and development of skills at school”
- “[I am] more aware of the needs for children to learn a variety of ICT skills”
- “...it has made me realize that computers are powerful tools in engaging students in teaching them skills which will be useful in their future employment”.

Feeling they had a better understanding of student-centred teaching and learning.

Examples of statements on student-centredness

- “open the walls of the classroom, made me aware of students’ best learning approaches and their need to use ICT in learning”
- “placing students at the centre of learning, using questioning to help them define their ideas”
- “children are involved in all areas of the process of learning - at any age and level. ICT can be used and modified to suit topic and programme. LO provides another learning tool”
- “I now know ICT isn’t about the separate subject it is learning tools that make the learning process run by children base... through this children are learning skills that will be useful source for their future education/ future career”
- “ICT allows teachers and students to move away from teacher centred learning and gives students more independence/responsibility for their learning and greater access to learning (and fun). ICT links well to students’ multiple intelligences”
- “It has helped me realize the range of techniques available for learning using students centred learning. Develop my own knowledge base in order to teach. Recognise the potential for developing students’ motivation & inspiration to acquire a passion for learning - life - long in groups and as individuals in a global sense internationally”.

Getting new ideas about setting up a resource-rich teaching and learning environment.

Examples of statements on resource rich teaching

- “info link programme, class books using digital camera and computer text, maths games to support class programme”
- “websites make more information available to children make presenting of findings (children’s knowledge) to be presented in many more ways”,
- “It has contributed to my understanding by opening a new world in my teaching. It has helped me describe concepts by showing students visually. Websites showing muscle movement are excellent”.
- “Open up a huge resource base to teachers and students.”

Increased knowledge of different teaching / learning styles and approaches:

Examples of statements on teaching/learning styles

- “Strengthened my awareness of kinesthetic and visual learners”
- “Have learnt much more about cooperative learning with ICT. The need for critical things etc. Have engaged finding out how other staff members have used ICT effectively”
- “caters for learning styles of children, special needs able to work independently. Encourages cooperative learning. Puts another stance on learning”
- “Better understanding of teaching styles but I now need lots of time to actually develop it and put into practice”
- “Reinforced social constructivist model of learning”
- “Has made us more aware of the difference between the way I have learnt and the way today's student learn. Made me adapt materials & resources & take less for granted”
- “I have learnt about inquiry learning. It has been quite a change in thinking for me”.

Increased understanding of the meaning of ‘quality’ in learning:

Examples of statements on ‘quality’ in learning

- “I realise the way in which learning becomes more accessible and enjoyable for students through ICT”
- “Developed understanding about use to motivate student interest”
- “Confirmed ideas about asking open questions and getting students to use ICT to develop higher order thinking skills”
- “to see the value of purposeful learning through an inquiry based style. Valuable skills acquired for life long learning to think independently and to find knowledge - how to resource it”
- “Interactive and student centred learning essential motivating tool”
- “Fantastic teaching and learning as it is visibly easy to correct to make look better and neater”
- “Fundamentals of motivation, richness prior learning remain intact & important to good practice. Contextual & perceptual variability principles would, and are facilitated with use of ICT”
- “Fostering thinking skills & collaborative tasks”
- “It has confirmed that when students engage with a resource, learning takes place more efficiently. However I see ICT as a resource and as such it can have limitation”
- “Provided too for personalising learning. Potential for deeper problem solving, analysis, synthesis, and increase ownership”
- “has reinforced my philosophy of educating students rather than passing on knowledge - therefore some emphasis on evaluating quality of ICT information and their source”.

Challenging pedagogical perspectives through sharing and discussion with colleagues and members especially through the learning community and conferences:

Examples of statements on challenging notions of pedagogy

- “Attending learners conference”
- “made national and international conferences available - have been able to keep up with current pedagogy”
- “through attendance at conferences the most important part from a pedagogical point of view”
- “It has been through other PD on T&L that I have applied to ICT PD that has made the difference”
- “Involvement with programmes like Te Hiringa I te Mahara Masters Programme at Te Whare Wananga o Aotearoa opens up the opportunity to improve skills that have been improved opens by the ICTPD programmes”
- “Speakers at ICTPD conference were interesting and challenged me to think about how I organise my classroom & the type of activities I do”
- “Theory and pedagogy changes have been made due to PD over 3 years.”
- “Being exposed to new developments and changes in thinking. Being exposed to top rate speakers - conferences – workshops”.

Providing practical ideas for classroom teaching and curriculum provision and sharing these with colleagues:

Examples of statements on acquiring practical lesson ideas & sharing

- “Enjoy hands on and modeling examples of using ICT within classroom programmes”
- “Presented different methods, software, internet resources to apply variously for my curriculum area”
- “Some good ideas were generated in my attendance at cluster days - I was able to bring them back, adapt and apply them”
- “While teaching physics / maths could be abstract using ICT makes it possible to teach and for students to learn”
- “realise the importance of structure in a lesson i.e. ICT helps considerably”
- “The programme drew on theory and latest practice showing how different educators have incorporated ideas into their classroom programmes / environments. Links were made between local teachers / schools that allowed me to see how teachers were using these ideas with the same children I am teaching”
- “Gain practical and theoretical models for implementing a more integrated curriculum”
- “It has given me new ideas of ways of teaching things to children”
- “Boosted own opinion of integrated curriculum being way forward / way to lesson assessment load”
- “A much greater understanding of how easy it can be to incorporate ICT into all areas of the curriculum. Great to go on courses and have sharing sessions”.

Teachers' classroom practices

When teachers were asked about the extent to which their classroom practices had changed as a result of participation in the ICTPD programme, a quarter of them indicated their classroom practices had changed to a large extent or completely and about half of them (49%) said their classroom practices had changed to some extent. Only a very small group (7%) said no change had occurred in their classroom practices at all (Table 17).

Table 17. Changes in teachers' classroom practices

Extent of change in classroom practices	%
Completely changed	2%
To a large extent	23%
To some extent	49%
Very little	19%
Not at all	7%
Grand Total	1513

There were some demographic differences in teachers' responses to this question. Female and primary teachers stated higher levels of change in their classroom practice than male and secondary teachers (Gender, $X^2=23.57$, $df=4$, $p<0.05$; School Sector, $X^2>50$, $df=4$, $p,0.05$). Whereas 28% of female and 41% of primary teachers indicated a complete or large change happened to their classroom practices, 18% of male and 14% of secondary teachers respectively indicated the same levels of change (Table 18).

Table 18. Changes in teachers' classroom practices by gender and sector

Levels of classroom practices change	Female	Male		Primary	Secondary
Completely changed	3%	2%		5%	1%
To a large extent	25%	16%		36%	13%
To some extent	48%	51%		45%	52%
Very little	18%	21%		11%	24%
Not at all	6%	10%		3%	10%
Grand Total	1030	461		695	799

To investigate further the significance of these changes in classroom teaching practices, teachers were also asked to state the positive and negative effects of incorporating ICT-based activities into classroom programme that they had observed or experienced.

The main positive effects of integrating ICTs into classroom teaching mentioned by teachers related to:

Teaching with more confidence and enthusiasm:

Exemplary statements on increased confidence

- “I’m more confident using equipment, teaching students”
- “I’m now able to use ICT confidently”,
- “I am more confident and willing to use more programs”
- “increases confidence, provides more options for concluding performances at the end of ... units”
- “Confidence to use email. Use more spreadsheets”
- “I have become a much more effective classroom teacher with the incorporation of ICT based activities”
- “Confident to use ICT without looking “stupid””
- “Feel confident in helping students with ICT”
- “Able to produce resources easily”.

Making learning for students more engaging and interesting:

Exemplary statements on increased engagement

- “makes learning more interesting for the pupils”
- “children love ICT being used”
- “children are more enthusiastic”
- “higher pupil interest - more variety”
- “Lesson becomes quite enjoyable from students point of view”
- “More strings to your bow so kids are more interested”
- “Increase student interest level in learning resources”
- “makes learning more interesting for the students, am able to hold their attention for long”
- “Higher student motivation when working on computers compared to exercise books”
- “Motivation (of students and myself) makes classroom control easier. Individualisation of delivery, new possibilities of delivery methods”
- “creates interest, students enjoyed on task. More exciting for them and me - conveys message in a good way”.

Enhancing/expanding their own teaching skillset:

Exemplary statements on increased skills

- “broadening of my teaching skills”
- “my planning, research, ethics more quickly neatly done”
- “New presentation methods, using new technology”
- • “Tried Powerpoint presentations”
- “being able to put websites on knowledge net knowing they can't be doctored. Put homework on the website”
- “learned how to use data projector”
- “Learned to do/make Powerpoint”
- “I'm more ICT literate, so I can use ICT to comment with learning opportunities for my students”
- “I can use the wonderful animations and documents on the internet in my classroom to explain concepts”
- “I can use more interesting techniques to present material. Students enjoy using computers / Skills in ICT”
- “Being able to use multi-media resources”
- “Ability to produce digitally enhanced Photoshop images & presentation styles”.

Using a wider range of activities which cater to a greater range of student need:

Exemplary statements on wider range of activities

- “greater variety of approaches, student enthusiasm”
- “More interactive, students can relate to it better”
- “Increased variety of teaching modes”
- “More engagement and personalised learning”
- “I'm able to provide for individual learner needs. The quality and range of resources is hugely magnified. I share my teaching load with online mentors/advisers”
- “able to provide a wider range of learning activities which appeals to a greater range of students”
- “able to show children more programmes”
- “provide more range of activities”
- “Involving akonga in activities to support and enhance their studies”
- “Two children working at a time in reading - one reading to me other doing work on the computer”
- “Greater variety of activities, improved presentation and learning material easier access, storage, sharing & updating of learning materials”.

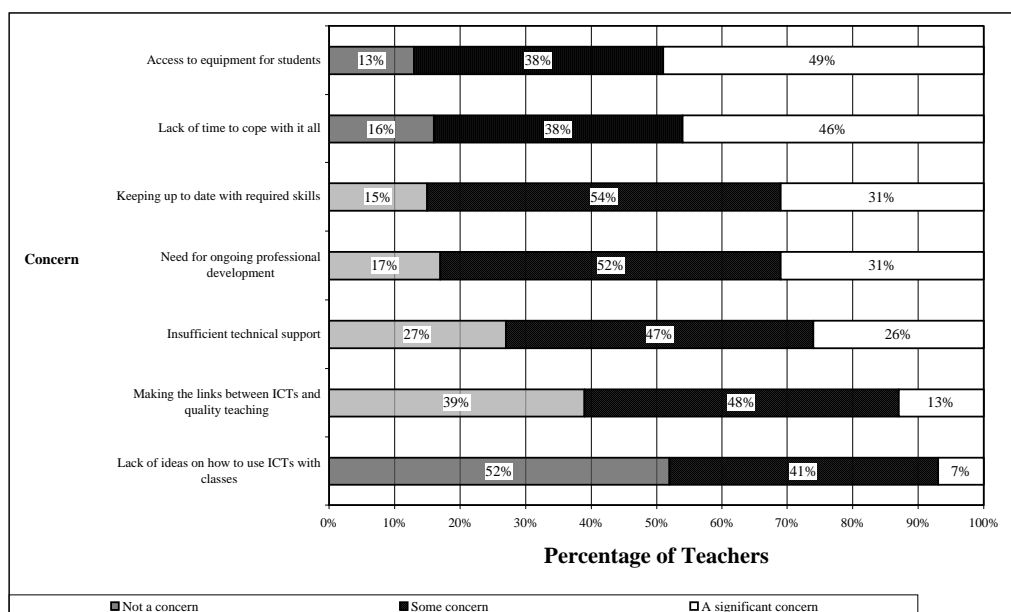
Facilitating better, or more efficient, curriculum learning:

Exemplary statements on enhanced curriculum provision

- “providing great opportunities for further study, great off spin into other curriculum areas”
- “I find the visual aspect of using iPhoto and Kidspiration, galaxy maths programme. PM software plus publishing of children written language is a positive enhancement to my teaching”
- “provides a wonderful resource for ESOL lessons, especially iphoto/slides/books etc... an excellent communication tool”
- “great reinforcement/support of literacy programme”
- “Composition tasks have become more accessible”
- “ICT based activities reinforce learning in literacy numeracy”
- “Reduce (save) time for writing on board by shooting up the typed up document using data projector”
- “The simulation of physics principles using graphics is very supportive to teaching the subject”.

