

Intel® Teach Evaluation

Research Report

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1. BACKGROUND AND INTRODUCTION

1.1 THE SOUTH AFRICAN CONTEXT

The many challenges facing the South African schooling system have been under the spotlight during 2006 (and before). Amongst other issues, the quantity and quality of teachers in the South African education system has been identified as a critical factor influencing the transformation of the system with the ultimate aim of improving learners' chances of success. In response to these challenges, 2006 saw the release of a National Policy Framework for Teacher Education and Development. The framework states that:

Since 1994 they [teachers] have had to cope with the rationalisation of the teaching community into a single national system, the introduction of new curricula, which emphasize greater professional autonomy and require teachers to have new knowledge and applied competencies, including the use of new technologies, and radical change in the demographic, cultural and linguistic composition of our classrooms.¹

...teachers are the essential drivers of a good quality education system. International evidence shows that the professional education and development of teachers works best when teachers themselves are integrally involved in it; reflecting on their own practice; when there is a strong school-based component; and when activities are well coordinated.²

The above two quotations highlight the importance of teacher education and professional development. Teachers in South Africa are currently faced with a range of training opportunities and obligations, most notably curriculum training to support the introduction of the new curriculum. In addition to the demands of a new curriculum, teachers also need to be prepared for teaching in the 21st century. Much has been written about '21st century skills' and what these skills requirements demand of education systems. For example, the Partnership for 21st Century Skills makes reference to global awareness; financial, economic, business and entrepreneurial literacy; civic literacy; health and wellness awareness; critical thinking and problem solving skills; communication skills; creativity and innovation skills; collaboration skills; information and media literacy skills; contextual learning skills; ICT literacy and life skills.³

The South African response to the development of these skills in the schooling sector is evident in the Revised National Curriculum that was released in 2002 and 2006 for grades 10 to 12 (Further Education and Training, FET, level). This new curriculum envisages a particular type of learner:

¹ Ibid, pg. 6

² Department of Education (2006). The National Policy Framework for Teacher Education and Development in South Africa. 'More Teachers; Better Teachers'. Government Gazette, 23 October 2006, pg. 5.

³ Partnership for 21st Century Skills, <http://www.21stcenturyskills.org>

The curriculum aims to develop the full potential of each learner as a citizen of a democratic South Africa. It seeks to create a lifelong learner who is confident and independent, literate, numerate and multi-skilled, compassionate, with a respect for the environment and the ability to participate in society as a critical and active citizen.⁴

And, a particular type of educator:

Educators at all levels are key contributors to the transformation of education in South Africa. Teachers have a particularly important role to play. The National Curriculum Statement envisions teachers who are qualified, competent, dedicated and caring and who will be able to fulfil the various roles outlined in the Norms and Standards for Educators of 2000 (Government Gazette No 20844). These see teachers as mediators of learning, interpreters and designers of Learning Programmes and materials, leaders, administrators and managers, scholars, researchers and lifelong learners, community members, citizens and pastors, assessors and learning area/phase specialists.⁵

In developing such learners and educators, an outcomes based approach to curriculum has been adopted. An outcomes based approach considers both the content and the *process* of learning as critical. Both the content and the process of learning are articulated by the formulation of specific learning outcomes that should be achieved by the end of the learning process for a given phase and subject area. In addition to specific subject-based outcomes, the following critical and developmental outcomes underlie the curricula developed for each learning area. The critical and developmental outcomes are underpinned by the values enshrined in the South African constitution.

The critical outcomes envisage learners who are able to:

- Identify and solve problems and make decisions using critical and creative thinking;
- Work effectively with others as members of a team, group, organization and community;
- Organize and manage themselves and their activities responsibly and effectively;
- Collect, analyze, organize, and critically evaluate information;
- Communicate effectively using visual, symbolic and/or language skills in various modes;
- Use science and technology effectively and critically, showing responsibility towards the environment and the health of others; and
- Demonstrate an understanding of the world as a set of related systems by recognizing that problem solving contexts do not exist in isolation.

The developmental outcomes envisage learners who are also able to:

- Reflect on and explore a variety of strategies to learn more effectively;
- Participate as responsible citizens in the life of local, national, and global communities;
- Be culturally and aesthetically sensitive across a range of social contexts;
- Explore education and career opportunities; and

⁴ Department of Education (2002). Revised National Curriculum Statements for Grades R-9 (Schools). Department of Education, Pretoria: South Africa, p. 8.

⁵ Ibid, p.9.

- Develop entrepreneurial opportunities.

In 2003, the South African Department of Education (DoE) released a White Paper on e-Education. The White Paper states that 'e-Education revolves around use of ICTs to accelerate the achievement of national education goals.'⁶ E-education implies that learners and educators are ICT-capable, rather than ICT literate only, and includes the abilities to:

- Apply ICT skills to access, analyse, evaluate, integrate, present and communicate information;
- Create knowledge and new information by adapting, applying, designing, inventing, and authoring information;
- Enhance teaching and learning through communication and collaboration by using ICTs; and
- Function in a knowledge society by using appropriate technology and mastering communication and collaboration skills.⁷

However, achieving the outcomes of the new curriculum and the e-Education White Paper is difficult, particularly in a context where many teachers commonly have poor educations themselves due to the legacy of the apartheid education system. The National Framework for Teacher Education and Development states that:

Most reports on South African education indicate that the majority of teachers have not yet been sufficiently equipped to meet the education needs of a growing democracy in the 21st century global environment.⁸

Against this background, the potential of a programme such as Intel® Teach is clear. Intel® Teach seeks to, amongst others, develop teachers' skills in using project-based learning, questioning approaches, higher order thinking and integrating ICTs, where appropriate, to support their work in learner-centred classrooms. This value was recognized by the South African Department of Education, with Intel® Teach being one of two programmes specifically mentioned in the White Paper on e-Education.⁹

This potential notwithstanding, a further challenge of the South African education context is important to consider as it influences the implementation of Intel® Teach in South Africa. ICT infrastructure in South African public schools remains poorly developed.¹⁰ Although much improvement has taken place in recent years, many schools still have no or very few computers available for teaching and learning. Still fewer schools have internet connectivity, and those that do, often work with expensive dial up connections making online work costly, time consuming and in some instances not feasible. The situation differs widely across provinces as shown in the table below.

⁶ Department of Education, (2003). White Paper on e-Education. Transforming Learning and Teaching through Information and Communication Technologies, p.7.

⁷ Ibid, p.7.

⁸ Department of Education (2002). Revised National Curriculum Statements for Grades R-9 (Schools). Department of Education, Pretoria: South Africa, p. 6.

⁹ Ibid, pg. 11.

¹⁰ The challenge of ICT infrastructure and teacher ICT skills has been documented in some detail in earlier evaluation reports and is not repeated here.

Table 1 Statistics of computers in South African schools (2005)¹¹

Province	Schools With Computers	Schools With Computers For Teaching And Learning
Eastern Cape	14.20%	4.50%
Limpopo	13.30%	4.90%
KwaZulu-Natal	24.20%	11.40%
Mpumalanga	70.00%	16.00%
Free State	52.50%	14.60%
North West	70.00%	22.90%
Northern Cape	84.30%	55.00%
Gauteng	90.50%	57.40%
Western Cape	99.40%	61.80%
National	57.60%	27.61%

In 2005, 27.6% of schools had access to computers for teaching and learning nationally, with provincial access percentages varying from 4.5% to 61.8%. The lack of infrastructure also impacts the ICT skills that teachers have developed, with many teachers in the country having little or no basic knowledge of computers. Thus, while Intel® Teach has great potential to support the country in developing the kinds of teachers needed in the context of national and global education imperatives, programme implementation needs to be understood as one part of a more complex approach to integrating ICT into classrooms and achieving the pedagogic objectives of both Intel® Teach and the new South African curriculum.

1.2 OBJECTIVES OF THE 2006 INTEL® TEACH EVALUATION

Intel® Teach was in its fourth year of implementation in South Africa in 2006. The programme underwent major changes moving into year four. These were:

- *Revised materials* – the South African localized programme consisted of a four-day modularized course. In addition, modules could be used stand alone for specific workshops. The online Thinking Tools were integrated with essentials to form one programme.
- *New training model* – The train the trainer approach is no longer being used. Instead two senior trainers from each province were trained by SchoolNet South Africa (SNSA) with the aim of running training in schools in their province. In some instances this training is funded by provincial departments of education (PDE). Well resourced schools also independently request SNSA to run training in their schools. In addition, PDE employees were encouraged to become senior trainers to provide training at schools in their province and also support for teachers' implementation in the classroom.

The objectives of the Intel® Teach evaluation for 2006 were to:

- Track implementation progress using the new training model, including: number of provinces involved, number of senior trainers trained, number of schools at

¹¹ National Department of Education, ICT Directorate.

which training has taken place, numbers of educators trained, and extent to which ICTs are being used to support teaching and learning following participation in Intel® Teach.

- Evaluate implementation of the provincially-based training model in order to:
 - Understand the role(s) that the Provincial Department of Education (PDE) plays;
 - To identify factors supporting or hindering PDE involvement and through this to learn lessons for other provinces;
 - To document how PDE training and orientation sessions take place;
 - To review responses of PDE officials to this training; and
 - To assess the value of training PDE officials – i.e. does participation in training or orientation sessions translate into training in schools, and support for teachers.
- Understand how the new materials are being used – for stand alone workshops, three day course, four day course etc.

2. METHODOLOGY

A mixed-methods approach to data collection was used. This included qualitative and quantitative data collection, including surveys, observations, semi-structured interviews and focus groups. The methodology used for the three main components of the research is summarised below.

Review of programme implementation

- Researchers attended initial senior trainers' training and higher education/DoE orientation sessions;
- Course evaluation forms and trainer reports submitted to SNSA by senior trainers following training sessions were captured and analysed.
- Senior trainers were requested to complete a short email questionnaire.
- Ongoing communication with project manager.
- One day conference evaluation forms were completed by participants at the provincial conferences. Participants were requested to provide their name and contact details if they were willing to take part in evaluation research. These participants were included in the annual survey (see below).
- Telephone interviews were conducted with provincial representatives based on their involvement in the Intel® Teach programme.
- Review of senior trainers refresher course done by distance:
 - Review of email exchanges;
 - Trainer report; and
 - Email survey for participants.

