Evaluation of a pilot project on information and communication technology for rural education development: A Cofimvaba case study on the educational use of tablets

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ABSTRACT

In an endeavour to find solutions to the country's improving but ailing education system the South African government through some of its departments is attempting to find out if the introduction of technology in the class room has the potential to improve teaching and learning. The paper is based on a pilot study currently underway in Cofimvaba in Eastern Cape Province where tablets were introduced to teachers in eleven schools. The paper used the Cofimvaba ICT4RED initiative as a case study to ascertain how teachers accepted the introduction of tablets at their schools for teaching and learning. The main research methodology is qualitative multiple case study research with interpretivism as paradigm. Data were gathered though the use of questionnaires administered to teachers. The results showed that most teachers embraced tablets and were using them in the classroom, for their own professional development and personal use. Therefore, within the South African education system the introduction of tablets in learning and teaching is an important step towards improvement of education particularly in poorly resourced schools.

Keywords: Information and Communication Technology, ICT for development, rural development, technology acceptance model, Education, Learning, interpretivism

INTRODUCTION

The origin of the term e-learning is up for debate as different scholars place it at different places and points of time. What makes this difficult is the fact that, "in the history of e-learning, it is important to note that there is no single evolutionary tree and no single agreed definition of e-learning" (Nicholson, 2007). Nicholson indicates that e-learning evolved in different ways depending on the area of human endeavour involved. The term has been around from the late 1950s but its evolution became faster with the advent of the Internet from around 1995 "when it was all called "Internet based Training"(IBT), then "Web-based Training"(WBT) then "Online Learning" and finally e-learning, adopting the in vogue use of "e" during the dot com boom" (Fatma, 2013).

Today the focus is not only on online environments but also embraces "a full range of computer-based learning platforms and delivery methods, genres, formats and media such as multimedia, educational programming, simulations, games and the use of new media on fixed mobile platforms across all discipline areas" (Nicholson, 2007). Nicholson goes on to state that the key to accommodating e-learning is increased adoption of constructivist paradigm "and the uptake of constructivist pedagogies". This led to increased collaborative online learning environments.

In an endeavour to find solutions to the country's improving but ailing education the South African government through some of its departments is attempting to find out if the introduction of technology in the classroom has the promised potential to improve teaching and learning. The recent pilot study currently underway is in Cofimvaba in the Nciba district in Eastern Cape Province where tablets have been introduced in a number of schools to teachers and learners, excluded for this paper, for teaching and learning. Respondents were from the following junior secondary schools: Bangilizwe, Gando, Gudwana, Mcqawezulu, Mtimbini, Mvuzo, Ntsingeni, Siyabalala, St Marks and Zamuxolo, and two others were Khwaza Senior Secondary and Mthimbini Primary school. Therefore, this paper looks at the pilot study to ascertain how the project is continuing by looking at analysing the teacher's survey on their impressions on different uses of their tablets. This will be achieved by first providing the background to the study. Secondly, literature on elearning will be unpacked. Thirdly, a short discussion on the conceptual framework underpinning the paper will follow. These will be followed by short sections on the problem statement and methods and tools. The subsequent sections will concentrate on results, analysis and conclusion.

BACKGROUND

The Cofimvaba School District Technology Project is a joint initiative between the Department of Science and Technology, the national Department of Basic Education and the Eastern Cape Department of Education, and is aimed at contributing to the improvement of education in the rural area through technological innovation (Hanekom 2012). The project is intended to enhance education of mainly rural people. Hanekom further states that the Information and Communication Technology for Rural Education Development (ICT4RED) project is meant to improve the quality of teaching and learning and to ensure that the learning environment is conducive to allow ease of learning and teaching and technology implementation. Because environmental factors influence teaching and learning the project is anticipated to go further and provide technology interventions in among others ICTs, water and sanitation, health, nutrition and energy (Ford & Miril 2013).

The overall objective of the ICT4RED project is to document a model for e-textbook rollout in schools which can be replicated all over the country. This will assist the project to contribute towards improving the learner results and teacher skills by integrating technology in everyday learning, teaching and administration at schools (Williams, Marais, & Rampa, 2013). The ICT4RED project is implemented in three phases whereby phase 1 was piloted in one school (2012-2013), phase 2 expanded pilot to 11 additional schools (2013 – 2014), and phase 3 included an additional 14 schools (2014 – 2015).

The CSIR's Meraka Institute (Meraka) was commissioned by DST to roll out the project in Cofimvaba in the Eastern Cape. Meraka has installed a wireless mesh network in the area to open up access to broadband and teachers in 11 schools in the districts have received tablets and training on how to incorporate this in the classrooms (Hanekom 2012). The pilot is currently under way in the Nciba district in which technological interventions are tested to determine how technology strengthens the teaching and learning of Maths, Science and Technology in schools (Ford & Miril, 2013).

Now for this paper it was important for this project to have some kind of monitoring and evaluation process in order to assess and measure whether the aims and objectives are reached and to inform decisions and processes as the project goes along. This paper shares some of these lessons.

LITERATURE ON E-LEARNING TRENDS

Definition:

It is important to begin this by differentiating between e-education and e-learning. According to Campbell, (2001) "e-education involves e-teaching and e-learning along with the various administrative and strategic measures needed to support teaching and learning in an Internet environment. It will incorporate a local, regional, national and international view of education." South African Department of Education, (2003) states that within "the South African context, the concept of e-Education revolves around the use of ICT to accelerate the achievement of national education goals. E-education is about connecting learners to other learners, teachers to professional support services and providing platforms for learning. E-Education will connect learners and teachers to better information, ideas and one another via effective combinations of pedagogy and technology." The Department of Education considers ICT as a: (i) Tool for management and administration; (ii) Resource for curriculum integration; (iii) Communication tool; (iv) Collaborative tool for teachers and learners; and (v) Learning environment that advances creativity, communication, collaboration and engagement.

By looking at the two definitions "of education above" one sees that the distinctions are quite thin and difficult to see. However, Campbell's definition gives a little clarity as it indicates that e-learning is a subset of e-education. Therefore, what is e-learning?