Teachers also stated some negative effects of incorporating ICT based activities into their classroom programme, most notably frustration at a lack of equipment or unreliable ICTs, the longer time needed to set up equipment for classes, the need to upskill each child technically at each stage of the process, increased responsibilities such as security and safety, increased workload in preparation, and the need for a spare lesson plan in case of having an equipment failure. Indeed technical and equipment reliability issues seemed to account for most of the perceived constraints on ICT use, these being much more significant in peoples’ minds than pedagogical issues. Just under half of the teachers, for example, identified significant concerns about access to equipment for students (49%) and reliability, alongside lack of time (46%) for themselves to become familiar with the range of ICTs available (Figure 5).

Figure 5. Teachers’ concerns about the use of ICTs with classes



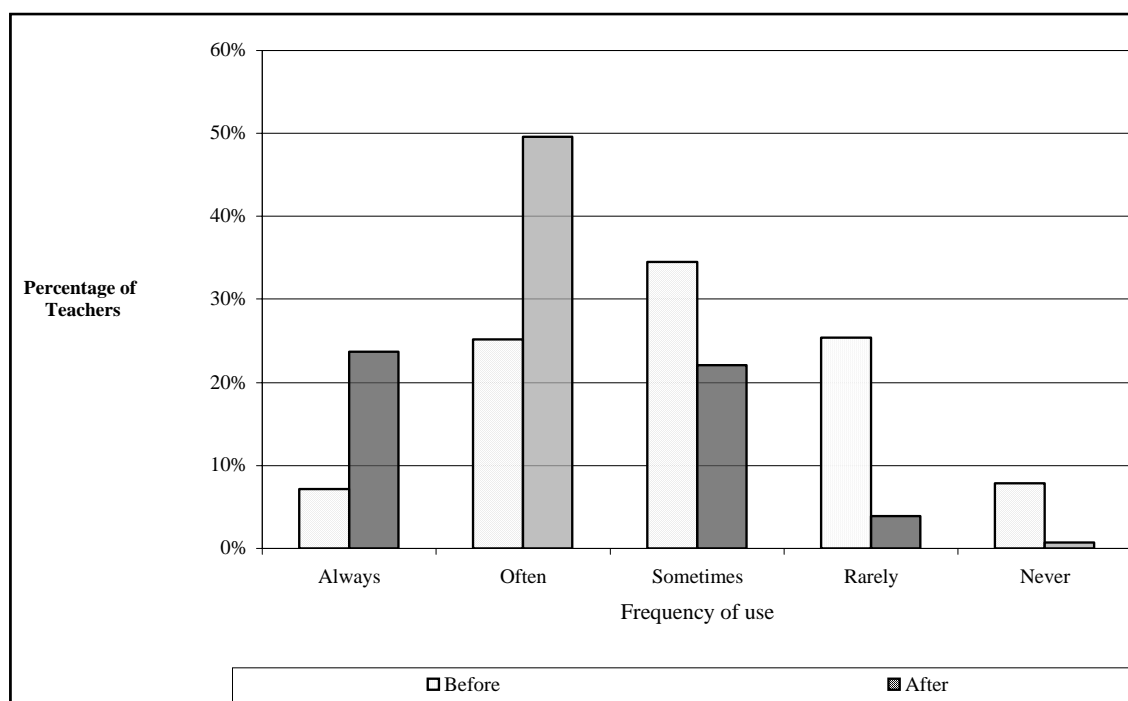
Effects of the ICTPD Programme on Usage for Administration

One of the original goals of the ICTPD programmes was that teachers use ICTs to increase 'administrative efficiency' within schools. This was investigated with respect to two key areas: teachers' use of ICTs for lesson planning and preparation, and teachers' use of ICTs for general professional administration. Teachers indicated a significant increase during the ICTPD programme in their ICT usage for both these purposes.

Teachers' use of ICTs for lesson planning and preparation

Teachers' use of ICTs for finding or producing resources for lessons increased significantly over the period of the programme. The proportion of teachers routinely ('always' or 'often') using ICTs for lesson planning increased by 42% over the period of the programme. By contrast, the proportion of occasional or non-users decreased from one third (33%) of teachers to only 5% (Figure 6).

Figure 6. Frequency of teachers' use of ICTs for finding/producing resources for lessons before and after the ICTPD programme

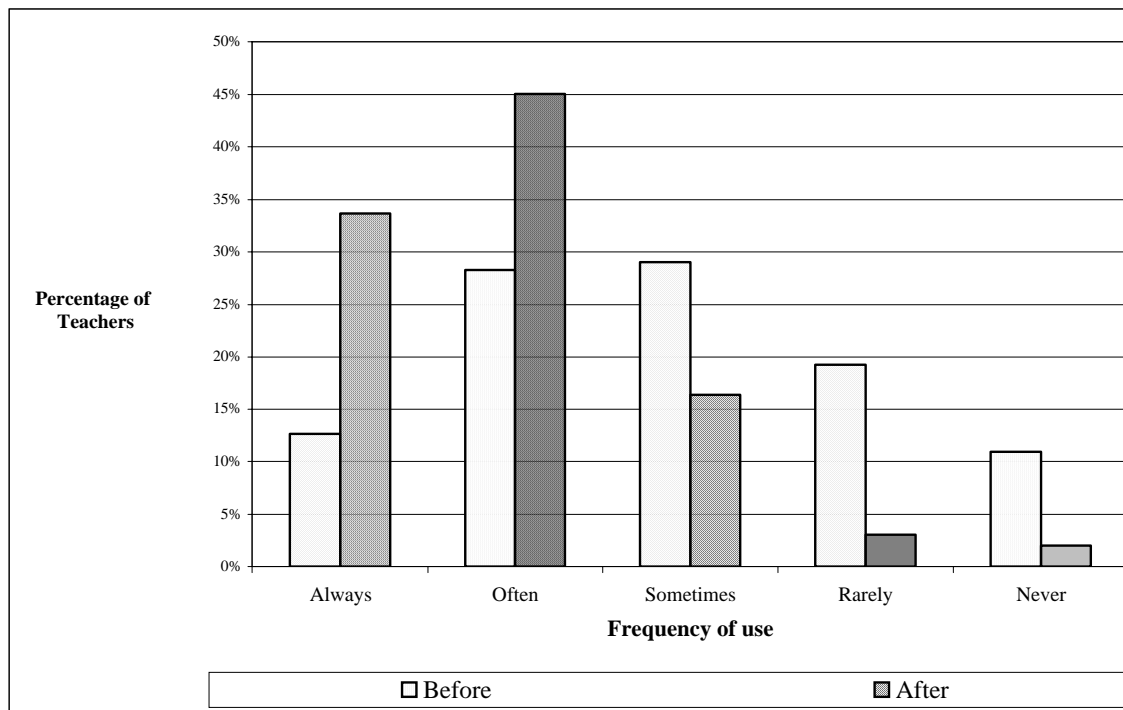


Teachers' use of ICTs for general school administration

The increase in teachers' use of ICTs for general school administration purposes such as reports, marks and grades, attendance etc was also substantial. While 41% of teachers indicated at the start of the programme that they routinely (always/often) used ICTs for general school administration

purposes, by the end of the programme this proportion was nearly doubled to 78%. Conversely the proportion of occasional or non-users decreased over the period from 30% to 5% (Figure 7).

Figure 7. Frequency of teachers' use of ICTs for general school administration



before and after the ICTPD programme

Effects of the ICTPD Programme on Student Learning

The ICTPD clusters contracts identify two significant performance indicators related to the expected downstream student learning effects of the professional development:

- a. Increased classroom usage of a range of ICTs by students, and
- b. The provision of 'quality learning experiences' for students through ICT-based activities.

Increased classroom usage of a range of ICTs

One measure of this is the percentage of 'high usage' teachers who integrated ICT based activities into "all" or "most" of their units of work over the period of the programme. This proportion increased from 14% at the start for the programme to 53% at the end. Conversely, the proportion of teachers who did not integrate ICTs at all decreased from 42% to 5% (Table 19).

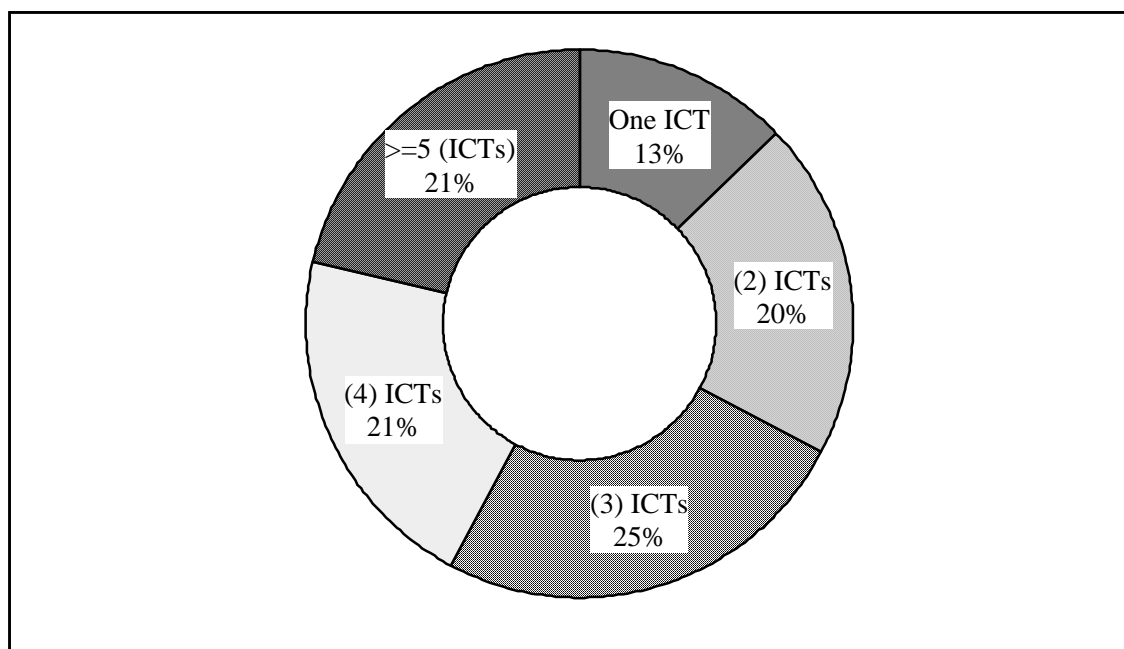
Table 19. The proportion of units of work in which ICTs were incorporated before and after the ICTPD programme

	% of teachers before the programme	% of teachers after the programme
All or almost all units	7%	17%
Most units	7%	36%
A minority of units	19%	42%
No units	42%	5%

The increase in the frequency of usage of ICTs with classes over time was correlated with all of gender, sector, confidence and length of time in the programme. Females and primary teachers increased their classroom usage significantly more than males and secondary teachers, although males in particular reported higher levels of usage on entry. The most significant of these correlations are probably those with sector, rising teacher confidence about classroom use as the programme went along, and the length of time in the programme needed to bring about such confidence.

A second measure of such effect is the range of ICTs used by students in classrooms. In this regard teachers were asked about the specific software/ICTs students used in their ICT based classroom activities. The students of two thirds of teachers had used three or more ICTs at different times in the final year of the programme, while those of a quite small minority (13%) had used only one ICT (Figure 8). It would appear, however, that while many teachers said they used a variety of ICTs with students, there were certain ICTs that were used much more often than others. As can be seen in Table 20, three or four ICTs in particular account for the great majority of ICT-based activities in classes. It would seem, therefore, that students use a relatively small group of particular ICTs very frequently and others rarely, rather than a wide variety often.

Figure 8. Number of different ICTs used by students in ICT based activities in previous year



The ICTs/software most frequently used by students were Word Processing (31% of ICT activities reported involved Word Processing), Scanning/Digital Camera use (29%), Internet (30%) and Slideshow applications (14%) (Table 20).

Table 20. Proportion of students' ICT activities involving particular ICTs

(Nb: numbers add up to more than 100 because more than one ICT may be involved in any one activity)

ICT/Software	%
Movie/Animation editing	4%
Music editing	1%
Multimedia Presentation	5%
Web authoring	1%
Slideshow	14%
Scan/Digital camera	29%
Graphics	6%
(WP) Word Processor	31%
E-mail & telecommunications	2%
CD Rom	4%
WWW	30%
Mindmap	3%
Simulation/Problem solving	1%
SS (Spreadsheet)	7%
Database	1%
Tutor	1%
D+P	1%
Total activities	3818

In sum, then, students in the ICTPD cluster classrooms used a relatively small, but for most increasing, range of ICTs during the programme, and they used them much more often than they had prior to the programme.