Provincial implementation (focus on one province)

- One researcher attended a three-day provincial training session. During this time detailed training observations were completed and focus groups held with participants. The standard training evaluation forms were completed.
- Departmental officials trained were asked to complete training evaluation forms as part of programme implementation.
- A follow-up email survey was sent to all provincial departmental people trained.
- Telephonic interviews were conducted with relevant provincial role players to assess implementation progress.

Annual Impact Survey

All countries implementing Intel® Teach are required to complete the annual impact survey. The survey has been localized and additional questions added to accommodate the changes to the South African programme. Data was collected during the third and fourth school terms. Participants trained as part of the 'new' and 'old' programme were requested to complete the survey. The data from this survey provided information on implementation at the school level.

2.1 SUMMARY OF RESEARCH INSTRUMENTS AND DATA COLLECTED

The following research instruments were used in this study:¹²

- One day conference evaluation forms
- Training observation forms
- Post training evaluation forms
- Annual impact survey
- Informal email surveys
- Provincial Department of Education interview schedule
- Course evaluation for senior refresher distance course
- Focus group schedule for training participants
- Teacher interview
- Focus group schedule for learners
- Senior refresher course evaluation forms.

Table 2 Summary of data collected

Data Source	Number Of Responses
One day conference evaluation forms	298
Annual impact surveys	58
Provincial orientation workshop evaluation	177 ¹³

¹² Copies of research instruments available on request. Please email: merridywilson@icon.co.za.

¹³ Although a total of 177 forms were submitted, several different formats were used by trainers making analysis of the full set impossible. The analysis presented below is based on 105 responses using the survey specifically designed for this workshop. All versions of the forms included space for participants to make general comments and to note highlights and difficulties of the training. This qualitative data was analysed for all 177 responses.

Data Source	Number Of Responses
Post training evaluation forms (provincial case study)	51
Provincial interviews	15
Interview with National DoE representative	1
Training observations	2
Focus groups with training participants	2 (21 participants)
Focus group with learners (case study school)	1 (7 learners)
Interview with teachers (case study school)	1
Trainer reports	5
Provincial orientation training follow-up email survey	8
Senior refresher distance course evaluations	8

2.2 RESEARCH LIMITATIONS

Although a relatively wide range of data was collected during the course of 2006 certain limitations were experienced. The scale of the research, from a budget perspective, was small and hence limited the extent of follow up that could be conducted. The major limitation to the study was low response rates to surveys.

Response rate to the annual impact survey has been low in previous years of the study, particularly so in year three (2005) and again in 2006. One of the reasons for this is that many of the teachers being targeted were trained as early as 2003. In some instances contact details have changed or teachers have left the schools at which they were based. In addition, it was found that many teachers check their emails very infrequently, with some survey responses coming in several months after the initial survey cutoff. Where possible, all late responses were included in the data set. As in previous years, incentives in the form of lucky draw prizes were provided to encourage response. All teachers who had been trained at the time of survey administration were requested to complete a survey form. Surveys could be completed via email or in hard copy where internet access was a problem. Emails were sent to all the Intel® Teach lists managed by SNSA. In addition, teachers trained through provinces were emailed and all one-day conference participants who provided email addresses were also contacted. Four follow-up emails were sent out during the course of survey implementation. As an incentive to complete the surveys, Intel® provided 20 lucky draw prizes, including flash discs, digital microscopes, Intel® bags and Intel® T-Shirts. Despite these efforts, the survey response rate remained low with only a total of 58 surveys being returned.

Similar challenges were faced with the email survey sent to participants in the provincial orientation workshop. In this instance, personalized emails with surveys attached were sent to approximately 300 people who had taken part in workshops in the case study province. Despite several personalized email follow-ups, only eight responses were received. Several of the email addresses were no longer functional when the survey was conducted.

As noted above, a total of 15 provincial interviews were conducted. The research team aimed to interview at least two people per province and then to follow up on additional people as noted by interviewees. An initial contact list was provided by SNSA and in some cases additional people were included as recommended during interviews. An introductory email was sent out to all potential interviewees requesting an appointment for the telephone interview. A few people responded promptly. For most, two or three additional emails and then follow up telephone calls were needed before finalising the meeting. In several instances, despite having set up interview appointments interviewees were not available. In each case the research team continued to follow up for additional interviews, up to a cut off date of 20th January 2007. At least one interview was conducted in each of the nine provinces. In five provinces it was only possible to interview one representative.

These limitations notwithstanding and when considered together with the other data collected during training observations, focus groups and interviews, a useful range of data was collected.

3. UNDERSTANDING PROGRAMME IMPLEMENTATION

As noted above, from 2005/2006 the implementation focus and process of Intel® Teach in South Africa changed from the previous cascade model to one that places the provincial departments of education at the centre of implementation, with support of SNSA and Intel®. This approach is deemed important to ensure longer term sustainability and the integration of Intel® Teach within provincial teacher professional development processes. In addition, schools could independently request training which would be run by SNSA.

The Intel® Teach materials for South Africa were revised in early 2006 to take account of feedback from the annual evaluations (2003 - 2005), including the 2005 pilot of Teaching Thinking with Technology, and the need to provide more flexible opportunities for South African teachers to engage with the Intel® education programmes. The revised four-day course consisted of twelve modules. Modules could also be used stand alone for specific workshops at schools. Thinking Tools were integrated with essentials to form one programme. The Modules¹⁴ of the revised materials were:

¹⁴ The revised materials can be viewed at: <http://www.school.za/teach/>

Module 1: The Project Process
Module 2: Planning Projects
Module 3: Curriculum Outcomes
Module 4: Questions and Thinking
Module 5: Assessment
Module 6: Learning Strategies
Module 7: Learner Samples
Module 8: Learner Support
Module 9: Information Skills
Module 10: Classroom Management
Module 11: Learning Circles
Module 12: Maths Literacy Projects

In early 2006 training in the new modules was run for two senior trainers from each province and attended by a researcher from the evaluation team. A two-day introduction to the new modules was run for representatives from higher education institutions and the Department of Education (DoE). This two day session was also attended by evaluators. In addition, one day conferences consisting of four practical workshops were run in each province to introduce teachers and education department officials to the new materials.

During the course of 2006 a total of 455 educators were also trained. This training took place at two schools that requested training and as part of provincial implementation (see below).

Note that the materials were again changed in late 2006. Following a specific request from Intel® and the programme developers, the module incorporating the online Thinking Tools was removed from the South African version of Intel® Teach. These elements will be covered in the specific Teaching Thinking with Technology course.¹⁵ No data was collected following the further change to the programme, thus all findings in this report refer to the programme as outlined in the box above.

In this section of the report, programme implementation during 2006 is reviewed. In particular, we focus on an assessment of the one-day provincial conferences, responses from provincial representatives and training participants. In addition, a refresher course was run for senior trainers using distance education methodology. Although not part of the initial study, this element is also briefly considered.

¹⁵ See evaluation research conducted in 2005 and 2006 for details on implementation of Teaching Thinking with Technology in South Africa. The report of this evaluation can be provided on request.

3.1 PROVINCIAL CONFERENCES¹⁶

During April and May 2006, SchoolNet South Africa worked together with provincial education departments to hold one day Intel® Teach conferences across the country. Conferences were held in all but two provinces.

The purposes of these conferences were defined as follows:

- To give large numbers of teachers the opportunity to attend a conference with little or no costs involved;
- To introduce the new Intel® Teach materials to teachers and Provincial Education Managers;
- Encourage the Provincial Managers to fund training for poorly resourced schools as part of a well managed implementation agency for educational ICT teacher development;
- To reach well-resourced schools that could fund their own training; and
- To involve Provincial education managers in the process of organization, where possible.

The table below summarises the conferences held and attendance at each.

Table 3 Overview of provincial conferences

Province	Venue	Number Of Delegates
Gauteng	St Mary's School for Girls	39
Western Cape	Wynberg Boys' High School	86
Eastern Cape	Rhodes University	17
KwaZulu-Natal	Kearsney College	96
North West Province	St Conrads College	260
Limpopo	Polokwane Training Centre	112
Free State	Grey College	99
Total		709

At the end of the day, consisting of various workshop activities, all conference delegates were requested to complete a conference evaluation form. A total of 298 evaluation forms were completed (a response rate of 42%).

3.1.1 Summary of Conference Evaluation Data

Of those who completed conference evaluation forms, the majority were teachers (63%), followed by education managers (15%). While the majority of respondents were aware of the Intel® Teach programme prior to the conferences, 34.4% of respondents had not heard of the programme. As such, the provincial conferences seem to have served the dual aim of introducing the revised Intel® Teach materials

¹⁶ A full conference evaluation report was prepared early in 2006 and is available on request. A summary of key findings is presented in this report.

to those already familiar with the programme as well as introducing the programme to new participants.

While many respondents reported using ICTs to support their teaching (54.4%) prior to the conference, a large percentage, 40.9% did not use ICTs to support their teaching prior to the conference. The conference experience is likely to have provided some insight into the possibilities that ICTs bring for teaching. Similarly, 56.3% reported that they had some understanding of how to implement projects using ICTs prior to the conference.

Almost all respondents (97.3%) reported that the workshops they participated in improved their understanding of projects integrating ICTs. In addition, 82.0% reported that they planned to implement a project in their classrooms as a result of what was learnt at the conference. Further, most participants (92%) reported that they planned to use the online thinking tools in their classrooms.

Participants were asked to assess the extent to which they learnt new things about assessment, questioning and learner support during the workshops:

- 96.3% reported learning a new perspective on assessment;
- 92.7% reported learning new things about questioning in the context of projects; and
- 92.6% reported learning new things about learner support.

When asked if they were interested in completing the Intel® Teach programme, 28.5% agreed, and 66.8% strongly agreed.

Participants were asked for any general comments and also to identify the highlights of the conferences. Responses to the open-ended question on conference highlights were coded. A total of 96 of the respondents noted their specific conference highlights. A range of different highlights were noted, with the three most common being:

- Everything (30.2%)
- Thinking Tools (21.9%)
- Learning new approaches to teaching with ICT (18.8%)

Several participants noted that one day was not long enough to engage with the programme in sufficient detail.

The conference was good interesting but the time was very short / I would like to suggest that the organizers must increase time make two to three days.

Workshop need at least five days for IT to be effective. Information received during one day proved to be too much.

This conference would have been a success if it had more time at least 3 days.

We had limited time. I hope next time you will arrange a week workshop so that we can clearly understand everything.

The time was very short we did not explore as we expected.

