Intel® Teach 2008 Evaluation Report:

A Focus on the Western Cape Education Department Intel® Teach Essentials Model

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FINAL REPORT

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Contents

Acronyms

CA:	Curriculum Advisors
CAT:	Computer Applications Technology
ICT:	Information and Communication Technology
IT:	Information Technology
ITE:	Intel® Teach Essentials
FET:	Further Education and Training
LO:	Life Orientation
NBA:	Neil Butcher and Associates
SchoolNet SA:	SchoolNet South Africa (SA)
SMS:	Short message service
WCED:	Western Cape Education Department

Introduction

Neil Butcher and Associates (NBA) have been evaluating the Intel® Teach programme in South Africa since 2003. From 2003 to 2006, this research has included case studies at ten schools, conducting annual impact surveys, post training surveys, interviews with provincial representatives, a provincial implementation case study, and case studies of individual teachers using computers in the classroom. In 2007, the focus was on researching use of the Intel® Teach programme for pre-service teacher education. Each has resulted in an annual evaluation report (2003-2007).

In 2008, NBA was again approached to evaluate the Intel® Teach programme in South Africa, however the focus of the evaluation was to be on the Western Cape Education Department's training model. The 2008 evaluation of Intel® Teach sought to achieve the following objectives:

- Develop an understanding of the Western Cape Education Department (WCED) training model being used with Intel® Teach materials and approaches; and
- Develop a record of a selection of teachers' responses to the WCED training experience and its reported impact on their classroom practice.

The following primary evaluation questions guided the research:

1) What model has been adopted by the WCED in using the Intel® Teach materials?
2) What are the responses (strengths, weaknesses, and perceptions of value) of this model from the perspective of:
   a) Programme managers and trainers; and
   b) Teachers participating in the programme.
3) How does a selection of teachers who have participated in the WCED Intel® Teach training report that it has impacted on their classroom practice, if at all?

This 2008 Intel® Teach evaluation consisted of the following main deliverables:

1) Exploration of the WCED in-service Training Model using Intel® Teach materials and approaches;
2) A record of a selection of teachers responses to the WCED training experience and its reported impact on their classroom practice;
3) Collation of the above into an annual evaluation report.

This report is Deliverable Three and provides a consolidation of the 2008 evaluation.

The WCED training using Intel® Teach materials and approaches is referred to by the WCED project implementation team as Intel® Teach Essentials (ITE) training. It will be referred to as the WCED ITE training throughout this document.

Data Gathering

For the 2008 evaluation, various data-gathering techniques were used for Deliverables One and Two as outlined above. We describe each in turn.

We first describe the process for Deliverable One – the exploration of the WCED ITE training model. Two teacher centres in the Western Cape, one in Kuils Rivier and another in Worcester, ran in-service teacher training on an ongoing basis during 2008. This training

model involved taking teachers out of their schools and engaging them in a one-week training programme on integrating Information and Communication Technologies (ICT) into their classroom practice using the Intel® Teach materials and approaches. The training was run by WCED officials, and an external quality assurer was appointed to oversee the assessment components. The following data gathering techniques were used to gain an understanding of this model:

1) Collection and review of available documentation and data on the WCED training model.
2) Unstructured group interview with key project role players (Mike Chiles, Gerald Roos, Saaid Agherdien, Andre Wiese).
3) Semi structured interviews with:
   a) The ITE project manager (Saaid Agherdien);
   b) The two WCED trainers (Thea Victor and Moederick Jacobs);
   c) Deputy Director Centre for e-innovation in the Office of the Premier in the Western Cape (Andre Wiese).
4) Questionnaire response from Quality Assurer of SchoolNet South Africa (Gerald Roos).
5) Observation of part of a training session for a case study training group at each of the two teacher training centres in the Western Cape.
6) Collection of teacher feedback questionnaire on the training experience for the case study training groups (Kuilsrivier: n=10; Worcester: n=11).

We turn now to the process adopted for Deliverable Two – a record of a selection of teachers' responses to the WCED training experience and its reported impact on their classroom practice. The purpose of this component of the evaluation was to gather teacher feedback on the WCED training model, and record reported changes in classroom practice resulting from the training.

The original research design for this was to undertake the following data gathering activities:

1) Two case study school visits, where schools involved in the training would be visited and teachers involved in the training would complete a short survey questionnaire and participate in a focus group or short interview. Case study schools were to be selected opportunistically.
2) Focus group, survey, or spot telephone interviews conducted with a sample of teachers who had participated in the training.

However, following consultation with SchoolNet South Africa and Intel®, it was agreed that the approach to this Deliverable would change and new techniques for gathering feedback would be piloted. This new technique is referred to as the Most Significant Change (MSC) methodology.[1] The main feature of the MSC approach is that participants in projects are not asked directed and closed questions about an intervention, but rather are invited to tell or write a personal story about what they think has changed for them as a result of the intervention. They are encouraged to see this as a personal story or narration, rather than having to respond to pre-defined questions.[2]

[1] Davies, R & Dart, J (2005) *The Most Significant Change (MSC) Technique: A Guide to its Use.*

[2] The MSC technique is significantly more complicated than this, with an agreed process involving participants to review and select stories which they consider to embody the most significant change in relation to agreed domains for each intervention (See Davies & Dart 2005). It was felt that for the purposes of piloting this technique for the Intel® Teach evaluation, that only a process of collecting significant change stories would be embarked upon. No participant process for reviewing and selecting most significant change stories was planned.

It was felt that, because evaluation work on the Intel® Teach Essentials training in South Africa was in its sixth year and data had been collected from other sources in the closed format, this technique might provide richer and more detailed information about the ways in which particular teachers in specific schools were implementing their lessons at classroom level. It was also hoped that the resulting stories could be in a publishable format, thus forming a basis for lesson ideas of models of good practice to use in other contexts. The decision was therefore taken to pilot a process of collecting MSC stories from teachers who had participated in the WCED Intel® Teach training.

As a result, the following data gathering activities were undertaken for Deliverable Two:

1) One of the evaluators attend the Intel® Awards ceremony, where teachers were rewarded and congratulated for their involvement in the programme.
2) At this award ceremony, an evaluation questionnaire was distributed and collected from teachers in attendance (n=19). It was recognized that this group represented those who had excelled in the course.
3) A Most Significant Change methodology was piloted, where a competition was set up for teachers to tell their personal stories about how the Intel® Teach training had changed or benefitted their teaching. The competition was advertised via the WCED e-mail distribution list, in addition to using the e-mail addresses that teachers had submitted when attending the training. Several e-mail reminders and text reminders about the competition were sent out to all teachers on record who had participated in the training:
   a) 541 e-mails sent to e-mail addresses from WCED records of attendance, 3rd December, 2008;
   b) Bulk SMS sent to 460 cellular phone numbers from WCED records of attendance, on 19th December, 2008;
   c) Reminder e-mails sent on 30th December, 2008;
   d) Bulk SMS reminder sent on 6th January, 2009;
   e) Reminder e-mails sent on 14th January, 2009;
   f) Bulk SMS reminder sent on 16th January 2009;
   g) Reminder e-mails sent on 30th January, 2009; and
   h) Bulk SMS reminder sent on the 06 February 2009.

   Given the time of year and school holidays, it was agreed that final submission for stories would be on 14th February, 2009. This gave teachers who had attended the training in 2008 adequate time to write their stories.
4) The evaluation research team received 20 responses or enquiries from teachers about the competition. Six significant change stories were submitted. From these, the two top stories were selected and received their prizes.
5) The teachers submitting these winning stories were then asked to participate in an interview and a school visit with an evaluation researcher. These two winning entries were purposively selected as the case study teachers (or schools) to demonstrate how the Intel® Teach programme had been received at school level. A case study write-up of each teacher was collated. The case study was compiled drawing on the following data sources:
   a) The stories submitted by the teachers who had attended the Intel® Teach training;
   b) An interview with the teacher at the school;
   c) An interview with the principal or head of department at the school;
   d) Informal discussions and lesson observation of learners while at the school.

The data collected through these activities was then analysed and presented in an evaluation report. This was circulated to Intel® and SchoolNet South Africa to invite comment on

accuracy of the descriptions and to seek additional clarification on particular findings. The comments from these organizations were then integrated into the report before it was circulated with the relevant WCED officials. Again, comments were invited on the accuracy of the descriptions and an opportunity to explain or comment on particular evaluative findings was provided. The comments provided through this process were then integrated into this final evaluation report.

Description of the WCED ITE Model

This section presents the findings and provides evaluative comment for Deliverable One of the 2008 Intel® Teach evaluation: exploration of the WCED in-service training model using Intel® Teach materials and approaches.

Overall Management and Implementation

After several years of Intel® Teach courses being run in the Western Cape by SchoolNet South Africa and using Intel® funding, the responsibility for continuing a component of this training was passed to the WCED. During 2008, two teacher centres in the Western Cape, one in Kuilsrivier and another in Worcester, ran in-service teacher training on an ongoing basis. This training model involved taking teachers out in subject groups or specialization from either primary or secondary schools and engaging them in a one week training programme on integrating ICT into their classroom practice using the Intel® Teach materials and approaches. The training was run by WCED officials and an external SchoolNet South Africa quality assurer was appointed to oversee the assessment components.

Several factors are noteworthy about this model in comparison to other training approaches. First, the training was offered by the provincial Department of Education and provided at teacher centres in the province.[3] Second, the training took place during the week in school time. Substitute teachers were paid to take on participating teachers' classes and school responsibilities during this week. Third, curriculum advisors at district level participated in the training with the relevant group of teachers.

Relations Between Government and Main Role Players

There are four main role players involved in the Intel® Teach Essentials programme in the Western Cape: Intel, SchoolNet South Africa, the WCED and the Centre of e-Innovation in the Office of the Premier of the Western Cape. The role of each is described as follows:

Table 1 Key role players and their functions in the WCED ITE model

Organization	Person responsible	Role
SchoolNet South Africa	Janet Thomson and Gerald Roos	SchoolNet SA is the custodian of the Intel® Teach programme, undertakes quality assurance, and trains trainers. All assessment of teachers is done by SchoolNet, including assessment of portfolios that teachers produce during the course. The organization issues certificates for participating teachers and has facilitated accreditation of the course by SAQA (The course carries 16 credits).[4] SchoolNet's role was limited to training of senior trainers, assessment of portfolios produced by teachers, and provision of

[3] The WCED used senior trainers who had been trained by SchoolNet South Africa to facilitate the Intel® Teacher Essentials the course.

[4] Interview with Deputy Director of e-Innovation Centre, November 2008.

Organization	Person responsible	Role
		certificates. SchoolNet organized an awards ceremony to congratulate those WCED teachers who had achieved Gold and Silver standard portfolios during 2008. In addition, SchoolNet provided a degree of quality assurance that was agreed upon by the WCED. This took the form of ensuring that senior facilitators/ trainers reached the required standard before being allowed to train teachers.[5]
Intel	Parthy Chetty	Original project funder from 2003-2005. Subsequent involvement in providing training materials and support, as well as funding evaluation activities.
Centre of e-Innovation in the Office of the Premier of the Western Cape	Andre Wiese	Motivated for continuation of Intel® Teach programme in the WCED. Provided human resource support and guidance to ITE project manager. Secured incremental funding from WCED for continuation of the programme.
WCED	Saaid Agherdien	Project management of WCED training: including logistical organization of training, recruitment of teachers, and management of finances.

There was a clear shift in responsibility in the project from 2005 onwards, where the WCED was invited to continue certain components of the ITE training work in the Western Cape province.[6] The WCED was invited to draw on the materials and approaches which had been adopted by SchoolNet South Africa in offering the training programme in prior years. The WCED was not initially in a position to take on this role. Subsequently, however, through intervention of the Centre of e-Innovation, which is located in the Office of the Premier in the Western Cape, a project manager for the programme was appointed, incremental funding was raised to offer the training to WCED teachers, and training was offered via the two identified teacher training centres in the province. This was undertaken from 2007 onwards.

Scale of the WCED ITE Intervention in 2008

The key people involved in project management of the WCED training reported that about 500 teachers participated in the course in 2008 and that they planned to increase this number in 2009.[7] Uptake was described as follows by the project manager:

> In 2008, a total of 40 training sessions were conducted with 20 of these taking place at the training centre at Worcester and 20 at the training centre in Kuils Rivier. According to their planning, it was anticipated that each training session would have at least 17 teachers. Due to unforeseen circumstances only about 520 teachers and curriculum advisors were trained in the 2008-2009 financial year.[8]

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[5] Project manager questionnaire, SchoolNet SA director, March 2009

[6] SchoolNet SA continued to offer training in the Western Cape, through various projects, including Intel® and Microsoft Partners in Learning. There is still some training funded by Intel® as well as Intel® training funded by other directorates/sections of the WCED - such as Dinaledi Schools project and the WCED Focus schools project - which trained more than 80 teachers from a range of schools across the province also in 2008. This evaluation focuses on the ITE training offered by the WCED as directed from the Centre for e-Innovation in the Office of the Premier. Communication with SchoolNet SA, April 2009.

[7] Semi structured group interview with key project role players, October 2008.

[8] Interview with ITE project manager, November 2008.

The overall budget for this intervention is substantial. The deputy director of the Centre of e-Innovation Training Unit explains that:

> The course is funded by the WCED from the Internal Human Capital Development budget. Funding for the course started three years ago, at about R600 000 per annum. For 2008-2009 the allocation for the ITE Project is some R1 500 000, which has been increased for the next financial year.. The average cost of the ITE course is about R3000 per person per course, including the cost of seconded teachers, transfer payments to schools, training materials, catering as well as accommodation. [This should be viewed in relation to an overall provincial budget on e-Learning:].[9]

According to the new ITE project manager, the WCED Intel® Teach Essentials budget is in the region of R1.8 million for the 2009 period. The target is to train at least 600 WCED educators and support staff. This budget excludes e-Innovation centre costs, and makes provision for the following:

- R1000 transfer payments are made to schools for the replacement of their educators who are on the five day ITE training course.
- Participants' travelling costs are subsidised in accordance with monthly tariff rates provided by the Department of Transport.
- Participants that need to travel more than 120km a day are eligible to receive accommodation at a guest houses close to the training venue.
- Catering which includes a morning tea and lunch for the week are also covered by the project funds.
- A flash disk containing the ITE course material for each participant.
- SchoolNet SA for portfolio assessments and certificates.
- Salaries of two administrative staff and two replacement educators for the two provincial ITE trainers. (Now four seconded teachers facilitating ITE training sessions and three admin assistants.) [10]

The WCED ITE Course Structure

Course Aims and Purposes

The Intel® Education international website, describes the Intel® Teach Programme as

> Helping K–12 teachers to be more effective educators by training them on how to integrate technology into their lessons, promoting problem solving, critical thinking and collaboration skills among their students.[11]

Intel® Education in South Africa, describes the Intel® Teach Programme as follows:

> Intel® Teach – Essentials is available at no cost to both experienced educators and pre-service educators to help them integrate technology into instruction and enhance student learning. Educators receive training on how best to create assessment tools and align lessons with educational learning, goals, and standards. The program incorporates use of the Internet, Web page design, and student projects.[12]

Very similar course objectives are evident in the WCED ITE model in South Africa. Key people involved in project management of the WCED training, reported that the WCED ITE

[9] Interview with Director of e-Innovation Centre, November 2008.
[10] Project Manager, ICT training, Centre for e-Innovation, e-mail communication, March 2009.
[11] Intel international, http://www.intel.com/education/teach/index.htm?iid=ed_nav+teach
[12] Intel South Africa, http://www.intel.com/cd/corporate/education/emea/eng/za/elem_sec/teach/341215.htm

course is project-based and teachers are taught how to integrate technologies in teaching and learning.[13] They explained that, during training sessions, teacher participants design projects and collate a portfolio which is the resulting artefact from their intended learning.[14]

Each role player had a slightly different personal description of the course aims and purpose. Their responses are tabulated below:

Table 2 Project managers and trainers perceptions of the course aims and purpose[15]

Role player	Description of aims and purpose
Deputy Director of e-Innovation Centre	Looking at outcomes in the Intel® Teach course, it is educational. It introduces teachers to new ways of working in the classroom. Its focus is on teaching content through projects. All who have been teachers find it easy to understand. It is a course based on needs. It is a customized course. It assists teachers on how to use technology in the classroom. In the Western Cape we have a Khanya Project which focuses on basic ICT skills and they have to move schools to e-learning. The Intel® Teach course offers much more. It is about using technology creatively in the classroom. It opens new fields for teachers and learners and shows them that there are other things that they can do.
ITE project manager	As a teacher I have always been worried by my inability to get my learners to think and when I was told that we were going to be offered a course that would help us to help learners develop high order skills, I decided to take the course after which I went back to implement in my class and was convinced that the course had potential to help learners develop higher order skills. I was able to get learners more involved and excited about learning. So when I came to work as Project Manager I thought that the course might motivate teachers to want to teach again because many teachers are disillusioned. This is one of the reasons why many of them come to do the course. We hope that the course will get them excited and motivated to want to go back to their classes to do things differently and to get their learners motivated about learning again. From my personal experience it works. So basically we are hoping to get teachers excited about teaching and get learners motivated to learn.
WCED trainer	To help teachers integrate computers in their classroom work. Some of the teachers had wanted to do it but had not been prepared. So the course aims at giving them a proper plan on how to do it.
WCED trainer	The course integrates ICTs and the curriculum through project based learning. The course aims to give learners an opportunity, through teacher facilitation, to learn. It aims to promote high order and thinking skills.

From the above responses, it is clear that the WCED ITE course aims to support teachers in integrating technology into their classes. Its focus is not on basic ICT skills in isolation, but on pedagogical approaches. It does this by encouraging a project-based learning approach and focusing on higher order thinking. A key part of the purpose of the course – as articulated

[13] Semi structured group interview with key project role players, October 2008.
[14] Semi structured group interview with key project role players, October 2008.
[15] Individual interviews with direct of e-Innovation centre, ITE project manager, and WCED trainers, November 2008.

strongly by the ITE project manager – is to improve motivation for both teaching and learning.

Key project role players reflected what they thought may change in teachers' classroom practice as a result of the ITE course, in relation to their use of technology, and their classroom teaching.

One of the trainers reported that use of ICT should be viewed by teachers 'as a tool for supporting learning in the classroom. Teachers must prepare in order to support learning'. In terms of shifts in classroom practice, one of the trainers reported that:

> They [the participating teachers] change in the way they facilitate their lessons and that they will go the project way. Some teachers have asked how they should use curriculum content and I have said they must use projects. This will force learners to find information for themselves not to give too much but allow learners to find information to learn and for teachers to support them.[16]

Speaking from his own experience, in schools, the project manager mentioned the power of ICT to connect learners to the world and access information from the internet, to allow for communication with other learners, and help them to think:

> What got learners excited was that as part of their classroom work, they could go into the Internet, search for and find information. This exposed them to a whole new world. They could communicate with other learners internally and externally. They worked differently and this helped them to think, taking them to next level.[17]

Course Assessment and Accreditation

The WCED ITE course is assessed using informal formative assessment during face-to-face training sessions, and summative assessment of a portfolio prepared by each participant. A minimum portfolio must be prepared and submitted by the last day of the course (Friday), but participants are then given a week or two to rework it before submitting it for final assessment.

Portfolios are marked externally by a SchoolNet South Africa representative and returned with a marking rubric and assessor comments. There is some limited opportunity for participants to resubmit portfolios for remarking. This process was described in very similar terms by both trainers and the project manager, as reflected in this table:

Table 3 Descriptions of assessment requirements

Role player	Description of WCED ITE assessment requirements
Project manager	A formal assessment is done at the end of the course by SchoolNet. During the training sessions, trainers do conduct informal assessment by for example checking on what teachers are doing and supporting them. By the end of the course teachers need to produce a portfolio of which the minimum requirements are clearly stipulated. This includes a Project plan which covers description of the project, assessment strategy, learner support materials, learner samples and teacher support materials. Their portfolios get submitted to SchoolNet for marking. They come back with a mark, rubric used for assessment and comments by the marker. Teachers can use the feedback

[16] Individual interview, WCED trainer 1, October 2008.
[17] Interview with ITE project manager, November 2008.

Role player	Description of WCED ITE assessment requirements
	provided by the assessor to rework and resubmit their portfolios. On few cases teachers have asked if they could re-submit. Due to budgetary constraints we have not been able to offer then all the opportunity. We have only done so in cases where we had identified a person as a possible future trainer.[18]
Trainer 1	During the training sessions the trainers provides teachers with feedback on a continuous basis. On Fridays teachers present their portfolios and they are given feedback. They are given a week to incorporate the feedback and to submit their portfolios. The trainer has to ensure that all the portfolios have been completed i.e. ensure that all minimum things that should be in the portfolio have been included. It is not part of the trainer's role to check or assess the quality. The trainer then submits the portfolios to the external assessor. When the portfolios come back the trainer looks at the comments and expresses their opinion where necessary. At the end of the course teachers must have produced portfolios. The portfolios cover the following: • 1 Learner sample; • 3 Assessment tools (encompassing pre, formative and summative); • 2 Learner support tools; and • 1 Educator support tools.[19]
Trainer 2	During the training, trainers do a lot of informal assessment by checking on what the participants are doing and advising them. They also look at one another's work and give one another feedback. I try to get to every single person, go through their projects and give feedback. Friday morning, teachers present their work and are given feedback. After the presentations we give them one or two weeks to make changes before the portfolios are sent to the external assessor. When the assessors are finished they send the portfolios back to the trainer with feedback and the trainer forwards the portfolios to the teachers. Teachers who want their work to be remarked are allowed to do so. Only one teacher had indicated willingness to resubmit for remarking but had not done so.[20]

The project manager explained that the ITE course was initially intended to carry a certain number of Continuing Professional Development (CPD) points for teachers, and so accumulate towards their professional development requirements. However, the CPD process has not been finalized, and so this not yet in place. It is also possible to have successful completion of the course formally recognized as the first assignment of a module within an Advanced Certificate in Education (ACE) course as offered by the University of Kwazulu Natal.[21] It is not known how many WCED teachers, if any, have opted to take on a formal programme, as this has not been tracked.[22]

Mode of Delivery

Teachers taking the course were required to attend one week of face-to-face training at one of the two training centres in Kuils Rivier and Worcester. [23]

[18] Interview with ITE project manager, 11 November 2008.
[19] Interview with WCED trainer 1, November 2008.
[20] Interview with WCED trainer 2, November 2008.
[21] Clarification obtained from G. Roos, April 2009.
[22] Interview with ITE project manager, November 2008.
[23] Semi structured group interview with key project role players, October 2008.