The provision of 'quality learning experiences' for students

Although the provision of 'quality learning experiences' through ICT-based activities was a significant expected effect of the ICTPD programme, the definition of what might constitute a 'quality' experience in this regard was left largely up to the cluster teachers and their facilitators to define. In the various surveys, therefore, we asked teachers to identify the specific learning activities their students had taken part in during the PD programme, the Essential Learning Areas covered by these activities, and the specific student learning outcomes they expected from or observed during those activities. These observed learning outcomes provide a window into what the teachers saw as the 'quality learning experiences' using ICTs provided during the programme.

A qualitative analysis of data from this and previous cohort surveys suggests that, in the teachers' minds at least, 'quality' learning experiences with ICTs were felt to be those which:

1. are student-centred and suited to students' individual needs
2. result in high levels of student motivation and engagement
3. promote a range of generic cognitive and social abilities. For many these generic abilities include ICT skills themselves, but more notably, and for more teachers, they take the forms of communication skills, higher order thinking or problem solving, creativity, and socio-collaborative skills
4. relate to a wide variety of subjects, topics and curriculum objectives.

The rest of this section analyses the outcomes of the ICTPD programmes in relation to these four indicators of the provision of 'quality learning experiences' for students.

1. Student-centredness and individualised learning

Teachers sometimes reflected in the open-ended questions of the survey that their ICT-based activities had specifically fostered more 'individualised' learning, but, like previous cohorts, they more often than not they saw this 'individualization' less in terms of activities being selected or tailored to specific, predetermined individual needs, than that the incorporation of ICT activities had fostered a general 'student-centredness' in their lessons.

Examples of learning outcomes related to student-centredness

- "[I'm] adapting lessons for kinesthetic and visual learners"
- "[Using ICTs let's me cater] for learning styles of children, [and] special needs [students] being able to work independently"
- "[I'm] more aware of the difference between the way I have learnt and the way today's students learn"
- "students [are] at the centre of learning, by using questioning to help them define their own ideas"
- "teachers and students can move away from teacher centred learning and give students more independence & responsibility for their learning and greater access to learning (and fun)"
- ICTs "link well to students' multiple intelligences"
- ICTs are "helping me realize the range of techniques available for learning using student centred learning".

They talked, for example, of ICT activities being particularly useful in allowing them to create lessons to meet a variety of learning styles and being more aware of learning styles themselves. They talked also of ICTs allowing them to put the students at the centre of the learning process and to foster independent enquiry using a range of teaching and learning techniques.

Examples of learning outcomes related to student-centredness (Cont.)

- “students were in charge of own display for camera - proud of their achievement”
- “less able students can become experts”
- “Ability to work at their own speed”
- “It has put the onus on the student to find the information that they require”
- “Allows you to work in a with a multi level group”
- “Individual learning - can work at own pace”
- “[students are] responsible for their own learning empowerment”,
- “the variety of activities caters to large range of learning styles”.

2. Student motivation

A second group of student benefits and student learning outcomes identified by the teachers related to increased student motivation when using ICTs. Often this was expressed as a consequence of ICT activities being more conducive of individual student work, or as a flow-on effect of the greater variety of activities that students were engaging in as they undertook new ICT based activities during the programme.

Motivational gains were also identified as a major learning outcome for quite a number of the specific ICT activities described by teachers in Question 8 of the survey.

Examples of learning outcomes related to student motivation

- Students were “more interested in what they were learning”
- “enjoyment of task they may have found- boring otherwise”
- “Confidence for students to attempt different things”
- “They really enjoyed helping make the slideshow”
- “Being able to enjoy doing research and project presentation”
- “Willingness to actively get involved - and even help the teacher teach!”
- “motivation for sequenced writing”
- “Games to consolidate vocab learning in fun way”
- “Highly engaged whole class”
- “Greater pride in presentation”
- “Huge learning and motivation in the topic”
- “Motivation for written work”
- “Introduced interest for students”.

A numerical analysis of Question 9 data shows that the routine involvement of students in ICT activities with motivation/engagement learning outcomes doubled over the period of the programme (Table 21).

Table 21. Proportion of teachers reporting high motivation/engagement outcomes of student ICT-based activities before and after the ICTPD programme

Activity focus	Frequency		
	Time	Once or twice a week	Daily/almost daily
Motivation/Reward/Engagement	Before ICTPD	9%	3%
	After ICTPD	17%	8%

3. Generic cognitive and social skills

The vast majority of teachers reported that the range of cognitive and social skills and abilities that students learned or demonstrated in classrooms was “increased” or “greatly increased” as a result of incorporating ICT-based activities into their classes.

Evidence related to the provision of learning experiences with a generic skill focus was gained explicitly from certain survey questions, and implicitly from others. The most explicit outline of the particular skills demonstrated by students in classes comes from responses to open ended questions in which teachers described the specific ICT-based classroom activities they had tried as part of the PD programme and the specific student learning outcomes observed in relation to those activities.

The most frequently identified group of student learning outcomes related to enhanced generic cognitive learning skills. Over half (52%) of the learning outcomes of specific ICT activities listed in response to Question 8 directly related to this in one way or another.

Examples of identified learning outcomes related to achieving generic cognitive skills

- “ability to use logic and reasoning”
- “Students love improved their problem solving ability”
- “Creativity in the arts and literacy work”
- “Problem - solving and risk taking (they are more confident to do this)”
- “Quality of thinking”
- “Thinking skills - road maps etc. higher thinking skills”
- “Creativity and innovation that has no boundaries”
- “solutions more creative”,
- “worked collaboratively”
- “encourage sharing and cooperation”
- “cooperative activities learnt to work together better”
- “scaffolding - building on previous knowledge”
- “independence and interdependence”
- “ability to problem solve collaboratively”
- “thinking/problem solving – independence”
- “gaining communication skills”
- “control over outcome that is often achievable with paper and pen e.g. Inspiration and Kidpix”
 - “cooperative learning, helping other students, decision making skills”
- “work is presented well for those who don't have those skills with pen and paper”
- “social communication strengthened”
- “problem solving experience leading to problem solving skills development”
- “Better group work - more focused”
- “Improved research skills”
- “shared / group learning”
- “Able to display creativity”
- “That they developed confidence & worked in groups to create work”
- “They think - what to search, where to find it from”
- “Using their images / creativity to present information”

Within this general learning outcome category of ‘generic skills’, the specific skills most often identified were thinking skills (most notably communication and presentation skills, information seeking and searching skills, and higher order or critical thinking skills), creative skills, and socio-collaborative skills.

It is often argued that student use of certain ICTs is more rather than less likely to involve the application of certain generic cognitive skills. For example, student use of simulation software or multimedia production often involves problem solving skills; use of the internet most often involves the application of information gathering and processing skills; drill and practice programs are likely to involve content memory testing or rule application, and so on. Student engagement in ICT activities involving such packages may therefore be at least some indication of the demonstration of a variety of generic cognitive skills. We therefore asked a question which connected such skills with examples of ICT activities likely to involve them. The pattern of students’ use of ICT-based activities linked with such skills is outlined below.

3a. Communication skills

The use of ICTs such as faxes and emails for topic related communication with experts outside the classroom did not increase dramatically over the period of the programme, though we note that the proportion of teachers whose students had ‘never’ engaged in these activities did reduce from 72% of teachers to 46%. The proportion that reported regular student use for this purpose several times a term increased from 7% to 20%, but neither of these became daily or weekly occurrences in many teachers’ classes (Table 22).

There was a more dramatic reduction in the proportion of non-use and increase in the proportion of regular (termly or better) use in relation to ICT activities for other communications activities, notably for presentations to teacher or peers. By the end of the programme the proportion of those whose students had ‘never’ used ICTs for multimedia presentations had decreased from 60% to 26%. Conversely, by the end of the programme the students of just over half of the teachers had engaged in this at least a few times a year or a few times a term. Static print presentation, by contrast had been relatively more common prior to the programme but this too increased over the period of the programme. By the final year of ICTPD the students of some 30% of teachers were using ICTs for static print presentations on a routine (weekly or more) basis.

In all three aspects of ICT use for communication skills, primary students were more likely to be regularly involved in these activities than secondary students.

Table 22. Frequency of students’ engagement in ICT based activities connected to communications skills, before and after the programme

Classroom activity	Frequency Time	Not at all	Once or twice in the year	Once or twice in a term	Once or twice a week	Daily/almost daily
	Static print production/presentation	Before	30%	30%	26%	11%
After		14%	17%	40%	22%	7%
Multimedia presentation	Before	60%	25%	11%	3%	1%
	After	26%	27%	35%	10%	2%
‘Online’ interaction with others (email, fax etc)	Before	72%	16%	7%	3%	1%
	After	46%	19%	20%	10%	6%

3b. Information Processing skills

As had been the case with the previous cohort, the increase in regular student use of ICTs was most dramatic in relation to searching for, or gathering information, especially from the Internet. Teachers reported a significant increase in students’ regular engagement in such activities over the programme. For example, 29% of teachers reported that their students had “never” accessed or searched for information on the Internet before the programme. After the programme this proportion had declined to 9%. At the other end the regular use of the Internet and library catalogues etc increased dramatically. The percentage of teachers reporting very regular (daily or weekly) engagement of students in Internet based information searches increased almost threefold from 13% to 43% (Table 24). By the end of the programme it would be fair to say that the students of over three quarters (78%) of the teachers in the programme were using ICTs for information processing on a regular (termly) or routine (weekly or daily) basis (Table 23).

Primary students were more likely to be involved in using ICTs regularly for information processing than secondary students.

Table 23. Students' engagement in ICT-based activities related to a variety of cognitive skills before and after the programme

Classroom activity	Frequency Time	Not at all	Once or twice in the year	Once or twice in a term	Once or twice a week	Daily/almost daily
	Creativity	Before	62%	23%	10%	3%
After		30%	24%	29%	12%	4%
Information gathering/processing	Before	29%	31%	26%	11%	3%
	After	9%	12%	35%	30%	13%
HOTs, problem solving etc.	Before	68%	18%	10%	3%	1%
	After	47%	21%	21%	9%	2%
Curriculum practice	Before	53%	22%	14%	8%	2%
	After	28%	20%	25%	19%	8%
Technical skills	Before	46%	24%	18%	8%	4%
	After	22%	15%	28%	24%	11%
Collaborative learning and social interaction	Before	70%	18%	9%	2%	1%
	After	52%	19%	18%	8%	3%

3c. Higher Order and Critical Thinking skills

When teachers were asked about ICT activities associated with higher order thinking skills such as problem solving or synthesis and evaluation, the results show that the proportion of 'regular' and 'routine' users doubled over the period. However, such increases were less than those noted for information gathering and were lower also than those reported for communications and creativity-based activities.

Reflecting perhaps one aspect of many teachers' view that the use of ICTs had increased the individualisation of learning, there was also an increase in the frequency of students' use of ICTs for reinforcement of content knowledge, practice at rule application and concept learning through the use of drill and practice or tutoring software. Again, the proportion of teachers' whose classes had never used these technologies for these purposes reduced noticeably over the programme, and conversely the proportion of teachers who reported daily or weekly student engagement in such classroom activities increased. By the end of the programme about a quarter of teachers were reporting routine (weekly or daily) use of ICTs for curriculum practice of this type.

There were no statistically significant sector differences in relation to increased student use of ICTs for higher order thinking and critical thinking skills.

3d. Creativity

In relation to ICT activities connected to creativity the proportion of non-users of ICTs for creative activity halved over the period, from 62% to 30%. Conversely the proportion of routine users increased from 5% to 16%. The greatest student use of ICTs for creative activities were in the 'regular' (termly) rather than 'routine' (weekly/daily) categories.

Primary students were more likely to be involved in using ICTs regularly for creative activity than secondary students.

3e. Social skills

The frequency of student engagement in ICT based activities related to collaborative learning and social interaction, such as working in groups to solve a problem, collaborating on DTP projects etc, also increased over the period of the programme. Over two thirds (70%) of teachers said their students had never engaged in ICT based activities connected to collaborative learning and social interaction during the year prior to the programme. At the end of the programme this had reduced to 52%. The proportion of teachers who reported high levels (daily or once/twice a week) of their students' engagement in collaborative ICT based activities increased from 3% to 11%. Again, the bulk of the proportional increase seems to have occurred from the non-use or rare use categories to those of occasional or regular use.

Primary students were more likely to be involved in regular collaborative use of ICTs than secondary students.

Note: ICT skills as generic skills

Interestingly, and as had also been the case with the previous cohort, a significant proportion (21%) of identified learning outcomes of ICT use related to student acquisition of ICT skills per se. (See examples in the box).