Overall, the responses to the conference and to the revised Intel® Teach programme were positive. Some examples include:

I found the conference stimulating and informative. It was relevant and critical for teachers to get this knowledge.

I wish that training of this nature does not come only once and to few educators. Let training be done more often and many educators be involved.

The workshop was interesting and mind provoking

The manner in which the new programme has been packaged is friendly. It will be easy to apply.

Thanks, I enjoyed all sessions. This course is a dream come true to me. Lets increase school participation.

Excellent presentation by highly informed presenters who were willing to go an extra mile to assist those who where lacking behind

It was very interesting I even forget that it was Saturday. I enjoy it and looking forward to complete the course if it may come to my school.

Hallelujah/ I love that this training help teacher to actually use ICT in the curriculum!!

3.2 PROVINCIAL LEVEL IMPLEMENTATION

Since the role of the provincial education department has become increasingly important for programme implementation, careful review of this approach as well as identification of key successes and challenges is important. Progress regarding use of Intel® Teach at the provincial level differs widely across provinces as is evident in the sections below.

3.2.1 Overview of provincial representatives' perspectives

This section draws on the responses of provincial departmental officials during telephone interviews. As noted above, as far as possible, more than one provincial representative was interviewed to provide a means of verifying interview data. This was, however, not always possible.

Research participants were assured of the confidentiality of their responses. Commonly this is done by not including names in the research report. However, since the number of people involved in programme implementation in each province is very small it might be possible to identify a person based on their province and affiliation. For this reason in the quotations presented below the province name is not included. This is a limitation as the context from which a person speaks is

important and adds to the interpretation of the response. However, maintaining confidentiality was deemed to be of greater importance.

3.2.1.1 *Provincial ICT strategy*

All provinces reported having some form of ICT in education strategy in place, although some provinces have developed their strategies and plans far more than others. Seven of the nine provinces see Intel® Teach as supporting provincial strategic priorities. The stage at which the province is with respect to infrastructure rollout and basic ICT skills training for teachers determines whether Intel® Teach is part of the short or longer term provincial planning for teacher professional development. With respect to the two provinces that did not agree that Intel® Teach was supportive of their objectives, one province has a specific provincial project and does not see much potential for Intel® Teach within this context, reported to be mostly due to the fact that school computer labs are already being fully utilized and hence do not allow for additional use of the computers. The representative from the other province criticized the lack of accreditation, and training numbers that are too small to meet the need in the province.

While all provinces reported the existence of some strategy guiding their work, it was clear that certain provinces had much more clearly defined frameworks for ICT than others, as shown in the following descriptions of strategic priorities for the provinces:

It's delivering two key services, one is e-learning, in other words integrating the curriculum with ICT and making sure learning is aided through technology and the other is administration, assisting school managers to manage school administration. Assisting educators to better plan and manage their jobs, for example lesson planning.

Rollout of ICT equipment and then rollout of skills to educators and learners, mostly basic ICT literacy. The training of educators is cascaded in levels, ICT integration is likely to be more important in the reviewed strategy than in the original one.

Assist and upskill teachers in developing ICT skills and their integration in the curriculum.

We have the full range now. We have everything from ICT professional development for managers, teachers and learners. Implementation of norms and standards for the use of ICT in all public institutions, have development and distribution of electronic content materials. Support of connectivity, the internet and electronic communication, and then infrastructure to all schools.

We worked according to the White Paper on e-Education and developed a provincial strategy around that.

Well, as it happens as a province we participated in the development of the white paper in 2003. We came back to the province, consulted with universities and businesses and came up with a business implementation strategy. Its about putting ICT resources into schools, dealing with the issue of ICT resources, dealing with lines of communication (Telkom/Vodacom), the professional development of teachers and district and provincial levels.

I am not sure if my view is the correct one. What is the point of putting ICT into schools with no understanding of the theoretical framework. People in the department have different vision and there is a lack of technical support. It must be part of educational theory...getting children to use the Internet just for the sake of it isn't useful. You must think of what you are doing, just dumping boxes in schools.

We have no leadership in terms of ICT, everything is politicised and there is no political will. There is no policy and no implementation plan.

3.2.1.2 *Strengths and weaknesses of Intel® Teach*

Provincial representatives were asked to reflect on the strengths and weaknesses of Intel® Teach. Their responses are summarised below. In some instances the provincial representative was more involved in management or implementation and less so with the training itself. In these instances, interviewees did not provide specific comment on programme strengths and weaknesses. Several participants also provided commentary on the revised materials, but this has been included in section 3.3 below.

The most commonly noted programme strength was the focus on ICT integration and the fact that the programme is curriculum based, for example:

Intel® is coming at the right time. We talk of integration but we have no idea how to integrate.

It is not just about ICTs, it is more about portfolios and computers are just a tool.

Teaching ICT within context, in an educational environment.

It was also noted that participation in Intel® Teach provides opportunity for teachers to develop and share learning resources. One participant felt that the main strength was that the programme was not subject specific:

The Intel® model is generic and accommodates all learning areas.

Few of the participants reported specific programme weaknesses as much of their experience related more to implementation challenges (see below). One participant remarked that the training approach of Intel® Teach was not the same as the training approach used for National Curriculum Statement (NCS) training:

In the NCS training they have a specific approach that they follow and Intel® deviates from this. My experience is that experienced teachers find this ok, but teacher who are less familiar with the NCS find it more difficult. It is a process issue.

Implementation challenges experience in provinces

Three provinces specifically reported challenges with rollout of infrastructure and/or technical challenges which impact on success of programmes such as Intel® Teach. For example:

The orders for computers have been placed but none of the schools have received computers yet. At most schools they are still busy with all the security arrangements, building burglar bars. We are aiming to have all IT and CAT schools with computer rooms by the end of the financial year.

We do not have sufficient infrastructure to implement what the teachers have learnt in the training. They don't have access and what has been taught is lost or partly lost.

Technical problems, but this is now being attended to. Several people are employed to go to schools to help with technical problems. Only a few educators implement what they learned in the training.

In the case of these three provinces, Intel® Teach was seen as part of the longer term strategy for the province and was still regarded as supportive of provincial goals.

Three specific areas in which challenges were experienced across provinces emerged clearly from the data. These were, staff shortages, budget allocations within the province and teacher training fatigue. Each is briefly described below.

Staff shortages: In most provinces there remain only a small number, in some instances only one person, responsible for ICT in education. This clearly limits what is possible with respect to implementation, even when clearly defined strategies are in place. For example, interviewees noted the following:

Staff resources are also not available in the province. Once we identify schools in the province there is a delay in terms of implementing. Coordinators time is full, the DoE should employ someone at district level, this would make rollout much better. We need dedicated people to assist.

We have been hamstrung with lack of funding and human resources up to last year. We have only had three or four people working on ICT in the province. Now we are busy appointing people. At the moment we only have two strong districts but hopefully this will improve.

I have trained most of the learning area managers. However, their workload is too much for them to be able to concentrate on ICT integration. They focus on the new curriculum in the learning area.

Budget allocation to support training: Some participants noted that the extent to which provinces are willing to commit budget to ICT integration training is a reflection of commitment at the provincial level.

A challenge is the mindset thing, at the head office level. People need to change their mindset to come to see the role of ICTs in education. We have trained the people and most now see the value so it is not about training people but about how resources and budgets are allocated which demonstrates the level of commitment. We are still not there yet in this area and it is difficult to access budgets for ICTs.

Budget is always an issue so unless you make the programme part of what provinces are doing then provinces are not likely to have budget. There have been some issues raised around funding. I have heard people say things like, 'Intel® and Microsoft have so much money why do we have to fund it'.

There has been very little progress, we do not have a budget at the moment and are totally reliant on donor funding. Everything is at a planning stage. Next financial year there is a budget.

ICT, unlike other programmes was not budgeted for. Only now has the national treasury set aside money which will be divided amongst the provinces.

The challenges of funding and human resources in provinces was also emphasized during an interview with a national department of education representative who noted that:

You see the problem we have at the moment in the provinces, and it is a problem that has been coming for years, is human resources. We don't have, or there is no dedicated staff for ICT education in some of the provinces. In [province name removed] we got dedicated staff, they've got a training manager specifically looking at ICT training for teachers. What they have done, they have set up structures. They have contracted Microsoft, they have contracted Intel® for their programmes and they have actually worked out a programme for their district and a bunch of officials to go through it, incorporating it into their daily support services. In other provinces that's not the case, in [province name removed], for instance, we've got one person doing ICT in the whole province, in a province of over 6000 schools. In [province name removed] we've got the same problem when we also have one or two people, they have District Officials, and they have been doing the training but its still not a collaborated sort of training, it is more as an add on.

Teachers' training fatigue: Several provincial representatives reported that teachers were currently taking part in so much training due to the introduction of the new curriculum that teachers are experiencing 'training fatigue'. Related is the challenge of when training takes place. In some provinces training may not take place during school time which means that teachers need to take part in training during school holidays or over weekends.

We also face the major problem of teachers being trained in the holidays. There is such a lot of training that teachers need to take part in. However, if you ask teachers to choose between ICT training or curriculum training then many of them select ICT training. So, ICT and curriculum people need to coordinate their training.

Since teachers are complaining that training is taking up too much time, the province is looking at having a training day in schools where a pool of teachers come in to take classes for teachers who are taking part in training on that day.

Some interviewees also remarked that teachers' level of ICT skills was a challenge to implementation, for example:

They [teachers] tend to say that they have the basic ICT skills needed to take part in Intel® but when the training starts you see that many don't actually have these skills. Some fear that if they don't have the basic skills they will be overlooked and will lose out on the opportunity.

This was, however, not a common response as even where teachers were reported not to have basic skills in place, provincial representatives saw Intel® Teach as a longer term strategy and part of a professional development pathway for teachers to follow as the worked towards integration of ICT in the classroom.

Some interviewees reported that participants tended to struggle with focus¹⁷ and content questions and that teachers who participated sometimes wanted to "hang on to their content approach – 'otherwise I am teaching nothing'".

¹⁷ In South Africa the term focus question is used instead of unit question.

3.2.2 Assessment of Intel® Teach training provided at the provincial level

During 2006 one province embraced Intel® Teach, and working with Intel® and SchoolNet South Africa was able to train 263 provincial officials (mostly curriculum and subject advisors) and 70 teachers. The province has a provincial ICT in education framework that is based on the e-Education White Paper, thus with a focus on developing ICT capability in the province. Most of the teachers in the province have completed basic ICT training. This means that many of the teachers are equipped to take part in the more advanced Intel® Teach training.