Many scholars have found the e-learning concept to be broad and hard to define as it encompasses teaching, learning and technology. E-learning is sometimes substituted by other concepts such as computer-based learning, technology-based training and computer-based training (Friesen, 2009). For example, Manville (2003) includes in the definition (i) content and learning objects, (ii) learning environments, (iii) simulations and document repositories, (iv) learning support systems, and (v) tools for management of learning.

Campbell (2001) says, "E-learning is learning which takes place as a result of experiences and interaction in an Internet environment. It is not restricted to a regular school day and can take place in a variety of locations, including home, school and community locations e.g. libraries, cafes etc." Another definition is by AADM Enterprises Inc. (2009), "The use of any electronic technology to aid in the acquisition and development of knowledge and understanding in order to demonstrably and positively influence behaviours. E-learning focuses on four general categories identified as: (i) technology-driven, (ii) delivery-system-oriented, (iii) communication-oriented, and (iv) educational-paradigm-oriented (Sangrà, Vlachopoulos & Cabrera 2012).

The challenge is to come up with one all-inclusive definition for e-learning, particularly for this study, without getting into the area of e-education. Since different scholars look at e-learning concept from different positions we intend to come up with a definition which is all inclusive, that is, one which talks to learners, teachers, management, content and technology. Therefore, on the basis of all these definitions our understanding of e-learning incorporates educational philosophy, technology as the medium of instruction, subject content and how it is packaged, support and management (of enrolment, teaching and learning) which are all centred around technological enablement of learning and teaching.

Scope:

For this paper the scope of e-learning is restricted to: Content: where it is delivered through ICT technologies such as Internet, intranet, audio or video tape, satellite TV, and CD-ROM, desktop, laptop or notepad, palmtop or hand held computers. It can be self-paced or instructor-led. Flexibility: learning from anywhere and everywhere is crucial to e-learning. The connection to the

internet and the explosion of social media have allowed this flexibility in the personal learning environment. Collaboration: whereby learners are able to connect with other learners and teachers.

Context:

The study of e-learning particularly in Africa is done within the context of the following challenges: infrastructural constraints, lack of skills, high costs of implementation, differing cultural attitudes, lack of digital content, etc. The value we try to derive from e-learning is determined by the digital content, ICT technologies, social collaboration and flexibility of learning as described in the scope section above. This helps us in how: (i) information is displayed, (ii) the environment for interaction is designed, and (iii) instructional elements are set up.

Challenges to e-learning:

In another study carried out in 34 countries in Africa and among 147 e-learning practitioners the following challenges were identified: Infrastructural constraints, lack of training, excessive costs, logistical challenges, cultural attitudes, limited awareness and ineffective leadership, etc. (Hollow and ICWE, 2009). These were all classified into three categories of (i) resources, (ii) infrastructure, and (iii) understanding.

Almost four years later ITU (2013) identified the following challenges in low income countries: affordability, capacity, inclusion, content, and quality assurance. The ITU further elucidates that the challenge of slow adoption of e-learning is a result from the "constantly evolving technologies into present teaching models and methods".

Fatma (2013) raises the issue of most awareness of e-learning as a major challenge to the majority of rural people. Fatma goes on to say, "Lack of infrastructure in terms of connectivity, availability of Internet, etc. is another issue."

e-Learning trends

The eLearning landscape is one that is fluid and continuously changing. In simple terms e-learning trends are divided into two categories: (i) trends in approaches and (ii) trends in technologies. The African continent has seen three major technology trends converge with the power to contribute to learning. Abell and Long (2010) indicate "The technology trends in hardware and power are very compelling in enabling Africa to transform education using eLearning". They talk about three major trends in e-learning as (i) the low-cost computing devices, (ii) low powered computing devices and (iii) low-cost energy.

Abell and Long state: (i) the trend toward low-cost computing devices is exemplified by MIT's One Laptop Per Child (OLPC) Program to develop $100 laptops for education. (ii) The trend to lowered power consumption of computing devices is as important. (iii) Innovation driven by the market for netbooks, tablets, and eReaders has led to low power processors, screens, and other components. The third trend is the availability of low-cost off-grid energy and technologies like photovoltaic solar panels and wind turbines are significantly cheaper and more feasible today than just a few years ago. Many schools in Africa have either no electricity or have very unreliable power grids. This has represented an extreme limitation to the use of eLearning. Once these three are adopted Africa will be able to "leapfrog developed world education solutions by using e-content, low-cost devices, cloud computing, and renewable energy sources" (Abell & Long 2010. Looking at the Western countries one sees different trends in e-learning which include the following: (i) Gaming (Gamification): increased role of games in learning is seen in many courses

and learning management systems. (ii) Interactivity: more interactivity rather than just power point presentation. (iii) HTML5: Long term interactivity and m-learning. This provides better performance, multimedia, and connectivity. (iv) TinCan API replacing SCORM; (v) Responsive Web Design: A web design approach aimed at crafting sites to provide an optimal viewing experience across a wide range of devices. And (vi) Open Source e-learning platforms are gaining momentum in higher education.

E-learning is taking a strong foothold in other sectors such as ICT, business services, financial and pharmaceutical sectors, national health services, defence and public and local government institutions. According to Campus Technology (2012) the following trends are also prevalent: (i) Digital texts: The move to reduce the costs of education, including both the costs of books and of running school bookshops has ensured that the latest editions of digital textbooks are available. (ii) Distance learning programs: Again many universities are offering distance education programs with robust tools. (iii) The online learning environment becomes more personalized because of advancements in interactive technologies. And (iv) Mobile technology and apps.

Tablets, laptops, and mobile phones are each playing their respective roles in the mobile revolution that's taking place on today's college campus. Athey (2012) also talks about social-collaboration as one of the trends where "The rise of social provides an open environment with opportunities for communication and collaboration."

Benefits of eLearning:

The following benefits to instant access to ICT means for education are identified by ITU (2013) as: (i) expanding the reach and equity of education; (ii) facilitating personalised learning; (iii) powering anywhere, anytime learning; (iv) providing immediate feedback and assessment; (v) Ensuring the productive use of time spent in classrooms; (vi) building new communities of learners; (vii) Supporting situated learning; (viii) Enhancing seamless learning; (ix) Bridging formal and informal learning; (x) Minimising education disruption in conflict and disaster areas; (xi) Assisting learners with disabilities; (xii) Improving communication and administration; (xiii) Maximising cost efficiency.