This is perhaps testimony to the resilience over the programme of a teacher focus on technical skills as a prerequisite for effective learning activity with ICTs, even as the focus of the PD itself moved towards pedagogical and learning issues. It also perhaps reflects a teacher view that such skills themselves are seen as a legitimate outcome of students' experience at school, along with curriculum cognitive skill and other benefits. The open-ended responses make it clear that teachers see the role of technical skill acquisition through ICT use not just as preparation for further school lessons. It is also a part of a wider function of preparing the students for a technologically permeated future. ICT skills were also very much seen as useful 'life skills' and a necessary preparation for functioning in 21st Century society.

Examples of learning outcomes related to achieving technical skills

- "increased technical skills"
- "learning to use a variety of media/resources"
- "Confidence in using equipment and programmes"
- "Skills in using different software - enhanced use of Kidpix"
- "Developing skills in the use of ICTS"
- "It was good to see the process of ICT skill development"
- "Beginning to see ICTs as tools not toys"
- "can use a variety of ICT's to meet their needs"
- "Consolidates skills in an enjoyable way - Maths & Eng Games improved keyboard skills"
- "Increased skills & opportunity"
- "Develop skills using a variety of technologies"
- "Learnt new skills on computer - putting animation in inspiration"
- "More students able to use the various ICTs"
- "Manipulate features of Photoshop to create a capture emphasizing positive features"
- "Photo of each pupil in the introduction of self as part of "getting to know you"".
- "Incorporate digital images in assignment" • "Creating animations and putting text over digital pictures"
- "Moviemaking, website creation, digital images, sound recording, animation"
- "opening up today's technological world",
- "acquiring and using skills that they will use in most jobs"
- "learning more connected with everyday life"
- "learners appreciating the benefits of the world they live in"
- "gaining ICT skills for the future" .

4. Curriculum Objectives: Essential Learning Areas in which students used ICTs

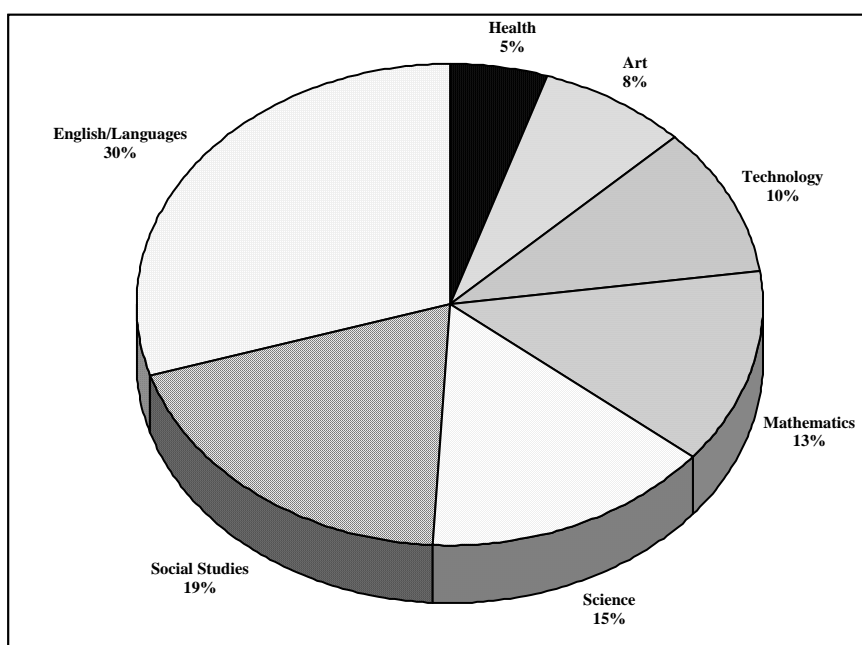
One of the most frequently identified group of learning outcomes of students' ICT activities were those related to curriculum and the achievement of specific curriculum objectives. About a quarter of the learning outcomes identified in question 8 related directly to the achievement of specific curriculum objectives (See examples in box to the right), and a large proportion of the 'Curriculum Practice' usage in Table 23 was accounted for by student use of Drill and Practice and Interactive Tutorial software.

The largest proportion of ICT-based student activities reported by teachers related to the Languages Essential Learning Area (30%), followed by Social Studies (19%), Science (15%) Mathematics (13%) and Figure 9, below.

Examples of learning outcomes related to achieving specific curriculum objectives

- "reinforcing numeracy and literacy skills"
- "Computer animation highlight physics concepts"
- "NCEA assessments - using excel for internal assessments"
- "Chemical formula exercise Atoms topic understanding"
- "Viewing experiments - reinforcement of learning"
- "Java applet proof for Pythagoras"
- "simulation of physics"
- "Forming graphics, solving equations, supplying mathematical processes, statistical evaluation"
- "Essay writing skills"
- "Drawing label body parts"
- "understanding how micro-organisms grow"
- "Identification of plants and microquests"
- "Digital story books to enhance literacy"
- "story writing - letter writing"
- "Use web quest to obtain 5 facts about spiders and insects"
- "Planning a design for recycling bins"
- "Describe Andy Warhol's pop culture art - produce 4 head & shoulders thumbnails"
- "presentation for social studies"
- "Clearer understanding of concepts"
- "various maths concepts"
- "Understanding of the NZ stock exchange"
- "Biomechanical analysis"
- "Work on year 9 plant bio"
- "work on circuits"
- "Apply mathematical concepts with the calculator"
- "Simulation describes process matching DNA"
- "presenting info on acid rain".

Figure 9. Students' use of ICTs in different Essential Learning Areas



Participant Evaluations of the Programme

The final major Performance Objective of the ICTPD cluster contracts addressed in the surveys was the objective to provide “appropriate advice, PD and support” to teachers. According to the contract guidelines, this was to be indicated by high levels of participant satisfaction with the PD programmes offered in the various clusters, so several questions were included in the survey to gather data on this Objective.

Teacher satisfaction with the programme

Generally, teachers indicated high levels of satisfaction with the programme in relation to meeting their goals, and the great majority felt it had been a positive factor in their recent development as teachers.

The vast majority (c.88%) of the participating teachers indicated that their goals had been met either partially or to a large extent. About 13% of teachers felt their goals had been fully met or exceeded, and about 35% felt their goals had been largely met. About 10% of teachers felt their goals had not been met, the majority of these being secondary teachers.

Teachers were asked about three kinds of goals: technical skills, practical ideas for classroom uses of ICTs, and improved quality in teaching and learning. The highest levels of goal achievement was in relation to the goal of acquiring practical ideas for using ICTs with classes, but the margins were not statistically significant across the three types of goals. For all three goal types, just on half of the teachers said that these goals had been largely met, fully met or exceeded (Table 24).

Table 24. Levels of ICTPD goal achievement reported by teachers

Goal Level of achievement	Technical skills	Classroom ideas	Quality of teaching and learning
Exceeded	1%	3%	3%
Fully met	8%	10%	10%
Largely met	35%	37%	33%
Partially met	46%	39%	42%
Not met	10%	11%	13%
N	1483	1489	1470

There was no gender difference among teachers in terms of their feeling about technical goals met, although female teachers reported slightly higher levels of goal achievement related to ideas for classroom teaching and learning and quality of teaching than male teachers.

However, there was a noticeable difference between primary and secondary teachers in terms of levels of goal achievement. For all three goal types, but especially for goals related to improving teaching and learning generally, primary teachers reported higher achievement levels than secondary teachers.

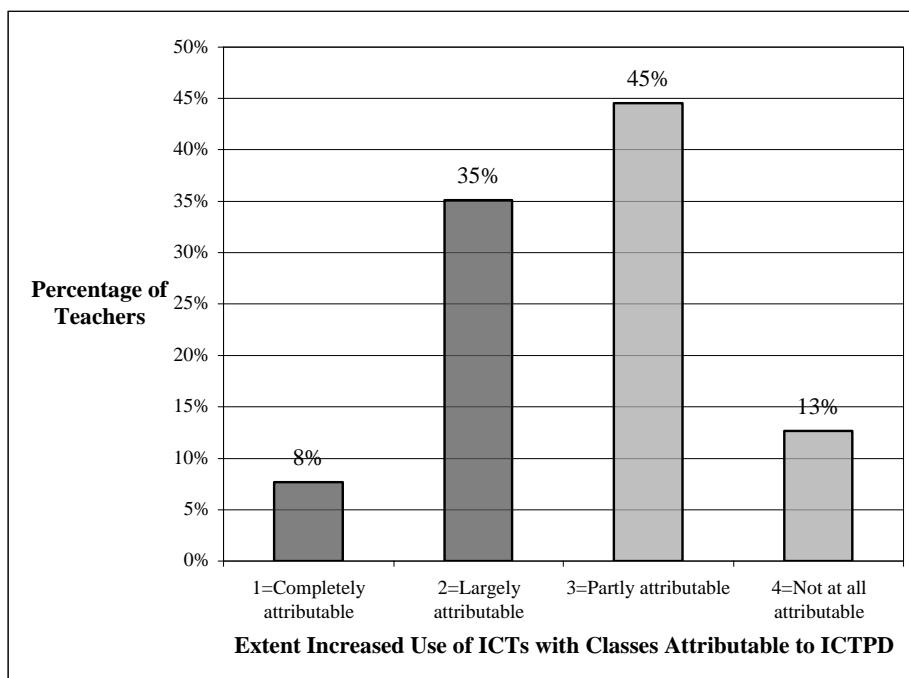
It is difficult from the data to determine whether this reflects any kind of comparative deficit in the quality of PD provision or relevance in secondary clusters compared to primary, or whether a somewhat higher proportion of secondary teachers are simply 'harder to please'. It may also reflect the generally higher entry point levels of confidence and skill reported at the beginning of the programme by secondary teachers.

As has been found in relation to many other effects of the ICTPD programmes, there was a significant correlation between the length of time individuals were involved in the programme and their level of goal achievement. Across all three goal types, and both sectors, the longer the period of involvement, the higher the levels of goal achievement.

The ICTPD programme's contribution to teachers' increased ICT usage

Teachers were asked directly about the extent to which their increased use of ICTs with classes over the three years of the programme was directly attributable to the programme. The great majority of teachers (90%) indicated that the increase in their ICT usage was attributed either largely or partly to the ICTPD programme. Some 43% said that their increased use of ICTs with classes was either largely or completely attributable to the programme (Figure 10). Again, there were some within group sector differences in that primary teachers were more likely to attribute increased ICT use with classes to the programme than secondary teachers.

Figure 10. The extent to which increased use of ICTs with classes is attributable to the ICTPD programme



In a triangulating question, teachers were asked how significant the programme had been in contributing to their overall development as professionals. If anything they were more positive on this than they had been in the question about attribution to usage, a small minority (11%) said it had not been significant to their overall development. A third (33%) of the teachers said the programme had

been slightly significant to their overall development as teachers. Over half (56%) of teachers indicated that the programme had been either significant or very significant as a factor in their overall development as teachers.

Teachers' opinions on various aspects of the ICTPD programme

Since each of the clusters implemented their own programme 'model' there was no clear 'model' that seemed more successful than others. However, when teachers were asked to comment on the particular aspects of their particular programmes that they most and least appreciated, they often commented on similar issues. The feedback in relation to the most and least appreciated aspects is summarised below, categorised by: programme content; programme leadership; programme delivery; and the raft of broader developmental opportunities that accompanied the programme, beyond simply 'school' or 'cluster' events.

Programme content

Appreciative statements by teachers about the ICTPD Programmes and their particular cluster models fell roughly into four main categories: learning new technical skills; gathering and sharing practical ideas for ICT integration into classroom curriculum programmes; learning about principles of effective teaching and learning in general; and more effective use of ICT for administrative tasks in schools.

The importance of programme leadership, especially from facilitators

Teachers appreciated especially their facilitators' knowledge, willingness to support, and ongoing availability.

Examples of appreciative statements around programme content

• Learning new skills

"learning about new software - Garageband, Inspiration etc...", "having help with ... Movie Maker", "learning to use the digital camera and making a slide show", "Technical skill development", "use of Powerpoint - edit a website", "Training of use of TKI website", "Learning new skills - Hyperlinks"

• Classroom Curriculum Ideas

"learning things that are appropriate to me and my students", "Having maths programmes for us in last session this year", "The increased diversity of opportunity and increased focus with regard to specific requirements of my curriculum area". "Getting together with other math staff & discussing ideas of how to incorporate IT into lessons & looking at what is available"

• Improved Teaching and Learning

"new information about teaching & learning", "ideas for use in classroom to enhance learning & teaching", "Powerful learning models, development in questioning skills" "development of learning and creative thinking culture of classroom", "How to include higher order thinking into class prog."