Each group taking a course comprised a maximum of 17 teachers. Facilitated sessions ran from approximately 8am to 4pm, from Monday to Friday. There were two half-hour breaks for tea, and a one hour break for lunch. Tea and lunch were provided at the training venues.[24] The training took place during school time. Schools organized for replacement teachers, who were paid through the project budget.[25]

During facilitated sessions, participants each had access to a computer. They were guided through the manual and in completing these activities for the course. The facilitator made use of a data projector, and mixed a presentation style with plenary discussion and individual work on particular activities. Activities in the sessions were described as follows by one of the trainers:

> We start by trying to let people who do not know about a project plan know about it, so that they know steps to follow in developing a Creative Project Plan which covers assessment standards and assessment tools. It also requires teachers to do a project as if they are learners so that they get a feel of what the outcome of their project plan would look like and let them realize areas where they can support learners and where learners can do things on their own. In that portfolio teachers also have to create support documents that they think kids will need, create documents to support themselves or other teachers who would do similar projects. During the course we also spent some time on copyright laws so that teachers understand ways of using information that they get on the Internet.[26]

Course Materials

Teachers participating in the ITE course received a printed manual, a flash drive or memory stick containing the course Compact Disk (CD) content, and several printed handouts such as the programme schedule.[27] The decision to provide content – which is usually on a CD – on a memory stick was taken so that teachers were able to save their work during the course and take this work home with them.[28]

Recruitment and Selection of Teachers to Participate in the Course

Participating teachers were drawn from different schools in the WCED and come from different phases, grades, and learning areas. [29] The process of identifying and recruiting teachers for the training programme was described as follows by the ITE project manager:

> In preparing for training sessions we communicated with curriculum managers and advisors in the five districts offices and gave them guidelines on how they should recruit participants. These included the fact that four spaces were provided for per learning area, not more than two teachers per school, per learning area and so on. The Curriculum Advisor (CA) would then communicate with schools and teachers. The CA would then forward a list of possible participants to the course to the project manager. The office of the project manager would then communicate with the identified teachers to ensure that

[24] Researcher observations of training sessions, November 2008.
[25] Semi structured group interview with key project role players, October 2008.
[26] Interview with WCED trainer 2, November 2008.
[27] Interviews with ITE project manager, WCED trainer 1 and trainer 2, observation of training session November 2008.
[28] Interview with ITE project manager, 11 November 2008.
[29] Semi structured group interview with key project role players, October 2008.

> they understood what the course was all about and what would be required of them. This was to ensure that the course was in line with their expectations and that they understood fully what is going to be covered in the course.[30]

This is an important part of the WCED model, as curriculum managers and district officers are directly involved in recruitment for the course. Curriculum advisors are also encouraged to participate in the course. The course is part of district support offered to schools, and not completely divorced from these processes (as is often the case in other provinces).

Being comfortable with basic computer use was considered to be a requirement for taking the WCED ITE course. The project manager described this requirement as follows:

> The course focuses on pedagogy and assumes that teachers already have technological skills. We expect teachers to be comfortable with the technology. It does not have time to teach people basic computer skills. So the requirement is that teachers must have done computer skills and are already using computers for things like administration, planning, typing examination papers etc. Our course focuses on bringing technology and pedagogy together.[31]

Although this is the case in theory, implementing this requirement in practice was more difficult. This is discussed in greater detail in the evaluation analysis.

Selection, Preparation, and Support for Trainers

Trainers were selected from amongst teachers in the WCED who had completed the ITE course run by SchoolNet SA in previous years. They were required to have proven track record with SchoolNet SA training or have attained 'gold status' on the SchoolNet SA ITE course. Where a potential trainer clearly showed potential to offer the training but did not meet these criteria, they were required to complete the course to attain the 'gold status' level.[32] It was thought to be important that the trainers were good teachers and were based in the area where they would train.[33] Trainers selected were bilingual and able to code-switch from English to Afrikaans when teachers chose to use Afrikaans. Although the materials were developed in English, having bilingual trainers to allow such code-switching and engage in discussion in the language with which teachers were most comfortable was important.[34]

Trainers went through some additional training with SchoolNet SA before taking on their trainer role. The SchoolNet trainer (and quality assurer for the course) also offered to provide electronic support to them after this orientation training. This was viewed positively by the trainers:

> We did get some training from SchoolNet SA. They take us through the manual before the training. Also, if you have any problems you can email Gerald from SchoolNet for advice. So we do get a lot of good support when we need it.[35]

Staff meetings at the e-Innovation centre were also reported to be a means of providing support to the trainers and ad hoc contact with SchoolNet SA for support. There were also reported plans for contact with trainers offering similar programmes in other provinces:

> We have staff meetings where trainers are able to share experiences. We also do get [the SchoolNet SA representative] to do refresher courses. We are planning to have a little

[30] Interview with ITE project manager, 11 November 2008.
[31] Interview with ITE project manager, 11 November 2008.
[32] Interview with ITE project manager, November 2008.
[33] Interview with Deputy Director of e-Innovation Centre, November 2008.
[34] Researcher observation of training session, November 2008.
[35] Interview with WCED Trainer 1, November 2008.

workshop that will involve people from other programmes as well where we can discuss issues together. This may be physical or electronic.[36]

Feedback from Teachers on the WCED ITE Course

On completion of the course, participants were required to complete a course evaluation questionnaire as a way of giving feedback to the trainers and project managers.[37] At the time of collecting data for this evaluation report, this feedback had been captured but not systematically analysed or reported.[38]

Perceptions of Effectiveness of the Model from Key Role Players

This section provides an overview of evaluative comments that key role players made about the WCED ITE course. They reported their views on teacher response to the course and its impact in schools. They also reflected on strengths and weaknesses of the model and its implementation.

Teacher Response and Impact

Based on informal feedback and their familiarity with the evaluation feedback questionnaire data, trainers both felt that there had been a positive response from teachers to the course.

Table 4 General reports on teacher feedback on the WCED ITE course

Role player	Reported teacher feedback on the course
Trainer 1	Those who have implemented the course are positive and see its value. Some have indicated that they have logistical issues in their school where for example they are not able to access computer laboratories at their schools.[39]
Trainer 2	We have received very positive feedback. One teacher went back to his school and said that the course was a waste of time. But that teacher was often out of the classroom during the session giving a lot of excuses that he was making arrangements for a rugby match at his school. All other teachers have been very positive. Some have reacted that they are 'born again teachers'. Some have said that they feel motivated to go back to the classroom and apply what they have learn in the classrooms. Some of the teachers have indicated that they have had challenges implementing what they learnt due to lack of facilities for example you find that there is only computer which is the headmaster's office.[40]

In these comments about teacher feedback, both trainers reported on cases of teachers having difficulties implementing what they had learnt on the course when they were back at their schools due to lack of access to ICT facilities.

[36] Interview with Deputy Director of e-Innovation Centre, November 2008.
[37] Semi structured group interview with key project role players, October 2008.
[38] As such we have included analysis of this internal feedback data as part of this evaluation report.
[39] Interview with WCED trainer 1, November 2008.
[40] Interview with WCED trainer 2, November 2008.

The e-Innovation centre Deputy Director, project manager, and both trainers all felt that the WCED ITE course was valuable and was having an impact in the WCED schools:

Table 5 Reported impact of the WCED ITE course

Role player	Reported impact of the course
e-Innovation centre Deputy Director	We believe it is an excellent investment. All teachers are positive when they finish the course. Those who have had bad experiences with the course it is usually as a result of lack of competence be it in their knowledge of the curriculum or due to lack of required computer skills.[41]
Project manager	From informal interaction with teachers who have been to the course, they tell us that they have used certain aspects of the course. So the response has been generally positive. We have seen teachers excited about having implemented aspects of the course. Sometimes we get phone calls from principals who while enquiring about other things also give positive feedback about teachers who have been to the course. [42]
Trainer 1	I think it is [having an impact]. We have to look at the results in terms of people getting gold, silver and bronze awards with an assessment done externally.[43][44]
Trainer 2	I think it is having an impact. I have spoken to a few teachers. Every time I see them I ask they have applied what they learnt and they are all positive and that kids enjoy what they do in class. The course has ensured that they do not just use computers as glorified type writers but that they use technology in classrooms for teaching purpose. Many say want laptops and overhead projectors to show kids what can be done. Some said they have started projects to recycle paper so that they can raise money to by data projectors. The course has taught them that they should not rush through their work but should give learners a chance to answer high order and thinking questions.[45]

Evaluative Reflections on the Course

In general terms, it was felt that the WCED ITE course was effective and that the model adopted was working and successful. The fact that teachers leave their classes for a week to attend the training was thought to have both positive and negative results. However, project role players thought that the positive results outweighed the negative ones. The key positive factor was that, for the relevant week, participating teachers were able to focus on the course and its requirements. This was thought to be a better model than those where teachers either have to attend sessions in the afternoon or during school holidays.[46] This view was shared by the trainers, with one emphasizing the teachers' ability to focus in the intensive sessions:

> I think the model is working. During the time that teachers are here they are able to focus on the course and the materials they are given. They have time to pay attention to

[41] Interview with e-Innovation Centre director, November 2008.
[42] Interview with ITE project manager, November 2008.
[43] Interview with WCED trainer 1, November 2008.
[44] The SchoolNet South Africa records of assessment for the WCED Intel training includes the results for 292 teachers. These show that 4% of these teachers were awarded Gold certificates, 17% were awarded Silver certificates, and 40% were awarded bronze certificates. 26% of these teachers in the assessment records were issued certificates of completion, and 12% were not awarded a certificate. (Assessment records obtained from SchoolNet SA director, April 2009).
[45] Interview with WCED trainer 2, November 2008.
[46] Semi structured group interview with key project role players, October 2008.

> the course, which was going to be difficult if they to do it through for example distance learning.[47]

The other emphasized the content shift to integrate technologies into the curriculum:

> [The WCED ITE model] is a positive staff development initiative. It is a great start for integration of technologies into teaching and learning. Most teachers are unable to integrate technologies and the curriculum and this is the strength of the model.[48]

The Deputy Director of the e-Innovation Centre reported the following when reflecting on the model being adopted:

> We have concentrated on the quality rather than quantity. We looked at introducing other training models but were not in favour of the weekend model because we felt there was too much training required on teachers so we tried to stay clear of the weekend model. The Cape Teaching and Leadership Institute is the only organization allowed to train teachers during school hours as part of their professional development. We had to convince the management to do the training under the same banner with the same conditions that no teaching time was lost hence we had to introduce the concept of replacement teachers whom we pay. So we are comfortable in the knowledge that we are not losing too much teaching time.[49]

In terms of considering alternative models, such as including some distance education components, the Deputy Director went on to explain:

> We have thought about [alternative models] but do not have any plans for now. Next year we will deliberate on other models such as getting more people involved. This may include making use of people who have done the course to do it at school level. We may look at a model that will involve surrounding schools as well and perhaps an electronic course in the form of e-learning but this might not be easy because not everybody is a self-directed learner. Also our experience is that giving people a CD and hoping that they will learn by themselves does not work. People need to be assisted. So we will have to weigh all these options. We will also have to look at possible ways of collaboration with other ICT programmes.

The project manager shared these views, and demonstrated that alternative models had been considered:

> Fortunately, having been a teacher I have been involved in a couple of other models of training that included out-of-teaching where teachers are trained during school holidays or on weekends. I have been through the cascading models where a certain number of teachers are trained and they would be expected to train others. I understand the strengths and weaknesses of these models. The idea of taking teachers out of the classroom during school ours as part of their professional development enables them to focus on the course rather than worry about other things happening in their schools. The WCED agreed on this model on conditions that we would find replacement teachers so that no teaching time was lost. Superficially the model works, because it is able to get teachers to focus on the course but whether it is significantly different in terms of impact remains to be seen because we have not conducted any impact evaluation.

He was, however, cautious to claim that the model was having an impact at school level in the absence of an impact evaluation. Notwithstanding this caution, there generally seemed to

[47] Interview with WCED trainer 2, November 2008.
[48] Interview with WCED trainer 1, November 2008.
[49] Interview with Deputy Director of e-Innovation Centre, 13 November 2008.

be agreement amongst the key role players that the model was working, and, while some areas might need attention, the overall approach was appropriate.[50]

Key project role players identified the intensive nature of the course, which allows teachers to focus on the course content and takes them away from their school commitments, as a major strength of the model. Use of replacement teachers to facilitate this was thought to be an asset.[51]

There were also positive comments on the possibility of bringing together teachers from the same learning area to participate on the course:

> It has proven useful to bring people together in subject groupings. We have tried to get people from the same learning areas for each of the training sessions but this was not always possible. In Worcester for example it is difficult to get fifteen teachers from the same learning area. Even if you did it would be difficult to find placement teachers. And this would have been more difficult in learning areas such as Mathematics. However bringing teachers same learning area together brought a lot of momentum. We think they have shared knowledge and resources and have gained from one another.[52]

In this regard, the role of Curriculum Advisors (CAs) in convening the groups, as well as being involved participants in the course (in some cases), seems to have been an important feature of the WCED model. One of the trainers explained that, as CAs are responsible for inviting teachers to come to the course, it is often the case that they come from the same learning area.[53] The importance of the CA role was recognized by the programme manager:

> Curriculum advisors are important in the course. They have assisted in terms mind shift. The course is a radical move from some teachers and therefore support from Curriculum Advisors is very useful and we were happy to see some of them attending the course.[54]

Including CAs in the course was also seen by a SchoolNet SA representative to be an important factor in the success of the WCED.[55]

One trainer felt that the content and instructional design of the course was a key strength:

> I think the fact that people coming benefit from the idea that when teaching they must involve higher order thinking skills in classroom. It focuses on one specific question and works around the question. The course itself is also well done in terms of the layout.[56]

Within this context of a generally positive view of the WCED ITE course and the model it had adopted, there were areas of weakness or challenges identified by the key role players. These included:

- The quality of and turnaround time for assessing portfolios and consistency in assessment of portfolios;
- Lack of follow-up support for teachers once they return to their schools after the course;
- Lack of screening of basic ICT skills when selecting teachers to participate in the course;
- Local relevance of the course to the South African curriculum context;
- Poor quality or poor preparation of replacement teachers who substituted at the schools for the teachers while they were on the ITE training course.

[50] Semi structured group interview with key project role players, October 2009.
[51] Semi structured group interview with key project role players, October 2009.
[52] Interview with Deputy Director of e-Innovation Centre, 13 November 2008.
[53] Interview with Worcester WCED trainer, 12 November 2008.
[54] Interview with Deputy Director of e-Innovation Centre, 13 November 2008.
[55] Personal communication with SchoolNet SA director, November 2008.
[56] Interview with WCED trainer 2, November 2008.

These issues of concern and challenges were raised by several role players. One person involved in project management commented about the intensive timeframes of the course, reporting that teachers found the timeframes for portfolio submission difficult, but that this was a constraint with which they had to work. This pressurized nature of the course was also thought to be a possible reason for concerns about portfolio quality.

We elaborate on each perceived weakness in turn.

Key project role players felt that the quality of portfolios produced by participants during the sessions was generally low. Several possible explanations for this were put forward. One highlighted the pressurized nature of the course, noting that there was too much work to be covered in the one week and that this affected the ability of teachers to produce work of good quality in that week.[57] Another considered the trainer's ability to provide feedback and guidance to the teachers as another possible explanation. A third reflected on the competence of curriculum advisors, who were not secure enough in their ICT knowledge to be able to offer constructive feedback to the teachers they were meant to support. [58] One trainer thought that the low quality of portfolios was 'in most cases due to the lack of computer skills that affect teachers' ability to work' explaining that 'many [teachers] get de-motivated in the process,' and then do not take up the opportunity to incorporate feedback given to them by trainers and resubmit their portfolio for external assessment.[59] It was pointed out that poor quality of portfolios was a result of deficient pedagogical content, not of poor ICT skills.[60]

It was also generally recognized that the turnaround time of portfolio assessment had been too long. There were differences of opinion about reasons for this. Some WCED role-players felt that it was partly due to only using one SchoolNet SA assessor,[61] who had other work commitments.[62] The project manager felt that this had been a result of inefficiencies from both SchoolNet SA and WCED.[63] The assessor felt that there had been problems in receiving portfolios late and often in multiple batches. This was confirmed by the SchoolNet SA director, who reported that one of the new assessors had also experienced problems in receiving large batches of portfolios in a single submission.[64] Related to this was a concern about the assessment of certain portfolios,[65] and the project manager felt that some level of moderation may be required in future.[66]

Lack of follow-up support for teachers in their schools once they had completed training was also identified as an area of concern. There was agreement among all key role players that, once teachers have finished their one week training session, they go back to their respective schools. There are no systems for following up to see if teachers are making use of new found

[57] A SchoolNet SA representative pointed out that this difficulty had been pointed out to the WCED in March 2008. However, the WCED did not seem able to respond with an alternative course structure. (SchoolNet SA communication, April 2009)
[58] Semi structured group interview with key project role players, October 2008.
[59] Interview with WCED trainer 2, November 2008.
[60] SchoolNet SA communication, April 2009.
[61] It should be noted that SchoolNet SA subsequently appointed more assessors and was no longer relying on one person. SchoolNet Sa communication, April 2009.
[62] Semi structured group interview with key project role players, October 2008.
[63] Project manager questionnaire, SchoolNet SA director, March 2009.
[64] SchoolNet SA director communication, April 2009.
[65]The SchoolNet SA assessor noted that there had been errors in the first batch of portfolios that were assessed, and explained that these which were caused by a weakness in the file management process. He was no aware of any other problems with the portfolio assessments. SchoolNet SA communication, April 2009.
[66] Semi structured group interview with key project role players, October 2009.

knowledge and to provide them support.[67] The intense face-to-face nature of the one-week programme provides little opportunity to offer support to teachers once they return to their schools. One trainer explained that she had no formal means of providing support to teachers once they move out of the course. She explained that she had offered some support to a few teachers:

> Few participants have asked for email support. Some have called me to come and see what they do in their schools and this one of the weakness of the course[68] in that there is no follow up to schools. This is a role that CAs should play as well. They have to share their knowledge with teachers.[69]

Difficulties in selecting teachers who have basic ICT skills as a requirement for the course were also considered to be an area of concern. This was thought to affect facilitation and participation in sessions:[70]

> We will have to put emphasis on the screening. We have communicated this to the Curriculum Advisors that we want them to send teachers who are technology ready. But teachers do not want to lose on opportunities, so even when they know that they do not qualify, they put their names and they do attend. But the problem is that such teachers lose on the pedagogical reality of the course as a result they fail to submit their portfolios. Proper screening might also help improve the quality of portfolios. [71]

During 2008, there was no screening of those teachers interested in the course to assess their computer skills before they registered for it, and this was seen as a challenge facing the course. The ITE project manager explained that:

> To be successful the course actually requires teachers to have certain levels of computer literacy. But some teachers [participating in the course] still need basic computer skills. This often affects trainers and other participants' ability to move at required speed to meet the objectives of the course.[72]

This problem of establishing a minimum requirement for basic computer literacy was also mentioned by one of the trainers. From the trainer's perspective', it is difficult to work with a range of teacher who are not all competent in basic computer use:

> The requirement for participating in the course is that teachers should be computer literate but often this is not the case. When people are not computer literate, it does affect the speed and wastes a lot of time and those teachers end up losing a lot on the content of the course. It is a difficult thing to control though especially because even those that come to the course with required computer skills, by end of the week they are usually thankful – feeling that the week was not necessarily spoilt, it is time used fruitfully because not only would they have learned computer skills but would also have learnt from the course materials.[73]

The ITE project manager indicated that the WCED was busy piloting an ICT Skills course which may be introduced as a requirement for admission to the Intel® Teach Essentials and explained that 'this will require that course requirements and objectives be clearly communicated to the district office to schools so that the right people are sent to attend the

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[67] Semi structured group interview with key project role players, October 2009.

[68] Note on the use of the term 'course': This was a direct quotation from one of the trainers. However the weakness may refer to the management and administration model being adopted – and so not be a weakness of the course itself. This is an area where further engagement about the exact problem and how it may be overcome – involving all relevant parties, may be required.

[69] Interview with Kuilsriver, WCED trainer, November 2008.

[70] Interview with director of e-Innovation Centre, November 2008.

[71] Interview with ITE project manager, November 2008.

[72] Interview with ITE project manager, 11 November 2008.

[73] Interview with WCED trainer 1, November 2008.

course'.[1] It should be noted that this area of concern may have impacted on the quality of portfolios.[74] However, the evidence for this does not emerge clearly from these evaluation activities. The SchoolNet SA assessor explicitly felt that the low quality of the portfolios was a pedagogical issue, and not a reflection of lack of ICT skills.[75] This issue has, however, not been investigated further to determine whether or not there is a correlation between these two areas of concern.