Two forms of training were provided with Intel®’s support. A two-day Orientation to Intel® Teach workshop was provided for most of the curriculum departmental officials. The purpose of the orientation session was to introduce curriculum staff to the programme so that they could better support ICT integration in schools. The two-day participants were not trained to become trainers as this was an overview of the programme only. In addition to the two-day orientation, a four-day training session was provided for lead teachers in the province. These were teachers who had been identified as exceptional teachers in their subject areas through a different provincial project. The aim was for these teachers to become provincial trainers and/or to develop learning materials in their subject areas.

3.2.2.1 Responses to two-day orientation workshop

The following table summarises the responses recorded in the course evaluation forms (n=105).

Table 4 Summary of workshop evaluation forms

	Question	Strongly Disagree	Disagree	Agree	Strongly Agree
1	I was fully informed on the purpose of this workshop prior to the workshop.	16%	41%	36%	7%
2	I now understand what the Teach to the Future programme is about and what my role will be.	1%	1%	70%	28%
3	I had an understanding of projects integrating ICT before the workshop.	9%	40%	40%	11%
4	The workshops helped to increase my understanding of projects integrating ICT.	1%	1%	71%	27%
5	I understand the nature of a Teach to the Future project.	1%	0%	79%	20%
6	I think that the Teach to the Future type of project can be implemented successfully in classrooms (once teachers are trained).	1%	1%	62%	26%
8	I believe that the 4 day full-scale training will equip teachers to implement this type of project.	1%	5%	65%	29%

	Question	Strongly Disagree	Disagree	Agree	Strongly Agree
9	I think that this type of project can be used by teachers achieve curriculum outcomes (learning outcomes and assessment standards).	1%	1%	61%	37%
10	I learnt new perspectives about questioning, specifically the project focus question.	1%	1%	56%	42%
11	I learnt new perspectives on an assessment strategy.	1%	5%	65%	29%
12	I learnt new things about learner support.	1%	6%	72%	21%
13	I think that the training materials adequately cover important project planning skills.	1%	0%	71%	28%
14	I will recommend Intel Teach to the Future to colleagues.	1%	0%	55%	44%
15	I will fully support teachers who have received this training.	1%	0%	57%	42%

Based on the responses on the course evaluation forms, it seems that most participants found the orientation training to be useful. The data shows that most (98%) reported that their understanding of projects integrating ICT had improved during the two-day orientation. Most participants noted that a four-day version of the training would equip teachers to implement projects integrating ICT (94%). Interesting, 88% reported that projects integrating ICTs could be successfully implemented in classrooms. However, during focus groups discussions with teachers, many reported that implementation in the classroom was unrealistic (see below).

In addition to learning about projects integrating ICTs, most of the participants also reported learning new perspectives on assessment strategies (94%) and learner support (93%). A review of trainer reports supports this data as trainers commented that participants benefited from the training in terms of pedagogical understanding.

A total of 57% of the participants did not feel that they were adequately informed about the purpose of the workshop. Several also made comments in this regard, for example:

Not knowing what to expect at the course. Not well-informed wrt developing a portfolio etc. Had we all known that there would have been less frustrations and sometimes feeling less inadequate.

If I had had time to prepare / read up (literature review) I think it would have helped me to get into the programme more swiftly. Coming into the course as a blank page was scary!

Was a bit daunting at the beginning. We should have been made aware of the course content before we started.

One of the most common difficulties reported by those who took part in the two-day orientation session was related to the time constraints of a two-day session, the volume of material to be covered in this time, and the challenges of lack of ICT skills when working within very tight timeframes. For example:

Too much to swallow in a short space of time.

It was “pacted” for 2 days. More time is needed.

The course is at least one day too short, and it will be suggested that this class come back some time soon for at least two days for further conceptualisation.

Two of the provincial trainers interviewed also noted that several participants had found the two-day orientation to be too short with some of the two-day participants requesting a place in the four-day training.

Overall, the response to the orientation workshops was positive. One trainer noted that:

It is interesting to note that both sessions were attended by individuals who attended under duress and were intent on finding fault with the programme. On both occasions they left with positive attitudes and an appreciation of the potential value of the programme (Trainer report).

Participants in the workshops noted a wide range of highlights. A few examples are provided below.

I think the project can add value to the classroom teaching situation. It was a very good opportunity to reflect on teaching practice and to review how project work can be employed constructively. Thank you it was valuable.

Various tools available to teachers. Links to various web resources. Forms question section was enlightening.

The material is sound and can be used with or without ICT support.

I think the training was very informative. Well presented. Learnt more on Questioning strategies.

Strong emphasis on critical thinking - very positive step!

I was made aware of many concepts!

Excellent: clear, integrated, coherent, thorough, relevant etc. You are good.

Opened up a pool of skills and tools that I was not aware of. My computer skills improved! I felt safe in group and that created an openness to share and learn.

The discussion on the Sprite and Pepsi mixture really shows how one's mind can be changed through your own and others thoughts. I really enjoyed the way members of the group initially agree on certain points but, as they heard other's ways of reasoning, they start to change their opinions.

Gave me a different perspective on projects; became a bit enthusiastic as to how teaching can become different if all role players in education really come together and make certain ideal situations realistic.

3.2.2.2 *Assessment of one three-day teacher training session*

(Note that this assessment is based on one specific training session and should not be generalized to all training conducted in the province or in other provinces)

A researcher from the evaluation team attended three days of one of a teacher training session held in April 2006. The purpose of this part of the research was to observe the response of teachers to the training and to gather feedback on the training model. On day one of the training 25 participants took part, 26 on day two and 24 on day three. The course was shortened from four to three days as teachers were not able to take more time than this off from school. At the outset of the programme the trainer told teachers that they could apply to become senior trainers for SchoolNet after completion of the training and following assessment of their final portfolios.

Two focus groups were conducted (all participants had an opportunity to take part in one of the focus groups). Overall, the responses from one group tended to be largely negative and critical of the provincial department of education and Intel® Teach. The responses from the second group were, however, much more positive. It is unclear why this difference in opinion occurred. The main difference between the groups was that the first group was made up mostly of teachers who had not heard about Intel® Teach prior to the training while the second group included some teachers who had heard about the programme, and one who had participated in training during 2004.

Some teachers participating felt that they had been 'instructed' to attend the training because they were part of another project. However, since they were participating in additional work they already had very large workloads without any additional remuneration. Some teachers reported that they were not given sufficient information regarding the training and felt that the course was creating additional pressure and work. Some were hoping to develop their computer skills and learn how to use their laptops.

We had a different expectation, the way it was set out in the information we got. We didn't come here to plan a project, we thought we were going to use the technology as a tool in the classroom. I don't really believe that you need to use computers for that.¹⁸

I didn't know much about computers when I arrived, just how to turn it on, and we are only getting to the computer stuff now, and now with the time that is left over there is not sufficient time.

Several teachers also commented on time constraints faced during the training, particularly since the training took place over three instead of four days, which limited what they were able to complete.

The time is too short, except for the computer teachers.

So many things to focus on, we need more time.

¹⁸ Note: the information letter provided to teachers stated that 'This is an international programme for teaching using ICT in the classroom. The course focuses on designing effective, simple classroom projects;

I didn't have enough time to do the things. Yesterday was a steam roller session and then when I got home I was really tired and then I had homework.

I think we spent too much time on questions, we went on till lunch time doing one small component.

Its difficult, they've taken away 7 hours of training, and now they have to decided to fit it all in!

I don't work on laptops everyday, cause my subject doesn't lend itself to use of computers (English). It took me ages to get some ideas and generate something for the programme. It was so difficult to come up with a focus question. I kept changing it.

The training must be more thorough, where you feel comfortable enough to train other people. This training has been too rushed and I don't feel comfortable to train others.

Time - time- time. There is not enough time to do the theory, group discussions etc. and still come up with a project and all the support material in 4 days. We are all very willing but there is not enough time. I suggest investigating other ways - maybe EDN style for getting the training done with teachers.

Course equalled a mad 3-day stressful rush.

The researcher noted that teachers had varying levels of computer literacy and this is also likely to have affected their experience of the training:

The levels range from some educators that struggle to save and create folders and others that are completely comfortable with all aspects of training. However, informal discussion with the trainer and representatives from [provincial department of education] revealed that this group have a much higher level of computer literacy than the other group that had previously been trained (Researcher observation notes).

These more negative comments not with standing, several of the participating teachers reported that the training was very useful and was something that they would use (at least elements of) in their classrooms.

To implement some of the things is good, like creative thinking.

Definitely, some of the elements that we've done here that will have to become part of classroom practice.

I would like to come back to a refresher course, after some time come back and share what we have implemented in our classrooms with others.

Definitely. My learners have just done a project. I plan to redesign the project in line with the Intel® format.

When asked if they would be interested in becoming more involved in Intel® Teach as trainers the participant teachers appeared to have mixed-feelings. Some were interested but concerned about time constraints and their current workload, while others did not see themselves becoming trainers. For example:

Right now I don't feel confident but I would like to become a senior trainer in the future.

I won't do it as another extra, I just don't have time.

I wouldn't mind getting involved, if you want to get out of teaching this would offer new opportunities.

3.2.3 Anticipated impact of provincial training at the school level

Ultimately, the aim of Intel® Teach is to impact on teaching and learning in the classroom. Participants in the provincial interviews and training sessions were asked to reflect on what they saw the anticipated impact to be in schools. Training has also taken place in some schools in the province. When working at the school level, school selection tends to be linked to other programmes being implemented by the provincial education department. This is partly to ensure that Intel® Teach can build of programmes providing basic ICT skills training and also to ensure that schools have the required infrastructure to benefit from a programme like Intel® Teach. However, this decision is also related to funding of Intel® Teach, as training budget from various programmes can be used to fund Intel® Teach training where this is aligned to the objectives of the specific project. This was described as the 'plug and play' method by one interviewee.

One provincial representative anticipated a great impact in schools:

The impact will be enormous. From [province name removed] point of view, we would have had to develop training on ICT integration ourselves, but since we didn't have to invest in this ourselves we have been able to focus on some of the other important details needed to make ICT integration successful, such as access to and training in specific software. Also, the training provides teachers with a tremendous sense of empowerment and improves their self image. It provides a rich background, especially for GET educators who have more scope to work across the curriculum. In addition to supporting teachers in their jobs, they have also been enriched personally. (Provincial representative)

Similarly, when asked in an interview what effects the training of provincial officials has had, one interviewee remarked that:

It has given them insight, actually, it was like an awakening to computers and what the potential is. These people are now taking more interest in the schools and what is possible with computers in the different subject areas. Many of those who took part in the training are quite new to computers.