• Administration uses of ICTs

"use of admin programmes. Using knowledge net", "use of ICTPD for school administration", "Training in admin software", "admin by staff. TAUNZ conference in Greymouth good for meeting other staff"

Exemplary comments on the importance of Facilitator leadership.

- "Contribution by (xxx) to my class programme, ideas, suggestions, access to data projector, software"
- "Facilitator (xxx) has fantastic ideas",
- "The leadership of ICT facilitator working with me and children in the classroom",
- "the help by our facilitators. They have been available and helpful and support".
- "support and guidance from cluster facilitator and ICT lead teacher for our school".
- "time with facilitator to meet my particular requests",
- "the quality of facilitator",
- "being support by facilitator in using Kidpix".

Programme delivery

Teachers appreciated almost all of the many different aspects of programme delivery modes, especially the various modules and courses arranged by facilitators, small group sessions, one to one help, facilitators' in-classroom visits, arranged visits among schools, and practical (hands on) workshops and so on. There were no clear 'favourites' in this regard but some exemplary teachers' comments can be seen in the box to the right.

Examples of statements around programme delivery.

- "Group working on windows movie maker opportunity for after school /weekly lessons"
- "Time with the ICT facilitator in small groups",
- "Workshops were numbers are small and the opportunity for own hands on experience as facilitator demonstrates"
- "release time to practice new skills and great facilitators"
- "1-1 sessions/Sharing / looking at ICT in other classes/schools session in small groups/ Numeracy ICT websites"
- "the one on one or small group workshops as we are all at different stages of learning"
- "The course - "powerful learning" • "Facilitator visit"
- "Courses: inspirational support of ICT facilitator"
- "Module - ideas (practical ideas) for teaching",
- "In class help and support. Prof. Devel"
- "Having support in classroom"
- "having [facilitator] in the classroom working with the children and hearing her suggestions with using ICT in the classroom with the children".

Broader opportunities that accompanied the programme

Teachers appreciated the many different opportunities that came up alongside the ICTPD programme. The most often mentioned of these were the conferences, outside visitors, meeting other teachers from other schools, and sharing expertise and knowledge with colleagues.

Exemplary comments on broader programme opportunities

- "Last conference had most practical / relevant workshop"
- "Cluster conference – July"
- "Networking with others/conferences, meetings - sharing ideas re books, programmes, processes"
- "Conferences - 2 this year"
- "conferences, cluster professional development, cluster group sharing"
- "The collegiality / sharing of the principals' group and the shared learning activities we have engaged in"
- "Being able to share my journey at the conference day and listening to the keynote speaker-xxxx"
- "for chance for our staff to share in learning encouragement and development"
- "visiting another school to share success".

Suggestions for improvement

The most often identified suggestions for improving their ICTPD programmes related to: giving more time for teachers to practice what they have learnt; providing greater variety of subject based sessions; improving technical support in schools to avoid ICT failure; and enhance the availability of computers and software. These aspects paralleled the Concerns about integrating ICTs discussed in an earlier section.

Examples of suggested improvements to ICTPD programmes and models

- “The knowledge that I can do more but frustrated by time & effort required to put into practice”,
- “Lack of time to learn and practice newly acquired skills despite management allowing/encouraging”,
- “Not enough time to 'fiddle' or 'play' with ICT - develop skills the ICTPD initiated initial thirst for more with colleagues”,
- “Sessions specifically designed for teachers of other subjects e.g. An English focus. It would have been good to have a PE related session”,
- “Dealing with things that don't work”,
- “Not enough courses (range of) limited by lead teacher skills”,
- “Needed for more subject specific learning activities to make it at all useful”,
- “failure of network, lack of computers to deal with pressure on teachers to use these with all classes”,
- “Attending workshops on software that I will never use in my teaching”,
- “Not enough equipment e.g. Using data projector in Room to show children examples - 27 children around a 15 inch screen”,
- “lack of laptops in independent schools - staff should be given same opportunities as state schools”,
- “Learning softwares (range was narrow)”

Comparison with Previous Cluster Cohorts

Entry profile of participants

The social and professional demographics of the participating teachers varied little from those of previous cohorts in terms of cluster size, teaching experience or gender, but differed significantly from previous cohorts in relation to school sector. While in previous cohorts secondary teachers had been underrepresented, and had been distinctly in the minority, in the 2003 cohort secondary teachers were represented appropriately in their proportion to the teaching population generally, being about half of the participants.

The goal profiles of the four cohorts have been quite similar. Teachers' goals on entering the programmes consistently focused on acquiring technical skills, and to a lesser extent on getting ideas for classroom use, and to an even lesser extent 'better teaching and learning' generally.

In general, the entry skills with ICTs of teachers joining the ICTPD programmes in 2003 were moderate, and have continued to steadily increase from cohort to cohort, especially with regard to the use of the Internet. This would indicate that there continues to be a moderate 'ICT upskilling effect' occurring in the general teaching population, independent of the ICTPD cluster programmes.

Entry levels of ICT usage for school administration, lesson planning and preparation also continue to increase over time. In particular, the marked decline in the proportion of participants who had 'never' used ICTs for administrative purposes prior to the programme continues. This again would indicate a general increase in usage for these two purposes nationwide that is occurring more or less independent of the cluster programmes. We also note that teachers from all cohorts continue to use ICTs for lesson preparation and administration more than they had used ICTs for teaching and learning prior to joining the ICTPD programme.

On the whole, and predictably given the purpose of the PD, teachers joining all four of the ICTPD cohorts reported consistently low levels of prior use of ICTs for teaching and learning, though within this overall trend usage levels continue to vary according to the particular ICT used.

In contrast to the general rise reported in teachers' entry level ICT skills and in their use of ICTs for lesson planning and administration, entry levels of ICT use for classroom teaching and learning, and their levels of confidence about such use, change little from cohort to cohort. Entry point usage levels in particular have been consistently low for all cohorts, including the 2003 cohort. The only exception to this relates to Internet use, where much lower proportions of 2002 and 2003 cluster teachers reported they had 'never' used the Internet with classes prior to the ICTPD programme compared to earlier cohorts (Figures 14,15 & 16).

Teacher effects

Teacher skills

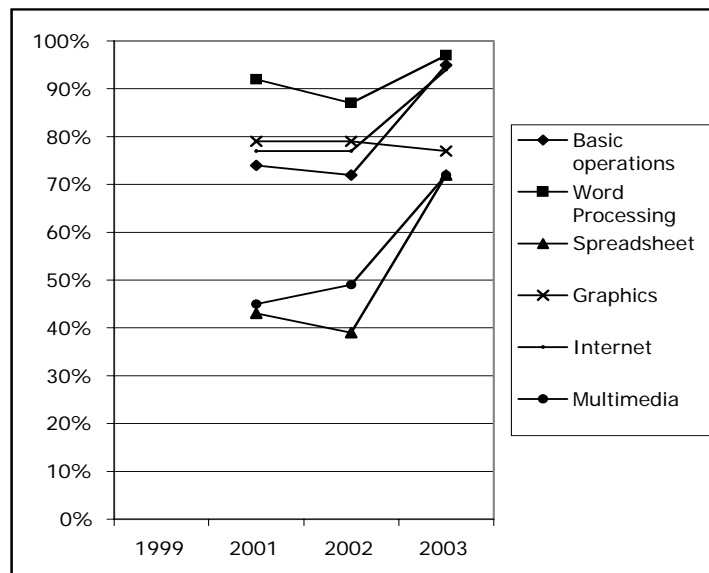
The reported increases in skill levels over the period of the ICTPD programmes were considerable for all cohorts, especially for female and for primary teachers.

Similar proportions of teachers in the 2001-2003 and 2002-2004 cohorts reported “moderate’ or ‘high’ skill levels at the end of their programmes. However, a noticeably higher proportion of the 2003-2005 cohort reported such levels, except in the case of graphics skills, which have remained relatively static across cohorts (Figure 11).

Reported *gains* in ICT skills also seem greater than for the earlier cohorts. This difference may be partly explained by increasing entry level skills among each successive cohort, and partly perhaps by the much higher proportion of secondary teachers in the 2003 cohort (secondary teachers consistently report higher skill levels than primary teachers in all of the surveys). The increase is significantly different to the flat line trend of the two earlier cohorts, however, and other factors may well be at play, one possibly being the effect of the laptop scheme for secondary teachers which was implemented during this cohort’s programme.

The particular skill areas where the greatest and lowest gains in competence were reported over the period of the programme, were similar to those reported by both earlier cohorts.

Figure 11. Proportion of teachers reporting moderate/high skill levels at the end of ICTPD programmes, across a range of ICT skills, 2001-2003 cohorts

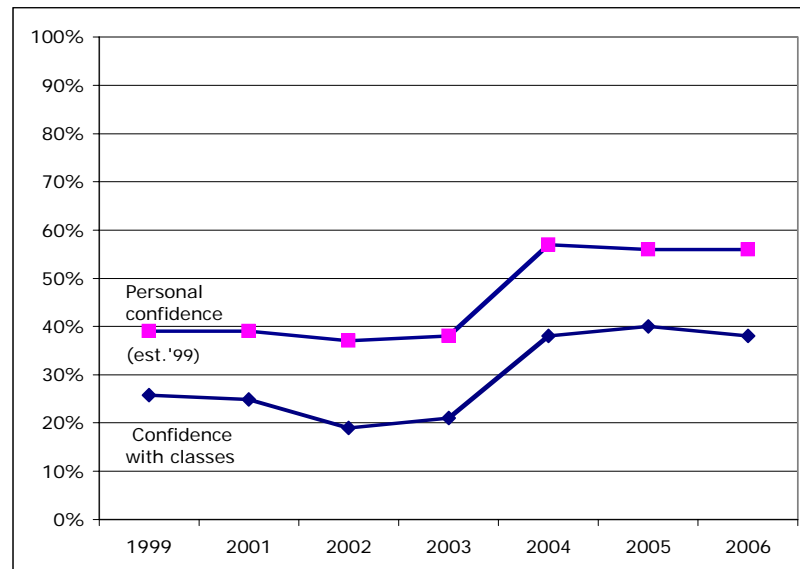


Teacher confidence

Figure 12 indicates that overall confidence levels on entry to ICTPD programmes stayed quite stable from the 1999 to the 2003 cohort, rose significantly for the next cohort (2004-7) and levels off again thereafter. Clearly, something significant seems to have happened in 2003-2004 to raise teacher confidence levels across the board. It is tempting to surmise that this relatively rapid and then

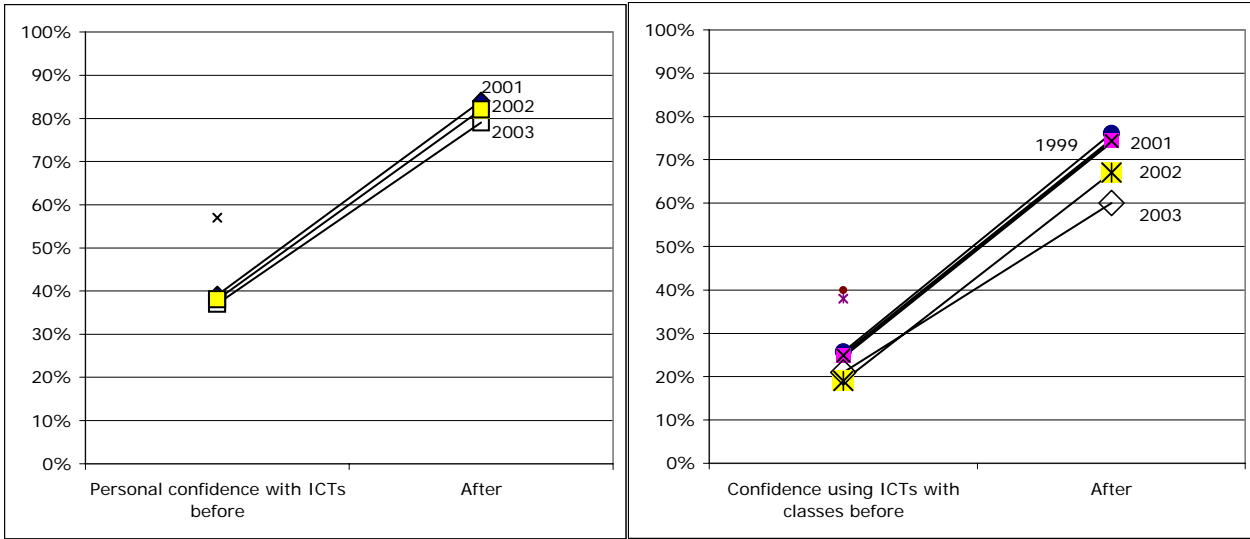
sustained increase reflects an impact of the STELA and TELA laptops for teachers schemes, which began their roll out at that time.