Interestingly, SchoolNet SA indicated that it also experienced this problem, but felt that it did not experience it on quite the same scale as the WCED had. Enrolment in the course for SchoolNet SA had always been done online, which requires a basic level of computer competence[76] in the applications process.[77] Online registration was part of the initial model used by SchoolNet SA in the beginning of the Intel® Teach project in South Africa.[78] SchoolNet SA welcomed the fact that the WCED ITE course was being positioned as a more advanced course which required a basic ICT course to have been completed before teachers are selected and or eligible for it. The SchoolNet SA director made this point as follows:

> Now that the most enthusiastic and computer literate teachers in each district have been trained it appears as if there is a concern about the readiness of teachers currently attending the courses. It is admirable that the officials concerned have identified this issue and have taken steps to address it by arranging for teachers to reach the required level for Intel® Teach by attending preliminary and appropriate preparatory courses such as WebQuest ICT Integration training which introduces teachers to the first steps of simple project based learning.[79]

SchoolNet SA reported that it has recently solved the problem of low ICT skills for the Intel teach course, to a greater extent, by ensuring that schools have successfully completed other training before their teachers attend an Intel course. So SchoolNet SA has followed the same approach as the WCED management on this matter.[80]

The basic computer skills level seemed to be a greater hindrance to the course than the fact that teachers come together in one group from different phases and subject areas. The project manager explained that 'during sessions attempts are made where possible to group teachers according to their phases, learning areas and grades so that they can work together and share information.'[81] This view was shared by one of the trainers, who explained that, although she was a Computer Applications Technology (CAT) teacher, she felt able to support teachers across all subject areas:

> I have had no problem providing support to teachers of other learning areas. I learn from them but also in the training sessions we usually have subject advisors who assist with subject specifics where necessary. Also the course content is largely general and the same for everybody which makes it easier for one to handle it.[82]

It was also recognized that the ITE course needed to be adjusted to be more locally relevant to the South African context and curriculum. This localization process was described by the project manager as follows:

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[74] Possible connection raised by Intel representative, communication, April 2009.
[75] SchoolNet SA communication, April 2009.
[76] Clearly however, ability to enrol online, cannot be equated to ICT proficiency generally. SchoolNet SA communication, April 2009.
[77] Questionnaire with SchoolNet SA director, 30 March 2009.
[78] SchoolNet SA communication, April 2009.
[79] Questionnaire with SchoolNet SA director, 30 March 2009.
[80] SchoolNet SA communication, April 2009.
[81] Semi structured group interview with key project role players, October 2008.
[82] Interview with WCED trainer 1, November 2008.

> The Intel® Teach Essentials Course is a pre-designed international course. A consultant was engaged to customize the course to the South African curriculum requirements. I was not part of this customization process but having taken part in the previous versions of the course and I have seen changes that came as a result of feedback that was given. This is another reason we have wanted curriculum advisors to be part of the course. We have asked them to communicate to us any additions or changes that they might want to see happening in the course so that the course can be further adapted where necessary. Already another version of the course has been developed which although I don't have much information about, I understand it is going to implement WEB2 technologies and will focus on bringing social collaborative tools. The whole Intervention is an attempt to speak to the White Paper on e- Education which stipulates and provides guidelines on the amount of teachers that should be involved in e-education by 2013 etc. [83]

This problem was also raised by one of the trainers, who commented that:

> The course is still too American; it still needs to be customised. It is also still too general. The team needs to go through it to rework it. It has a set way of doing things and I think it needs to look at the needs of participants because in most cases teachers know about these things.[84]

This observation was not, however, shared by all key role players. Representatives from SchoolNet SA reported that facilitators were specifically told that course content was flexible, and that they should adapt it according to the audience.[85] As such, the extent to which this is a problem, as well as what would constitute an appropriate response to this apparent weakness, is not clear from the available evaluation data. The role of CAs in interpreting the course and ensuring its relevance to the WCED context was seen as pivotal to this process or localizing the course content:

> We agree that the course does need some adjustment and this also where the involvement of CAs becomes critical so that they can tell us how else the course should be adjusted and we can send their comments to SchoolNet to get the course further customized. But we have also told teachers to adapt the course to their own situations where necessary.[86]

The Deputy Director for e-Innovation also reported that replacement teachers may be having an impact on quality of teaching and learning at the school (for that week). He explained that:

> One of our concerns relates to replacement teachers and our worry is that they might not be able to produce work of same standard to teachers. We have tried to mitigate against this by informing teachers on time hoping that they would be able to do proper preparations. So we understand that they may be some loss to teaching time.[87]

This same concern was reported by SchoolNet SA, where the Director referred to reports from a WCED department official that quality of teaching suffered under the replacement teacher.[88] It was, however, felt that, if there was a loss in quality teaching for the one week when the teacher was away from their school, it could be argued that this could be justified in terms of the enhanced teaching that was expected to happen when the permanent teacher returned to that classroom after the ITE training.[89]

[83] Interview with ITE project manager, November 2008.
[84] Interview with WCED trainer 1, November 2008.
[85] SchoolNet SA communication, April 2009.
[86] Interview with Deputy Director of e-Innovation Centre, November 2008.
[87] Interview with Deputy Director of e-Innovation Centre, November 2008.
[88] Questionnaire from SchoolNet SA director, March 2009.
[89] SchoolNet SA communication, April 2009.

Teachers' Responses to the Course Experience

In this section, we provide an analysis of teachers' responses to the WCED ITE course. This was collected through internal evaluation questionnaires, administered by the ITE project team; and then through data collected on teachers' responses as part of this external evaluation process.

Internal Course Feedback Questionnaire

The WCED ITE project team collected evaluative feedback from teachers on their responses to the course by means of an internally administered questionnaire. We received internal feedback questionnaire data for 117 participants in the WCED ITE course in 2008. This included data from 77 teachers (66%), 20 heads of department (17%), 13 curriculum advisors (11%), five deputy principals, and two e-learning facilitators. This data set represented a 22% sample of the population of approximately 500 participants.

In the internal feedback questionnaire, teachers were asked to rate their responses to a series of statements using a four point scale: 'strongly agree', 'agree', 'disagree', and 'strongly disagree'.

Respondents agreed most strongly with the following statements (where proportions of 'strongly agree' statements were made by more than 55% of the group, and fewer than 5% showed any disagreement with them):

Table 6 Statements with which most respondents to the internal feedback questionnaire strongly agreed

	Strongly Agree	Agree	Disagree	Strongly disagree
I will recommend this course to a colleague	66%	31%	3%	1%
I used the resources on the CD during the course	62%	38%	1%	0%
The facilitator supported me when I needed help	62%	35%	2%	2%
The workshops helped to increase my understanding of projects integrating ICT	61%	38%	1%	1%
I was able to learn from my peers in group sessions	58%	38%	2%	2%

It is very encouraging to note that 97% of the respondents agreed that they would recommend the WCED ITE course to a colleague.

In general most participants also agreed with the following statements (more than 90% of respondents 'agreed' or 'strongly agreed'):

Table 7 Statements with which most respondents to the internal feedback questionnaire agreed

	Strongly Agree	Agree	Disagree	Strongly disagree
I learnt new things about learner support	50%	46%	3%	2%
I plan to implement my project in my classroom as a result of this course	45%	50%	4%	1%
I enjoyed working in groups	45%	50%	3%	1%

	Strongly Agree	Agree	Disagree	Strongly disagree
I learnt new things about questioning	44%	50%	4%	2%
I learnt new perspectives on assessment	43%	50%	6%	1%
I learnt more from the whole-class feedback sessions	38%	55%	8%	0%
I have a clear idea of how to implement my project	31%	62%	5%	3%
I found the course manual useful	24%	68%	8%	1%

It is also very positive that over 95% of the respondents reported that they planned to implement their project in their classroom as a result of the WCED ITE course. The same proportions agreed that they had learnt new things about learner support, and had enjoyed working in group.

Table 8 Statements with which several respondents to the internal feedback questionnaire disagreed

	Strongly Agree	Agree	Disagree	Strongly disagree
The tip sheets helped me to complete the tasks	30%	57%	9%	4%
I referred to the tip sheets in the Resources folder	20%	66%	9%	6%
I had no understanding of projects integrating ICT before the workshop.	31%	36%	25%	9%
I used the course manual more than the CD	9%	24%	64%	3%

It seems that respondents seemed to make more use of the CD materials than the manual. Although most reported using the tip sheets, there was less strong agreement about use of tip sheets than about use of resources on the CD and the overall course manual itself (see above). Most respondents used the CD resources more than the manual.

External Evaluation Processes

We collected teachers' responses to the WCED ITE course through this external evaluation research process in several ways. First we designed an evaluative feedback questionnaire for teachers who had been on the course. This was administered in the following ways:

- A researcher attended the awards ceremony held in Cape Town. Teachers attending this ceremony completed the questionnaire (n=19). We realized that this group comprised a sample of 'award-winning teachers' (who had achieved high results in their portfolios).
- A researcher observer two case study training sessions – one held at each teacher training centre (Kuils Rivier: n=8; Worcester: n=9). We expected that these case study groups, which were conveniently sampled based on training dates, would provide better representation of the whole group. We have referred to each group as case study 1 and case study 2.
- We asked teachers who won the significant stories and were included as case studies of reported impact to complete the same questionnaire. These two teachers were also considered exceptional (having won the stories awards) and so were grouped with the 'award winning teachers'.

In total, we had questionnaire responses from 38 teachers, representing 7.6% of the total of 500 teachers trained on the WCED ITE course. As a result of the small sample and in view of the nature of sampling which included award winning teachers, the data should be interpreted

as reflecting the views of particular case study groups of teachers and not be generalized the whole group.

Second we conducted spot interviews with teachers present at the awards ceremony, as well as those attending the case study training sessions. Third, we collected narrative accounts of the impact that the WCED ITE has had at school level (analysis of which is presented in the next section).

Teachers completing the evaluation questionnaire were asked to indicate in which type of area their school is located. Their responses as tabulated below:

Table 9 School type for teachers in each case study sample

	Rural	**Township/peri urban**	**Urban**
Training group case study 1	89%	0%	11%
Training group case study 2	0%	50%	50%
Award winning teachers	29%	14%	57%

The teachers in training group case study one were mostly primary schools teachers, with only two teachers teaching grades 8 and 9 at high schools. Almost all were Arts and Culture teachers, although they taught a spread of subjects as their second specialisation. They were accompanied by their Arts and Culture curriculum advisor.

The teachers in training group case study two were all high school teachers. All of them taught either physical or natural science, with mathematics or life science as their second teaching subject. They were accompanied by the Science curriculum advisor.

In the award-winning teachers' group, there were five primary school teachers and the rest (76%) were high school teachers. Two of these primary school, award-winning teachers were computer teachers. Most of the award-winning high school teachers tended to be either mathematics, physical or natural science, or CAT teachers.

All teachers in the case study samples provided information on their access to computers in their classrooms and in a computer room or media laboratory at school, and at home:

Table 10 Teacher access to computers in their own classroom in each case study sample

	0	**1**	**2-4**	**5-7**	**More than 7**
Training group case study 1	100%	0%	0%	0%	0%
Training group case study 2	87.5%	0%	12.5%	0%	0%
Award winning teachers	52%	29%	0%	0%	19%

In general, very few training case study teachers reported having access to a computer in their own classroom. Almost half of the award-winning teachers reported having access to at least one computer in their own classroom. Those award-winning teachers reporting having more than seven computers in their classrooms were CAT or Mathematics teachers.

Table 11 Teacher access computers in a computer laboratory media room at school in each case study sample

	1-10	11-20	21-30	31 – 40	41 or more
Training group case study 1	0%	22%	56%	11%	0%
Training group case study 2	0%	13%	25%	13%	38%
Award winning teachers	0%	0%	10%	48%	33%

All teachers reported having access to computers in a computer laboratory or media room in their schools. The award winning teachers tended to be from schools where there were more computers than in the training group case study schools.

Table 12 Teacher access to a computer at home in each case study sample

	Yes	No
Training group case study 1	67%	33%
Training group case study 2	75%	25%
Award winning teachers	90%	10%

A third of teachers in training group case study one (where more teachers reported to be from rural primary schools) indicated that they had access to a computer at home. This was the case for three quarters of the teachers in training group case study two. It is remarkable (although not surprising) that 90% of the award-winning teachers indicated having access to a computer at home.

The award-winning teachers had all been on WCED ITE course some time prior to the awards ceremony. As such, we could ask them to reflect on how often they have used ITE related materials since completing the course.

Table 13 Awarding winning teachers' reported use of WCED ITE materials since completing the course

Since completing your ITE training, how many times have you:	**More than 10 Times**	**4- 10 Times**	**1 - 3 Times**	**Not at all**	**Did not receive**	**No response**
A. Used your Intel® Teach manual?	38%	38%	14%	0%	0%	10%
B. Used the Intel® Teach CD Rom?	24%	43%	14%	5%	0%	14%
C. Visited Intel® Teach Innovation in Education website?	10%	24%	38%	14%	0%	14%
D. Made use of online thinking tools in your classroom?	10%	5%	24%	33%	5%	24%

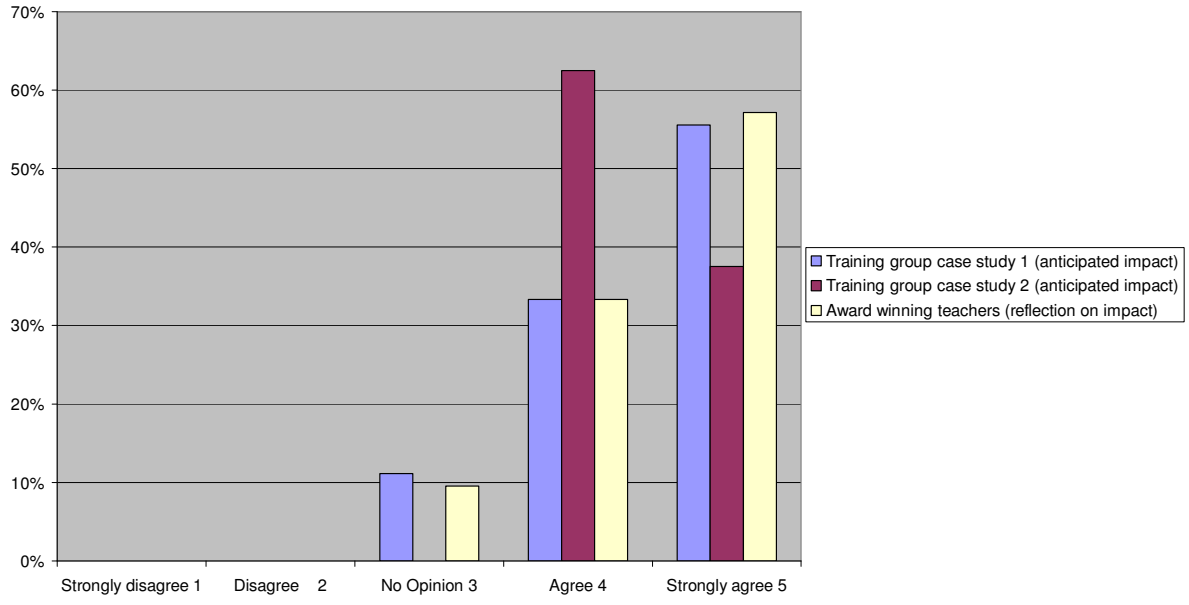
For the training group case studies, this question was not relevant as they were still completing the WCED ITE course. We were able to ask them how often they thought they and their learners would engage in technology-integrated lessons once they completed. We compared this to how often the award-winning teachers reported having engaged in technology integrated lessons since they completed the course.

Table 14 Anticipated and reported frequency of technology-integrated lessons with learners from training group case study teachers and award winning teachers respectively

	Daily	**Weekly**	**Monthly**	**Several times a year**	**Once a year**	**Never**
Training group case study 1 anticipated frequency	0%	11%	11%	56%	0%	11%
Training group case study 2 anticipated frequency	13%	50%	13%	25%	0%	0%
Award winning teachers reflection on frequency since completing the training	10%	52%	24%	10%	0%	5%

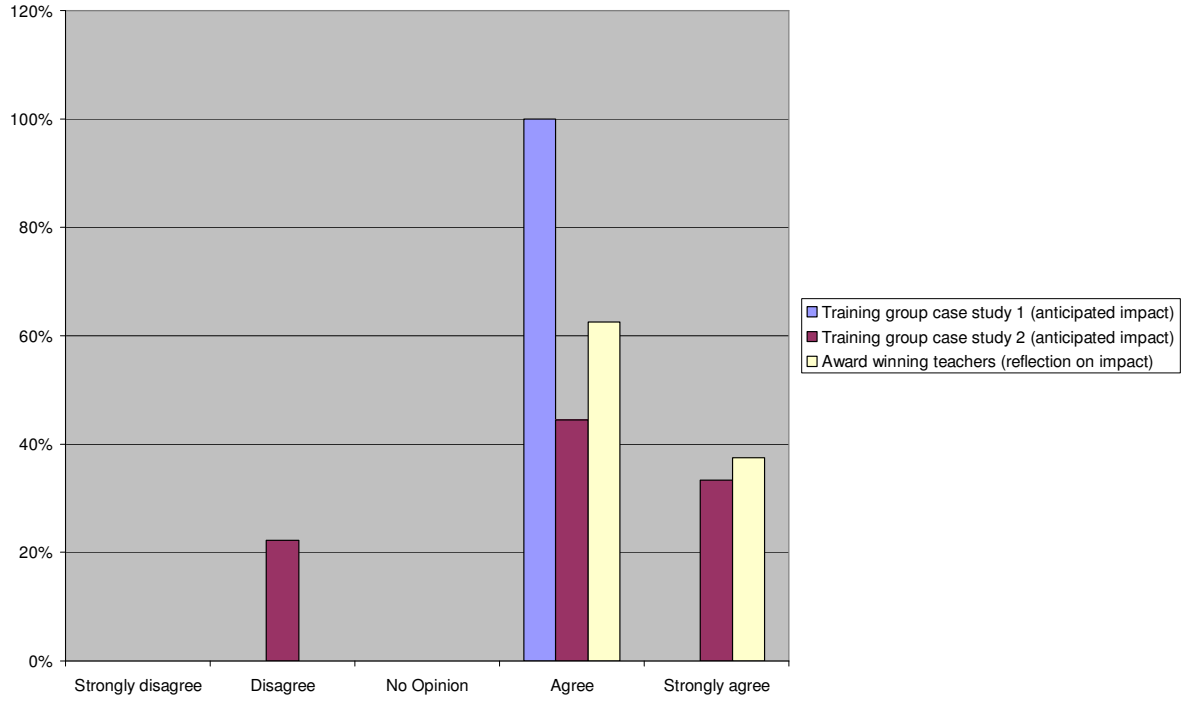
All groups of teachers were asked to indicate, on a scale of 1 to 5, the degree to which they agreed or disagreed with a series of statements about impact of technology-integrated lessons on their learners. For the training group case studies, this was asked as an anticipation of impact, while, for the award-winning teacher group, it was posed as a reflection on their actual experience since completing the training. The responses of each group to these statements are presented in the series of charts that follow:

Chart 1 Learners are motivated and actively involved in the lesson.



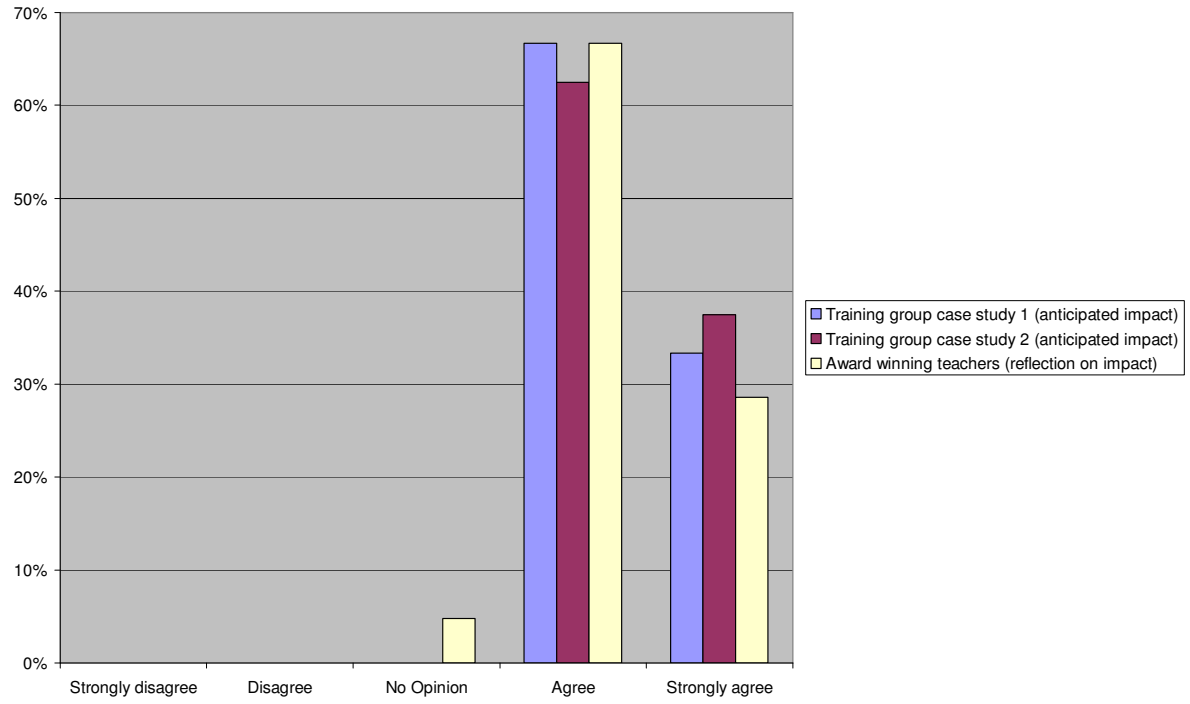
Most teachers from all sample groups agreed or strongly agreed with the statement that learners are motivated and actively involved in technology-integrated lessons.