Iowa State University's elearner (undated) identified the following advantages of e-learning: Class work can be scheduled around work and family; reduces travel time and travel costs for off-campus students; students may have the option to select learning materials that meet their level of knowledge and interest; students can study anywhere they have access to a computer and Internet connection; self-paced learning modules allow students to work at their own pace; flexibility to join discussions in the bulletin board threaded discussion areas at any hour, or visit with classmates and instructors remotely in chat rooms; and elearning can accommodate different learning styles and facilitate learning through a variety of activities.

Disadvantages of online or computer-based learning Iowa State University's elearner (undated): Learners with low motivation or bad study habits may fall behind; without the routine structures of a traditional class, students may get lost or confused about course activities and deadlines; instructor may not always be available when students are studying or need help; slow Internet connections or older computers may make accessing course materials frustrating; managing computer files and online learning software can sometimes seem complex for students with beginner-level computer skills; and hands-on or lab work is difficult to simulate in a virtual classroom.

It was discovered that in 2013 laptops, mobile phones and social networking are the most popular technologies supporting education. This is indicated in Table 1 which show data extracted from

The eLearning Africa Report of 2013 and representing data collected from 42 African countries and 413 elearning practitioners.

Table 1: *Popularity of technologies supporting education*

Technologies	% of respondents
Laptops	83%
Mobile Phones	71%
Social Networking	60%
Desktops	67%
TVs	34%
Radios	31%
Tablets	20%

CONCEPTUAL FRAMEWORK

Grounded Theory (GT) is the research methodology from which a conceptual framework is generated. Grounded theory is regarded as a general research method which is not owned by any one school or discipline (Scott 2009). According to Scott GT normally provides guidance data collection methods be it quantitative or qualitative and "details strict procedures that are utilised for data analysis". Grounded Theory may be defined as "the discovery of theory from data systematically obtained from social research" (Glaser & Strauss 1967). In order to accomplish this, researchers are required to keep an open mind at the start of the research, "coloured as little as possible by expectations based on existing theories" (Taber 2000).

Scott (2009) suggests that GT is fundamentally a research method and by strictly utilising it one gets involved in a research process which will lead to theory 'grounded' in data. Therefore, both the research method and research output have the same name. Scott provides the following methodological stages: (i) Identify your substantive area – this refers to the area of interest; (ii) Collect data – relates to the use of qualitative or quantitative data or a mixture of the two; (iii) Open code – relates to the open coding and data collection as integrated activities (iv) Write memos throughout the entire process. The development of your theory is captured in your memos; (v) Conduct selective coding and theoretical sampling – stop when the core category and main concern are recognised; (vi) Sort your memos and find the Theoretical Code(s) which best organises the substantive codes; and (vii) Reading of the literature and integrate with your theory through selective coding.

We are using GT in this study because of the flexibility it provides to researchers. Therefore, open mindedness is of utmost importance when using GT.

PROBLEM STATEMENT

In an endeavour to find solutions to the country's improving but ailing education, in particular the school leaving certificate (Matric), the South African government through some of its departments is attempting to introduce technology with the intention to improve teaching and learning. The recent pilot study currently underway is in Cofimvaba in the Nciba district in Eastern Cape Province where tablets were introduced in a number of schools to teachers and learners for

teaching and learning. A number of modules were taught and these included those dealing: with teaching, use of social media, peer support and strategies, etc. Now our challenge is to find out if teachers after attending a number of modules accepted and used effectively tablets allocated to them for teaching, learning and personal development.

METHODS AND TOOLS

The main research methodology will be qualitative multiple case study research with interpretivism as philosophy. "Interpretive methods start from the position that our knowledge of reality, including the domain of human action, is a social construction of human actors" (Walsham 2006). It accepts the notion that individuals create meaning within a specific environment (Hanson 2008).

These methods support our research paradigm because of their flexible use, particularly with technology, while allowing future developments. The research employed interpretive methodologies which included the use of case study and questionnaire for data collection. The case study research method can be defined as an empirical study that uses multiple sources to investigate a contemporary phenomenon in a real-world context (Yin 1984 & Thomas 2011) and emphasise detailed contextual analysis of a limited number of events or conditions and their relationships (Soy 1997). The weaknesses of case study methods, according to Mikkelson (1995), are that sometimes they serve as a foundation for generalisations, which might be erroneous. In this study, a number of TCs will be studied as part of our case studies.

Rich data were collected using questionnaires whereby the objective was to find out how respondents used their tablets, for what and to determine the levels of confidence in their use. Questionnaires are one of the most frequently used methods of collecting effectiveness data and they can be composed of items that address information and attitudes (Reeves and Hedberg, 2003). The aim of the questionnaires was to ascertain the real impact of how teachers are using tablets in their teaching.

ICT4RED: COFIMVABA CASE STUDY

The Information and Communication Technology for Rural Education Development (ICT4RED) project started in 2012 and will run until 2015. The project team held a workshop titled "What it looks like when it's fixed" with the aim of getting buy-in from the schools. This workshop was attended by representatives of headmasters, School Management Teams, School Governing Bodies of each of the 26 Nciba Circuit schools and Cofimvaba district officials in December 2011. In August 2012 the first phase (Phase 0) of the project started at Arthur Mfebe School with handing out of tablets and training the teachers on how to use the tablets and introducing the learners to cell phone-based supported for maths and science i.e. Dr Math, QuizMax and other MXit-supported educational applications. The success of these endeavours led to a broader pilot which included more schools. The Minister of Science and Technology, Deputy Minister of Basic Education and the provincial minister of Eastern Cape Department of Education launched the Cofimvaba Technology for Rural Education Development (TECH4RED) project on December 3, 2012. At this launch learners were provided with two MobiKits each containing 20 learner tablets. This marked the first tablet provision to learners in Cofimvaba.

The ICT4RED project was launched on 1 April 2013 with 11 schools (Bangilizwe, Gando, Gudwana, Khwaza, Mcqawezulu, Mtimbini, Mvuzo, Ntsingeni, Siyabalala, St Marks and Zamuxolo) making Phase 1 of the project. This launch included a workshop attended by headmasters of these schools. At this launch learners from Arthur Mfebe made presentations on

the use of tablets in supporting learning. In May 2013 the first training session on the use of tablets was held and 16 district officials were provided with tablets.