The feedback from subject advisors and curriculum people who took part in the orientation training was very positive and all see the role that ICTs and the Intel® programme could play in schools. They have recognized that this is what is needed in the classroom. The challenge is how to get people trained. I think we need to locate this within professional development for teachers.

However, in the follow up survey, of the eight participants who responded, only two had specific plans to implement what they had learned in the future. Five of the eight had made use, in some form, of elements of what they learned in other teacher training processes.

Not all teachers agreed with the positive impact statements made above, for example in focus groups it was noted that:

Tuesday its back to school and back to normal and the laptop is left at home as I'm scared that someone will steal it. Someone needs to show me how to use PowerPoint etc. I thought that they were going to show us how to use the tool, the laptop, to create subject materials and use the Internet to find materials. (Participant teacher)

The programme is totally different to what is being done in schools. Is this just a waste of time or is this the new way in which projects will be taught in schools? (Participant teacher)

The underlying principles of the course imply that learners will have access to certain resources. It is very difficult to get hold of resources. Where we are, getting to the library is a 3 hour trip (1.5 hours there and 1.5 hours back) and in some cases 3 hours to get to school. Time is an issue! (Participant teacher)

To increase interest in Intel® Teach training at schools and hence improve impact at the school level, teachers emphasized the importance of some form of recognition for teachers who take part in training.

You get teachers who are very petty and small minded. When we try to train the teachers at our schools they will say 'who do you think you are?' The Department could write letters to the schools to recognize that we have completed training.

When asked specifically what role the provincial department of education could play in supporting ICT integration and participation in the Intel® Teach programme most teachers highlighted the provision of resources as well as further training as the key support needs.

3.3 RESPONSES TO THE NEW MATERIALS

As noted above, in early 2006, revised Intel® Teach materials, incorporating thinking tools as one module, was released. Senior trainers received training in the new materials, the Department of Education and representatives from Higher Education Institutions took part in a two-day introductory session, and teachers were introduced during the one-day provincial conferences. Overall, the response to the revised materials has been very positive, as shown by the comments below.

I had the opportunity to complete the first Intel Teach to the future. I also presented the first course to my colleagues. I liked how this new course is streamlined and the new project plan document is much more user friendly and less intimidating than the former unit plan document. The new manual is also less intimidating as well. (lead teacher)

It is wonderful, I'm very excited by it. It takes the programme and tailors it for the South African teacher. The first thick manuals were too much and the examples were not always relevant. The new one is a good middle ground and is much more user friendly (Senior Trainer)

The manner in which the new programme has been packaged is friendly. It will be easy to apply (Teacher during one-day conference)

I think the new course is more focused on curriculum issues than the first. Better for the teachers as it is more focused on project based learning (Senior trainer and provincial representative).

I think the change in the materials is tremendous! It gives a lot more encouragement for teachers and it is now a really impressive programme (Provincial representative)

Teachers appreciate the revised and modularized materials, they appreciate that the course is now more concise and easier to deal with psychologically (Provincial representative).

The initial one was too long and extensive for what teachers here need. People had trouble absorbing what was in there. It was too detailed for what was needed and not well enough linked with the curriculum. I have heard that the new version is improved in these areas but I have not worked with it too much (Provincial Representative)

Teachers were very impressed with the training programme, especially impressed with the thinking tools and the assessment that fits in very well with the curriculum. (Provincial representative).

To date in the research very few critical comments have been made about the revised materials. The following was said by a provincial representative:

I have mixed feelings about it – largely because of personal reasons. I felt that I had just got to grips properly with the original five day model and then it changed.

With the old model we had complaints from teachers that 5 days was too little time for what they needed to do. Now with the new materials we still get the same complaint from teachers. Many have said that there is some theory that could be left out, for example the learning theories as they cover this in their other training and then it is a duplication. Several teachers have also asked for training to be more practical. (Provincial representative).

I think one of the weaknesses is that teachers can choose what they think they need for the programme. A lot of time teachers think they don't need to complete parts of the programme because they don't understand it. There's too much freedom. Don't have to do anything. They shouldn't be able to progress until they've done certain parts of the programme. With the Intel® course you really need teachers that are really competent computer users, if teachers are worried about how to do something they spend too much time concentrating on the skills needed to complete the task rather than the task at hand. They should build in a kind of evaluation of teachers ICT skills. Then the teachers could focus on what the course is about and not on ICT skills. (Provincial representative)

3.4 QUALITY ASSURANCE: SENIOR TRAINER REFRESHER DISTANCE COURSE

In an effort to ensure the quality of Intel® Teach training, the need for a refresher course for provincial senior trainers was identified in mid-2006 following review of several trainees' portfolios which were not deemed to be of an acceptable standard. It was not possible to bring all the senior trainers together for a five day refresher course. This was largely due to time constraints of senior trainers who also have many other responsibilities at their schools or within provincial departments of education. For this reason, it was decided to make use of a distance mode of delivery

for the senior refresher course. The curriculum remained exactly the same as the face-to-face version; just the mode of delivery was different.

The course introduction introduces the distance course as follows:

The materials on this CD are a distance version of the South African Intel® Teach Essentials course. You must participate in most of the activities with a peer from your own institution, whom we shall refer to as your thinking partner. In some critical areas you will be able to refer to an online tutor for support.¹⁹

Each participant was asked to identify a 'thinking partner' at the outset of the course in an effort to maintain the pair and share elements of the programme. Assessment was formative, often taking the form of a dialogue between the tutor and the participant. Participants were not able to progress to the following module until the desired standard had been achieved. This means that all participants completed the course with a complete and high quality portfolio.

A total of 21 participants took part and completed the course with an average of 75% or more. No participants completed the course to be told that they had not passed due to the formative assessment built into the programme. A few participants withdrew during the course for various reasons, including that they were not suited to become senior trainers at this point. Participants were invited in early October 2006 and given until 20th December 2006 to complete the course. Several participants, and the tutor, identified this short and fixed timeframe as a limitation of the course. For example,

Enough time [is needed] for the various activities and stages, because this way of learning and teaching is new to most learners. Learners should not fall in the trap of just wanting to get to the end product instead of really thinking about each activity and exploring each one to the fullest (senior trainer).

Although not part of the original evaluation planning it was decided to include this element of the programme in the evaluation research to better understand the potential of the distance mode of deliver for senior refresher courses. A course evaluation form was developed and completed by eight participants. The tutor provided a training report and responded to additional questions. A cursory analysis (this was all that was possible within the confines of this study) was done of selected email exchanges from during the course.

Overall, the response to the distance mode of deliver was positive. The tutor stated that:

As a tutor I was able to sit and reflect on what I needed to say and how to say it. I found that I was able to deepen my own understanding in this way in terms of what the important elements of the portfolio are and how they align to each other, e.g. how the assessment standards align to the learn support and learner sample; how the learner support documents should support activity in the zone of proximal development; how the assessment and learners support strategy should be described in the project description. These are all things of which I was aware before but one never has time to

¹⁹ www.school.za/teach_dist/docs/intro.htm

emphasize these to individual teachers in contact training. In conclusion, I was very pleased with the way the tutor can give more in-depth feedback and deepen a participants' understanding (Tutor report).

A short review of selected email exchanges also demonstrated the value of this approach in supporting active engagement with all elements of the programme as well as creating opportunities for reflection on the part of participants, thinking partners and the tutor.

The materials also included a series of multimedia support materials. Most of the participants who submitted course evaluations reporting making use of these materials which were noted to support the learning process, clarify key points, help with development of understanding and assisted participants to think more creatively.

All participants who submitted course evaluation forms reported an improvement in their understanding of:

- Using questioning to support learners' thinking processes;
- The value of using projects in the classroom; and
- Integrating ICT into teaching.

In addition, four of the thinking partners did very well in the course, with the tutor describing three of them as 'exceptional'. All four were invited to become senior trainers and accepted. Thus, this method of course delivery also supported the identification of new senior trainers.

Some participants made note of challenges experienced during the training. The most common response was related to the timing of the training (the very busy end of the year) and the limited time available (deadline for completion of 20th December 2006) which sometimes compromised on time for reflection. One participant reported that the programme was too structured and sometimes led to feelings of being stifled and frustrated and another felt that more interaction with the tutor would be helpful. Two participants reported that they would have valued an opportunity to communicate with other participants on the course. This was particularly the case in instances where the thinking partner was not always available to engage with the participant. One participant made a practical suggestion - that the modules be numbered so that it is easier to keep track of where one is in the programme.

Participating senior trainers were asked whether they would prefer face-to-face or distance modes of delivery in future refresher courses. Of the eight who responded, responses were roughly evenly split [online = 2, face-to-face = 3; either = 3]. Examples of responses included:

Face-to-face. It gives you more confidence as you can expect scaffolding from the trainer much more than you get online. (Senior trainer)

Online, because of my work commitments I would like to work at my own pace and time, within the broad timeframe. In the face-to-face sessions I worried far too much about the quality of my final product, from about day 3 to day 5, thus neglecting the most vital aspect of high level, in depth and critical thinking (senior trainer).

I have done the course both ways. The five day mode is great because one is totally focused, but it is also pressured and there is limited time for reflection. Doing it in the online distance mode gives one more time to think about ideas and improve on them. I think I would have benefits even more if I had more interaction with my thinking partner. I would have valued being part of the follow-up face-to-face to training. Each mode has its pros and cons. I don't think I have a very strong preference either way. (Senior trainer)

Neither, I like a combination. If, however, I must have a choice I'd prefer the online distance mode delivery for myself, but the face-to-face training session if I had to do it with others.

For myself: because I like to think at my own pace. For training others: it is easier to get to know the students when face-to-face and to intervene quickly when problems develop. (Senior trainer)

Since the senior refresher course took place in late 2006 the evaluation research could not assess the effects of this course on the quality of training provided by senior trainers.