Chart 2 Learners work together more often than in previous, comparable assignments



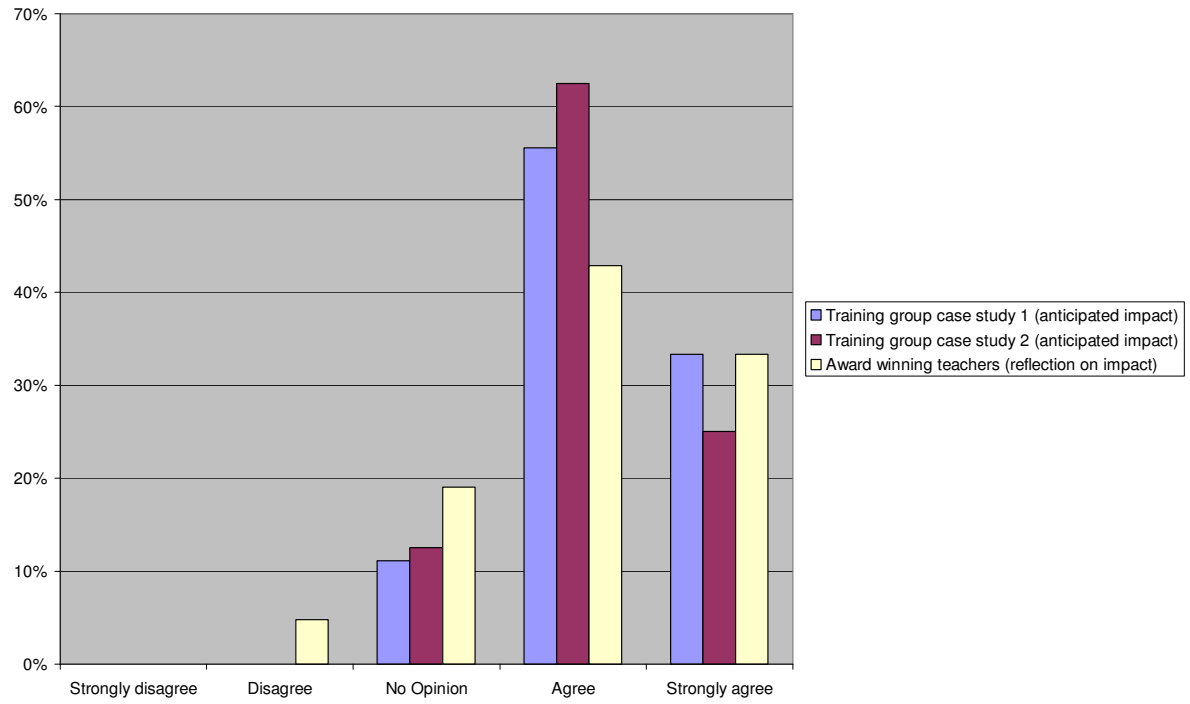
Most teachers agreed or strongly agreed with the statement that learners work together more often than in previous assignments, when engaged in a technology integrated lesson. A few training group 2 case study teachers disagreed with this.

Chart 3 Technology-integrated lessons address learners' different learning styles



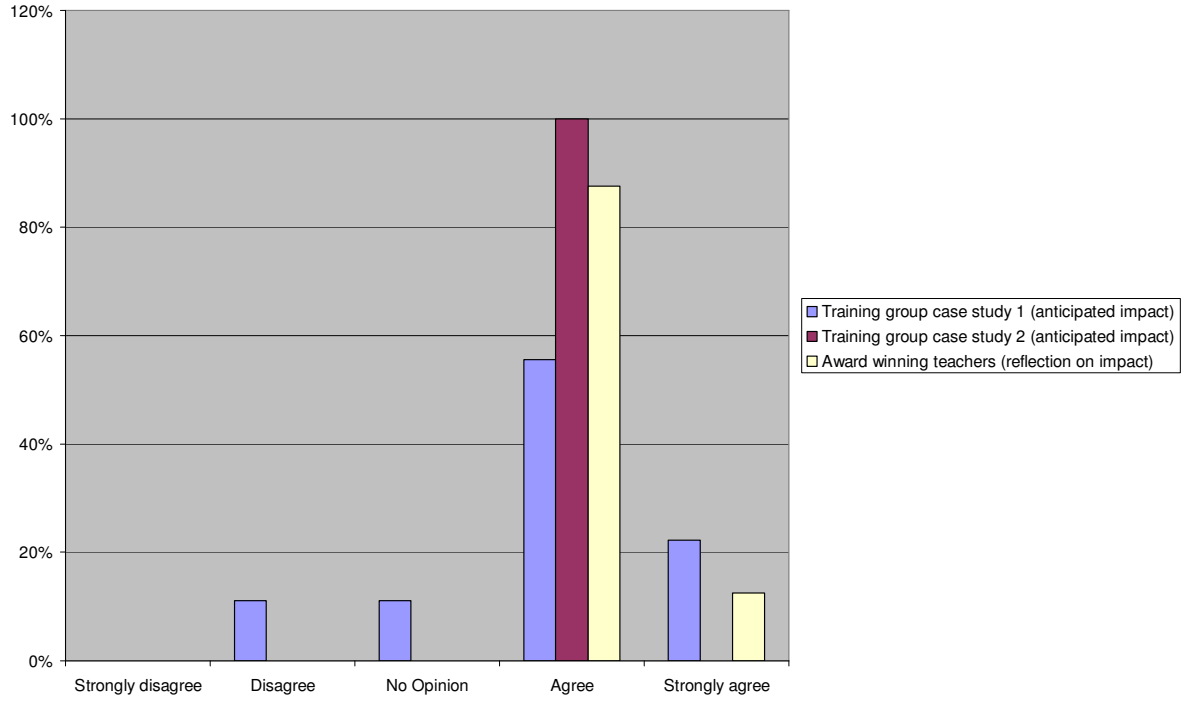
Almost all teachers – across all sample groups – agreed or strongly agreed with the statements that Technology-integrated lessons address learners' different learning styles.

Chart 4 Learner work shows more in-depth understanding of content than in previous, comparable assignments



The majority of teachers agreed or strongly agreed that learners' work shows more in-depth understanding of content than in previous, comparable assignments when engaged in technology-integrated lessons. However a notable proportion of teachers offered no opinion on the statement, and one award winning teacher disagreed with it.

Chart 5 Learners are able to communicate their ideas and opinions with greater confidence than in previous, comparable assignments



Again, most teachers agreed or strongly agreed with the statement that learners are able to communicate their ideas and opinions with greater confidence than in previous, comparable assignments, when engaged in technology-integrated lessons. One of the training group 1 case study teachers disagreed while another offered no opinion on this.

The award-winning teachers were asked whether, since completing their Intel® Teach Essentials training, there had been any change in how frequently they did various activities in their classes. The training group case study teachers were asked to indicate if they anticipated changes in the frequency of their various activities in their classes.

The award winning teachers were asked to reflect on whether since the WCED ITE course they now did any of these activities less or more, or whether there was no change in frequency:

- Use a textbook as a primary guide for instruction;
- Use Questions to structure lessons;
- Access the Internet to aid in developing lessons or activities;
- Use a computer for administrative work (for example, grading, attendance, creating handouts);
- Present information to learners using computer technology;
- Use rubrics to evaluate learner work;
- Have learner review and revise their own work;

- Have learner present their work to the class;
- Have learner engage in independent research using the Internet;
- Have learner work on group projects;
- Have learners choose their own topics for research projects.

The activities were presented in the above order, and teachers were also given an option to indicate if they felt that the particular activity was not applicable to the WCED ITE course. For the training group case study teachers the same process was followed, however they were asked to indicate which activities they anticipated they would now do more or less, or not change.

These was greatest convergence in responses across the sample groups of teachers regarding them accessing the Internet to aid in developing lessons or activities, presenting information to learners using computer technology, having learners review and revise their work, and having learners engage in independent research using the Internet.

Chart 6 Reported change in frequency: Access the Internet to aid in developing lessons or activities

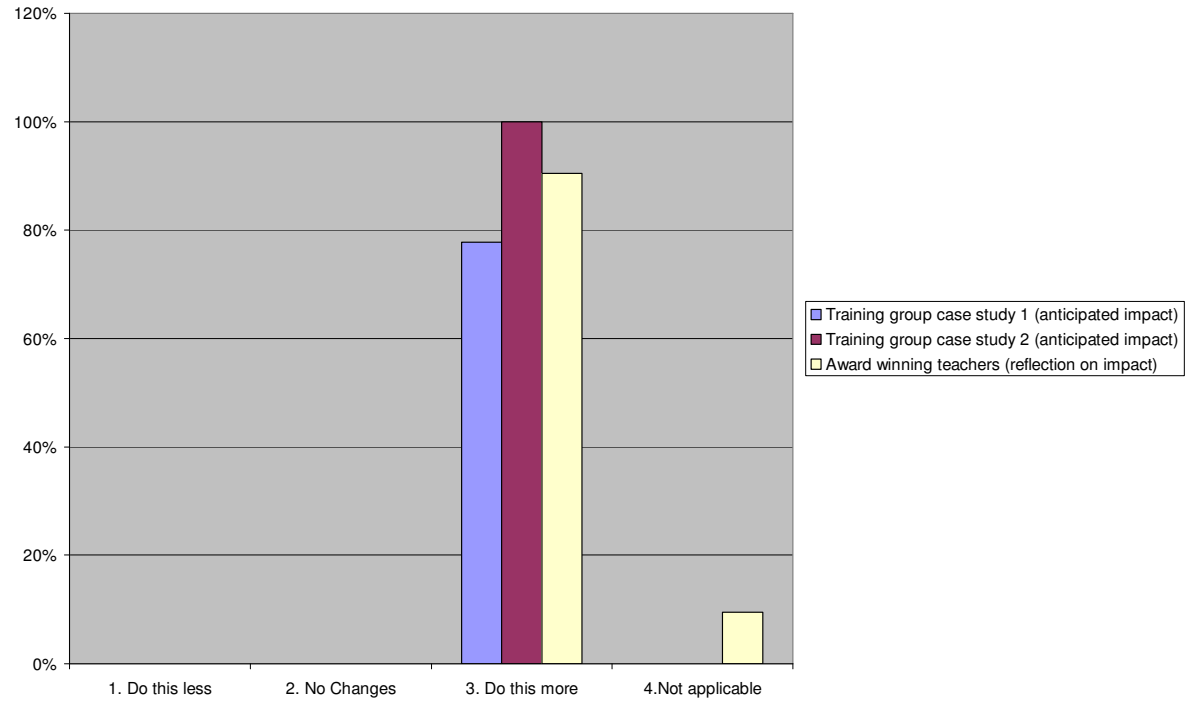


Chart 7 Reported change in frequency: Present information to learners using computer technology

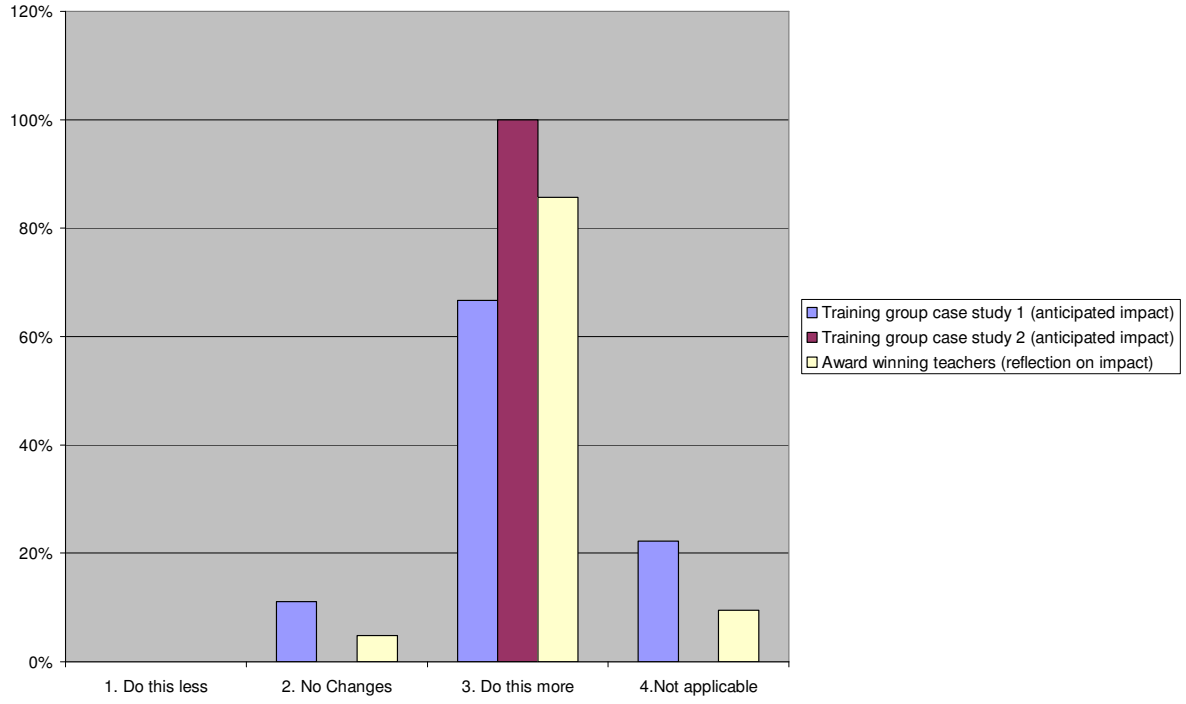


Chart 8 Reported change in frequency: Have learners review and revise their own work

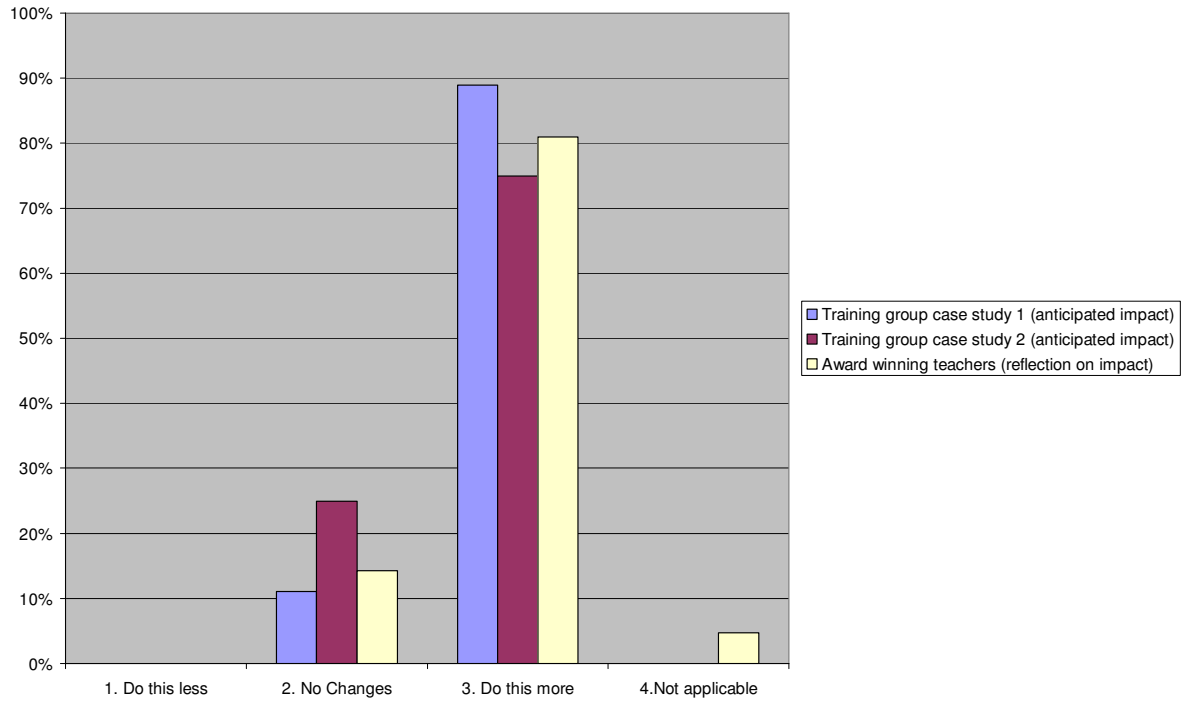
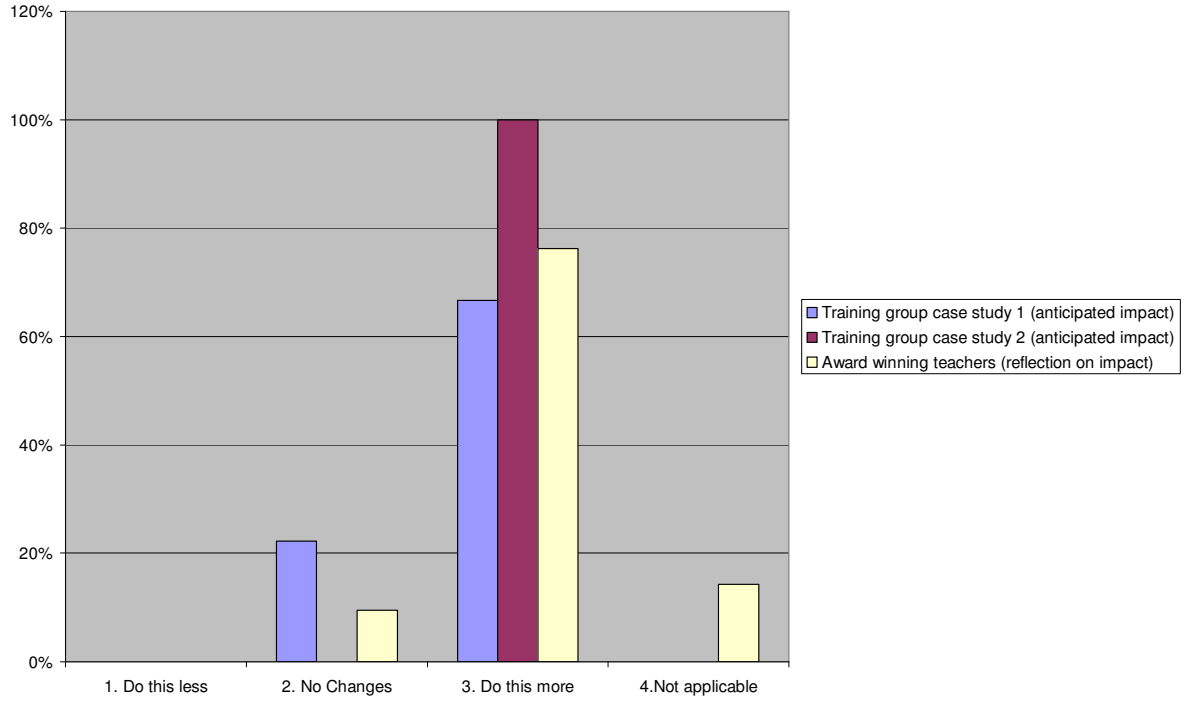


Chart 9 Reported change in frequency: Have learners engage in independent research using the Internet



There was less clear agreement on changes in frequency of the other activities, as is reflected in the following summary table.

Table 15 Reported changes in frequency of other key activities (anticipated or perceived actual change)[90]

	Do this less	No changes	Do this more	N/A
Use a computer for administrative work (for example, grading, attendance, creating handouts)				
Training group case study 1 (anticipated impact)	0%	22%	78%	0%
Training group case study 2 (anticipated impact)	0%	22%	78%	0%
Award winning teachers (reflection on impact)	0%	10%	81%	5%
Use a computer for administrative work (for example, grading, attendance, creating handouts)				
Training group case study 1 (anticipated impact)	0%	33%	67%	0%
Training group case study 2 (anticipated impact)	0%	13%	88%	0%
Award winning teachers (reflection on impact)	0%	14%	81%	5%
Have learner work on group projects				
Training group case study 1 (anticipated impact)	0%	44%	56%	0%
Training group case study 2 (anticipated impact)	0%	13%	88%	0%
Award winning teachers (reflection on impact)	0%	19%	71%	5%

[90] For each activity, the average across the 3 groups: training group case study 1, training group case study 2, and the award winning teacher group was taken for each response. Where these averages were more than 80% it was considered to have substantial agreement that this activity was being or would be done more. These activities have been presented as individual charts above. Where the average was less than 80%, the activities were tabulated in the summary table, and ordered with activities where the average across the sample groups was high (78-79%) at the top of the table, and low (2%) at the bottom.

	Do this less	No changes	Do this more	N/A
Use rubrics to evaluate learner work.				
Training group case study 1 (anticipated impact)	0%	44%	56%	0%
Training group case study 2 (anticipated impact)	13%	25%	63%	0%
Award winning teachers (reflection on impact)	0%	19%	76%	5%
Have learners choose their own topics for research projects				
Training group case study 1 (anticipated impact)	11%	11%	56%	22%
Training group case study 2 (anticipated impact)	0%	13%	75%	0%
Award winning teachers (reflection on impact)	0%	29%	52%	5%
Use questions to structure lessons				
Training group case study 1 (anticipated impact)	11%	33%	56%	0%
Training group case study 2 (anticipated impact)	13%	25%	63%	0%
Award winning teachers (reflection on impact)	0%	19%	62%	10%
Use a text book as a primary guide for instruction				
Training group case study 1 (anticipated impact)	56%	44%	0%	0%
Training group case study 2 (anticipated impact)	75%	25%	0%	0%
Award winning teachers (reflection on impact)	48%	24%	5%	19%

The teachers in each sample group were also asked what they considered to be the strengths and weaknesses of the WCED ITE course

Teachers in training group case study 1 described the following as strengths of the course:

- I'll be able to get the kids more interested and excited to do their tasks.
- Ek het meer rekenaar geletterd geraak sal beslis meer van checklist gebruik maak [I became more computer literate and will definitely make more use of checklists] The hands on experience.
- Interaction, computer skills are upgraded, exchange of ideas.
- It empowers educators to cope with technology.
- It is interesting, especially learning different techniques towards your lessons. To be able to learn how to integrate computers in your classroom. It's a new challenge for me.
- Dit bemagtig opvoeders on hulle beter voor te berei vir die klaskamer. Om leerders meer bewuis te maak vir die gebruike va di komper [It assists teachers to prepare themselves better for the classroom. It makes leaders more aware of the uses of computers]
- Om opvoeders bevoeg te maak om gemakliken voor die rekeneer te sten en leerders gereed te maak vir die wereld daar buite. [To equip educators to be comfortable using a computer and to prepare leaders for the world outside of school]

This group seemed to focus on computer skills and building familiarity with ICT for use in the classroom as the main strength of the WCED ITE course.