A number of courses were offered to teachers of participating schools under the stewardship of CSIR Meraka Institute. At the end of each professional development training module teachers were given tasks to perform in class or as homework at their schools. For these teachers to earn a personal tablet they needed to attend and complete all training modules. At the end of each module each teacher received a badge. The first school to earn a projector through all its teachers completing their modules was Zamuxolo Junior Secondary School, one of the poorest schools in the project. The badges teachers earned during training contributed towards the school receiving a number of technology gadgets like printers and projectors.

In July 2013 the first professional development session for the 144 new teachers from the 11 schools took place at Queens College, Queenstown with 100% attendance. At this event teachers were each given their tablet and this was followed by a tablet orientation course which was followed by modules 1 and 2.

RESULTS

The results of this teacher survey show the functions respondents performed with their tablets. Here we are presenting some of the results of the questionnaire which was administered to participants of the Cofimvaba ICT4RED project.

Teaching Purpose:

The Bar Chart in Figure1 shows that fifty seven percent (57%) of participants use tablets frequently for finding information for class, 63% develop teaching resources, 60% develop digital content and 53% use them in the classroom for showing digital content. On the other hand 17% of the teachers did not use tables to develop teaching resources, 8% did not develop content and another 8% did not use tablets in class for digital content development.
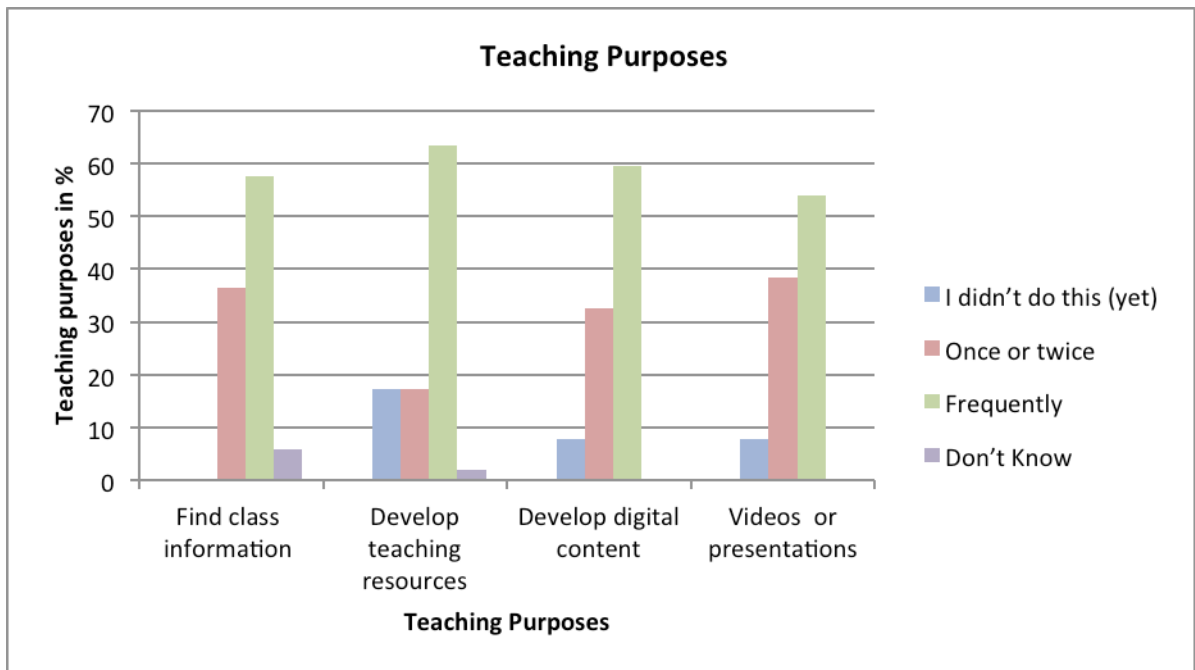
Figure1: *Bar chart indicating purposes teachers used their tablets for*

Some participants have used tablets fewer than twice where 36% used them to find information for class, 17% for developing teaching resources, 32.69% for developing digital content, and 38.46% for using tablets in class. About 6% of teachers have indicated that they did not know whether they used tablets for finding information for class and 2% indicated that they did not develop teaching resources on tablets.

Social Media

Over the past three months many respondents had started to engage frequently (35.85%) in social networking, instant messaging (39.62%), 41.5% accessed emails, 11.32% internet banking (see Fig.2 below). Most people use tablets to take pictures 90.57%, 79.25% to access Apps, 58.49% to record sound clips, 71% for recording videos and 41.51% for research.
Again, there were those respondents who used their tablets less than twice to perform all the above activities: social networking (22.64%), 24.5% in instant messaging, 41.5% emails, 15% internet banking, 9.43% to take pictures, 15.9% to access Apps, 28.3% to record sound clips, 22.64% for recording videos and 28.3% for research.