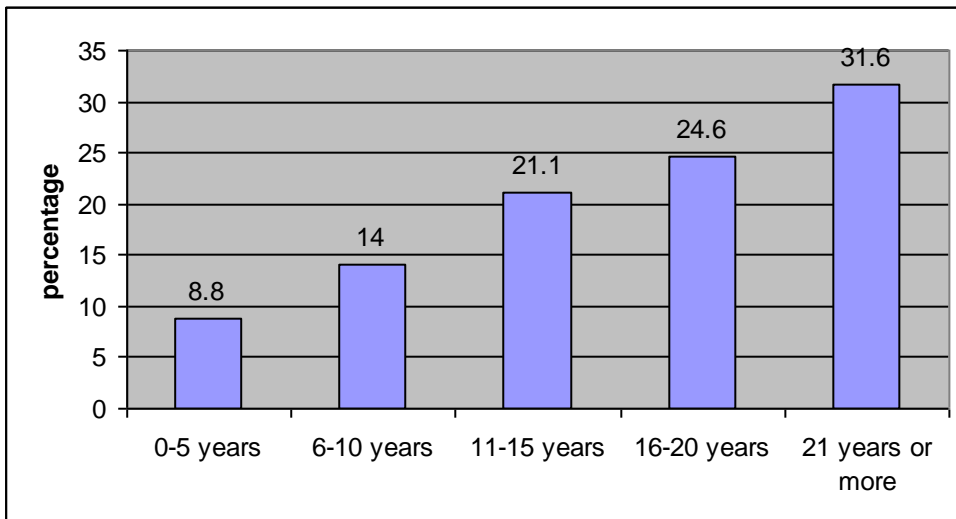
4. RESPONSES OF TEACHERS TRAINED

4.1 ANNUAL IMPACT SURVEY

As described in the methodology section above, a total of 58 responses to the annual impact survey were received. Thus, while this survey data does provide an indication of how ICTs are being used in the classroom following participating in the Intel® Teach programme, this should not necessarily be assumed to generalize across all teachers who have been trained.

The sample of teachers who responded was 56% female and 44% male. Very few teachers (5.3%) fell in the '20-29 years' age category. Respondents were roughly spread across the '30-39', '40-49' and '50 and above' categories. Most of the participants were based in urban areas (76%), compared to 11% in rural areas and 13% in townships. The figure below summarises the number of years teaching experience of the sample.

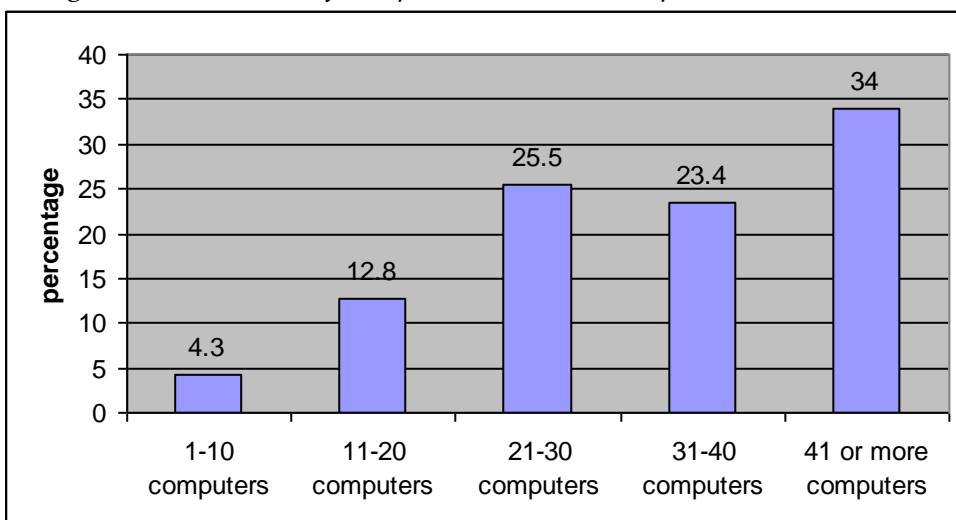
Figure 1: Number of years teaching experience



Interestingly, the number of years experience increased somewhat uniformly across the sample. The greatest percentage of respondents (31.6%) has 21 years or more experience. This is expected when we consider the age distribution described above. Approximately half of the sample took part in training prior to 2006 (i.e. using the old version of the programme).

Almost all, 90% of respondents reported that they had a computer lab at school, with 77.1% of respondents also reporting that the computer lab had internet access. The figure below shows the numbers of computers available in the computer labs.

Figure 2: Numbers of computers in school computer labs



Most of the participants reported having at least 20 computers in the school computer lab, with 34% of the sample having more than 41 computers available.

The vast majority of the sample (88%) also reported having computers at home. It is quite likely that those who have computers at home were more likely to access their emails regularly and hence receive and respond to the email survey. This introduces a particular bias in the findings of the survey, as having access to a computer at home is likely to impact on use of ICTs in the classroom.

Respondents were asked to indicate how regularly they have used their manuals, CDs, the Intel® website and the online thinking tools since participating in training. Responses are summarised below.

Table 5 Summary of responses regarding use of Intel® Teach resources

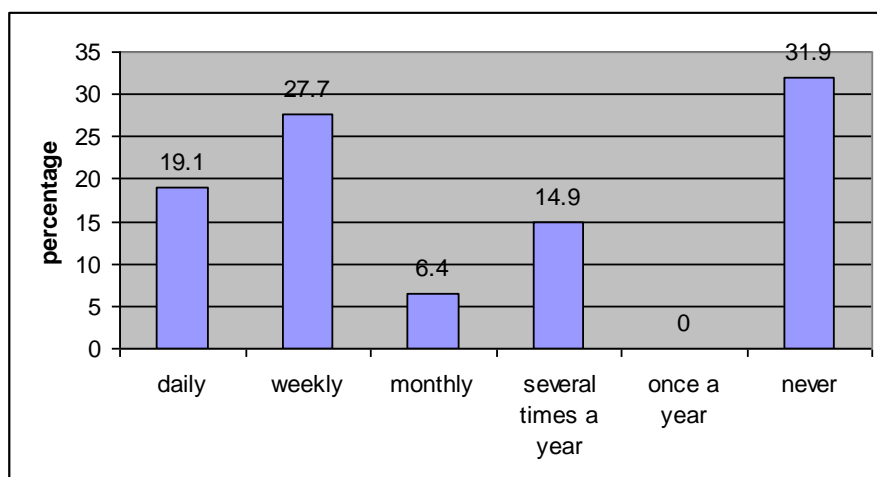
Question	More Than 10 Times	4-10 Times	1-3 Times	Not At All	Did Not Receive
a) Used your Intel® Teach to the Future manual?	27%	27%	29%	10%	6%
b) Used your Intel® Teach to the Future CD-ROM?	30%	20%	36%	8%	6%
c) Visited the Intel® Innovation in Education website?	13%	28%	28%	30%	2%
d) Made use of the Online Thinking Tools in your classroom?	16%	2%	22%	53%	7%

In most cases the majority of respondents have made use of the various Intel® Teach resources following training. Use of the CD-Rom appears to be slightly higher than use of the Intel® Teach manual. A total of 40% of the sample have used the online thinking tools at least once, with 16% reporting use of the tools more than ten times. However, the majority of the sample (53%) have never used the online thinking tools.

4.1.1 Technology integration

Many of the respondents reported implementing some or all of the unit plans they developed during training in their classrooms. 60% reported doing so 'more than once', 18% 'once', and 14% reported that they planned to use their unit plans before then end of the school year. The remainder had never used their unit plans. Respondents were asked how regularly that have their learners engage in technology-integrated lessons.

Table 6 Regularity with which learners engage with technology-integrated lessons



While 'never' engaging learners in technology integrated lessons was reported by 32% of the sample, a relatively large proportion did engage learners in technology integrated lessons quite regularly. A total of 46.8% had learners using technology at least weekly. Similarly, 50% of the sample reported that they had learners use technology in new ways since their Intel® training. These are a positive findings, but as noted at the outset of this section, should not be generalized to all teachers since it might be that teachers with computers at home (the majority of this sample) find it easier to prepare and make use of technology integrated lessons.

Teachers were asked to describe a technology-integrated lesson. While some descriptions cannot be classified as technology integration, for example, the use of PowerPoint presentation by a teacher to cover specific content or computer literacy-type lessons, several interesting examples demonstrating various levels of ICT integration were provided. Two examples that also show application of project-based learning are quoted below. All relevant examples are presented in Appendix One.

A lesson on Volcanoes. Research done using a Word template provided by myself. Facts to be gleaned from Encarta Kids and a thinkquest on Volcanoes. Once facts have been accumulated, pupils then transfer this knowledge into a Website using MS Publisher. They are to come to a conclusion whether they would like to visit a volcano and why.

Learners worked in pairs doing research on a famous person. They then prepared a TV interview. One learner being the interviewer and the other the famous person. They had to type and prepare the interview in dialogue style, using Word in the IT Class. They then played out the interview in the English Class. After which they came back to the IT Class and prepared a magazine article on the same famous person. Doing more research, gathering pictures from the Internet. They then write the article in a Newsletter using Publisher.

The table below summarises what teachers saw to be the primary objective of their technology-integrated lesson (n=34 - the teachers who provided lesson descriptions).

Table 7 Summary of lesson objectives

Lesson Objective	Percentage Of Teachers Selecting This Option
Learners learn curriculum content	17.4%
Learners work on basic skills (such as math or reading)	4.3%
Learners express their ideas/opinions by creating multimedia products	17.4%
Learners conduct research	13.0%
Learners gain preparation to success in the workforce	4.3%
Learners present information to an audience	13.0%
Learners improve their computer skills	17.4%
Learners learn to work in groups	0%
Learners learn to work independently	4.3%
None of the above	8.7%

Lesson objectives noted as primary by more than 10% of teachers who provided this information have been highlighted in table 8.

Teachers reported the following regarding impact of the lesson on their learners.

Table 8 Teachers' report of impact of technology-integrated lessons on learners

Impact Statement	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
a) Learners were motivated and actively involved in the lesson.	0%	0%	2.8%	52.8%	44.4%
b) Learners worked together more often than in previous, comparable assignments.	3%	6.1%	21.2%	36.4%	33.3%
c) Technology-integrated lessons addressed learners' different learning styles.	0%	0%	17.6%	55.9%	26.5%
d) Learner work showed more in-depth understanding of content than in previous, comparable assignments.	2.9%	2.9%	25.7%	34.3%	34.3%
e) Learners were able to communicate their ideas and opinions with greater confidence than in previous, comparable assignments.	3.0%	3.0%	21.2%	45.5%	27.3%

Overall, teachers who implemented technology enhanced lessons reported a positive impact on learners across all the impact statements provided, but particularly with respect to learner motivation and involvement in the lesson.

