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E-learning Evaluation in the Department of Education Limpopo Province

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ABSTRACT New technologies have changed the nature of education in the past two decades. Online interaction is being introduced into a flexible model of learning. This paper explores e-learning as a knowledge sharing process; the role of staff development and the use of information and communication technologies to facilitate innovation in the classroom. The study was carried out in the Nokotlou, Lebowakgomo and Polokwane circuits of the Department of Education. The study found that the respondents are aware of the importance of e-learning and that there is a pressing need for educators to be trained in e-learning. It was also found that there is a significant lack of e-learning equipment and network coverage especially in rural areas. It is recommended that the cost of the internet be reduced; that IT is part of teacher training and that the Department of Education in Limpopo applies e-learning best practices from other provinces.

INTRODUCTION

Knowledge sharing is a crucial tool in effective business ventures and education. To be successful in the 21st century, educational institutions should be knowledge organisations that are managed by knowledge workers (teachers, academics). These knowledge workers must be able to provide solutions to the new challenges facing teaching and learning. This paper critically assesses how e-learning as an educational tool applied by knowledge workers can revolutionise teaching and learning in the Nokotlou, Lebowakgomo and Polokwane circuits of the Capricorn district of the Department of Education. A paradigm shift is taking place in education that promotes an interactive learning experience between student and teacher. This is achieved through electronic learning (e-learning0 and mobile learning (m-learning). E-learning refers to the use of a computer and a network to enable the transfer of skills and knowledge. It includes computer-based learning; web-based learning; virtual education opportunities and digital collaboration. Content is delivered via the internet, intranet, extranet, audio and video tapes, satellite TV and CD-ROM, among many other media. Multimedia instruments allow teachers to create interactive presentations through the integration of text images and audio to facilitate critical thinking, and group and networked learning communities (De Gagne 2011: 11). M-learning can be described as learning that occurs when a learner is not at a fixed, predetermined location that makes use of mobile technologies to access, explore and assess information (City of Polokwane 2014: 21; Feser 2010: 112). The internet acts as the medium through which these technologies are delivered to the end user. The use of video conferences as an e-learning initiative is also becoming more relevant with the shortage of educators in scarce skills subjects like mathematics and science. Holmes and Gardner (2006: 23) state that video conferencing is emerging as a means of communication, incorporating broadcasts through microwave technology or internet-based streamed video techniques using two-way compressed video and television. They further observe that there is considerable use of inexpensive, low-end video-conferencing using a webcam, microphone and speakers. The South African government has demonstrated the political will to ensure universal access to mobile technology through the enactment of the Electronic Communications and Transactions Act of 2002, Chapter ll.

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Problem Investigated

This paper examines the application and effective use of e-learning as a knowledge sharing

process in the Nokotlou, Lebowakgomo and Polokwane school circuits. It seeks to determine the extent to which e-learning forms an integral part of teaching and learning in these school circuits.

The aim is to determine how e-learning can be enhanced by the Department of Education in the Capricorn district and how its application can improve the accessibility of educational information.

Arising from the above problem, the paper poses the following questions:

- What are the e-learning opportunities in the Nokotlou, Lebowakgomo and Polokwane school circuits and how is this relevant to teaching and learning?
- How ready and prepared is the Department of Education to implement e-learning in the Capricorn district?
- To what extent does infrastructure contribute to the huge gap between the e-learning offering and the actual situation at schools in the Capricorn district?
- What is the best strategy to create synergy between e-learning and education in the Capricorn district?