There were a large number of respondents who have never used their tablets to do some of the above mentioned activities. For example, 37.74% never used social networking tools, 33.96% instant messaging applications, 52% internet banking, 11% and 15% never used emails and research respectively. Those who never recorded videos were counted at 1.89%, 3.77% never recorded sound clips and only 1.89 never access Apps.
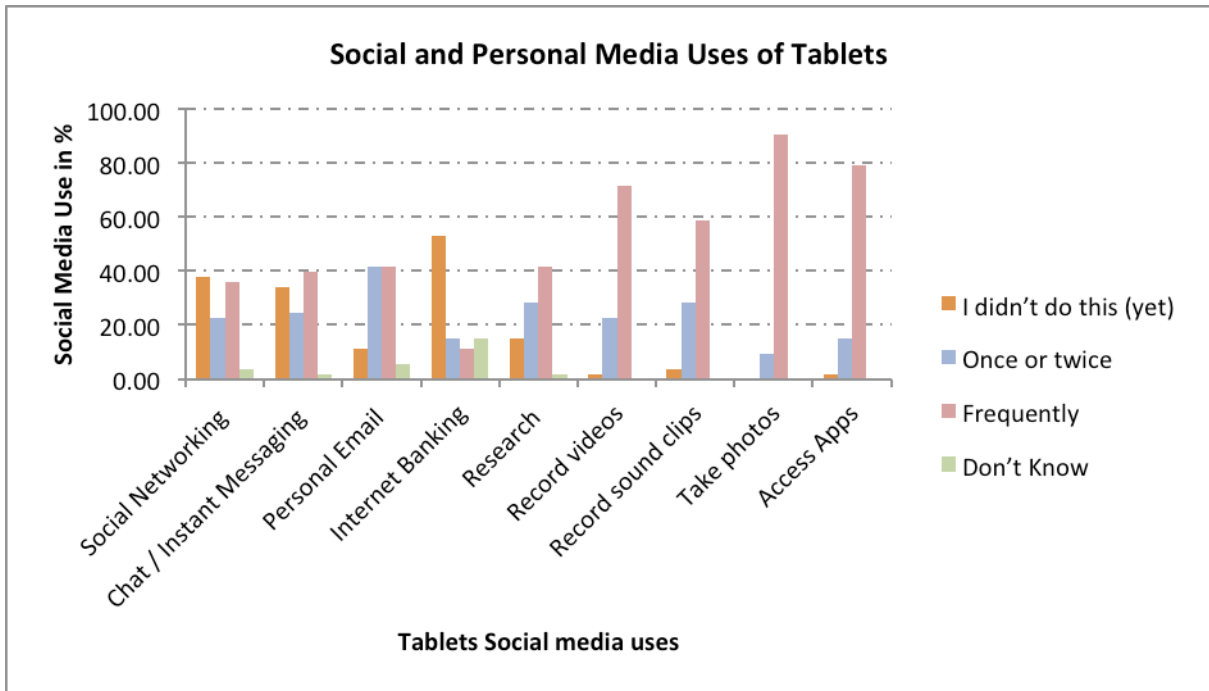
Figure 2: Bar chart indicating teachers' social media uses

Peer support

The participants (94%) agreed that they got support from the peer groups based at the school while 4% indicated that the peers at school were not giving them enough support and 2% did not know whether the peers at school supported them or not (see Figure 3).
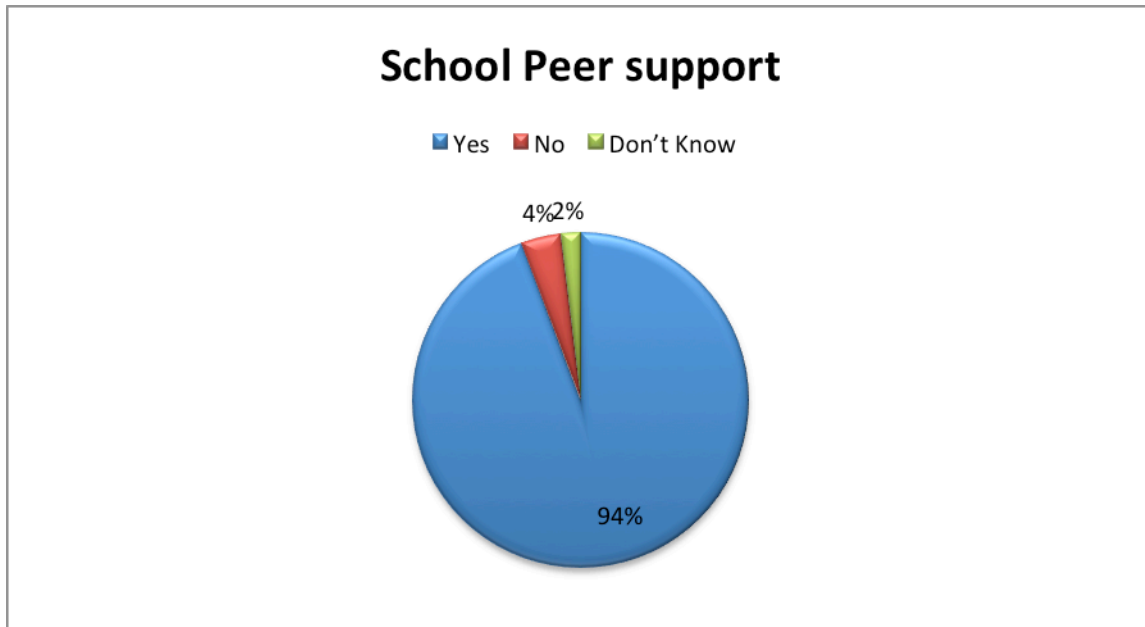
School Peer support

■ Yes ■ No ■ Don't Know

4% 2%

94%

Figure 3: Pie chart showing peer support of respondent.

Software and Hardware Experience

The majority of participants (Fig.4 below) did not experience any problems with hardware and software: tablets (75%), apps loaded on tablet (85%), tablet battery (64%), tablet charger (100%), sound quality (51%), photo/video quality (81%), Wi-Fi connections (66%), internet connection (47%), USB port (57%) and the ability to access removable storage (60%).

Some educators indicated that they did not know whether they experienced problems with the hardware or software of their tablets with regard to Wi-Fi connections (6%), internet connection (6%), USB port (21%) and tablets' ability to access removable storage (19%).