4.1.2 Challenges limiting technology integration

Respondents reported on a range of challenges experienced. For some, these challenges meant that they were not able to implement any technology integrated lessons. For others, the challenges limited the success of their lessons.

The following challenges were reported as experienced during a technology-integrated lesson.

Table 9 Challenges experienced during implementation of technology-enhanced lessons

Challenges	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree
a) It was difficult to manage your learners on the computers.	40.0%	37.1%	5.7%	14.3%	2.9%
b) Not enough computers were available.	50.0%	19.4%	2.8%	22.2%	5.6%
c) You did not have adequate access to the Internet.	45.7%	14.3%	5.7%	17.1%	17.1%
d) The class time or lab time that was available was too short.	25.0%	19.4%	11.1%	30.6%	13.9%
e) You did not have strong enough computer skills.	51.4%	28.6%	17.1%	2.9%	0%
f) Many learners did not have strong enough computer skills.	17.1%	51.4%	5.7%	14.3%	11.4%
g) You did not have adequate administrative support.	52.8%	13.9%	13.9%	19.4%	0%
h) You did not have adequate technical support.	47.2%	27.8%	8.3%	16.7%	0%
i) You did not have adequate instructional support.	55.6%	22.2%	11.1%	11.1%	0%

Based on the data in table 10 it appears that the majority of those teachers who reported implementing technology-integrated lessons did not agree that the challenges listed had influenced their lessons to a great extent. Although each of the challenges listed was experienced by some teachers, the most common challenge appears to be that class or lab time was too short to complete the lesson.

Those teachers who did not implement technology-integrated lessons were asked to reflect on possible reasons for this. Unfortunately, most respondents did not provide answers to this section. Of the twelve teachers who did respond, the main challenges appear to have been:

- Too few computers available;
- Inadequate access to the internet;
- Lack of software; and
- Too little planning and preparation time.

Yet, it was reported above that the majority of teachers had at least 20 computers available, with 34% of the sample having more than 41 computers available. Further, the majority of the respondents 67.4% reported working with learners in the computer lab at least weekly, with 32.7% using the computer lab with learners daily. However, the majority of survey respondents (56.9%) reported that it was 'very difficult' or 'somewhat difficult' to schedule time in the computer lab which may partly explain the challenges noted above.

4.1.3 Approaches to teaching and learning

Since Intel® Teach also focuses on project-based lessons as a teaching and learning strategy, the impact survey included questions related to teaching and learning, or pedagogic approaches.

The majority of respondents reported that the teaching strategies of Intel® Teach were new to them, with 20.5% noting that this was ‘very true’ and 40.9% that it was ‘somewhat true’. Only 38.6% of the sample did not find the teaching strategies to be new. Even though many find the teaching and learning approach to be new, the majority reported that the teaching strategies were relevant to their teaching goals, with 55.6% stating that this was ‘very true’, 33.3% ‘somewhat true’ and only 11.1% that the teaching strategies were not relevant to their teaching goals.

Survey respondents were asked to indicate the extent to which their use of various teaching and learning approaches had changed following training. Most of the options were answered by 47 respondents, however, in some instances one or two additional respondents did not provide a response.

Table 10 Reported changes in teaching and learning strategies.

Teaching And Learning Strategy	Do This Less	No Change	Do This More	Not Applicable
a) Use a textbook as a primary guide for instruction.	37.8%	37.8%	13.3%	11.1%
b) Use Questions to structure lessons.	6.5%	19.6%	63.0%	10.9%
c) Access the Internet to aid in developing lessons or activities.	2.1%	19.1%	61.7%	17.0%
d) Use a computer for administrative work (for example, grading, attendance, creating handouts).	4.3%	10.6%	78.7%	6.4%
e) Present information to learners using computer technology.	0%	23.9%	58.7%	17.4%
f) Use rubrics to evaluate learner work.	6.5%	23.9%	63.0%	6.5%
g) Have learners review and revise their own work.	2.2%	40.0%	46.7%	11.1%
h) Have learners present their work to the class.	2.3%	32.6%	55.8%	9.3%
i) Have learners engage in independent research using the Internet.	4.4%	17.8%	55.6%	22.2%
j) Have learner work on group projects.	2.2%	24.4%	62.2%	11.1%
k) Have learners choose their own topics for research projects.	6.7%	48.9%	31.1%	13.3%

Table 11 provides positive evidence of the possible impact [possible, since this is self report data not verified through observation] of Intel® Teach on teaching and learning strategies, with teachers reporting change in a positive direction for many of the teaching and learning approaches promoted through the programme. The use of questions to structure lessons is an important focus of Intel® Teach and a

particular emphasis in the South African localised materials. The data shows that 63% of the sample reported making use of questions more often to structure their lessons. The data points to a decreased reliance on textbooks and an increase in the use of the internet. 62.2% reported having learners work on group projects more often. The greatest change was reported for the use of computers for administration purposes, with 78.7% reporting that they do this more often.

4.1.4 School-based case study

The case study school was a large, well resourced, all girls' public high school in Bloemfontein (Free State Province). The teacher who took part in the case study research is a provincial senior Intel® trainer and the computer studies teacher at the school. This teacher has made much use of Intel® Teach pedagogic principles and the online Thinking Tools in her classroom, mostly as a component of learners' project work. The 2006 case study visit focused on exploring a grade 9 computer studies project that ran over approximately 3 months during the course of the year. The researcher conducted an interview with the teacher, reviewed examples of completed projects and held a focus group discussion with learners. In addition, earlier in the year the teacher had asked learners, in groups, to reflect on their experiences of completing projects. This reflection took the form of a group discussion, led by the learners, and videoed by the teacher. This video data was made available to the researcher, transcribed and incorporated into the analysis.

The box below briefly outlines the grade 9 project.

<p style="text-align: center;">'Can [school name removed] surf the internet safely?'</p> <ul style="list-style-type: none">• Learners listened to a talk by an expert on online safety• Investigated key words related to online safety• Used Visual Ranking to prioritise key words and compare with other groups in the class• Compiled a summary using Inspiration• Each learner selected a core topic as the focus for their research, for example:<ul style="list-style-type: none">• Pornography• Shoulder service• Spam• Cell phone usage - MixIt• Malware• Learners compiled a survey related to their topic• Handed out the survey to Eunice girls to complete• Calculated statistics• Compiled graphs in Excel and copied them to Word (each learner prepared a formal research report).• Made recommendations for improving online safety at their school. <p>The teacher provided feedback to the learners at each step in order to provide scaffolding and to ensure that all learners were able to produce an excellent project of which they were proud.</p>

During the learner focus group discussion, all learners reported that they enjoyed using visual ranking and enjoyed comparing their rankings with those of the other learners. All would like to use the tools again. One of the main reasons given for enjoying their work with Visual Ranking was:

It is interactive and we get to see what others are doing and we can make comparisons which was interesting.

Further, learners reported that they found the tool helped them to think through their project topics. For example:

Yes, it helped us to see what was most important. It challenged our thinking because you see what others think and you can read their comments and then you think again about what you thought was most important.

Learners did not experience any challenges using the online thinking tools. They reported that the tools worked very well and were not slow. None of the learners could think of ways in which Visual Ranking could be improved, they were all 'happy with the tool as it works well and is easy to use'.²⁰ When asked whether they liked doing projects the majority of the learners reported that they did, for example:

Projects are nice because they help you to learn more about different topics that you might not have learnt about.

However, a few learners noted that they did not really enjoy projects and complained that projects take a lot of time as learners have to write everything in their own words.

The teacher reported that one of the strengths of the Intel® approach is that the learners take ownership of their projects. For example, the researcher was shown how learners include 'credits' at the end of their presentation to show the work that have done.

The following quotations taken from the learners' reflection video demonstrate the thinking processes that learners have been through during the course of their project work.

You summarise the parts that you think are most important....
You also start to criticize the information more.

Each time you have to think...you have got something and then you need to see how it fits in...because sometimes you think I'm going to do this and then it doesn't work out like that so you have to change it.

It [experience of doing the project] will help me from you know, like a business aspect – like one day when you have to pitch an idea to a company you will know, ok, I've done this before and know what the process is.

You have to think about things and talk to people...get your thought going.
Usually it is just copy and paste copy and paste and this time its like you can't just put all that stuff in, you have to think what am I going to put in.
You have to critically analyse it.

²⁰ Note that the ICT resources and connectivity at the school are very good.

You've got to think about the choices you're going to make. Are you going to choose to do this thing or this thing and then you look at the advantages and disadvantages and say I'll take this one and then you've got to analyse and see afterwards...did I make the right choice and then go back and say should I do it this way or add this on here or the other page and then swap it all around...you have to put it all together.

5. CONCLUSIONS AND RECOMMENDATIONS

The introductory section of the report included a quotation from the recently released National Framework for Teacher Education stating that the majority of South African teachers are not currently equipped to meet the education needs demanded for a global 21st century. The need for teacher professional development was also highlighted. It was noted that Intel® Teach is a programme that could contribute to the solving this challenge. The 2006 evaluation data presents some initial evidence in support of this claim. For example, the case study shows the value of Intel® Teach in supporting the development of learners' thinking skills through application of project-based teaching and learning strategies. The annual impact survey data also points to an increase in, amongst others, project-based learning, use of questions to structure lessons, having learners engage in independent research and present their work when teachers are able to implement technology-integrated lessons. Thus, given an enabling environment that supports implementation (see below), Intel® Teach has a valuable role to play in supporting South African education priorities.

The research data points to a particularly positive response, at all levels, to the revised Intel® Teach programme. The revised materials were regarded as more suitable for South African teachers and more practical to implement at provincial and school levels.

This potential notwithstanding, training numbers in 2006 were low compared to previous years. During 2006, two provincial senior trainers from each province were trained in the revised materials, 21 senior trainers completed the distance refresher course and a total of 445 teachers were trained. The provincial representatives' interviews and provincial case study provided some information for understanding why this was so.

Seven of the nine provinces in South Africa reported that Intel® Teach supported provincial ICT and education priorities and saw the programme as part of their short or long term rollout of ICTs and efforts to achieve ICT integration in schools. The three main challenges to successful rollout of Intel® Teach through the provinces (as reported by provincial representatives) were staff shortages, budget allocation to support the training and the fact that teachers (particularly at the FET level) are currently taking part in curriculum training during most school holidays making it very difficult to find suitable dates for Intel® Teach training. These challenges, and the others noted in the report, need to be specifically factored in to programme planning if Intel® Teach is to be successfully integrated within departmental processes.