Figure 12. Proportion of teachers' reporting moderate to high levels of confidence with ICTs on entry to ICTPD programmes, 1999-2006



For all cohorts, reported *increases* in confidence as a consequence of the ICTPD programmes have been significant, both with regard to teachers' personal confidence with ICTs and their confidence about student use of ICTs in their classes (Figure 13). Large proportions of teachers from all cohorts have reported moderate and high levels of confidence about ICT usage at the end of the programme. The relative increases in classroom confidence are significant for all cohorts but do seem to be slightly decreasing in magnitude over time, perhaps reflecting the ever increasing range of ICTs available to teachers and a growing awareness through the programme of the complexity of pedagogical issues surrounding effective assimilation of ICT use with improved teaching and learning.

Figure 13. Proportions of teachers reporting moderate to high levels of confidence with ICTs before and after ICTPD programmes, 1999-2003 cohorts



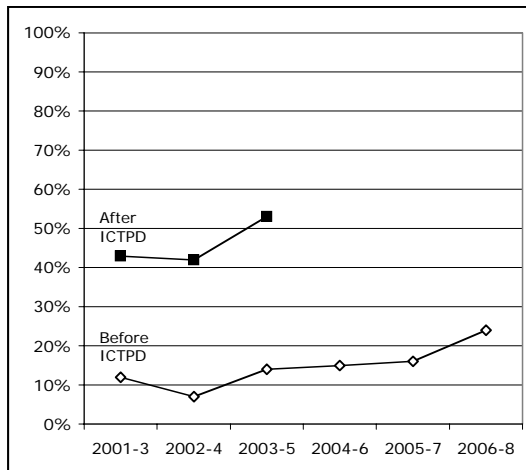
Usage for administration and lesson planning

Taking into account the still low but relatively higher entry level usage of the 2003 cluster teachers, the trends reported for the 2003 cohort are comparable to those reported by previous cohorts.

Provision of quality learning experiences

Increased classroom usage

Figure 14. Proportion of teachers whose students routinely* used ICTs for classwork before and after the ICTPD programme, 2001-2005



(*ie: ICTs were incorporated in 'all' or 'most' of their units of work over the previous year.
Note: Comparable data were not collected for the 1999 cohort)

The extent to which teachers integrated ICT-based activities in ICTPD cluster classes increased significantly from quite low entry points, and to similar extents, for all three cluster cohorts for which there is comparable data. The 2003 cohort is the first for which the majority of teachers at the end of the programme were routinely incorporating ICTs into 'most' or 'all' of students' units of work.

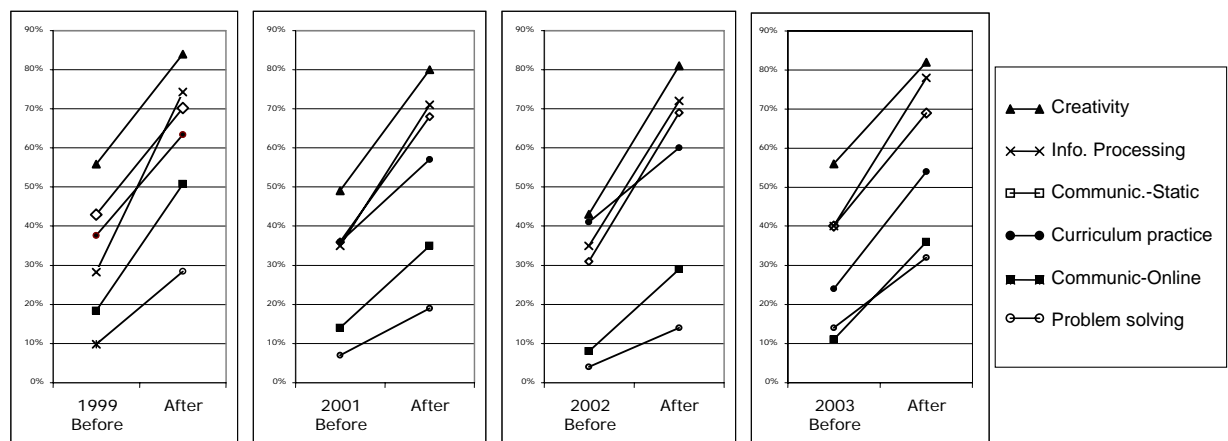
Student learning activities

On those indicators where direct cross-cohort comparison is possible, there seem few major differences among cohorts with regard to the types of learning outcomes reported for classroom use of ICTs, and the reported increases of such use over the period of the programmes.

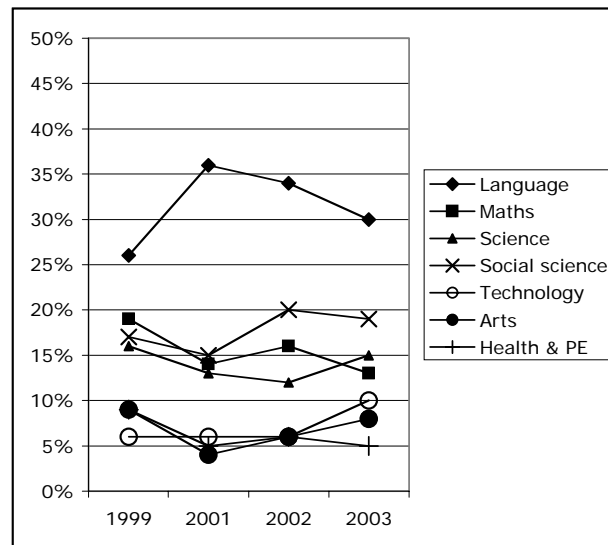
It was noted that entry point student use of ICTs for online communication (mostly emailing) has decreased somewhat over time but that exit levels of such use have stayed stable. Student use of ICTs for information processing (predominantly Internet use) continues to show the greatest increases over the period of the programmes. Use of ICTs for problem solving activities, reported previously as declining from 1999 to 2002 cohorts, recovered to 1999 levels in the 2003 cohort. Most of this 'problem solving' use is explained by student use of spreadsheets in the 2003 cohort. Similarly, routine use of ICTs for curriculum practice (Drill & Practice, computerised tutorials, multimedia books etc) showed a slight decline from 1999-2002 but recovered in the 2003 cohort. Student use of multimedia production tools (not shown separately in Figure 15) continues to be a feature of the cohorts, especially in primary schools. Increases in student use of ICTs for other categories of learning seem to be staying stable across cohorts.

Figure 15. Proportions of teachers' reporting frequent* classroom usage of ICTs for various learning outcomes, before and after the ICTPD programme, 1999-2005

(*At least once per term on average in the previous year)



The distribution of student usage across Essential Learning Areas at the end of projects shows no clear trends across the cohorts, except perhaps a slight decline in the proportion of ICT activities for maths and a corresponding overall rise in social science and language activities. Language activities account for the highest proportion of ICT activities in classes for all cohorts (Figure 16).

Figure 16. Proportion of ICT activities by Essential Learning Area, 1999-2003 cohorts

The proportions of different learning outcomes from increased ICT use reported by the 2003 cohort were somewhat different to those reported by previous clusters. In particular the 2003 cohort reported proportionally more generic cognitive skill outcomes and proportionally fewer curriculum specific outcomes than the 2002 cohort. This may reflect an increasing focus on generic teaching and learning in the programmes. It may also reflect an impact of the current revision of the curriculum statements and the consequent raising of the status of generic skills in curriculum development through the evolving Key Competencies.

The range of ICTs used by students in individual teachers' classes seemed to decline for the 2002 cohort but recover for the 2003 cohort, though it still seems that individual teachers in later cohorts are using a few ICTs often rather than broadening the range and variety of ICTs used in classrooms.

Participant satisfaction with programme

Levels of goal achievement and expectations met were similarly high across all cohorts. For all clusters, participant satisfaction varied by sector and length of time in the programme, with primary teachers and those in the programme for longer stating higher levels of satisfaction than secondary and those in the programme for only a few months.

Conclusion

The overall conclusion arising from the study is that the 2003-2005 ICTPD programme had a marked and significant effect on the teachers and students in cluster schools with respect to all of its key goals. There were high levels of goal achievement reported by participants, and marked increases or changes with respect to the Ministry's objectives as outlined in cluster performance agreements.

At the national level, the programme seems to have very much achieved its overall goals of increasing teachers' skills and confidence with ICTs, increasing teachers' use of ICTs in order to improve administrative efficiency in schools, improving teachers' understandings of the educative purposes of using ICTs in teaching and learning, increasing classroom usage of ICTs, and providing quality ICT-mediated learning experiences for students. While stating these as general effects on the population of cluster teachers and classrooms as a whole, we note that at a national level the ICTPD programme seems to have had a greater impact among primary teachers than among secondary teachers.

APPENDICES

- Appendix 1. Performance Measures for ICTPD Clusters
- Appendix 2. Baseline Survey Questionnaire, 2003
- Appendix 3. End of Project Survey Questionnaire, 2005

Appendix 1

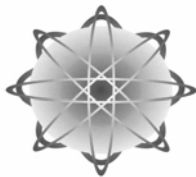
Performance Measures and Targets as Incorporated in Cluster Contracts. 2003 cohort

Intended Outcomes

Success Criteria/Evidence

Increased skills and confidence of teachers in using ICT	Half yearly surveys* show increased skill and confidence among participating teachers
Improved understanding about the roles of ICT in teaching and learning to meet important learning outcomes of the curriculum.	Half yearly surveys* show improved understandings among most participating teachers
Increased classroom or student use of ICTs	Half yearly surveys* show increased student usage and an increased range of ICTs used in each participating school.
ICTs are used for quality learning experiences in classrooms	Half yearly report identify the types of learning that students have undertaken when using ICTs in classrooms.
Information and resources developed within the cluster are communicated to the wider education sector	Cite instances of the information, strategies and resources provided to the ICT network and education sector via contributions to: Learning Experiences ShareIT database Online discussions through Think.com Contributions to publications Presentations given to conferences
Increased administrative efficiencies achieved within cluster schools	Half yearly surveys* show increased and effective use of ICT in administration
Appropriate policies and long term plans developed for each participating school	Copies of school policies on ICT and ICT plans that are incorporated in school strategic planning, appended to each end of year Milestone.
Appropriate advice, professional development and support provided to other schools	At least 90 % of schools in the cluster are satisfied with the quality of the professional development programmes provided as shown by half yearly and year end surveys generated by cluster.
* Half yearly surveys (as provided by the MOE)	

Appendix 2



Information and Communication Technologies

2003-2005 Cluster Schools ICT Professional Development Project
Ministry of Education

Baseline Data Survey

This questionnaire is designed to assist Facilitators with the planning of appropriately targeted professional development, and to contribute to independent research into the ICTPD School Cluster project. Individual responses will be kept strictly confidential to the cluster Facilitator and a Research team contracted to the Ministry, though the results of statistical and other analyses of the data may be published in non-attributable and aggregated form

The survey is in 6 Parts. Please complete the relevant sections of all PARTS.

PART 1. Demographics

PART 2. Professional Development & ICT

PART 3. Views on ICT in Education

PART 4. Current ICT Skills & Abilities

PART 5. Current use of ICT for Planning, Preparation, Administration etc

PART 6. Current Use of ICT with/by Students.

PART 1: DEMOGRAPHICS

Cluster Name or Lead School: _____

Your Name: _____

School: _____

Current position(s) of responsibility: _____
(DP, HOD, Syndicate Leader etc etc)

No. years teaching experience: 0-2 yrs 3-5 yrs 6-10 yrs 11-15 yrs
 16-20 yrs 21-25 yrs 26-30 yrs 30+ yrs

Gender: Female Male

Year Levels taught this year:
(please circle year levels) **0 1 2 3 4 5 6 7 8 9 10 11 12 13**

Subjects taught this year: _____

*(Secondary/Intermediate
Specialist Teachers Only)*

PART 2: PROFESSIONAL DEVELOPMENT IN ICT**1. How many days (or day equivalents) of formal ICT Professional Development had you had in the last 2 years prior to the Cluster project?**

eg: night classes, in-service courses, after school sessions, holiday courses, online courses, tertiary papers etc.

- None 1 to 5 days 6 to 10 days more than 10 days

2. How do you prefer to learn new ICT skills?

Please rank the following options in order of preference (1 being the LEAST preferred option)

Ranking

a	On my own, with written support material	
b	One to one with a tutor	
c	Working regularly with a partner	
d	In a small group	
e	In a large group <i>ie. lab situation</i>	

3. What are your preferences when working in a group?

Please tick the appropriate box for each of questions a-d.