There was a small percentage of teachers who experienced various problems with both the hardware and software: tablets (25%), apps loaded on tablet (15%), tablet battery (35%), sound quality (49%), photo/video quality (18%), Wi-Fi connections (26%), internet connection (47%), USB port (19%) and the ability to access removable storage (19%). None of the teachers experienced problems with their tablet chargers.
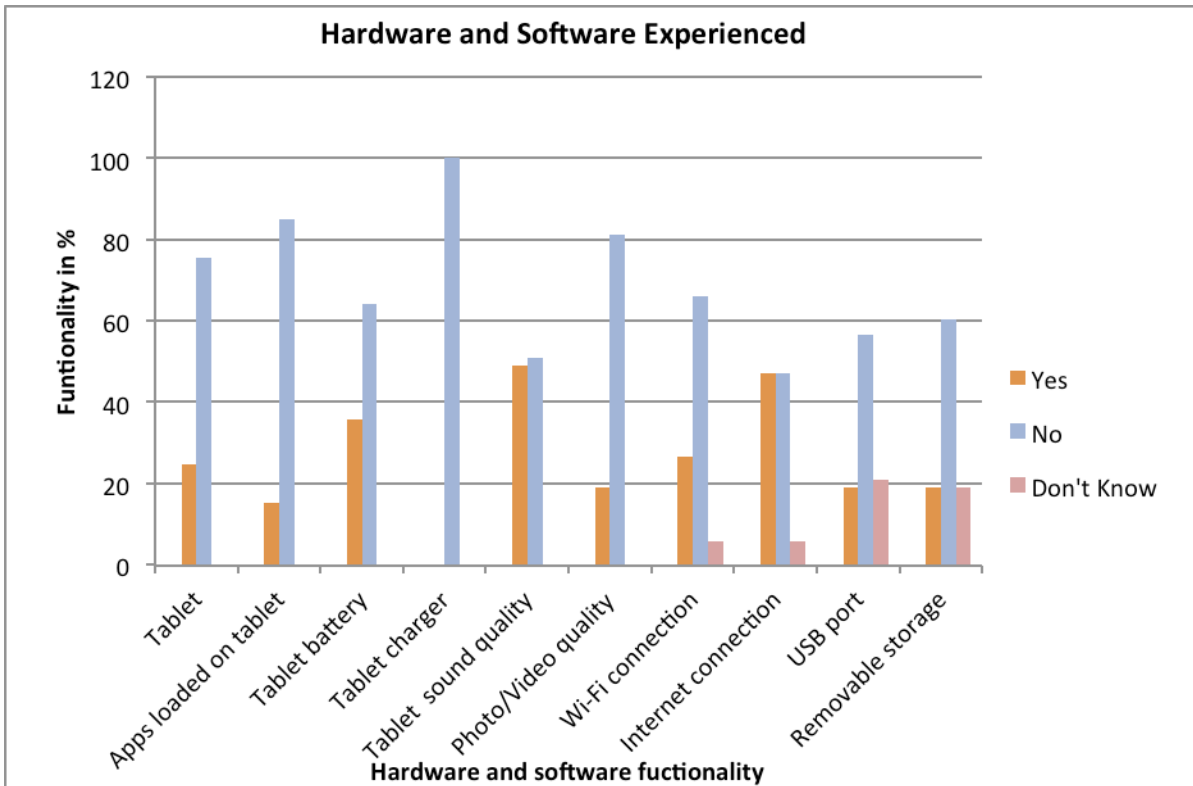
Figure 4: Bar chart indicating teachers' experiences with hardware and Software

Personal Development

A large number of educators used tablets for their own professional development (Figure 5) where 79.25% like reading frequently, 71.7% watched professional development videos, 66% listened to professional development content and 69.81% made contact with people who helped them learn.

There were teachers who have used tablets once or twice for reading content for their own professional development (20%). 19% have watched professional development videos while 28% have listened to professional development content and 24% have made contact with people who have helped them learn.

Again few respondents never used tablets for their professional development with 9.43% having never watched professional development videos, 3.77% never listened to professional development content and also never made contact with people who could help them to learn.
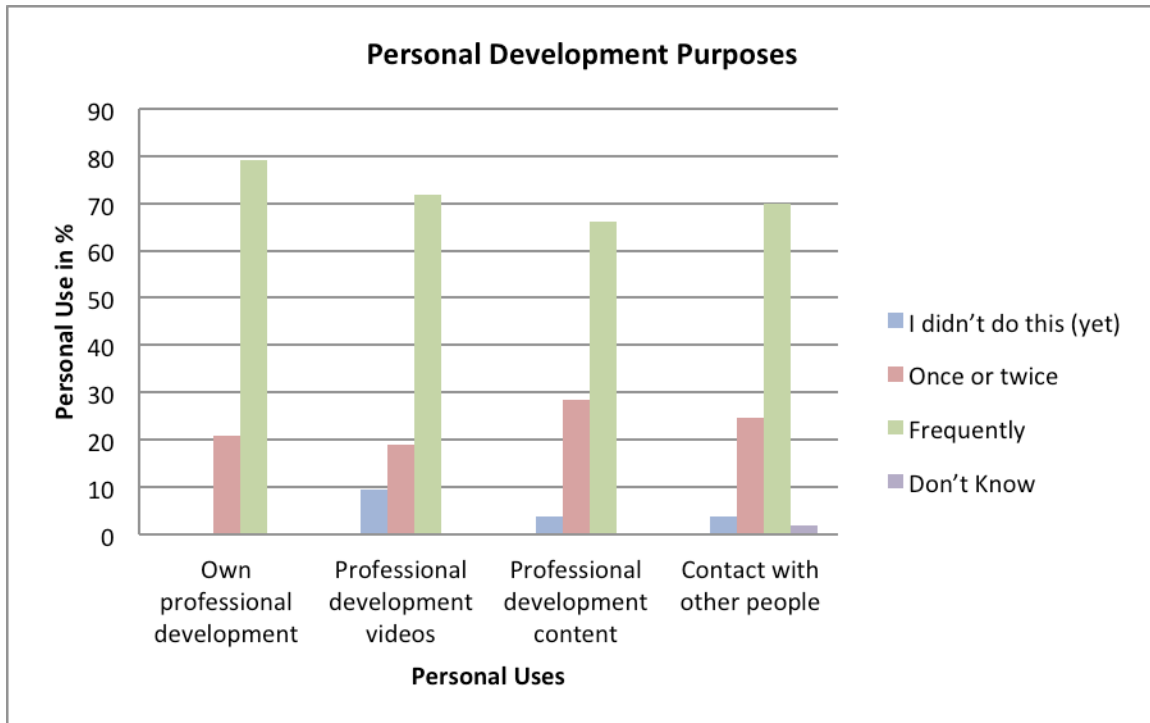
Figure 5: Bar chart indicating teachers' development purpose

ICT Committee Support

The ICT committee is giving full support to the teachers with 94% agreeing. Only 2% of participants did not receive sufficient support and 4% do not know if ICT committee gives sufficient support.