The teachers in training group case study 2 identified the following as strengths:

- It presents another method of project- based approach. It focuses on Curriculum Outcomes (CO's); DO's and A's. Work from bottom up (from the product back).
- Teach educators to integrate lessons (Application @ schools). Learners should do less projects since integration takes place. Emphasis on integrating science with ICT and other learning area. Designing of projects using ICT.
- The link between creative outcomes-based education and harnessing technology (ICT) to enhance its application.

- The specificity of this course. Addressed project development in an intensive way. Driven by discussion from participants and guided by course materials.
- Greater understanding of what makes for successful assessment.
- Teacher empowerment.
- To equip the educators to use technology and be easy to develop the skills of their learner through certain aspect i.e. project- graph drawing.

This group seemed to focus on the project-based nature of the course and its clear links with the particular subject area (in this case, Science) as key strengths of the course.

From the award-winning teacher group, several key theme areas emerged which had also been raised in the training group case studies. Integrating ICT into the classroom was considered a strength of the course in several of the comments:

- It broadened one's view and approach to new information
- More constructive planning. Make use of computer technology in the classroom
- Integrating ICT and the curriculum
- Equip educators on how to use technology in class
- I have learned a lot more of how to use the computer with children
- Equip educators with so many tools to utilize in their own classroom. Improve ability and knowledge of ICT integration

Several strengths identified focused on the project-based approach and pedagogical approach adopted in, and advocated for, in the course:

- Using a problem-solving approach to projects. The focus question grabs the learners attention leading to more interactive learning.
- This course is truly an eye opener. It has really changed the way I have prepared my lessons- engaging learners and getting them to use computers more effectively.
- Opportunity to reflect on learning styles. Opportunity to reflect on presentation (creative) of learning content.
- The course gives a good idea of how to go about doing projects.
- It empowers teachers to adapt their teaching methods to incorporate 21st Century skills.
- It helps you as teacher to get the children to think for themselves in Grade 1 that is one of the biggest problems.
- Structured projects for learners, In-depth questions, In-depth thinking.
- Task based education. Learner learns to formulate questions and look for answers.
- Bied jou lesse onders aan. Meer ingestel op tegsdogie. [Conduct your lessons in a more technical way…
- Laat jou meer dink oor jou aanbiedings, vraagtelling, leerders se manir van data verwerking- Prihbet jou om meer inoverend te wees met aanbreding van lesse [Allows you to think more about preparation, questioning, and teachers a way of handeling data. Enables you to be more innovative in your preparation of lessons.]

Several of these comments mentioned the questioning approach and challenging learners to think. There were also several comments about the overall instructional design of the course and the important role of the trainers in modelling processes and scaffolding learning:

- Good setting, good supporting documentation. Proficient presenters.
- It has great potential if rolled out and applicable to all students.
- It is certainly the best course I have been offered by the WCED with a fresh approach using technology and offering a more 'modern' tool to Foundation Phase Teacher.
- Guiding you in order to effectively complete the course. In that way you learn to scaffold and also see if what you expected.
- Modeling by trainers and supporting participants.

When reflecting on weaknesses of the WCED ITE course, several teachers in training group case study 1 mentioned that the time allocated for the course was too short.

- Time is too short
- Dit neem hopeloos te veel tyd. Wanneer kom jy die Ander admin uit [There is hopelessly to little time. When does the other admin come out?]
- Time is too short
- For me this is totally something new. If I just had more time so that each section could be done/discussed more thoroughly. This is totally something new, but I learnt a lot in one week.

Two teachers (from this predominantly primary school and Arts and Culture training group), felt that more attention should be given to practical subjects:

- Daar moet meer aandag geskenk word aan die praktisie vakke [More attention needs to be given to the practical subjects].
- Gee meer aandag an die praktisie vakke [Give more attention to the practical subjects].

The training group case study 2 teachers also raised the allocation of time as a problem. Although in this case two teacher felt there was too little time, while another felt there was too much:

- Extend the time with either a day or two. Let teachers bring along a completed project.
- Too short, more time needed.
- Could have been done in less time.

One teacher in this group commented negatively on the trainer ('the trainer should have a more professional approach') and suggested that 'the course could also be extended and or divided into two parts'.

The award-winning teacher group's comments about weaknesses of the course also mentioned limited time as an area of difficulty:

- Course must be over a longer time.
- The course must be given in +/-2 weeks not one week like ours.
- Time!!! Need more time for the course. On the 4th day I really realized what I have to do.
- It is a bit rushed.

Several comments from this teacher group focused on how the overall instructional design of the course could be improved. Two teachers from this group felt that the course needed to be more obviously related to the South African context

- Still a bit too American. Would be nice to me to use South African examples.
- The materials should be more South African appreciable i.e the examples.[91]

Two award-winning teachers felt that clearer information on what was expected in the portfolio would be useful:

- The presenter could begin with a clear description of the 'product' required from the course before the group embarks on developing their individual presentation.
- Good course introduction - must tell participants and maybe show them what the portfolio is going to be like.

[91] These were the comments from two of the award winning teachers. It is not clear the extent to which these sentiments are shared across the whole group – and whether this sentiment was more prevalent under the facilitation of particular trainers. The sentiment is noted here as it may require further investigation. This cannot be viewed a generalised sentiment of all participants in the course.

One teacher felt that the course would be improved if the trainers were phase specialists for the particular group: 'The presentation by a teacher experienced in the Phase would be better 'focused'.' Another teacher felt that there was a need for more continuity and regular tracking.[92] Several of the teachers in this group felt that the training should be extended and reach more teachers:

- All I would do is get more teachers to be trained.
- Not reaching [enough] teachers - need more centres not just two.
- Further development. Training gold achievers to train others.

[92] It is unclear from the questionnaire comment exactly what is being referred to here. The comment on course weaknesses reads: 'continuity - no regular tracking'.

Reported Impact of the WCED ITE Course on Teachers Classroom Practice

In this section, we present data collected on how teachers reported that the WCED ITE course impacted on their teaching practice in the classroom when back in school. This was done using several research techniques:

- Spot interviews conducted with teachers at the Awards ceremony;
- Informal feedback discussions held with teachers during the training observations;
- Significant Change Story Competitions; and
- School visits with the two winning teachers from the Significant Change Story Competitions and case study write ups of the reported impact of the course on these schools.

We present each in turn.

Spot Interviews and Informal Feedback from Teachers

Four teachers at the award ceremony were willing to share their experiences on their use of computers. We present their feedback on the course and their descriptions of how they have used it in their schools in this section as personal stories. It is important to note that these narrative accounts have been written by the researchers drawing on spot interview data. These stories were not written and submitted by the teachers themselves ('Significant Change Stories' are presented in the next section).

There were also several teachers at the observed training sessions who had discussions with the researcher about their experiences of the course. From these discussions, and their evaluation questionnaires we have collated their stories.

Collette's Story[93]

Collette teaches Computer Applications Technology (CAT) and Life Orientation (LO) in grades 9 to 11 in a township school in the Western Cape.[94] She does not have computers in her classroom, but the school has between 31 and 40 in the computer centre. She also has access to a computer at home.

Collette got involved in the Intel® Teach Essential course in 2007 after she saw an invitation issued by the Department for teachers interested in the course to apply. She thought that the WCED ITE course was the best that she had attended. She found the content of the course enlightening. It showed her good and easy ways of presenting her lessons and doing her class activities particular engaging learners in assignments and projects. From the course, she learned easy ways of assisting learners to access information for their assignments and projects. She also liked the fact that, during the training, participants worked with partners and/or groups and so she was able to learn from other teachers participating in the course.

[93] Pseudonyms have been used for these teachers, as they did not formally participate in the story competition, and did not grant permission for the names to accompany their stories.

[94] Computer Applications Technology (CAT) and Life Orientation (LO) are subjects offered in the Further Education and Training (FET) band in South African high schools for grades 10,11 and 12. CAT is an optional examinable subject. Life Orientation (LO) is a compulsory subject and not examinable.

She felt that being removed from her class to attend training for the whole week was not much of a problem because she was notified about it and was therefore able to prepare enough work for the replacement teacher to cover in that week. She identified two areas that she thought were weaknesses of the course. The first was the issue of time allocation. She felt that there was a lot of work that needed to be covered in a short space of time. This was a problem because participants of varying abilities were in the sessions, with some grasping ideas and moving fast while others were a bit slow. The second weakness constituted lack of monitoring after the course. She advised that more time should be added, and that teachers who have completed the course should be monitored and supported to ensure that they practise what they have learned and continue sharing information and resources.

Collette indicated that there had been a slight change in her teaching since participating in the WCED ITE course. This was particularly in her ability to assist learners find information for their assignments. She reported that she had also learned to save resources, where, for example, she no longer prints learners' work all the time but is able to do some marking on the computer.

Collette described a Grade 11 lesson as an example of how she had integrated technology into the lesson since completing the ITE course. It was a practical lesson on how to use computers to create tables, save, calculate, copy to Microsoft Excel, and use information from Excel. There were about 30 learners in the class. The main objective of the lesson was to develop computer literacy. It aimed to improve learners' computer skills. Learners worked on an assignment on the influence of cellular telephones on the environment. The teacher took them to the computer laboratory and helped them to search for information relating to their topic. They used Microsoft Word to type their assignments and PowerPoint to type and prepare their presentations. Collette felt that the lesson went well, that learners responded positively and were motivated.

Valerie's Story

Valerie teaches Physical Science in Grades 10 to 12 in a rural school. She does not have computers in her classroom, but the school has between 31 and 40 computers in the computer laboratory. She also has access to a computer at home. She joined the course after hearing about it from her Subject Advisor who informed her that the Department was looking for teachers interested in attending the course. She started attending in the 2008 March school holidays.

Valerie thought that the WCED ITE course was very good, and that one learns a lot as a teacher. She learned how to prepare learners to do their assignments, how to use computers for presentation, and how to make use of hyperlinks and Microsoft PowerPoint. She said that she had made use of computers before but had found that the course taught her new ways of integrating technologies into her lessons. Her week of training came during holidays and therefore teaching was not interrupted, but she would have had no problem with attending during school days if a replacement was organized. She was happy with the awards. Initially she was reluctant to accept her award, but after realizing the calibre of people who attended the course and the amount of work that went into the course, she realized that even a silver award, which she received, was a great achievement. She did not think there were any weaknesses to the course but thought that it required them to work very hard because of time constraints. She did not think that one week was enough for the course, and wished that it could be offered over a longer period. She was happy with how the course went.

Valerie felt that the course had changed her classroom practices. She felt more confident using her laptop in class and doing PowerPoint presentations. She said that, since she does not have computers in her classroom, she uses computers in the computer laboratory. She said that she takes her learners there to do research, design presentations, and produce brochures. She reports that she often does this in the afternoons, as this is when the computer laboratory is available.

Valerie explained that she did not have any specific lesson that she could talk about as she hardly uses computers in her lessons because there are no computers in her classroom. She does a lot of work on computers with her learners after school, and this usually entails assisting learners do research on various topics, design newsletters and brochures and prepare PowerPoint presentations.

Peter's Story

Peter teaches Life Sciences to learners in Grades 10 to 12 in an urban school. He has one computer in his classroom. The school computer laboratory has more than 40 computers and he also has access to a computer at home.

Peter got involved in the ITE Course in 2007 after a message was sent to principals to identify teachers in their schools interested in the course. The principal suggested that he should attend after realizing that he had been trying to do something with computers. He thought that the course was relevantly structured and teaching teachers how to do lessons at different levels and how to structure a lesson. Peter felt that the CD carried useful information on peer assessment and using rubrics. He said that it included different resources that a teacher can use to suit their needs, and that it also provides links to the Internet, thus enabling teachers to access more resources that they can use. He felt that the content, structure, and presentation of the course were excellent. He thought the fact that the course takes teachers out of their classroom for a week to focus on the training was a key strength, which helped to make it work. Peter was, however, critical of the fact that the course drew so heavily from American examples which did not readily fit into the Learning Outcomes in the South African context.[95]

Peter thought the WCED ITE course had definitely changed his classroom practice, while also reinforcing what he had previously been doing. He said he has now effectively integrated ideas from the course in his teaching. He felt that he was using technologies more than before. Since completing the course he said he had introduced a new model for computer integration into his classroom. He explained that he has added four desktop computers to his classroom so that there were now five in his classroom. His motivation for doing this was to ensure that learners are exposed to computers all the time, rather than only when they go to the computer laboratory. Given that the Internet in the schools is usually very slow, he said that he usually searches for information on any topic (for example, HIV/Aids) from the Internet, downloads these resources, and stores them on the computers in his classroom so that the content is easily accessible to learners.

[95] Unfortunately it was not clear from the evaluation data which examples were causing concern in the training materials. This may be an area which requires further examination.

Peter described a lesson on diseases when asked to provide an example of a lesson where he had used what was learnt in the course and integrated ICT into his lessons. The lesson was about Five Major Diseases affecting the South African community and was intended for about 40 learners. The objectives of the lesson were to learn curriculum content, conduct research, and work in groups. Some of the intended critical outcomes for his lesson included solving problems, managing time, and improving presentation skills. Peter explained that the 40 learners were divided into groups of eight. Each group was assigned a computer, and some of the learners in each group had their textbooks. Each group had to work on a particular disease. For example, Group 1 dealt with Cholera. Each group had to following a series of steps:

1. Search for and read information on the diseases with which they are dealing;
2. Prepare a PowerPoint presentation;
3. Present information to the class;
4. Create a brochure about the disease;
5. Make copies of the brochure and share with other learners.

Peter explained that his role during the lesson was to assist learners find and download information from the computers. He also facilitated the lesson to ensure that effective learning took place, assisted learners prepare for oral presentations, and corrected any errors that learners made.

Peter felt that this lesson had worked well. He explained that he had used the same tactics in the previous year with the old syllabus and got very good results, as one of his learners was the top Biology Learner in the Western Cape. He felt that, if he were to change the lesson, he would add more computers to the classroom to ensure that there were fewer learners per computer.

Peter felt that it was important that other teachers hear about but his Classroom Computer Model and consider this as option for their schools. He felt that this model could be used everywhere and with any subject. He thought it worked better than whiteboards and ensured long term exposure of learners to computers.

Magda's Story

Magda teaches Computer Skills to learners in Grades 1 to 7 in a rural school in the Western Cape. She uses the computer centre at the school for her lessons, which has between 21 and 30 computers. She also has access to a computer at home.

She got involved in the WCED ITE course in February 2008 after the school received an invitation from the Department of Education to send teachers interested in the course to a training session. As the Information Technology teacher in the school, she expressed interest in attending the course.

Magda thought that the course was very good and worth attending. She said she learnt a lot of interesting things and thought that every teacher should be given a chance to do the course. In particular, she said that she had learned to formulate questions that get learners to think rather than simply to access answers in the textbooks or computers. She thought that the course was well structured, and did not have any problems with attending the course during school days because the school had organized a replacement for her. Magda commented on the fact that there were too many courses taking place during holidays. She thought that awards were a

good way of motivating teachers. When reflecting on the weaknesses of the course, she thought that time allocated for the course was too short, because there was a lot of work that they had to cover in four days, with the fifth day being reserved for presentation of portfolios. She thought more time was needed.

Magda was certain that the ITE course had changed her classroom practices. She said that, when she now gives children projects, she gives them questions that will make them think and for which where answers are not readily accessible. She explained that, while she is an IT teacher, she tries to integrate teaching of IT skills into other learning areas. As a result teachers from other learning areas also get to assess most of the tasks that she does with her learners.

Magda described a lesson on poverty that she did with two grade 7 classes as her example of a lesson where she had integrated technology into the lesson and draw on what she had learned from the ITE course. She explained that the lesson was about poverty and ways of reducing it. She did the lesson with two groups of Grade 7 learners, comprising about 70 learners in total. The key objective of the lesson was life skills. In the process, learners learned basic computer skills, as well as how to conduct research. Magda explained that she divided learners into groups of four. In the first activity, learners were to discuss the effects of poverty on people and the psychological effects thereof. In the second activity, learners had to search for information on the Internet. She explained that using Microsoft Publisher, they had to develop a pamphlet using information that they gathered. Magda's grade 7 learners had to put their contact details on the pamphlets so that whoever needed more information could be able to contact them. Learners also had to find information on how poverty can be reduced. She explained that learners were guided towards entrepreneurial ideas, and had to find information on entrepreneurship. The final task was for them to design a website for their proposed businesses. Group assessment was carried out and she then carried out her own teacher assessment of the work.

Magda reported that she had experienced some challenges in implementing the lesson. For example, she found that, when she spoke of psychological effects of poverty, most learners did not understand what she meant and did not know what information they needed to look for. This required that she give more support to learners to guide them. Initially, she had thought that learners would be able to do this entirely on their own.

Magda thought that teachers needed to know about what she is doing in her lessons because she noticed that, in her school and those nearby, teachers still required learners to do projects using old-fashioned methods where they are expected to do a lot of writing and design charts. She said that, after attending the ITE course, she had started helping teachers in her school with their projects, giving them ideas on the nature of projects that they could do on the computers to make their work more interesting to learners. For example, a teacher in her school had wanted learners to search for information for their project, so she suggested that perhaps learners should use the information gathered to design a brochure. The teacher conceded that she had never thought about this option, but that it would be an interesting activity. Magda said that this lesson was then done and that her recommended shift in design had made the lesson interesting and fun. She was concerned that most teachers were not using computers, and that it is important for them to know that one can do a lot of interesting things using a computer.

Andre's Story

Andre teaches Technology to Grade 5 and 6 learners in a rural primary school. He does not have a computer in his own classroom, but his school has a computer laboratory with between 21 and 30 computers in it. He does not have access to a computer at home.

Andre attended the ITE course in November, 2008. This was one of the case study training group sessions observed by an evaluation researcher. He felt that time allocated for the course was too short. He felt that it was a difficult course and that it had been very challenging, but that he had learnt a lot from it. He said that the ITE course requires a 'mind shift' from how one has been doing things and that it had been a paradigm shift for him in his approach to teaching. He thought every teacher should go through this course.

Andre anticipated that, after the ITE course, he will less frequently use a textbook as a primary guide for instructions and that he will no longer allow learners to choose their own topic for research projects. He plans to do the following more frequently when he gets back to his school:

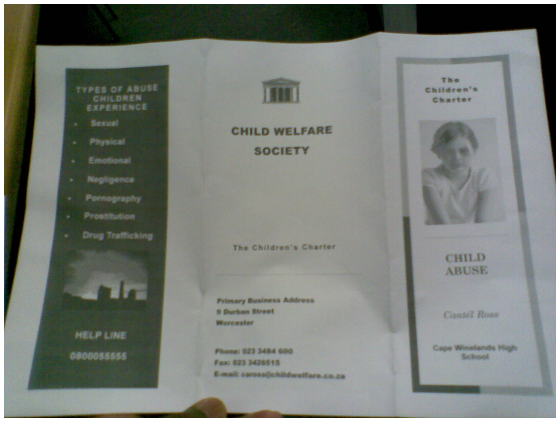
- Access the Internet to aid in developing lessons or activities;
- Use a computer for administrative work (for example, grading, attendance, creating handouts);
- Present information to learners using computer technology;
- Use rubrics to evaluate learner work;
- Have learner view and revise their own work;
- Have learners present their work to the class; and
- Have learner work on group projects.

Annetta's Story

Annetta is a Life Orientation curriculum advisor at the primary school level. She participated in one of the ITE course in November, 2008. This was one of the case study training group sessions observed by an evaluation researcher. This group included nine primary schools teachers and an Arts and Culture curriculum advisor. Two of the teachers in the group were teachers of Life Orientation and the others were mainly Arts and Culture teachers.

Annetta was very enthusiastic about the course and felt that she benefitted tremendously and learnt a great deal from it. She said that, when she came to the course, she did not know how to produce materials such as brochures but had managed to produce one by the end. She stressed that she did not know how to produce brochures before the ITE course.

Chart 10 Photograph of Annetta's brochure



Shawn's Story

Shawn teaches Physical Science and Geography in Grades 10 to 12 in a peri-urban school. He does not have a computer in his classroom, but the school has a computer centre with 41 or more computers. He also has access to a computer at home. He brought his own laptop to the ITE training session in which he participated in November, 2008. This was one of the case study training group sessions that was observed by an evaluation researcher. He was seen to use his laptop confidently throughout the observed training session.

He said that he was selected by the CA in his subject areas to attend the course and he decided to attend because he wanted to improve his teaching and technology integration skills. He had participated because he aimed to become more effective as an educator by being empowered. He had hoped to be able to engage learners in technology-integrated lessons weekly.

He thought that the particular strengths of the ITE course were the link between outcomes-based education and harnessing technology to enhance its application. He also felt that the course should be extended or divided into two parts because there was too much to be covered in such a short space of time.

The researcher observed that during sessions he carried himself professionally and was very focused. He seemed quite knowledgeable and was fairly dominant in the sessions. His computer skills seemed advanced, and it was clear that he had made use of computers previously in his lessons, which gave him some advantage. He asked questions and was quick to respond when the facilitator asked questions, as well as frequently giving his opinion when other participants asked a question.

In an informal discussion with the researcher, he indicated that he was initially a teacher but had then left teaching to work in the private sector as a training officer and in community development with a faith-based organization before returning. He was concerned that the course seemed to be rigid in the approach it proposed should be used. He did not feel that this was correct because, as far as he is concerned, teachers should be exposed to different methodologies and ways of doing things.

Significant Change Story Competition

All teachers who participated in the WCED ITE training during 2008 were invited to write a story about what, if anything, had changed in their teaching as a result of the training. This was structured as story competition to provide them an incentive to submit their stories. A series of competition invitations, and reminders were sent by SMS and email as described in the data gathering section above. The invitation to participate in the Significant Change Story competition read as follows:

- Do you have a story to share about using technology in your classroom or school?
- Do you want to see your story published and shared?
- Do you want to enter a lucky draw for R1,000 prize?
- Do you want to be eligible for a R1,000 Intel® Teach WCED Significant Change Story Award?

If so, read on:
We invite all teachers who have participated in the WCED Intel® Teach Essentials training course to submit a significant change story about the Intel® Teach Project.