Do you prefer to work in groups with...

a	<input type="checkbox"/> others at the same/similar levels of skill or experience re. ICT	or	<input type="checkbox"/> a mixture of levels of skill or experience re. ICT	or	<input type="checkbox"/> either / no preference
b	<input type="checkbox"/> staff from my own school	or	<input type="checkbox"/> staff from other schools	or	<input type="checkbox"/> either / no preference
c	<input type="checkbox"/> members of my own department or syndicate	or	<input type="checkbox"/> members of other departments or syndicates	or	<input type="checkbox"/> either / no preference
d	<input type="checkbox"/> separate primary or secondary groups	or	<input type="checkbox"/> mixed primary-secondary groups	or	<input type="checkbox"/> either / no preference

4. How able/willing are you to attend some sessions in your own time throughout the year?

Please rate each of these options with a 4,3,2,1, or 0 rating.

4 = enthusiastic. 3 = can arrange it. 2 = can but would rather not. 1 = would but can't arrange it.

0 = this is beyond reasonable expectation.

Rating

a	After school sessions	
b	Occasional Saturday mornings, <i>ie. perhaps one or two a year</i>	
c	Several Saturday mornings, <i>ie. perhaps three or four a year</i>	
d	School holiday programme - half day, <i>i.e. during the July &/or Sept breaks</i>	
e	School holiday programme - whole day, <i>i.e. during the July &/or Sept breaks</i>	

5. To what extent are you able to focus on ICT issues in your PD this year :

Please tick the box alongside ONE of the following descriptors

- ICT is the major focus of my PD this year
 ICT is a secondary focus for my PD this year
 ICT is a low priority for my PD this year

Comment	
---------	--

6. Preferred PD Activities

Facilitators in the ICT Clusters are planning to use a range of types of professional development activities. Please read the following explanation of each type, and indicate your preferred option/s in the grid below. Note that clusters are not necessarily contracted to offer all of these types of PD. This is to get some idea of your current preferences.

Write in each box a number 0-4 representing the extent of appeal of the activity.

4= has strong appeal 3= has some appeal 2= no view either way 1= does not appeal 0= I would hate it

Rating 0-4

a	Study Groups: Teachers join a study group of three or more members with common interests and goals. The group meets regularly (eg lunchtimes, after school, evenings) to explore new and better ways of teaching, to share tips, resources, stories and to develop trial projects. The results of these trials form the basis of discussion at subsequent meetings. Project directors would provide ongoing advice and support.	
b	Technology Coaches: Every teacher could become a technology coach - good at something and prepared to help and support others accomplish this. The idea is that everyone can make a contribution to the ongoing learning culture in the school. Responsibility is shared broadly so that each teacher has an area of expertise and everyone is an expert in something.	
c	Technology Mentors: Teachers who are highly skilled in certain areas are paired for a short time with less skilled teachers in order to pass on their expertise.	
d	Tutorials: Short bursts of on-site learning – perhaps an early morning session on inserting graphics into text or organising bookmarks in a browser for those unsure of the methods. The agendas for these short tutorials would be based on teachers' needs.	
e	Workplace Visits: Visits to ICT intensive workplaces would be organised so that teachers can see the impact of ICT and better understand the implications for learners and classrooms.	
f	Release Time: Time given to discuss and translate new ideas and strategies into practical classroom unit plans with the help of a mentor.	
g	Professional Reading: A regular selection of reading material will be available, which describes the latest developments in teaching and learning with ICT and also developments which could have an effect on schools in the future. Those choosing this option will receive hard copies of key readings for personal study.	
h	On-the-spot Support: Facilitators will be available to provide classroom support for those teachers who feel unsure when first trialing the use of ICT with their classes.	
i	Listserv Membership: This is an informal discussion group using email where teachers in the cluster can talk over problems and successes, ask questions and offer solutions. Teachers can gain confidence and may wish to join one or more of the many other listservs available for teachers.	
j	Workshops/Seminars: These will offer a varied programme of activities and will be scheduled outside school hours.	
k	School Visits: Visits to other schools both within and beyond the cluster to investigate initiatives that are being, or have been implemented.	
l	Financial support to attend or present at Conferences.	
m	Other (specify)	

7. Professional Development Goals

Please list 3 or 4 specific goals or objectives that you would like to achieve as a result of your participation in the ICTPD Schools Cluster Programme. Please indicate how important those goals are by writing a number 1-3 in the box alongside each objective to indicate priority.

1= A major goal. 2= An important but secondary goal. 3= A minor goal.

GOALS (BE AS SPECIFIC AS POSSIBLE)	PRIORITY (1-3)
a _____	<input type="checkbox"/>
b _____	<input type="checkbox"/>
c _____	<input type="checkbox"/>
d _____	<input type="checkbox"/>

PART 3: VIEWS ON ICT IN EDUCATION

8. Please indicate with a tick in the appropriate box the extent to which you agree or disagree with each of the following statements

(a) ICT can make major improvements to the **effectiveness of lesson planning and preparation.**

strongly agree agree not sure/neutral disagree strongly disagree

(b) ICT can make major improvements to the **effectiveness of school administration.**

strongly agree agree not sure/neutral disagree strongly disagree

(c) ICT can make major improvements to the **efficiency of curriculum delivery in my classroom.**

strongly agree agree not sure/neutral disagree strongly disagree

(d) ICT can make major improvements to the **quality of curriculum delivery in my classroom.**

strongly agree agree not sure/neutral disagree strongly disagree

(e) Overall, the investment by schools in ICT can be justified by the teaching and learning outcomes.

strongly agree agree not sure/neutral disagree strongly disagree

9. What, in your opinion, are the main benefits to be gained from the use of ICT in schools?

10. What are your greatest concerns about using ICT?

Please rate each of the following as it applies to you, on a 0-2 scale.

2 = significant concern 1 = some concern 0 = no concern

Rating

a	The ongoing need to upskill myself in using new software packages	
b	Access to equipment for my own professional use	
c	Access to equipment for my students' use	
d	Equipment breakdown/ technical problems	
e	The need to change my teaching style	
f	Not knowing how to include the use of ICT in my teaching programmes.	
g	Keeping up to date with new developments	
h	Lack of time to cope with it all	
i	Lack of support	
j	Too much change, too quickly	
k	Lack of training	
l	My suspicion that they don't actually improve learning	
m	Unexpected changes to the daily timetable	
n	Feeling already too far behind	
o	Lack of keyboard skills	
p	Other concerns. Please specify :	

11. How confident are you about using ICT?

Please tick the appropriate box.

(a) How confident are you about using ICT **personally**:

Very confident Confident Neutral Not Confident Anxious

(b) How confident are you about using ICT **in your classroom**:

Very confident Confident Neutral Not Confident Anxious

PART 4: CURRENT ICT SKILLS

Please note that this is a baseline survey to ascertain usage of ICT among cluster teachers on a national basis AT THE BEGINNING OF THE ICT CLUSTERS PROGRAMME. You are not necessarily expected to have much or any experience in the particular activities outlined below, and certainly not **all** of them, either now or at the end of the PD.

IF YOU CURRENTLY DO NOT USE A COMPUTER AT ALL, PLEASE TICK THIS BOX & PROCEED TO PART 6.

12. Please indicate your current level of achievement in each of the following ICT competencies.

*Tick the boxes which best reflect your **current** level of knowledge/skill attainment. (Be honest, but be kind to yourself! We will be asking the same questions again at the end of the programme.)*

a. BASIC COMPUTER OPERATION	
<input type="checkbox"/>	I use the computer to run one or two software programs that are available.
<input type="checkbox"/>	I run two programs simultaneously. I have several windows open at the same time and can transfer information between documents.
<input type="checkbox"/>	I troubleshoot successfully when basic problems with my computer or printer occur. I learn new programs on my own and can install software from a CD-ROM.
<input type="checkbox"/>	I can install most types of software. I can download updates and executable files from the Internet. I can unzip compressed program files. I can update hardware drivers.
<input type="checkbox"/>	I can handle the basic administration of an NT, Novell or Macintosh network.

b. FILE MANAGEMENT	
<input type="checkbox"/>	I do not save any documents I create on the computer.
<input type="checkbox"/>	I select, open and save documents.
<input type="checkbox"/>	I save work in a variety of locations eg. local hard drive, a specified network location, floppy disk. I create my own folders to keep my files organised.
<input type="checkbox"/>	I move files between folders and drives. I understand about directory paths and the use of folders.. I can use the find feature to locate files on the hard drive

c. WORD PROCESSING	
<input type="checkbox"/>	I do not use a word processing program.
<input type="checkbox"/>	I occasionally use a word processing program for simple documents. I generally find it easier to hand write most written work I do.
<input type="checkbox"/>	I use a word processor for much of my written professional work <i>ie. memos, tests, activity sheets and home communication</i> . I edit, spell check and change the format of a document.
<input type="checkbox"/>	I use a word processor for all my professional written work. I use editing and formatting tools with confidence <i>ie. tabs, headers/footers, auto-insertion, tables, footnotes, auto-numbering, bullets, hanging indents etc.</i>

d. SPREADSHEET USE	
<input type="checkbox"/>	I do not use a spreadsheet.
<input type="checkbox"/>	I understand the use of a spreadsheet and can navigate within one. I create simple spreadsheets and charts/graphs.
<input type="checkbox"/>	I use spreadsheets for a variety of record-keeping tasks. I use labels, formulas, cell references and formatting tools in my spreadsheets. I choose charts which best represent my data.
<input type="checkbox"/>	I am confident in the creation of complex spreadsheets with multiple formulae and circular references.

e. DATABASE USE	
<input type="checkbox"/>	I do not use a database.
<input type="checkbox"/>	I understand the use of a database. I can locate information from a pre-made database such as a library catalogue or school journal database.
<input type="checkbox"/>	I create my own databases. I define the fields and choose a layout to organise information I have gathered. I can use my database to answer questions about my information.
<input type="checkbox"/>	I can create complex databases with extensive search and analysis facilities.

f. GRAPHICS USE (Drawing/Painting //Image editing)	
<input type="checkbox"/>	I do not use graphics in my word processing or presentations.
<input type="checkbox"/>	I open/create and place simple pictures into documents using a drawing program and/or clipart and/or a scanner.
<input type="checkbox"/>	I can create and enhance graphic images using simple editing tools eg. resizing, recolouring, cropping, rotating.
<input type="checkbox"/>	I capture and edit images from a wide variety of sources eg. scanner, digital camera, Internet.
<input type="checkbox"/>	I use sophisticated image handling software with confidence eg. Corel, Photoshop.

g. INTERNET USE (WWW)	
<input type="checkbox"/>	I do not use the World Wide Web.
<input type="checkbox"/>	I can access Internet websites to find information. I follow links from these sites to various other resources.
<input type="checkbox"/>	I can successfully enter my own URLs (Website addresses)and make profitable use of keywords in Web search engines to explore educational resources.
<input type="checkbox"/>	I understand the significance of URL name structures and use 'and/or' queries and other advanced features of search engines
<input type="checkbox"/>	I can create web pages using either HTML or an editing program such as Front Page.

h. TELECOMUNICATIONS USE (E-MAIL)	
<input type="checkbox"/>	I do not have an e-mail account.
<input type="checkbox"/>	I have an e-mail account but I rarely use it.
<input type="checkbox"/>	I send and receive e-mail messages. I check my e-mail regularly and keep the size of my mail folders manageable.
<input type="checkbox"/>	I am confident in the use of e-mail. I use attachments, store addresses and nicknames, have a signature, forward mail and use listservs.

i. ETHICAL USE	
<input type="checkbox"/>	I am not aware of any ethical issues surrounding computer use.
<input type="checkbox"/>	I know that some copyright restrictions apply to computer software.
<input type="checkbox"/>	I am very clear about copyright restrictions as they apply to the use of software on both personal and school computers. I understand the function and significance of approved use policies and contracts.

j. VIDEOTAPE PRODUCTION	
<input type="checkbox"/>	I do not use a video camera.
<input type="checkbox"/>	I create original video tapes for home and school projects.
<input type="checkbox"/>	I create original video tapes using editing equipment.

k. PRESENTATION SKILLS/MULTIMEDIA	
<input type="checkbox"/>	I do not use a computer presentation program.
<input type="checkbox"/>	I am able to create a simple linear slideshow in presentation applications such as Powerpoint, Claris Works, KidPix or Hyperstudio. incorporating text and graphics
<input type="checkbox"/>	I am able to create presentations which incorporate text and graphics, but also various multimedia elements such as sound, video clips and simple animations..
<input type="checkbox"/>	I can create branching presentations incorporating methods of making presentations interactive such as buttons, timed links, or basic scripting etc.