Strategies used

A large percentage of teachers frequently used strategies that were taught in different courses (Figure 6). Jigsaw puzzle and story telling each had 71% of usage each while 78% of respondents had done role play, 50% utilised learning stations and 76% used mind mapping. Of those who used their tablets once or twice about 25% of teachers had used jigsaw, 26% storytelling, 19% role-playing, 35% learning stations and mind-mapping with 23%. However, a few respondents did not use these teaching strategies with jigsaw at 3.85%, 1.9% role-playing, 15.38% learning stations and mind-mapping with 1.9%.
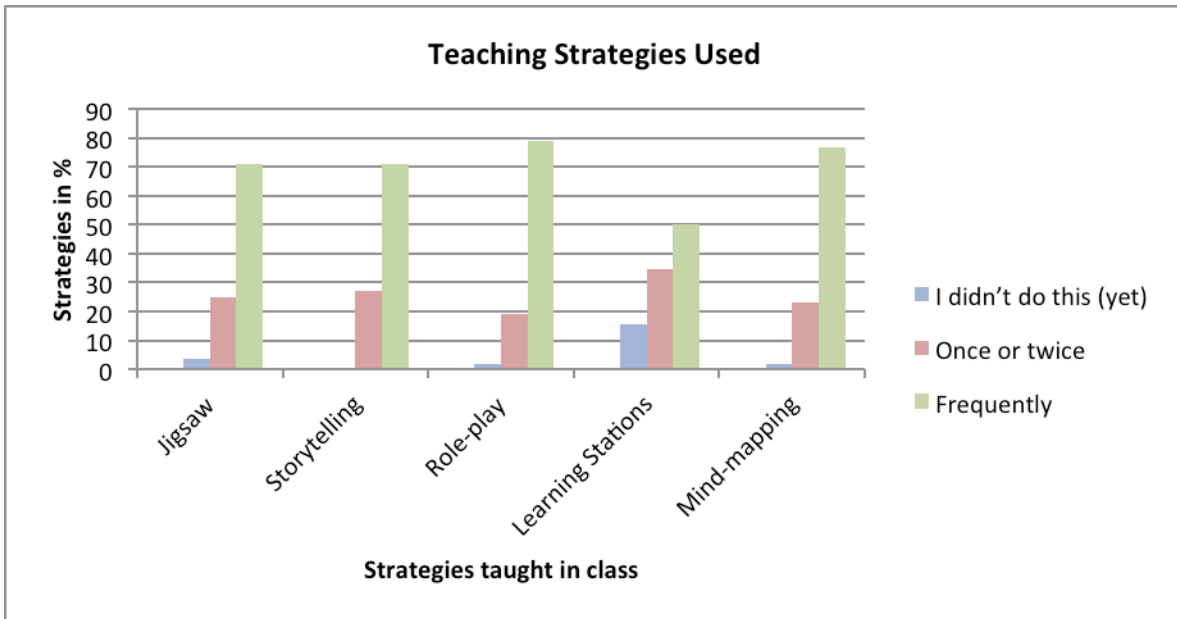
Teaching Strategies Used

Figure 6: Bar chart indicating teachers' teaching strategies used

Relevant Apps

Participants (Figure 7) strongly agreed that they found relevant applications for their purposes (28%), relevant subject specific digital content (20%), relevant grade specific digital content (22%) and variety of content available to help in teaching (13%). Many participants agreed that they found relevant applications (60%), relevant subject specific digital content (60%), relevant grade specific digital content (72%) and know there was a variety of content available to help with teaching (66%). Few teachers indicated that they did not find relevant applications (4%), relevant subject specific digital content (2%), relevant grade specific digital content (6%) and not much variety of content available to help teach in class (15%). Some participant strongly disagreed that they found relevant applications for their purposes (2%) and that there was a variety of content available to help teach in class.
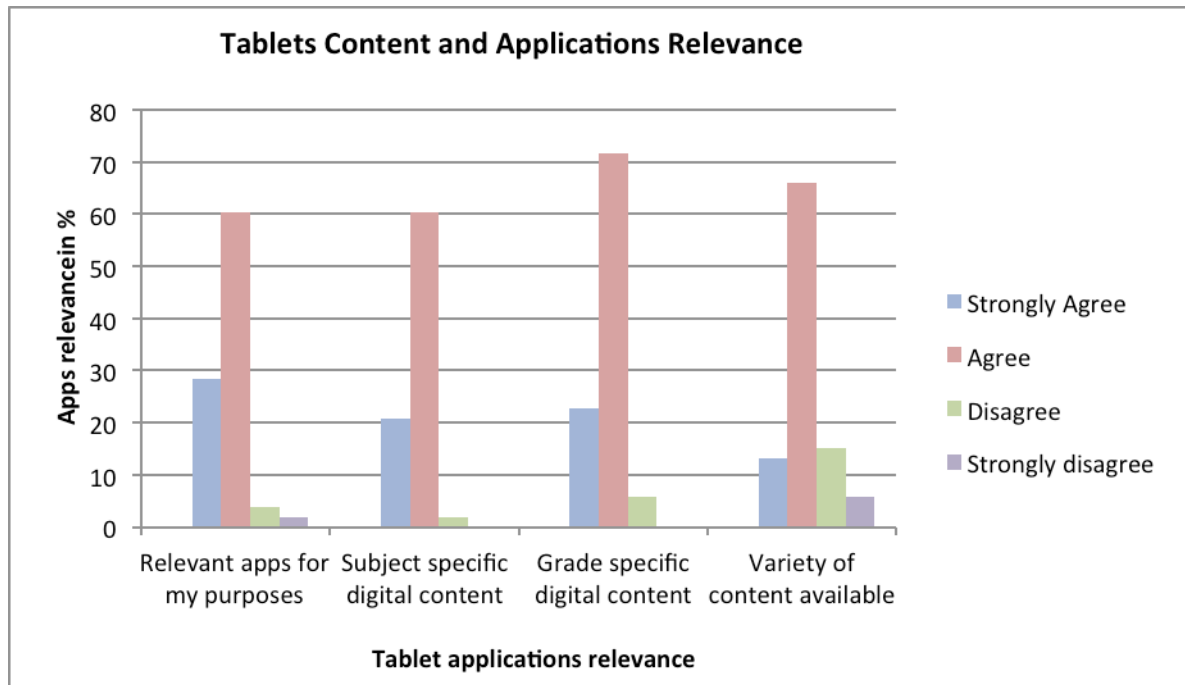
Figure 7: Bar chart indicating tablets content and applications relevance