COMPETITION INSTRUCTIONS
From your point of view, write a story that epitomises the most significant change that has happened to you or your school since you participated in the Intel® Teach Essentials course. You may choose to describe a particular lesson in detail to share with others, or describe something that has happened to you or your school in broad or general terms.

Stories should be no more than 500 words and may include up to 3 images. They should be intended to be shared with other participants in the Intel® Teach project. They will be used to

- understand what teachers value about the course so that the Intel® Teach Essentials programme can better support them in these areas;
- acknowledge an publicise what has already been achieved,

You may include pictures of (for example): yourself, your school, your learners or your learners work, your classroom to be published with your story.

Following the series of eight bulk SMS and e-mails reminders about the competition sent to the approximately 500 teachers, the evaluation research team received 20 responses or enquiries from teachers about the competition. Six significant change stories were submitted for entry into the competition.[96] From these, the two top stories were selected and the relevant teachers received their prizes. The two winning stories were selected on the basis of their level of detail, effort, and clear reference to a particular ICT integration lesson within a learning area or subject which could then be described in greater detail. Preference was given to lessons that had taken place, over lessons which were planned for the future.

All significant change stories received for the competition are presented below. These are the stories as they were submitted to the competition. However, as some entrants did not complete the template and therefore did not confirm permission for their names to be included with their stories, we have used pseudonyms for these teachers.

[96] It should be noted that this component of the methodology was being piloted. Should collection of significant change stories be attempted in future, alternative means of gathering story submissions would be required, as competition format does not seem to be sufficient to get a significant number of entries. Given the low response rate, two winners were selected from the six and each received R1,000 awards. The lucky draw was not conducted given the low response rate. Instead two winning story awards were granted.

Teacher Submissions

Marie's Story[97] (High school teacher in Athlone)

As an educator, I have come to learn that a well-ordered frame of mind controls my well-being. Before I was introduced to Intel's technology, I lived in a world that was far below the level of my potential. I was really enriched in the way my facilitator unlocked my perception of Intel® technology. I found him full of energy and eager to guide me with the planning of lessons for the future: how I need to be constructive; to analyze – need to establish realistic goals; ideas to plan ahead. The planning of a lesson is not about the topic or an event – but a process; a process of how to ingest, digest, absorb and assimilate subject matter and what to discard. I need to analyse what is real and as I integrate with other learning areas. My outcome would be not what I see, but how I see it. This will determine me to focus on the outcome, spend more time on questioning the question than concentrating on the answer to the question. I have come to know now more about open and closed questions. As I log in on different websites, I also come to realize that reality is not about the external world of objects and things around us, but the internal mind-set from which I view the world.

This year I am going to implement Marzano's Dimension of Learning into my lessons to create a positive environment in my classroom. Learners need to feel good about themselves. In the book, Created for a successful living, Wilfred Kent states: 'Self-worth must never be determined by external standards.' Learners compare their self-worth by their peers and the standards and values they have established. Therefore, learners' self-worth should not be determined how well they perform among their peers. This results in many learners committing suicide because of their inflated low self- image. Within each learner lies hidden potential that needs to be corrected, instructed and their outcome will measure their strength. 'Failure and success is not an issue'. One's self-worth comes to the fore when one has an enormous desire of strength to change, using those disappointments and failures as stepping stones to achieve something in the future. That is how one's character is formed, looking at the bigger picture at the end of the day.

Intel's technology helps learners to log in on different websites to gain information on certain concepts and terminology. In my planning and research, as well as the research done by the learners, we see Intel's technology as a buddy-system to guide us through uncertainties.

My outcome in every lesson should be that learners know how to formulate an argument, to give a logical presentation by using Power point or any other technology device via cell phones etc, to have an open minded approach and to justify their own statements and why they disagree with their peers.

Saul's Story[98] (High school teacher in Langa)

Using technology as a subject in my class room is for me an expectation in the curricula of just about everything.

When I did this course at ICT I realize how important it is to use technology in the classroom with multimedia lesson plan. PowerPoint really make a big difference in my class where the kids have fun and want to participate in each lesson.

[97] A pseudonym has been used for this teacher, who participated in the story competition, but did not use the template and so did not confirm permission for their names to accompany their stories.

[98] A pseudonym has been used for this teacher, who participated in the story competition, but did not use the template and so did not confirm permission for their names to accompany their stories.

The secret behind it is that they are learning as well. I discover that kids like more picture slides than endless bulleted slides. Through PowerPoint I can really see a big difference in my kids' performance. I as an educator am also more confidence of presenting my lesson to my learners. Yours in Education

Adrian's Story[99] (Life orientation high school teacher in Atlantis)

First of all I just want to thank INTEL for the opportunity to do the course. I was very sceptical at the beginning of the course, but soon my fears disappeared.

The person who facilitated the class was totally in control and he put us at ease. At the start I was scared, because my computer skills were very basic, but as soon as the class started I was very surprised at how easy it really was. I learnt a lot and I planned on teaching my subject group what I learned.

As soon as I started at school I IMPLEMENTED my new knowledge by preparing my lessons. The first lesson was for life orientation: Relationships: I prepared a PowerPoint presentation and added music as well as websites and pictures.

The kids listened to the music and have to focus on how it influences them.

Again I want to thank Intel for the opportunity.

Michael's Story[100] (teacher in a township school)[101]

I applied for a scholarship to fund a project that the learners will do. They are to integrate information technology in this project i.e. use of power-point, visuals and speech. I have been given a scholarship of $400.00 dollars. This money will be used to access information technology material to be used in this project.

This project will mostly entail a short visual backgrounds and interviews and a power-point presentation of the results. The theme of the project will be xenophobia. Why I have chosen this theme, it is because there is a large number of immigrants in our township. There is a large number of Zimbabweans who are used as casual labourers in the grape farms and you have a substantial number of Somalians who own spaza shops in the township. You do have a small number of Asians who also own spaza shops. Two years back there was xenophobic violence in the townships. These foreigners were chased out of the township and had their shops looted. Unlike in some parts of the country, here the violence targeted only the Somalians and the Zimbabweans were not targeted. This project will try to understand the causes, perceptions and motives behind the attacks. The involved parties will put their side of the stories and at end the learners will synthesise the information and report on it through the use of technology i.e power-point presentation.

The Winning Entries

We present the winning entries for the story competition below. These are the stories as they were submitted to the competition. Further more detailed information about each winning

[99] A pseudonym has been used for this teacher, who participated in the story competition, but did not use the template and so did not confirm permission for their names to accompany their stories.
[100] A pseudonym has been used for this teacher, who participated in the story competition, but did not use the template and so did not confirm permission for their names to accompany their stories.
[101] Michael teaches in a high school in Zwelethemba township in Worcester.

teacher and their particular school context was later developed into short case study descriptions which are presented in the next section of this report.

Joelene's Story

Joelene Juries[102] is a senior phase (Grade 7-9) Natural Science curriculum advisor for the Central EMDC of the WCED. She participated in the WCED ITE training course during 2008. She submitted a story about a lesson she conducted at Eros School in Bridgetown in the Cape Flats with learners with special educational needs, to the Significant Change Stories Competition in February 2009. This is her winning story:

> **Can bugs look after themselves?**
> By Joelene Juries
> Eros School, WCED
> February 2009
>
> During an ecology lesson in our school garden one of the bugs (see Figure 1) neither appeared interesting or perturbed by our harassment of its serene habitat. Upon exposure to squawks of excitement the whole community of bugs scattered at lightning speed, heading in all directions to safer quarters. Our little bug remained composed and completely surrendered to its humiliating capture by eager little hands
>
> Figure 1: Cellphone picture of Insect
>
> 
>
> Using the text book guide they were neither able to make a classification or answer the initial question: 'What kind of bug is this?' After discussion about bugs in general the learners agreed that their bug was not interesting at all. A focus question to facilitate their further enquiry was put to them:
> 'HOW COULD ALL BUGS BE INTERESTING?'
> Now if you think this may be a challenge for a group of grade seven learners with learning difficulties – think again.
>
> A small group gathered information about the little bug while one grabbed the jar and honed in on his drawing skills (see Figure 2). It soon dawned upon him that there was a

[102] Joelene Juries indicated that she wanted her name included in the story and that she consented to Intel using her story and images for publication. As such we have used her actual name in reporting this.

popping sound and a stench emanating from it. Upon closer inspection by the others they agreed with his observation.

Figure 2: Children's drawing

One bright spark posed his own interesting question: 'Is it a stink bug?' They all laughed in innocence, naturally. A digital image enabled its speedy release into the great outdoors. Further information on its classification was obtained from other resource books. 'Miss, come let's google it!', initiated an accurate scientific classification and identification. Wow!

The highlight of the enquiry occurred when one of the learners, in his quest to delve further into the enquiry, found a wonderfully-illustrated children's reading book in our own school library. In a most simplistic way, it shed more light about our little bug. It graphically illustrated its wonderfully adapted system of self-defence in the form of 'nasty gas emissions'. Most learners found the illustration in the book depicting chemical warfare between itself and an attacking spider much more interesting to reproduce (see Figure 2). I let them.

The learners shared their new-found respect for the little creature with much enthusiasm. They also agreed that the bug, *Brachinus speciosa*, appropriately called the bombardier beetle, was indeed interesting because it had a variety of defence strategies to avoid being attacked by predators. These include camouflage, mimicry, toxicity and scare tactics.

This was truly my a-ha moment in education. Learning through self discovery has proved an exciting experience both for me, the initiator of the enquiry, as well as the learners who pursued it to fruition. When they took the initiative to question, they were better able to take ownership of the answers they found.

The radiance on their faces when they presented the answers they found by themselves was memorable and most rewarding. This, connected to their delight at using

technological skills and equipment, made the journey of discovery even more exciting. A real win-win situation!

Technology can certainly be creatively used to fill the missing pieces of the jigsaw puzzle found in developing and inquisitive little minds. Irrespective of the challenges life bestows upon them, they all possess their own knowledge and they all want to learn. Let them. I am certainly proud to be called, '...their teacher...' for they have inspired me.

Estie's Story

Estie van den Berg[103] teaches natural science, life science, technology and mathematical literacy at DF Malan high school level (Grades 8 to 12) in Bellville, Cape Town. She participated in the WCED ITE training course during 2008. She submitted a story about Grade 11 Natural Science lesson she conducted, to the Significant Change Stories Competition in February 2009. This is her winning story:

Spark more interest!
Estie van den Berg

I attended the Intel® course in the beginning of the 4th term 2008 and I enjoyed it tremendously. I learned a lot about designing new projects and also about learner support. My computer skills improved as well.

When I got back to school it was very busy with setting of question papers, marking etc but I was inspired to use a lot of PowerPoint presentations. As I found my gr 11 Life Sciences classes boring I decided to revamp them by using PowerPoint presentations as we were beginning a new division of the work and I wanted all their attention as we had to work quickly through the work. The new section we started was about populations and how they interact. I needed to get the learners attention and get them discussing the issues.

I arranged to have a data projector in my class, with difficulty ! Once I had it was so great I wanted to have it permanently. I even used the Power point during one of the classes when I was assessed for IQMS. It went so well that the other two teachers wanted to use the data projector and I had none. They must have been impressed with my class.

Back to the gr 11 classes. It worked well from the beginning. The change of format immediately grabbed the attention. They liked the pictures I used and enjoyed it much more than the overhead projector I have been using before.
They where impressed with my skills with the computer and even thanked me for my trouble, can you believe it.

One particular lesson was about density independent factors influencing the size of the population. You have to talk about vulcanoes, tornadoes and tsunami etc and when I showed them different examples of each, I told them where and when the event took place and they could relate to it, for example the earthquake in China early in 2008.

To prepare for this lesson I searched on Google for pictures and made the PowerPoint with big pictures and few words. They loved it and it was so much more interesting than just discussing the events. I have found that the general knowledge of the learners are limited and with this class they learned the concepts as well as more of the world they

[103] Estie van den Berg indicated that she wanted her name included in the story and that she consented to Intel using her story and images for publication. As such we have used her actual name in reporting this.

live in. When they were tested during the examinations most of them did extremely well in this section.

As I enjoyed it so much I decided to use PowerPoint for my Mathematical Literacy classes as well. These learners do this subject because the have to and some have struggled with maths for a long time. Well, it was time for a different approach. They loved the presentation, even if it was sums and words on the screen. It was different, they can relate to the medium of PowerPoint, we can go slowly, one step at a time or you can go back and start again. Much more interesting when I used different colours for different steps, I marked the class work this way and it worked much better than the OHP or writing the answers on the board. I found the learners more attentive, trying to do their own work and not just giving up. It was also easy to go back to another lesson we have done before, without writing everything out again or wasting time to look for a transparency.

I enjoyed the classes so much more and I had so much less filing of transparencies to do. I am forever looking for the right file and the Transparencies; it is so easy to file them incorrectly. Since I also discuss the same subject with different grades e.g. global warming it is so much easier to find the information if it is filled on the computer.

Two Teacher Case Studies of Reported Impact

The two winning teachers of the Significant Change Story Competition were contacted and approached for permission to be visited at their school, where a researcher could further elaborate on their story, locate it within their particular school contexts, and develop a more detailed case study. This section presents these two case studies of reported impact at two schools in the WCED. The first case study is based on the winning story by Joelene Juries about Eros School and the second is based on the winning story by Estie van den Berg of D F Malan Secondary School. The case studies are informed by:

- The teachers' stories as submitted to the Significant Change Story Competitions;
- Evaluation questionnaires that the teachers completed about the WCED ITE training;
- Interviews with the teachers;
- Discussions with a selection of learners at each school;
- A discussion with the phase head teacher at Eros school;
- A discussion with the school principals at each school; and
- Lesson observation of the teachers with the learners at their schools.

This follow-up case study research process was thought to be an important component of the research design, as it provided an opportunity to collect information from other school role players (such as the principal, phase head, and learners) and to see the teacher 'in action' in their classroom, thereby validating and elaborating on the claims made in their significant change stories.

Technology Beats Adversity: Joelene's Story at Eros School

Eros school is situated in Bridgetown on the Cape Flats. The suburb is characterized by socio-economic challenges including a high unemployment rate, drug abuse, and crime. The school was originally for cerebral palsied learners but is currently meeting the needs of learners with different disabilities and in need of specialized education. Some learners at the school have slight challenges with movement while others have no muscle control, which results in contracted control of movement. Learners are supported through therapy in the

school to overcome the challenges they may have physically. There are 300 learners and 63 teachers in the school. This results in a very low teacher: learner ratio of 1:5. The school does not have a functioning library, although there are books in the library. The researcher was not taken to see the library as it was being painted. The senior phase head of department (HoD) responsible for revamping the library indicated that there would be work after painting it to organize the books in a more useable and accessible manner.

At the time of writing this case study, Joelene Juries was working on secondment as a curriculum advisor for Natural Science, for Education Management and Development Centre (EMDC) Central district. She had been seconded to the Department for three months. Joelene has been a teacher for 24 years, five of these at Lotus River Primary and the rest at Eros School. She received her teacher training at the University of the Western Cape. Joelene would consider going back to Eros school at the end of her secondment, although she reported to the researcher that she believes that, as a curriculum advisor, she is able to reach more learners than when she is at one school. Joelene seems to be an activist who believes in fighting for the rights of the powerless, especially the learners at Eros. She has sometimes found herself at opposite ends with some members of management in the school when she has raised unhappiness with issues such as the children's nutrition in hostel and in the school. Joelene does hostel duty and lives near the hostel. She indicated that learners in the hostel would benefit from a computer where they could do homework and play games. Currently, learners in the hostel do not have much to do. Joelene has access to a computer at home.

Eros School has a Khanya laboratory with 18 computers, which was installed in 2004 in collaboration with FirstRand Foundation. However, the laboratory was specifically set up to improve numeracy and literacy teaching and learning, and this seems to have become a source of contention as other teachers who do not teach literacy and numeracy need access to the laboratory for their own teaching. According to Joelene, she had to send a child to see if the laboratory was free in order for her to take her Natural Science classes there. She lamented that, even when the laboratory was not occupied and she was therefore in principle able to use it, the person in charge had frequently denied her access to it. The senior phase head at Eros school indicated that the laboratory was not functioning properly because there is a fear of technology by the teachers. She indicated that even though these teachers have been trained she did not think that the training offered empowers them well enough. As a result, she reported that even literacy and numeracy lessons are not being conducted in the laboratory. However, the Khanya person who used to manage the laboratory has since left the school and there was now a new flexible manager with whom the school hoped to work to ensure equitable access to the laboratory by all phases and learning areas. In this way, it was hoped that the laboratory would be opened in future, and its use would no longer be restricted to numeracy and literacy.

The Khanya computer laboratory at Eros School is a specialized laboratory that takes into cognisance learners' disabilities. The computer laboratory was designed according to a therapist's guidelines so spaces between desks are wide and wheelchair-friendly. There was wrist, arm, and foot support at each desk. The laboratory was also equipped with assistive devices in the form of tracker balls, joysticks, and head-operated mice. The following photographs show the layout of the laboratory and the teacher's and learners' work spaces.

Chart 11 Photograph of Eros School Computer Laboratory: teacher desk and white board

Chart 12 Photograph of Eros School Computer Laboratory: learners workspaces

As is evident from the photographs, very generous spacing between the benches and between the computer work stations was provided. The laboratory had 18 computers for learners, a server and a computer for the teacher. There is a Whiteboard in front of the class. There was no evidence of a data projector and a screen. There were no computers in the teachers' classrooms.

In the particular lesson described in the winning story, technology was used at three levels of teaching and learning. First, a mobile telephone was used to take a picture of the bug in the jar so that the bug could be released into its natural habitat. Second, learners used the internet to find an image match with the cellular telephone photograph. Third, the internet was used to find out more information about the insect after the internet search had identified its name. In addition to its teaching and learning function, technology was used by the teacher, who used a word processor to write her story and then emailed it for adjudication. So, from the beginning to end of the story, technology is seen as a powerful medium for the teacher's work.

In the lesson described in Joelene's story, learners were able to find out information about the bug on their own, through use of technology. In this way, they developed their research skills and proved that they could be independent knowledge seekers. According to the learners, learning with technology was a 'fun' way to learn. It was also an excellent way to learn for

retention because learners remembered what they had learned because of the excitement generated by engagement with technology. The learners in Joelene's class said that it was very exciting when they found out more about the beetle. They indicated that they did not use computers in their other lessons, and would be happy to use the computer more often. They indicated that they did not have access to computers outside the school. The following are some of the Eros School learners' comments about learning with technology:

- It is interesting
- It's more exciting to learn using the computer
- The computer gives you immediate feedback when you do something wrong.

Judging by the way the learners remembered facts about the lesson, there are strong suggestions that use of technology for teaching and learning helps learners engage more positively with learning and enables them to control their learning.

At the time of writing this case study, Joelene was not teaching at Eros because she was working at the district office as a curriculum advisor. However, she agreed to return to the schools to meet with the research and opted to recreate the winning lesson with some of the learners. Joelene gathered six learners, shown in the photograph below, and started using a question-and-answer format to get them to talk about the lesson. These learners were selected on the basis of their high levels of participation in the 'winning story' lesson. One of the learners had done the 'Google search' that led to identification of the insect's name, another had found a book in the library that showed a picture of the insect, based on a mobile telephone image that had been taken to release the captured insect. The book picture had been used to do a 'Google image search' and a match had been found which revealed the name of the insect's name as *Brachinus speciosa* or bombardier beetle. The other four learners had drawn pictures of the insect that were used in Joelene's story.

Chart 13 Photograph of Eros School Learners who participated in Joelene's lesson

The following interaction between Joelene and the learners is evident of the way she used questioning to get learners to remember the facts of the lesson:

> **Joelene**: What happened when we went to the Garden?
> **Learner**: We found an insect. Miss took it to the class, we had to draw it. We did not know about the bug so we needed more information.

Joelene: What happened to the other bugs when we lifted the stone?
Learner: They ran away.
Joelene: And this one?
Learner: It didn't run away and that made it interesting.
Joelene: Who was the student who found the name of the bug?
Learner: We found a book in the library with a picture of the bug and we searched on the internet.
Joelene: And what else did you find on the internet?
Learner: We found the characteristics of the bug. That it has a defence mechanism where it stinks and everything around it runs away.
Joelene: How did you know that the information of the bug was the correct information?
Learner: We had a photograph of the bug from a cell phone camera and we used this to search for pictures using google.[104]

Joelene indicated that the WCED ITE training had a huge impact on the way she taught and also in her new role as a curriculum advisor. She specified that she had started using a questioning technique more to get learners to actively participate in their learning. She also emphasized that she believed it was important for learners to engage in research to discover facts for themselves, as the learners in her class had done during the lesson on bugs described in the winning story.

In her position as curriculum advisor, Joelene highlighted that she was using the computer to develop assessment outcomes and tasks for different grades and sharing these. She was teaching herself how to work with Google Docs so that she could file and share her material on this platform. She noted that 2009 is the year of astronomy and as a result, all the PowerPoint slides she makes will be colour-coded with the year of astronomy's colour scheme, purple. She is burning CDs with templates and work schedules to give to teachers when she goes to schools to offer support. She is also developing acronyms to try to help teachers to remember the requirements for assessment standards.

Joelene certainly showed that, with determination, no user control rules can prevent a teacher from using available resources in the school to make use of technology to benefit learners. From the conversation with her, it is clear that school laboratory user policies should be open to include use by those who champion the cause of technology use in education. Joelene is truly a champion who, despite restrictive computer laboratory usage policies in her school, was able to use computers and mobile phone technology to create a lesson that was etched in the memory of her learners. Joelene also successfully showed that technology can benefit classroom- and office-based educators, as she has successfully transferred what she learned through the WCED ITE training to her new role of curriculum advisor. Joelene indicated that the training was very good as the trainees were forced to think about how they could use technology in their classrooms for teaching and learning.