Without staff and training budgets, significant training through the provinces is unlikely to occur in the short term. Related is a need to increase the number of senior trainers per province in order to rollout training to more schools. Given the success of the senior trainer refresher course employing a distance mode of delivery, together with the challenge of finding five days available to run face-to-face training with busy people who have existing job responsibilities, this approach might be one option for consideration in the training of additional provincial senior trainers.

It was noted in the report that some provinces see Intel® Teach as part of a longer term pathway of teacher professional development where infrastructure rollout has not yet been widespread or where the majority of teachers do not yet have basic ICT skills in place. It is recommended that programme implementation for the coming year focuses specifically on actively working with those provinces which, at present, provide an enabling environment for a programme such as Intel® Teach. This might include training additional senior trainers, providing financial support to appoint senior trainers within provincial departments, supporting provinces in the identification of schools at which training could take place, funding training at a specific number of provincial schools, lobbying for the inclusion of Intel® Teach as a training component within other related programmes. The 'plug and play' method of identifying other provincial projects that would benefit from Intel® Teach training might also be a useful method of expanding training possibilities, although there is a danger of overloading project participants. Focusing attention on those provinces providing an enabling environment would also provide a series of best practice examples that could inform planning for additional provinces as they become ready to implement Intel® Teach.

With respect to the process followed when working through provinces, the data available from the conference evaluation forms shows an overall positive response of participants to both the conferences and the revised Intel® Teach programme. With a total of 706 people having attended the conferences it seems reasonable to conclude that purpose one – providing an opportunity for teachers to attend a conference – was achieved. Based on the responses provided in the course evaluation forms it is clear that the conferences also succeeded in introducing the revised Intel® Teach materials to South African teachers and education managers. Further, this introduction reportedly inspired teachers to consider implementing projects in their classrooms. The majority of conference evaluation form respondents reported that the conferences increased their understanding of assessment, learner support, questioning and projects integrating ICT. Many participants seemed particularly excited by the possibilities of the online Thinking Tools. Further research is needed to assess the extent to which the conferences influenced teaching practices in the classroom, however, it does seem that holding provincial conferences of this nature is beneficial and likely to support programme rollout.

The data collected during the 2006 research provides a useful starting point for exploring provincial level implementation in more detail. While the two-day orientation for curriculum advisors was well received and reportedly raised

awareness and understanding of ICT integration as well as increased understanding of project based approaches and assessment strategies, several participants felt that this session was too short to provide a real foundation for supporting schools and teachers. This might be overcome to some extent by providing more detailed information prior to the session so that participants could arrive with some initial ideas formulated. However, it is likely that departmental officials who have not been specifically working with ICT arrive with a wide range of ICT skills levels, making a two-day session more challenging. If possible within time constraints, it might be worth considering a one day basic ICT skills introduction prior to the two-day Intel® Teach workshop.

When considering the three/four-day training of a specific group of teachers, the data highlights the importance of carefully considering the type of teachers invited for training. In this province it was found that although these teachers were experts in their subject areas, they were not necessarily the appropriate choice for ICT integration training, particularly where teachers had little personal experience using ICTs for teaching and learning. In addition, these teachers, through their participation in another programme felt that they were already overloaded, were 'forced' to attend the training and hence several were unwilling to commit themselves to Intel® Teach beyond participating in the training. As for the two-day orientation workshop, the provision of detailed information prior to the training is important in order to avoid the creation of expectations that cannot be met – for example that Intel® Teach is about developing one's ICT skills. It is also clear that running training over three instead of four days should not be considered in future as this does not allow sufficient time for participants to engage with the materials and hence the quality of learning and outputs (portfolios to take away) is compromised.

There was little implementation at the school level during 2006, although some training funded by the province is due to take place in early 2007. Teachers felt that the province could provide additional support with respect to ICT resources at schools and further training. Although teachers who complete training are awarded a certificate, participating teachers also felt that recognition from the provincial department, for example, in the form of a letter to their schools, would be useful to increase buy-in of other teachers at the school level.

The impact survey data (national sample) showed that, while 32% of the sample never engaged learners in technology-integrated lessons, 46.8% reported using technology at least weekly. This is a positive finding, providing a possible indication of the impact of Intel® Teach on teaching and learning. As noted in the report, however, given the small sample size and the fact that a large proportion of the sample reported having computers at home, it is likely that this is a skewed sample, not representing 'the average' South African teacher and hence should not be generalized. The many challenges to ICT integration at the school and classroom level were also noted in the report (based on impact data and teacher focus groups).

The main challenges included too few computers and that lessons in the computer lab tended to be too short for implementing meaningful ICT integrated lessons.

In sum, the following recommendations emerge from this study:

- The importance of focusing attention on provinces that provide an enabling environment in order to develop best practice examples and expand the numbers being trained was highlighted.
- Given the staff shortages in provinces which impact negatively on ICT in education rollout, there is a need to train additional provincial senior trainers and to explore possible funding mechanisms for training at school level. To demonstrate the value of Intel® Teach to provinces, Intel® might consider supporting training at a specific number of schools in each province demonstrating an enabling environment for Intel® Teach. SNSA senior trainers could be used for this training in the absence of sufficient provincial departmental trainers.
- The distance mode of delivery used in the senior trainer refresher course appears to be a successful approach, generating good quality portfolios and particularly in creating greater opportunity for learning and reflection on the part of all involved. It is recommended that such refresher courses are held annually as more senior trainers are trained in the provinces in order to maintain quality.
- The one-day provincial conferences provided a platform for raising awareness about Intel® Teach, but also of ICT integration more widely. It is recommended that such conferences be held regularly (perhaps bi-annually) to introduce any changes to the programme and to continue raising awareness at the provincial and school levels.
- Although full four-day training is not always an option due to time and budget constraints, it appears that two-day orientation sessions are too short to really have the effects desired. It is recommended that all training, even if of an orientation nature, be held over a longer period of time in order to allow participants to fully engage with the new ideas they are exposed to. This is particularly so where participants enter with widely varying ICT skills levels. Alternatively, the volume of information covered could be reduced for shorter trainings, for example, a specific focus on questions and thinking.
- The impact survey responses included some examples of how teachers are experimenting with ICT integration in their classrooms. It might be useful to compile and distribute a resource of such examples for those teachers who find ICT integration more challenging. Portfolio examples are currently included on the CD, however, shorter 'stories' told by teachers for teachers might also be useful motivators.

APPENDIX ONE: EXAMPLES OF TEACHERS' ICT INTEGRATION ATTEMPTS

The following quotations have been taken from responses submitted in the annual impact survey.

We study a country of choice for each class. My class chose China. I set up a programme for the children and put them into groups so that each group could study another aspect of China. They were taken to the IT room to look up and print information and also given books. They then made a poster about their information. This made it very easy to prepare their slides as they had all the information at their finger tips. Looking for pictures on the Internet was their final learning activity.

A lesson on Volcanoes. Research done using a Word template provided by myself. Facts to be gleaned from Encarta Kids and a thinkquest on Volcanoes. Once facts have been accumulated, pupils then transfer this knowledge into a Website using MS Publisher. They are to come to a conclusion whether they would like to visit a volcano and why.

An Internet-base research project which required pairs of learners to collate information on their chosen topic and produce a PowerPoint presentation which was presented to the whole class. All learners had a rubric to complete on presentations that they saw.

The lesson was about setting up a small office for the magazine project. Learners created a questionnaire (through my advice) and they are going to collect data and analyze it using Microsoft Excel. After carefully scrutinizing the need of the school community, they would then use Publisher to design posters for advertising the magazine. Thereafter, they get relevant articles and news that the school would like to read.

Learners worked in pairs doing research on a famous person. They then prepared a TV interview. One learner being the interviewer and the other the famous person. They had to type and prepare the interview in dialogue style, using Word in the IT Class. They then played out the interview in the English Class. After which they came back to the IT Class and prepared a magazine article on the same famous person. Doing more research, gathering pictures from the Internet. They then write the article in a Newsletter using Publisher.

Fund raising effort for the school - Music Concert. The learners must arrange a concert for the school in order to raise funds. Which famous band/singer will you approach to perform? Will they be available and at what cost? Compare 3 possibilities of artists to perform. What would the venue be and at what cost? How would you advertise? Where would the artist stay and at what cost? Which arrangements will be made for protection (security companies)? What would the ticket prices be? Will you be able to make a profit? Make sure you do. Assessing information. The learner should provide answers to the following questions in this progress document: Where can you find the information? The Internet, telephone directory, other people that have organized a similar event, magazines, newspapers etc. Which search words were used to look for the needed information on the Internet? Deciding on the relevance of information. Learners describe how they decided whether the information found was valid eg they checked the dates on the websites, when was it last updated, who uploaded the site and whether all the links work. Learners should also have checked information found eg dates in magazines. Presenting the document. Learners should present information in a word

processing/spreadsheet/publishing/presentation document in such a way that they demonstrate their skills. They should also show that formatting in a document can enhance the content. Search the Internet or magazines for artists of your choice. Draw up a questionnaire to establish the popularity of the artist amongst your school friends and people in your community. Use MS Word and draw a table listing the 3 possible artists to perform. Compare them with each other, availability; rate them in popularity, cost, special treatment etc. Draw up a spreadsheet indication of all your costs involved. Design an advertisement for the local newspaper to advertise this event. Design a poster as part of your advertisement. Make use of MS Publisher and design a ticket. Compare the different rates and facilities of possible places for the artist to stay. Compare the cost of hiring different security companies with each other.

I have been in three different schools since I did my training. Just after training the Grade 7 class went on an excursion to Isandlwana. I used that opportunity to get learners to type their own "story" about the trip. They then used Word and made a brochure for tourists, inserting their own photos and telling something of the history. Apart from this I have used my own laptop in my class in another school where I was teaching last year as there were no computers there. I cached websites on water conservation and got the class to work in groups of four. Each group had a turn-over period of a week to have access to the laptop and research a given topic such as drought; floods; dams; rivers etc. They also used e-mail to communicate with another rural school. I am presently teaching grades 2 to 3 and I integrate class work with technology on a daily basis.

Visual ranking tool to establish the steps needed if an extreme weather event occurred ie floods which we have had lots of in the Cape lately, or a tornado. How would we react and what steps are needed to minimize the effect?