PART 5: CURRENT USE OF ICT FOR PLANNING, PREPARATION & ADMINISTRATION**13. Please indicate the frequency with which you use ICT as part of your planning, preparation and presentation of classroom materials.***Enter a rating 1,2,3,4 or 5 in the box on the right.*

5 = Always 4 = Often 3 = Sometimes 2 = Rarely 1 = Never

Frequency

a	I use Word Processors or a Desktop Publishing package to produce task sheets, tests, handouts etc.	
b	I access the internet for finding and collecting lesson ideas.	
c	I access the internet for assessment items	
d	I access the internet to get official documents from the Ministry, NZQA etc.	
e	I get lesson content materials from electronic encyclopaedias on CD ROM.	
f	I produce lesson materials using digital cameras, video editing, digitising, scanning etc	
g	I access the internet for professional readings, subject association newsletters etc.	
h	Other use of ICT for planning, preparation etc (please specify)	

14. How frequently do you currently use ICT for the following administration purposes?*Enter a rating 1,2,3,4 or 5 in the box on the right.*

5 = Always 4 = Often 3 = Sometimes 2 = Rarely 1 = Never

Frequency

a	Recording or calculating assessments, marks and grades.	
b	Recording students' running records.	
c	Accessing staff notices.	
d	Email correspondence with colleagues on administrative matters.	
e	Writing Reports for parents.	
f	Recording absences.	
g	Other (Please specify)	

PART 6: CURRENT USE OF ICT WITH STUDENTS**15. What proportion of your units of work contains ICT based learning activities?***Please tick the appropriate box*
 all or almost all units
 most units
 several units
 one or two units
 no units
16. Describe any TWO activities you have tried involving student use of the ICT, and indicate how successful you consider that activity was in fostering student learning.

(1) _____

(2) _____

17. Please indicate the average frequency (using the 1-5 scale below) with which some or all students have done any of the following during your lessons over the last year.

*5 = Daily or almost daily 4 = Avg. 1-2 times a week 3 = Avg 1-2 times a Term
2 = 1-2 times over the year 1 = Never*

		Freq. (1-5)
a	Composing, editing and presenting creative work using Word Processors &/or graphics packages	
b	Composing, editing and presenting 'project' or content-based work using Word Processors &/or graphics packages	
c	Accessing or searching for information on the internet	
d	E-mailing other students or experts about a current topic or problem	
e	Presenting their learning in the form of computerised slide shows (mainly or exclusively text & pictures)	
f	Editing and composing multimedia presentations or videos using computer software (ie: including sound and moving images)..	
g	Data logging using external monitoring devices connected to a computer	
h	Working through content or concept simulations on computer	
i	Practising skills or reinforcing knowledge using content specific Drill and Practice programmes (eg: Maths Games, Reading Games etc)	
j	Learning from a computer based tutoring programme	
k	Writing computer programmes or scripting interactive presentations	
l	Accessing or searching for information on electronic encyclopaedias (eg: on CD ROM)	
m	Designing and/or creating web-pages to present learning	
n	Recording, calculating and analysing data using Databases or Spreadsheets.	
o	Faxing or phoning other students or experts about a current topic or problem	
p	Using the electronic catalogue to find appropriate reading in the library	
q	Other (specify)	

Thank you for completing this survey. We appreciate the attention you have given it. We will be revisiting the questions at the end of the programme with a view to identifying changes in usage etc over the period of the programme and assessing the impact of the programme in terms of meeting your needs and expectations.

This version of the baseline questionnaire has been developed by Vince Ham, Christchurch College of Education. It is based heavily on the Needs Analysis questionnaire developed by Liz Probert and Angela Longney for the Pakuranga ICT Cluster in the 23 ICT Cluster Schools Project 1999-2001.

If you have any queries or comments regarding the questionnaire, please contact: Dr. Vince Ham, Email: vince.ham@cce.ac.nz

Appendix 3.

QuickTime™ and a
100% LZW decompressor
are needed to see this picture.



ICTPD School Clusters Professional Development Programme 2003 – 2005 Clusters END-OF-PROJECT EVALUATION

This questionnaire is being distributed to all teachers who have been involved in the ICT School Clusters Professional Development Programme, so that you may contribute to the end-of-project evaluation of the Programme. It is part of an ongoing, independent research project on the ICTPD School Clusters.

Individually attributable responses will be kept strictly confidential to the research team, though generalised results, quotations and statistics may be published in aggregated form.

Please seal your completed questionnaire in the envelope provided, write your name and school on the back of the envelope, and return the sealed envelope to your cluster facilitator before Wednesday 21 September 2005

DEMOGRAPHIC

Cluster Name or Lead School: _____

Your Name: _____

(Needed for comparison with the baseline survey done at the beginning of the project)

School: _____

(Needed for comparison with baseline survey.)

Gender: Female Male

School Sector: Primary Secondary Both

Length/Duration of your involvement in ICTPD Programme: 0-6 mths 7-12 mths 13-18 mths
 19-24 mths 25-30 mths 31-36 mths

Indicate the timespan over which you received **active** ICTPD support as part of the cluster programme (Active support includes workshops, facilitator visits, conferences, seminars, etc)

THE ICTPD CLUSTER PROFESSIONAL DEVELOPMENT PROGRAMME

1. Please indicate your level (1-5 scale) of confidence in relation to personal and classroom use of ICTs with reference to **BOTH BEFORE** and **AFTER** taking part in the ICTPD Programme. Enter a rating 1,2,3,4 or 5 in EACH column. (See example)

1= Anxious 2= Not confident 3= Neutral 4= Confident 5= Very confident

	Confidence about using ICTs	Before PD	After PD
Example	How confident were/are you about using ICTs with your classes	2	4
a	How confident were/are you about using ICTs personally ?		
b	How confident were/are you about using ICTs with your classes ?		

2. Please indicate your level (1-5 scale) of competence with each of the following ICTs **BOTH BEFORE** and **AFTER** taking part in the ICTPD programme. Enter a rating 1,2,3,4 or 5 in EACH column

1 = Very low/None 2 = Low 3 = Moderate 4 = High 5 = Very high

	ICT	Before PD	After PD
a	Basic Computer Operation (running programmes, trouble shooting, etc.)		
b	File Management (manipulation of documents, folders, etc.)		
c	Word Processing (manipulation of text – programs such as Word)		
d	Spreadsheet (create charts/graphs, use for record keeping purposes – programs such as Excel.)		
e	Database (use pre-made databases such as library catalogue database or create own databases)		
f	Graphics (manipulation of pictures and images – programs such as KidPix, Photoshop, etc.)		
g	Internet (searching and/or website design)		
h	Telecommunications (email, chat, etc.)		
i	Presentation / Multimedia (incorporating sound, movies, etc.)		

3. Please indicate the frequency with which you used ICT BEFORE and AFTER the ICTPD programme for the two purposes below. Enter a rating 1,2,3,4 or 5 in EACH column.

1 = Never 2 = Rarely 3 = Sometimes 4 = Often 5 = Always

	Purpose	Before PD	After PD
a	School administration e.g. reports, marks and grades, attendance etc		
b	Finding or producing resources for lessons		

4. What have been the positive and negative effects on your teaching of incorporating ICT-based activities into classroom programmes?

a) **Positive:**

b) **Negative:**

5. What proportion of your units of work in the last year has contained ICT-based learning activities?
(Please tick ONE box only).

- Not applicable No units A minority of units Most units All or almost all units

6. a) To what extent have your classroom practices changed as a result of your participation in the ICTPD programme? (Please tick ONE box only).

- Not applicable Not at all Very little To some extent To a large extent Completely changed

b) Describe these changes to your classroom practices.

7. a) To what extent has the ICTPD programme contributed to your understanding of teaching and learning generally? (Please tick ONE box only).

- Not applicable
 Not at all
 Confirmed current ideas/understandings about teaching and learning
 Contributed some new ideas about teaching and learning
 Provided a whole new approach to teaching and learning

b) Describe how the ICTPD programme has contributed to your understanding of teaching and learning in general.

8. Describe up to 5 different ICT based activities that your students have engaged in during the last year?

Identify the subject or learning area (eg: Health, Science), the type of ICT/software you used (eg. Internet, word processor, digital camera), and the learning outcomes for students.

	Essential Learning Area	Software / ICT	Learning Outcomes for Students
	<i>e.g. English/Languages</i>	<i>e.g. Word Processor, Digital camera</i>	<i>e.g. Presenting different points of view</i>
	<i>e.g. Science</i>	<i>e.g. CD Rom tutorial, Spreadsheet</i>	<i>e.g. Work on Motion formulae problems</i>
a			
b			
c			
d			
e			

9. How often, on average, did/do your students use ICT based activities where the following constituted the main purpose of the activity? Please indicate a frequency of use for both the year BEFORE the ICTPD programme, and NOW in this last year. Use the 1-5 scale below

1 = Not at all 2 = Once or twice in the year 3 = Once or twice a term
 4 = Once or twice a week 5 = Daily/almost daily

	Purpose	Activity	Before	Now
a	Communication	<u>Static print</u> presentation: eg. making posters, journals, written stories etc		
		<u>Multimedia presentations</u> : eg. presenting results of project using PowerPoint or Hyperstudio etc		

		<i>Online interaction:</i> e.g. emailing or chatting with experts/other students on a current topic or a problem. Belonging to e-club or contributing to online communities		
b	Creativity.	e.g. designing and making slide shows, websites, editing and composing music, video etc. creativity focus		
c	Information gathering/processing	e.g. accessing or searching for information on the internet, accessing school library electronic catalogue, or data logging using external devices connected to computers.		
d	Problem solving.	e.g. calculating/analysing data, working through concept simulations on computer, designing or developing their own spreadsheet or database to solve a problem; interactive fiction		
e	Curriculum practice.	e.g. learning from tutoring software, reinforcing pre-taught knowledge or practicing skills; drill and practice		
f	Technical skills	e.g. cut and paste, file management, importing digital photographs, key board skills, how to use Inspiration		
g	Collaborative learning and social interaction	e.g. working in groups to solve a problem using spreadsheets etc, collaborating on DTP projects etc		
h	Motivation/Reward/Engagement	e.g. working on a CD Rom or game as a reward		

10. To what extent to date do you think you have effectively integrated ICTs into your classroom teaching and learning? (Please tick ONE box only).

Not applicable Not at all Very little To some extent To a large extent Completely

11. What were the main three benefits you observed for students/learners in their use of ICTs?

a) _____

b) _____

c) _____

12 To what extent were your goals/expectations met by ICTPD programme? Please answer with regard to the 3 types of goals below, using the following six point scale:

1= Not applicable 2= Not met 3= Partially met 4= Largely met 5= Fully met 6= Exceeded

	Goal's type	Extent to which a goal met
a	Technical skill development	
b	Ideas for using ICTs with classes	
c	Quality teaching and learning enhancement in general	

13. Which aspects of the last two terms of your ICTPD school cluster programme have you:

a) Most appreciated?

b) Least appreciated?

14. a) To what extent has any increase in your use of ICTs with classes over the last three years been attributable to the ICTPD Professional Development Programme? *Please tick ONE box only*

Not at all attributable Partly attributable Largely attributable Completely attributable

b) If other factors were involved, what were they?

15. What are your greatest current concerns about using ICTs in schools? *Please rate each of the following as it applies to you, on a 1-3 scale*

1 = No concern 2 = Some concern 3 = Significant concern.

	<i>Rating</i>	
a	Access to equipment for my students' use	
b	Insufficient technical support	
c	Making the links between ICTs and quality teaching and learning	
d	Lack of ideas on how to use ICTs with classes	
e	Lack of time to cope with it all	
f	Need for ongoing professional development	
g	Keeping up-to-date with required skills and knowledge on ICT developments	
h	Others: Please specify	

16. a) How significant has the ICTPD Cluster Programme been in your overall development as a teacher?

Not significant Slightly significant Somewhat significant Very significant

b) Comments:

Thank you for your participation in the ICTPD Cluster programme and for completing this evaluation.

Please seal your completed questionnaire in the envelope provided, write your name and school on the back of the envelope, and return the sealed envelope to your cluster facilitator before Wednesday 21 September 2005

Queries or comments regarding this questionnaire should be addressed to CORE Education:
Hasan Toubat. Email: hasan@core-ed.net or Sandra Williamson-Leadley. Email sandra.wl@core-ed.net