Leading with Technology: Estie's Story

D F Malan is a school established 35 years ago, which is located in the northern suburbs of Cape Town. The school is in Bellville, in an affluent part of the suburb. There are approximately 1,100 learners in the school, from Grades 8 to 12. There are 60 teachers in the school, making the average teacher: learner ratio 1: 18. School fees in the school are about R10,000 a year. At a meeting with Estie and the principal, after observing Estie's lesson, both

[104] Researcher case study visit to Eros School, March 2009.

Estie and the principal reported that the matriculation pass rate has been 100% each year. In the school's reception area, there are certificates of recognition from the WCED for the school's high achievement in this regard. The school also has a strong sporting culture and does well in hockey, netball, and swimming. It is well resourced in terms of teaching and learning materials and resources and has a well stocked library which learners can use for research. When a researcher visited the school, it was well kept and seemed to foster a positive atmosphere in teaching and learning.

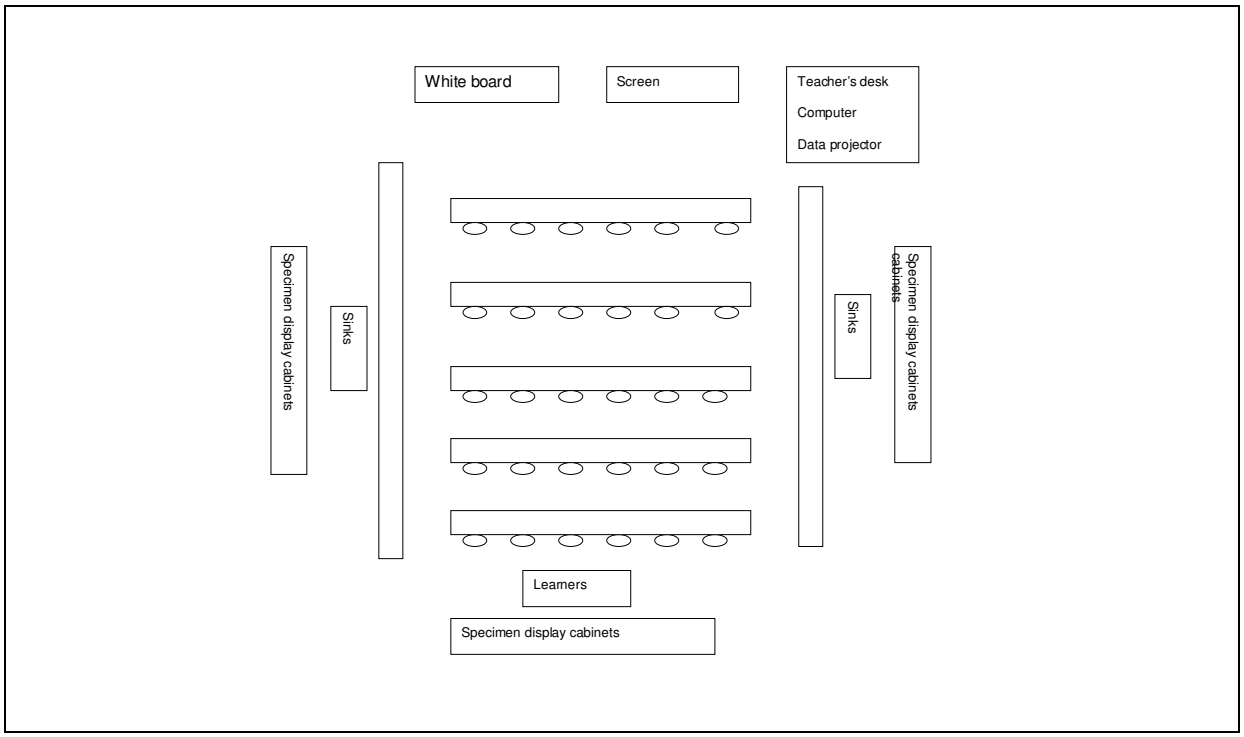
Estie van den Berg has been a teacher for 24 years, 20 of which have been spent at D F Malan. Estie taught at a school in Simon's Town, another suburb in Cape Town, for the remaining four years of her teaching career. Estie teaches Life Sciences, Technology, and Mathematical Literacy to Grades 8 to 12. She was awarded her teaching qualification through the University of Stellenbosch. She also has a Diploma in Library Sciences and helps in the library as her extra-mural activity. Estie indicated that she has access to a computer at home. She reported that, to improve their technology skills, she and several teachers in the school participate in a Grade 11 afternoon class on CAT. She pointed out that what she is learning from these classes has made her more confident with technology. She also highlighted that, when she is struggling with any aspects of technology use, her learners assist her.

The researcher visiting D.F. Malan School in March 2009 was struck by what seemed to be a very strong culture of technology use in the school. There were three classes with about 20 to 30 computers each where learners were taught using computers. These classes offered IT, CAT, and mathematics. There was an interactive smart board in the mathematics class. There was also a computer laboratory next to the library with about 40 computers. All of the computers were functional at the time of the visit. There were external service providers responsible for servicing and maintaining the computers. In the library, there were eight computers for research, with Microsoft Encarta loaded onto them. Each teacher had a computer with broadband Internet connectivity in the classroom. During the researcher visit to the school, all computer rooms, except the computer laboratory, were being used for teaching and learning. Estie and the principal indicated, however, that there is a shortage of data projectors in the school as 60 teachers are required to share two data projectors.

The principal indicated that the school was exploring acquisition of digital pens which are cheaper but almost have the same teaching and learning effect as interactive white boards. There is a teacher who manages the timetable for laboratory usage.

Estie was teaching a lesson in her classroom when the researcher visited the school. The classroom was very spacious. It was set up in a traditional arrangement where learners sit in rows on benches and the teacher's table is in front. As the fittings were fixed, the classroom arrangement could not be changes. The following diagram reflects the classroom arrangement for the class observed during the school visit:

Chart 14 Classroom arrangement at DF Malan



Estie's lesson was on genetic disorders and she was focusing on cystic fibrosis. In the lesson, Estie used a PowerPoint presentation, with very bright and captivating images to illustrate her point about how people acquire this disease genetically. Use of images was strengthened by use of text to explain the images. This seemed to make learning very captivating for the learners, who were very attentive and asked questions during the lesson. The following are examples of PowerPoint slides that Estie used in her teaching on the day of the researcher visit:

Chart 15 Example 1: PowerPoint slides used in DF Malan Natural Science class (Slide 1 Causes of cystic fibrosis)

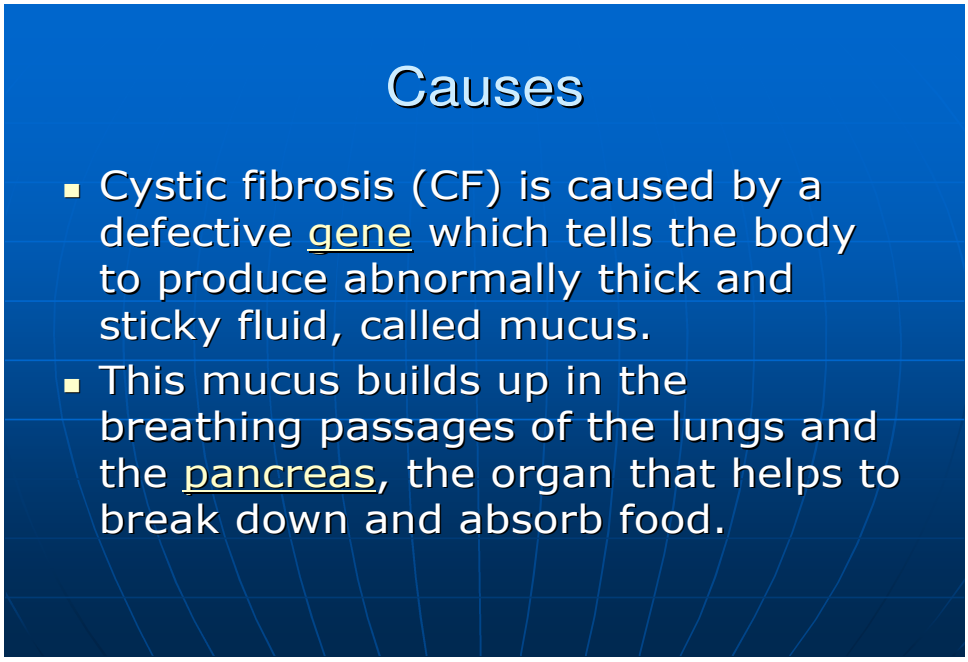


Chart 16 Example 2: PowerPoint slides used in DF Malan Natural Science class (Slide 2: Illustration of how cystic fibrosis affects the patient)

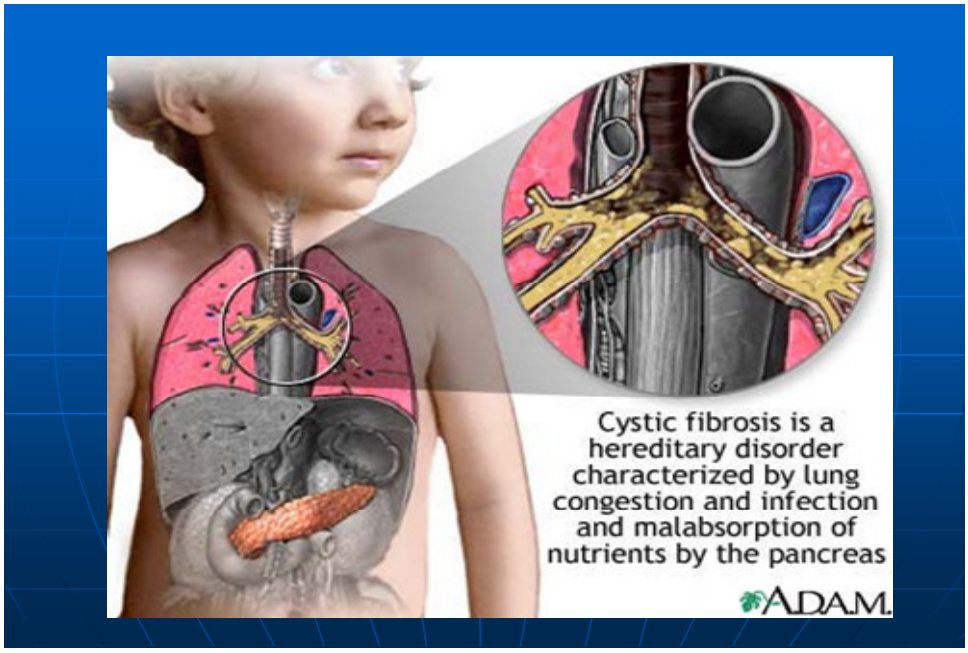
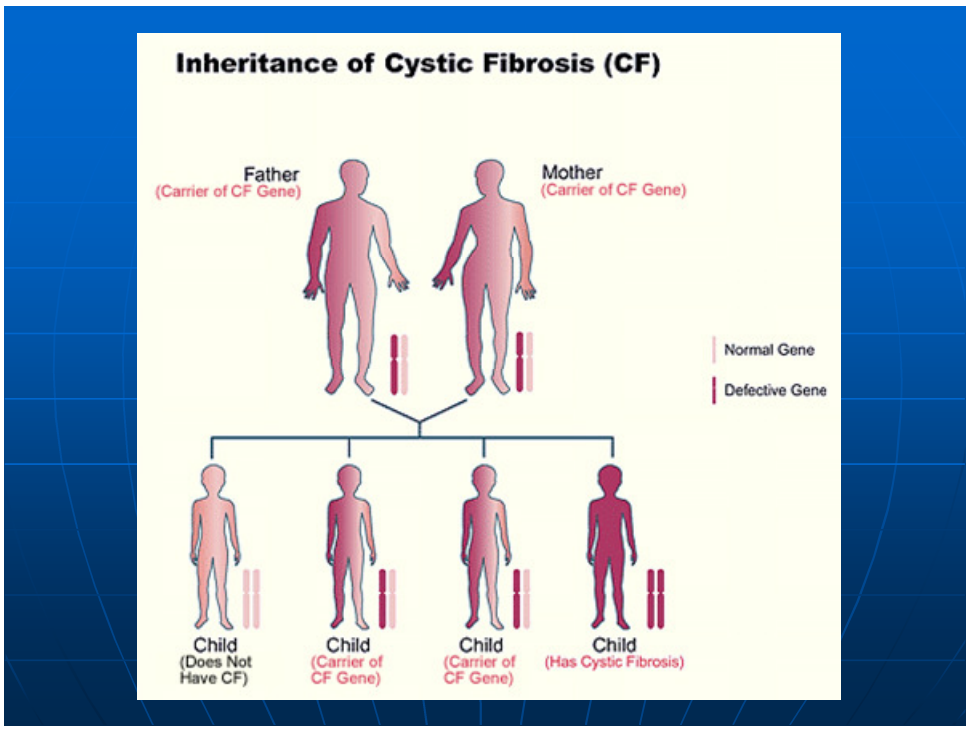


Chart 17 Example 3: PowerPoint slides used in DF Malan Natural Science class (Slide 3: Illustration of genetic factors in cystic fibrosis)



Slide one shows how Estie used brief notes to convey information about cystic fibrosis. Slide two shows the effects of cystic fibrosis on the lungs and the pancreas, while slide three shows the genetic disposition to cystic fibrosis. By using short text and diagrams, the information is accessible and seems to become more real. The learners seemed interested during the observed lesson and were engaged by these diagrams.

In Estie's story which she submitted to the story competition about her Grade 11 Life Science class, she described how she had shifted from using overhead transparencies to using PowerPoint presentations. A key component of this shift was that she was able to source images and information about particular events from the Internet for these presentations. Estie explained that her motivation for using PowerPoint was to make learning exciting and to capture learners' attention. This certainly worked in the lesson observed, where the learners were attentive and engaged, and a very positive learning atmosphere was created in the classroom. Estie attested that the change of media had immediately 'grabbed' the learners and she reported that they had enjoyed the lesson more, and showed their appreciation for the teacher for making such an effort. This sense of appreciation was expressed to the visiting researcher in the observed lesson, where some learners pointed out that many teachers were afraid of using technology and learners really appreciated the fact that Mrs van den Berg was not intimidated by technology.

Estie said that Google was a powerful search engine which she used to search for images. She explained that she made an effort to find clear images and to only use a few words per slide. This seemed to be very effective visually and was evident in her observed lesson. It appeared that use of PowerPoint may also have improved learners' understanding, as Estie pointed out that they did very well in the assessment when they were tested on populations. Perhaps the most important point that Estie made is how much she personally had enjoyed lessons and had enjoyed using PowerPoint. She stuck the researcher as having been highly motivated by

use of technology in her teaching. It seemed that using applications like PowerPoint had helped to revive and strengthen her interest in her work. As Estie pointed out, there is potential for adaptation of methodologies across subject areas. She reported that she had been able to adapt the methodology that she had used for Life Sciences to her Mathematical Literacy classes, where she made use of colour coding to differentiate the steps in the sums. Estie highlighted that a huge advantage of using PowerPoint was that slides can be filed and are easily retrievable for reuse if needed for other lessons.

It seemed that Estie had also helped to inspire other teachers in the school to start using a data projector. These teachers had assessed Estie for the Quality Management System peer assessment, and she believes they must have been so interested in her use of PowerPoint and so they were also motivated to try to use technology.

Estie highlighted that the WCED ITE training had a very positive effect on her practice. She pointed out that her computer skills had improved at the training. She was especially motivated by realizing how much more she could do compared to other teachers at the training. She felt that this had given her a lot of confidence. Estie reported that, after training, she was using the Internet more to access or aid her in developing lessons and that she was presenting information to learners in PowerPoint. Estie indicated that the training had taught her to use the Internet for research and as a result she would take learners to the computer laboratory to conduct research on some of the work she was teaching. To elaborate on this point, she gave an example of learners having gone to the laboratory to conduct research on genetic disorders.

Estie emphasized that she sometimes wanted her learners to present their findings using computer technology. She indicated that, if her learners asked her for PowerPoint slides that she had uses in her classes, she would print them out and give them to the learners. In an interview with the researcher after her observed lesson, Estie reported that technology enhances what is in the textbook and makes learning clearer for learners. She explained that learners can go to the textbook for detailed information and felt that use of technology also encourages self-directed learning. In her view, PowerPoint presentations make learning more visual. Estie said that she can also make use of question banks that she can access on the internet. She explained that she was currently busy writing a textbook for Grade 11 Life Sciences and that she wanted to include use of technology so that schools with Khanya computer laboratories could use their computers for teaching Life Sciences in a more visual way like she does.

The learners in the Grade 12 class that Estie was teaching when the researcher visited D.F. Malan school were very enthusiastic about learning with technology. They highlighted that learning with technology made learning very easy and interesting because of visualization from the images. One learner explained:

> The concepts are very complicated and when Mrs van den Berg uses PowerPoint it helps to explain the concepts in a way that we can understand better.

During the observed lesson, learners were very attentive, sometimes laughing in reaction to some of the images and asking questions of clarity. Learners expressed the sentiment that they would be very happy if all their teachers were to use technology. They indicated that only the mathematics teacher also used technology. They attributed lack of technology use by teachers to fear of technology and lack of IT skills to confidently use technology for teaching and learning.

Estie's story is one of determination to change teaching and learning for the benefit of learners. She seems to have capitalized on the school's available resources to make learning meaningful for her learners, and this seems to have helped to improve learning in ways that also excited her as a teacher. Her innovative use of PowerPoint also apparently encouraged two other teachers in the school to use the data projector for lesson delivery. Estie indicated that the WCED ITE training had empowered her to use PowerPoint confidently in her classes daily, something she did not do before the training. The strength of the training had been in the way that the trainers used concrete examples to demonstrate how to use technology for teaching. The trainers also modelled good practice by good use of technology for the training.

Summary of Findings and Recommendations

In this section, we summarize key findings of this evaluation against the primary research questions:

1) What model has been adopted by the WCED in using the Intel® Teach materials?
2) What are the responses (strengths, weaknesses and perceptions of value) of this model from the perspective of:
   a) Programmes managers and trainers;
   b) Teachers participating in the programme.
3) How do a selection of teachers who have participated in the WCED Intel® Teach training report that it has impacted on their classroom practice, if at all?

For each question, we provide a summary of findings which we have already been presented with its accompanying detailed evidence in the section above. Where appropriate we also make evaluative judgements expressing our interpretations of these findings. Finally we present a series of project recommendations which we think emerge from the evaluation findings, and which we put forward for future planning consideration.

Summary of Findings

What Model has been Adopted by the WCED in Using the Intel® Teach Materials?

There are four main role players involved in the Intel® Teach Essentials programme in the Western Cape: Intel, SchoolNet South Africa, the WCED, and the Centre of e-Innovation in the Office of the Premier of the Western Cape. Each has a clearly articulated role and has been an important role player in conceptualizing and/or implementing the WCED ITE model. Their precise roles have shifted over time, and now reflect a viable model for long term sustainability. What was initially direct Corporate Social Investment, which added value to the provincial education system but was essentially operating alongside the government offering, has now been integrated into provincial education support systems and is being implemented and funded by the provincial Department. Initial corporate investments were made in conceptualizing the course, developing materials, developing a model for implementation in the South African context, and building core local training capacity. This then shifted to a model where the course is driven, managed, and implemented by the provincial Department, with the original agencies supporting key activities, such as providing a quality assurance component and awards ceremony incentives.

This reflects a clear shift in responsibility from SchoolNet South Africa offering training using Intel® funding to WCED driving the ITE training in the WCED from 2007 onwards. In 2005, the WCED were invited to draw on materials and approaches which had been adopted by SchoolNet South Africa in offering the training programme in prior years. The WCED was not at first in a position to take on this role, but, through intervention of the Centre of e-Innovation located in the Office of the premier in the Western Cape, a project manager for the programme was appointed, incremental funding was raised to offer the training to WCED teachers, and training was offered via the two identified teacher training centres in the province. This delay in implementation and subsequent uptake by the provincial government

highlights the importance of having a clear location and project champion at provincial level to allow for projects to be integrated into provincial portfolios.

Key people involved in the project management of the WCED training reported that about 500 teachers participated in the course in 2008. The overall budget for this intervention was substantial, and should be viewed in relation to a significant overall provincial budget on e-Learning in the Western Cape. The average cost of the ITE course is about R3,000 per person per course, including the cost of seconded teachers, transfer payments to schools, training materials, catering as well as accommodation.

The WCED ITE course aims to support teachers in integrating technology into their classes. Its focus is not on basic ICT skills in isolation, but on pedagogical approaches. It does this by encouraging a project-based learning approach and focusing on higher order thinking. A key part of the purpose of the course is to improve motivation for both teaching and learning. This seems to be a very important facet of the WCED ITE course, as shifts in pedagogical practice have been raised and discussed as a strength of the course by all parties.

Teachers taking the course were required to attend one week of face-to-face training at the two training centres in Kuils Rivier and Worcester. Each group taking a course comprised a maximum of about 17 teachers. Facilitated sessions ran from approximately 8am to 4pm, from Monday to Friday. There were two breaks for tea of half an hour each, and a break for lunch for an hour. Tea and lunch were provided at the training venues. The training took place during school time. Schools organized for replacement teachers, who were paid through the project budget.

During the facilitated sessions, participants each had access to a computer. They were guided through the ITE manual and in completing the predesigned activities for the course. The facilitator made use of a data projector and mixed a presentation style with plenary discussion and individual and group work on particular activities. Teachers participating in the ITE course received a printed manual and memory stick containing the course content and several printed handouts such as the programme schedule. The decision to provide the content – which is usually on a CD – on a memory stick was taken so that teachers were able to save their work during the course and take this work home with them.

The WCED ITE course was assessed using informal formative assessment during the face-to-face training sessions, and summative assessment of a portfolio prepared by each participant. A minimum portfolio had to be prepared and submitted by the last day of the course (Friday), but participants were then given a week or two to rework it before submitting for final assessment. The portfolios were marked externally by a SchoolNet South Africa representative and returned with a marking rubric and assessor comments. There was some limited opportunity for participants to resubmit portfolios for remarking. The project manager explained that the ITE course was initially intended to carry a certain number of Continuing Professional Development (CPD) points for teachers, and so accumulate towards their professional development requirements, but the CPD process had not been finalized, and so this was not yet in place. It was also possible to have successful completion of the course recognized as credit towards a formal ICT Integration course offered by a University although it is not known how many WCED teachers, if any, opted to take on a formal programme.