Administrative purposes

Most people had not started using their tablets for administrative work (Figure 8) with 45% never using their tablets for typing exams papers (45%), recording marks (45%), administrative tasks (49%), and even email communication (43%). However there were other teachers who used tablets frequently for typing examination papers (30%), recording marks (32%), school administration purposes (30%) and school email communication (18%). There were a small percentage of teachers who used tablets fewer thna twice for typing examination papers (24%), recording marks (22%), school administration purposes (9%) and school email communication (30%).
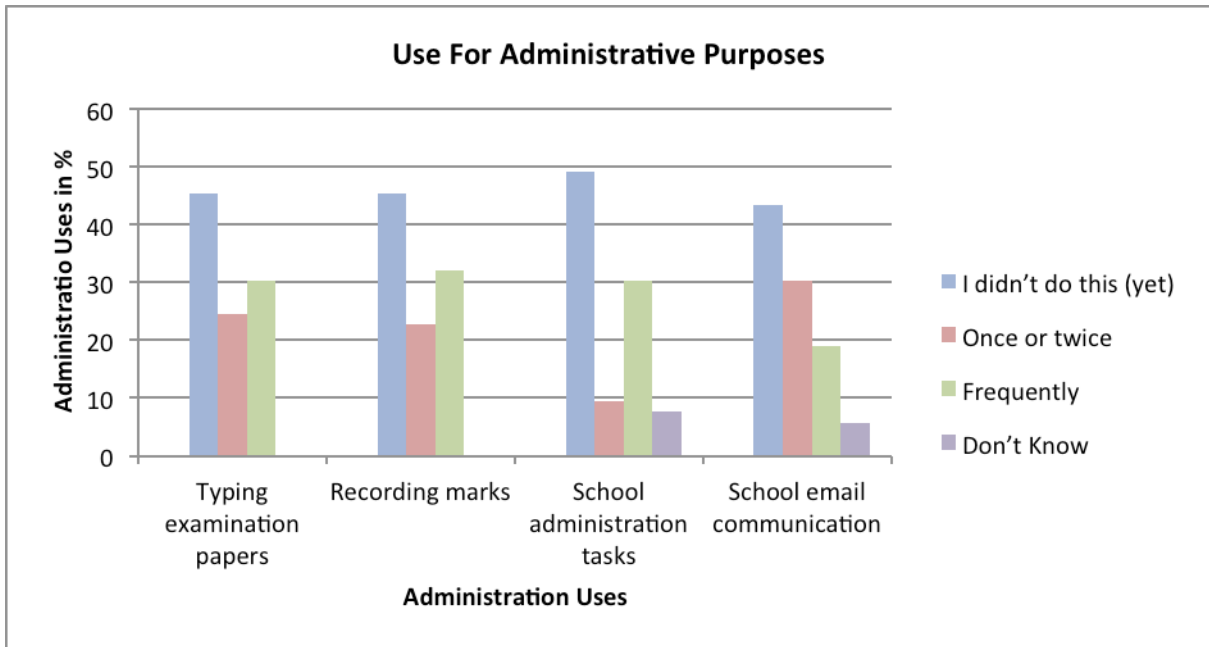
Figure 8: *Bar chart indicating tablets' use for administrative purposes*

ANALYSIS

The Cofimvaba School District Technology pilot project on the whole achieved its objectives. After introducing tablets to the teachers and attending a number of modules, the study shows that most teachers embraced tablets and started using them in the classroom and for their own personal and professional development. These teachers began to believe in their own strength to change the way they have been teaching. This is supported again by Park (2009) who elucidates "both e-learning self-efficacy and subjective norm play an important role in affecting attitude towards e-learning and behavioural intention to use e-learning." This belief in one's own strength to achieve their development goals (self-efficacy) is important in teaching, particularly where teachers have learned new skills. Parks goes on to state that e-learning self-efficacy may be considered an intrinsic motivational factor. on e-learning." The study also found that teachers learn best through active learning and reflective practice (Duncombe et al., 2004).

Within a short time most participants were already using their tablets in their teaching. This is in line with a statement by Mock (2004) who states that tablets can be used as an effective tool for grading, preparing lectures, and delivering classroom presentations. Tablets provide a simple way to integrate content live while teaching, whereas handwritten material with slides and figures can be prepared in advance. It can be seen that the majority of these teachers accepted this technology and used it well to find information, develop teaching aids and digital content and to adapt videos for classroom use, while a few respondents showed that they never use their tablets to look for information to use in their teaching duties.

Again, it was found that most respondents used their tablets for personal use by downloading Apps, taking photos, recording sounds and videos among others. This is similar to views raised by students who extensively used electronic tools (e-tools) such as mobile phones, emails, MSN, digital cameras, game consoles and social networking sides. The students reported that they would use any form of technology available to them if it would help them to learn (Trinder et al.

2008). This shows that both learners and teachers by learning and teaching with new tools they are developing new teaching strategies which will enhance education.

However, a few respondents were slow to adopt such things as social networking, instant messaging and emails, and internet banking, i.e. most things which requires one to register or use a password. Participants often lacked the incentive to login into the internet to take advantage of the broad learning community and in many instances this is because of the high costs needed to have access to these benefits (Ally 2009).

These tablets had been well received by both groups and there was a lot of support that teachers received from school and peers. Continuous professional development worked well in ICT if it is preceded by training from external ICT specialists (Cordingley, et al. 2007). The support structures put in place to assist teachers once trained seem to be working well with almost all teachers indicating that they are receiving sufficient support from their ICT committees. There has been little or no proof at all that teacher professional development makes any difference (Schrum 1999). Hence, it is important to note that the paper was not attempting to ascertain whether tablets work or not in practice but to discover their acceptance.

CONCLUSION

The Cofimvaba School District Technology pilot project on the whole achieved its aims. The respondents have accepted the tablet technology and are using it in their professional and personal circumstances. This can only assist them in their teaching duties and therefore this is another important step towards the improvement of education in poorly resourced schools and for the poor majority of South Africans.

We believe the way forward is for the pilot test to be broadened to include more schools in the area. On the evidence of this pilot we can see that teachers in the rural areas will happily use information and communication technologies if they are available. This can only help them but most importantly help learners by bringing new innovations to the classroom.

Finally, in places where there has been poor distribution of textbooks teachers are now empowered to look for the relevant information and to distribute it to their learners on time. It is important to note that e-learning is going to be very important going forward for a country like South Africa.

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