Participating teachers were drawn from different schools in the WCED and came from different phases, grades, and learning areas. Curriculum advisors were responsible for recruiting teachers in their learning area to the course, which was an important part of the WCED model. Curriculum advisors were also encouraged to participate in the course. The course was part of the district support offered to schools, and not completely divorced from these processes (as is often the case in other provinces or with other ICT training models). Basic computer proficiency was considered to be a requirement for taking the WCED ITE course, but implementing this requirement in practice was difficult.

Trainers were selected from teachers in the WCED who had a proven track record with SchoolNet SA training or met 'gold status' on the SchoolNet SA ITE course. It was thought to be important that trainers were good teachers and were based in the area where they would train.[105] Trainers selected were bilingual and able to code-switch from English to Afrikaans when teachers chose to use Afrikaans. Although materials were developed in English, having bilingual trainers to allow such code-switching and discussion in the language with which the teachers were most comfortable was an important feature of the selection of trainers.

Trainers went through some additional training with SchoolNet SA before taking on their trainer role. The SchoolNet trainer (and quality assurer for the course) also offered to provide electronic support to them after this orientation training. Staff meetings at the e-Innovation centre were also reported to be a means of providing support to the trainers and ad hoc contact with SchoolNet SA for support.

On completion of the course, participants were required to complete a course evaluation questionnaire as a way of giving feedback to the trainers and project managers. At the time of collecting data for this evaluation report, this feedback had been captured but not systematically analysed or reported.

Several factors are remarkable about this model in comparison to other training approaches. First, training was offered by the provincial Department of Education at teacher centres in the province. Second, curriculum advisors were involved in recruiting teachers for each training group and were themselves participants in the training. This meant that training generally drew together teachers from the same phase and learning area. Third, the ITE course has a strong focus on pedagogical approaches and aims to make shifts in classrooms practice towards a project-based approach to learning. The emphasis is on this pedagogical consideration, with ICT as a tool to support this, rather than on the ICT itself. Finally the training took place during the week during school time and not in school holidays or over weekends, as is commonly the case in South Africa. Substitute teachers were paid to take on the teacher in question's classes and school responsibilities during this week.

What are the Responses to this Model from Programme Managers and Trainers?

Project role players all felt that there had been a positive response from teachers to the course. The e-Innovation centre Deputy Director, project manager and both trainers all felt that the WCED ITE course was valuable and was having an impact in the WCED schools. In general terms, it was felt that the WCED ITE course was effective and that the model adopted was working and successful. However, both trainers reported on cases of teachers having

[105] Interview with Deputy Director of e-Innovation Centre, November 2008.

difficulties implementing what they had learnt on the course when they were back at their schools. This was attributed mostly to lack of access to ICT facilities at school level.

Key project role players identified the intensive nature of the course, which allows teachers to focus on the course content and takes them away from their school commitments, as a major strength of the model. Use of replacement teachers to facilitate this was thought to be an asset. This was thought to be a better model than those where teachers either have to attend sessions in the afternoon or during school holidays. This view was expressed by key project managers and shared by the trainers. There generally seemed to be agreement amongst key role players that the model was working, and that, while some areas may need attention, the overall approach was appropriate.

There were also positive comments on the possibility of bringing together teachers from the same learning area to participate on the course. In this regard, the role of CAs in convening the groups, as well as being involved as participants in the course (in some cases) seemed to be an important feature of the WCED model. One trainer felt that the content and instructional design of the course was a key strength.

Within this context of a generally positive view of the WCED ITE course and the model it had adopted, there were areas of weakness or challenges identified by the key role players. These included:

- The quality of and turnaround time for assessing portfolios and consistency in assessment of portfolios;
- Lack of follow-up support for teachers once they return to their schools after the course;
- Lack of screening of basic ICT skills when selecting teachers to participate in the course;
- Local relevance of the course to the South African curriculum context;
- Quality of substitute teachers and their impact on the quality of teaching at the school.

These were issues of concern or challenges raised by several of the role players. One person involved in project management commented on the intensive timeframes of the course, reporting that teachers find the timeframes for portfolio submission difficult, but that this was a constraint that had to worked with. This pressurized nature of the course was also thought to be a possible reason for the concerns about the portfolio quality.

What are the Responses to this Model from Teachers Participating in the Course?

The WCED ITE project team collected evaluative feedback through an internally administered questionnaire from 117 teachers (approximately 22% of the 500 participants) on their responses to the course. Participants were asked to rate their responses to a series of statements using a four-point scale: strongly agree, agree, disagree, and strongly disagree. It is very encouraging to note that 97% of the respondents agreed that they would recommend the WCED ITE course to a colleague. The vast majority reported that they made use of the resources on the CD, felt that the facilitator had supported them when they needed help, and believed that they had learnt about using projects to integrate ICT into their lessons and had learnt from their peers during the sessions. Over 95% of the respondents reported that they planned to implement their project in their classroom as a result of the WCED ITE course. The same proportions agreed that they had learnt new things about learner support, and had

enjoyed working in groups. It seems that respondents seemed to make more use of the CD materials than of the manual.

External evaluation perspectives from teachers participating in the course were gathered in three case study groupings:

- A case study of a particular training group (group one) where teachers were drawn from a more rural environment, were mostly primary schools teachers. They taught a spread of learning areas although almost all were Arts and Culture teachers. They were accompanied by their Arts and Culture and Life Orientation curriculum advisors.
- A case study of another particular training group (group two) where teachers were drawn from both township/peri-urban and urban schools. They were all either physical or natural science teachers, with mathematics or life science as their second teaching subject. They were accompanied by the Science curriculum advisor.
- A case study of the teachers who attended the awards ceremony, or who won the Significant Change Story Award (award-winning teacher group). This group of teachers were mostly from schools in urban areas, although this group included some teachers from schools in rural and township/peri-urban areas. Three quarters of this group were high school teachers and most tended to be mathematics, physical or natural science or Computer Applications Technology (CAT) teachers.

In general, very few training case study teachers reported having access to a computer in their own classroom. Almost half of the award-winning teachers reported having access to at least one computer in their own classroom. All teachers reported having access to computers in a computer laboratory or media room in their schools. The award-winning teachers tended to be from schools where there were more computers than in the training group case study schools. A third of teachers in training group case study one (where more teachers reported to be from rural primary schools) indicated that they had access to a computer at home. This was the case for three quarters of the teachers in training group case study two. It is remarkable (although not surprising) that 90% of the award-winning teachers indicated having access to a computer at home.

All groups of teachers were asked to indicate on a scale of 1 to 5 the degree to which they agreed or disagreed with a series of statements about the impact of technology-integrated lessons on their learners. For training group case studies, this was asked as an anticipation of impact, while for the award-winning teacher group it was posed as a reflection on their actual experience since completing the training. Most teachers from all sample groups agreed or strongly agreed with these statements:

- Learners are motivated and actively involved in technology-integrated lessons;
- Learners work together more often than in previous assignments, when engaged in a technology integrated lesson;
- Technology-integrated lessons address learners' different learning styles;
- Learners work shows more in-depth understanding of content than in previous, comparable assignments when engaged in technology integrated lessons; and
- Learners are able to communicate their ideas and opinions with greater confidence than in previous, comparable assignments, when engaged in technology-integrated lessons.

Teachers in each sample group were also asked what, in their view, were the strengths and weaknesses of the WCED ITE course. These were the main strengths as identified by teachers:

- Opportunity to build computer skills, develop familiarity with ICT for use in the classroom, and integrate ICT into the classroom;
- The project-based nature of the course, including the questioning approach and challenging learners to think;
- Its clear links with the particular subject area;
- The overall instructional design of the course; and
- The important role of trainers in modelling processes and scaffolding learning:

When reflecting on weaknesses of the WCED ITE course, the most commonly mentioned issue – which cut across all the teacher groups – was that the time allocation for the course was too short. There were several comments from the award-winning teacher group about how the overall instructional design of the course could be improved. Two teachers from this group felt that the course needed to be more obviously related to the South African context. Two award-winning teachers felt that clearer information on what was expected in the portfolio would be useful. Several teachers in this group felt that the training should be extended and reach more teachers.

How Do Teachers Report that the Course has Impacted on their Classroom Practice?

The award-winning group of teachers was asked to estimate how frequently they engaged in technology integration lessons with their learners since they completed the WCED ITE course:

- 10% indicated daily;
- 52% indicated weekly; and
- 24% indicated monthly.

It is very positive to see that 62% of the award-winning teachers indicated that they integrate technology into their lessons at least on a weekly basis. This was a comparable figure for the training group case study two teachers (mostly high school science teachers), where 63% anticipated that, following the WCED ITE course, they would integrate technology into their lessons at least on a weekly basis. The training group case study 1 teachers were far more conservative in their estimates. Only 11% of these, mainly primary school Life Orientation and Arts and Culture, teachers, anticipated integrating technology into their lessons on a weekly basis or more often.

This serves to highlight that different target groups for the WCED ITE training responded to the course in different ways. WCED teachers with basic ICT skills, are not a homogenous group. The greatest uptake of ICT into the classroom seems to be amongst high school teachers, in the mathematics and science and computer science areas, and where teachers have access to a computer at home. This point is not intended to imply that the WCED ITE is not having an impact on classroom practice, but it highlights that different groups of teachers seem better able and more likely to change their classroom practice as a result of training. One could postulate that the likelihood of the ITE course impacting on classroom practice seems to be, in part, a factor of the teacher's phase and subject area specialization, their access to ICT at school and at home.

The award-winning teachers were also asked whether, since completing their ITE training, there had been any change in how frequently they did various activities in their classes. The training group case study teachers were asked to indicate if they anticipated changes in the

frequency of their various activities in their classes. In this regard there was the greatest convergence in responses across the sample groups of teachers for them increasing how much they were:

- Accessing the Internet to aid in developing lessons or activities;
- Presenting information to learners using computer technology;
- Having learners review and revise their work; and
- Having learners engage in independent research using the Internet.

These are the four key activities which the majority of teachers across the groups reported as activities that they planned to do more frequently in their classroom lessons (or, in the case of the award winning teachers, were now doing more frequently).

Above we highlighted that the WCED teachers were not a homogenous grouping, and that different teachers (depending, amongst other factors, on their phase level, subject specialization and access to ICT at school and at home) seemed to respond differently the WCED ITE course. This affected reported levels of impact that the course has at school level. Notwithstanding this diversity in responses, we were able to collect several narrative accounts of how teachers were taking what they had learnt in the WCED ITE course back into their classrooms. These accounts were from different sources. Some were award-winning teachers accounts of what they now did differently in their lessons after the course. Some were descriptions of how teachers who were busy completing the training anticipated that they would use what they had learnt at school. Still others were stories submitted voluntarily to the Significant Change Story Competition. From this sampling of stories, it is clear that the WCED ITE course is having pockets of impact at identified schools. The following table provides a synopsis of the stories collected from teachers through this process:

Table 16 Teachers' Stories collected through this evaluation process

Group	Name	Grade	Type of school	Learning area/subject	Lesson example
Award winner	Collette	9-11	Township high school	CAT and LO	Grade 11 Internet research investigation into the Influence of Cellular telephones on the Environment.
	Valerie	10-12	Rural high school	Physical science	No lesson example but after school activity.
	Peter	10-12	Urban high school	Life sciences	Introduced 5 computers into his classroom. Group project with each group investigating a different disease affecting South African communities.
	Magda	1-7	Rural primary school	Computer skills	Project work on poverty with two grade 7 classes. This involved searching for information and producing a pamphlet using Publisher.
Case study training groups	Andre	5-6	Rural primary school	Technology teacher	Plans to change his teaching practice and reports having a mind-shift as a result of the course.
	Annetta	1-7	Curriculum advisor	Life orientation	Reports now being able to develop brochures and learning materials which she could not do before the ITE course.

Group	Name	Grade	Type of school	Learning area/subject	Lesson example
	Shawn	10-12	Per-urban	Physical Science and Geography	Uses his own laptop in the ITE sessions and reflects on the pedagogical approach adopted in the sessions.
Significant change story entrants	Marie	7-12	High school in Athlone		Plans to implement 'Marzano's Dimensions of learning' into her lessons. Would like learners to formulate arguments and give logical presentations using technology.
	Saul	7-12	High school teacher in Athlone		Reports that learners respond well to PowerPoint and 'like more pictures than endless bulleted slides'.
	Adrian	7-12	High school	Life orientation	Reports on a Life Orientation lesson on relationships where he used a Powerpoint Presentation with music.
	Michael				Plans a project on xenophobia where learners will prepare a Powerpoint presentation
Significant change story winners	Joelene	7-9	Curriculum Advisor	Natural science	Describes a lesson on identifying bugs using mobile telephone pictures and google image searches with learners with Special Educational Needs
	Estie	8-12	Urban high school	Natural Science	Describes a Life Science lesson on population using PowerPoint and the impact this has on her colleagues who also want to use ICTs. She also used the same techniques in Mathematical Literacy

This summary table highlights that teachers who narrate these stories of impact come from different contexts: some from high schools, others from primary schools; some in arts and culture others in mathematics, science. and computer science. Some are curriculum advisors, others are teachers. Some work in well-resourced schools with substantial access to ICT, while others work in historically disadvantaged schools. There is also evidence of impact in schools for learners' special educational needs. This is a very positive reflection on the WCED ITE course.

In addition, where we were able to investigate the descriptive accounts by two teachers by visiting their schools, observing their practice, and triangulating their accounts with the views of their colleagues and their learners, we found very encouraging data. The two winning stories were both validated through a school visit and developed into more detailed case studies of shifts in classroom practice.

Joelene's story of supporting learners with special educational needs in using mobile technology to photograph an insect, and then using the Internet to identify it and research it,

reflects a rich integration of ICT into a Natural Science lesson, which draws on the learners' own school environment. Learners were enthusiastic about their experience and the pictures of their work they produced as part of this lesson show their attention to detail in examining this insect. From this case study, it is clear that the WCED ITE course made a difference to these learners in this lesson. It also points to an enthusiastic curriculum advisor who is now championing the case of ICT integration into Science and trying to address problems with restricted access to ICTs in this particular school – as well in others in her district.

Estie's story of using PowerPoint to make her lessons more interesting and engaging for her Life Science students is also a success story. What may have been a description of a once-off attempt to improve lesson materials (as described in Estie's initial story about population) was found to be a technique which Estie used confidently in multiple lessons and across subjects. She was seen using the same technique with a different class and on another topic on the day of the researcher visit to her school. From learners' feedback, it was clear that Mrs van den Berg stood out as remarkable in comparison to other teachers with her extensive technology use in their school. In this case study, Estie's impact on supporting other teachers in her school was also brought to light. Estie attributes to the WCED ITE course her increased confidence and skill in using PowerPoint and the Internet to research suitable images and contexts to bring her lessons alive. This is another success story of school-level impact for the WCED ITE course.

Notwithstanding these very positive examples of school level impact, there was some evaluation data which pointed to possible lack of impact at school level for some of the teachers who have engaged in the course. The likelihood that (at least for several teachers) integrating technology into their lessons on a regular basis remains an unattained ideal emerged in several ways:

1. Some key project role players were very cautious about the school level impact, and felt that an impact study was required for any conclusions to be drawn on this.
2. Some key project role players, including the trainers, were concerned that there was no or little school level support built into the WCED ITE model. Once the intensive course was complete, teachers were then largely on their own when returning to their schools. The involvement of CAs in the courses as a means to provide this support was seen as possible vehicle for this ongoing support, however it was also recognized that quality and capacity of CAs varied considerably. If CAs are to provide this ongoing support and stimulus for innovative practice at school level, they are likely to require a supportive networking environment. In this regard, Joelene is probably the exception, rather than the rule, and formal means to support her and other CAs like may be required.
3. Responses from the training group 1 case study teachers (arts and culture primary school group), where most indicated that they thought they would only engage in technology integration lessons 'several times a year', was also telling of potentially limited impact at school level. Perhaps this case study group was just more 'honest' or more aware of the barriers to ICT adoption in schools, and their own limited access to ICT at home for this purpose. Whatever the reason for their low expectations, this group did not expect significant shifts in their classroom practice.
4. Several award-winning teachers were not able to describe a particularly lesson into which they had integrated technology. This was evident through spot interviews conducted at the awards ceremony, where a few teachers approached tended to describe ICT use in general terms and were not able to give concrete examples despite probing for details from the researchers.

5. Quality of submissions received for the Significant Change Story Competition showed that a few teachers submitting stories were only able to talk about what they hoped or planned to do in the future. Again, this was at times presented in rather vague terms without reference to a specific grade or learning area. This may well be a result of the format of the competition (which was a new research technique we were piloting), but the competition invitation did ask for detailed descriptions of a particular lesson. In this regard, both the response rate and the detail received in the stories submitted for the competition were disappointing.

With all sources – key project role players including trainers, award winning teachers, the case study training group teachers and those submitting stories of change to the Story Competition where all 500 teachers were invited to participate – hinting at limited use at school level, the possibility that the stories of impact we have presented are the exceptions to the norm cannot be ignored. There is no doubt in our minds that the WCED ITE course is a success. It is well considered, it is described in largely positive terms and reflected on critically and constructively by all concerned, and it has been enthusiastically and well received by all most of the teachers with whom we have had contact. However, the impact that the WCED ITE course is having on classroom practice at school level is not as clear. This study can confirm that there certainly are pockets of innovation and ICT integration into lessons, which teachers attribute to the WCED ITE course. How many pockets there are and how these weigh up against alternative accounts of complete lack of uptake or action when certain teachers return to their schools, remain unanswered questions.

Recommendations

The following recommendations emerge from this evaluation process. They are presented for collective consideration by all the project role players in their future planning processes:

1) Ensure that sufficient turnaround time for portfolio assessment is agreed and implemented so that both trainers and participating teachers have reasonable and clear expectations in this regard. This may require having more than one quality assurer.

2) Consider extending the time allocation, reducing the content or expectations, or splitting the intensive period of the course into multiple parts.[106] This may help to alleviate time pressure as teachers may be able to do some work independently on their portfolios.

3) Consider introducing a mechanism to screen teachers' ICT skills levels prior to enrolling on the course. This may be in the form of teachers having already completed a basic ICT skills course (as has been proposed by the WCED), and /or registration for the course being conducted online. Focusing on CA's basic ICT competence and using them to

[106] According to a SchoolNet SA representative, the international and recommended model is to do this course in much shorter and more numerous sessions (SchoolNet SA communication, April 2009). It may be possible to run the course for one day a week over eight weeks – thereby running 5 courses simultaneously over 8 weeks. It may also be possible to run the course with each cohort of teachers for two day sessions per week (over four weeks). By spreading out the contact sessions for each cohort or group of teachers, they will then have more time to think about their portfolio and develop their projects. This particular suggestion was put forward by SchoolNet South Africa, in a response to the evaluation researchers' recommendation to reconsider the course structure given all the feedback about there being too little time.

support teachers in their district and learning area using ICTs may be another mechanism to ensure that teachers recommended for the ITE course are basically ICT literate.

4) Review the ITE manual. We are aware that the ITE manual has been updated on occasion and that ideas for areas requiring adaptation and localization have been invited from teachers. It is not clear from the evaluation data how valid the comments are about the need to provide more South African examples. However, this issue has been raised by the trainers and some teachers (Award-winning group and the case study observation group). It may be opportune to revise the ITE manual with a particular focus on replacing any irrelevant American examples with South African ones. This instructional design update will assist the national programme. It would also be an opportunity to further improve the course based on several years of experience in using it.[107]

5) Require that teachers prepare a detailed briefing document for substitute teachers. In further strengthening the role of CAs recruiting for the course, a requirement for enrolling on the course may be that interested teachers have to prepare a briefing document for the substitute teacher, which outlines the week's lesson plans. The CA could be required to check that this is in place and sufficiently detailed for the substitute teacher.

6) Continue to introduce mechanisms to find and showcase innovative work being done by specific teachers. At present, there is very little detailed information available to know what is being done in WCED schools in relation to ICT integration. The competition that was piloted for this process, while not a resounding success (due to the quality and quantity of responses obtained) may be extended and repeated to provide one such possible incentive mechanism. One possible way to improve the entries, may be to have a facilitated session (such as at an awards ceremony) where teachers can be guided through a process of developing a story for submission. It may also help to have examples of stories to show teachers as examples for future processes. This would allow for collection of classroom-based stories of innovative lessons which can then be made available to motivate and inspire other teachers. The awards ceremony for high achievers in the course, also serves to play this motivating and show casing function. Perhaps the awards ceremony could be linked to a future ICT lesson stories competition. Similarly, submission of a story about a particular lesson could be included as portfolio requirement into the course.

7) Identify and implement mechanisms for tracking and supporting teachers after they have completed the course. Splitting an intensive course may help to give teachers a chance to finish their portfolios and perhaps try out an ICT integration lesson. However this alone will not provide sufficient ongoing support. Such support could be provided by creating a community of ICT champions – by showcasing and rewarding their innovative work (see recommendation six), providing them space to meet each other (through the e-Schools conference in the Western Cape', for example) and encouraging networks of subject- and phase-level support (through CAs and initiatives such as the Thutong learning spaces, for example). Having these mechanisms as a structured part of the ITE course, getting subject level distribution lists functioning, enrolling participants into Thutong learning spaces,

[107] In response to this recommendation, a SchoolNet SA representative commented that: 'As useful as this comment is it should be noted that they WCED will not be permitted to run the current course after 2009 and that the new course is entirely different and not an iteration of the version 5 course and, at this stage, does not have a manual'. Communication with SchoolNet SA, April 2009. The recommendation remains valid given the evaluation data – although implementing it will have to take into account the new circumstances for 2009.

and introducing other online collegial support networks as part of the ITE course may assist this process.