Literature Review

E-learning can be described as a set of practices which enhance people's potential to learn with others via technology-aided interaction. This can occur free of the barriers of time and place. It involves the utilisation of a range of digital resources, visual, auditory, and text-based, which enable learners to access, create and publish material that serves educational purposes. This material can be shared electronically with fellow learners and teachers both within and beyond the bounds of formal education contexts (Financial Times Lexicon 2014: 3; Daly and Pachler 2010: 217). Digital media has revolutionised the information society. Advances in Information and Communication Technologies (ICTs) have dramatically changed the learning and teaching process, mainly both developed and developing countries. The telecommunication infrastructure available for learning and teaching is gradually increasing in South Africa. Many schools are now enjoying the benefits of ICT to enhance the quality of teaching and learning (Department of Education 2003; The Economic Development Department 2014: 9). E-learning describes the fields of online learning, web-based training and instruction using technologies and associated methodologies (Horton 2001: 71). Learners learn in many different ways, and their learning potential can be improved by adjusting teaching styles to match learning styles. Holmes and Gardener (2006: 102) note that, e-learning enables the student and the lecturer to expand their learning and teaching environment. Knowledge sharing is defined as information that helps people work together to solve certain problems, develop new ideas and initiatives or implement policies or procedures (Cummings 2004). Kim and Lee (2006: 375) found that both the level of ICT application and the perceived ease of usefulness of IT systems were positively related to knowledge sharing. Van den Hooff and de Ridder's (2004) study established that the use of computer-mediated communication influenced knowledge sharing in organisations. The integration of IT systems into different business areas such as e-learning, customer relationship management tools, blogs and portals could increase knowledge sharing capacity. However, it should be noted that an IT system offers tools rather than solutions. Individuals are still responsible for sharing knowledge and information (Kim and Lee 2006: 376).

The Importance of Knowledge Sharing

Knowledge sharing is a critical means by which employees can contribute to knowledge application, innovation and ultimately the competitive advantage of an organization or academic institution (Horton 2001: 71; Limpopo Economic Development Agency 2014: 16). According to Wei et al. (2008: 223), an organisation's success depends on how well it develops intellectual property and shares it within the organisation. Reid (2003: 45) adds that knowledge sharing creates opportunities to maximise an organisation's capability to generate solutions and efficiencies that enhance competitive advantage. While agreeing with these statements, the researcher suggests that knowledge sharing can only be beneficial to an organisation when it is properly managed, guided and monitored using the medium of e-learning.

E-learning Infrastructure

An academic institution must have a reliable and efficient network and competent technical staff to support e-learning. The availability of

telecommunication infrastructure for teaching and learning is gradually increasing in South Africa. Many schools are exploiting the benefits of ICT to enhance the quality of teaching (White Paper on E-Education 2003). When used as an information technology term, infrastructure refers to the underlying technical components and processes (generally hardware, software and delivery mechanisms) that are used to deliver information technology services. A more refined definition of e-learning infrastructure primarily refers to applications that create, deliver, manage, personalise and evaluate learning programmes (Carliner 2004: 37). The challenge is to roll-out ICT infrastructure that is specifically suited to South African through appropriate technologies. It is hoped that South Africa will leapfrog into the new century, bypass the unnecessary adoption cycle and implement a solution that works now and has the capacity to handle future developments (White paper on E-Education 2003).

E-learning and the Effective use of the Computer

Of all the modern devices that have been adapted for educational use, the personal computer has probably had the greatest impact. According to Hoffler and Leutner (2007: 725), the computer has not only taken over most of the functions that used to be performed by a range of other devices, but has also come to be regarded as a kind of mental prosthetic, a way of extending human information processing capacity beyond what the unaided brain is capable of. A computer system refers to a computer and other support devices (known as peripheral devices) that work as a team to receive information (data) as an input. It then processes the information per the user's directives, and the output is the information in a usable format. Despite the difficulties that constrain the integration of computer-assisted education in management, teaching and learning, the South African Department of Education is determined to implement a progressive programme for change. As in most parts of the world, the South African education and training system has to respond to the pressures and challenges posed by the information revolution. It is for this reason that Government has expressed a strong commitment to the use of ICTs in education (Department of Education). With the help of computers, learners improve their perceptual skills and reinforce various concepts in different learning areas. They construct knowledge based on their experience. Constructivist classrooms have the potential to stimulate multi-perspective, self-directed learning and to provide scaffolds for interactive, meaningful knowledge construction. The researcher contends that the computer remains one of the main tools for the provision of e-learning in schools. Both the availability and usability of the right type of computers are imperative to the success of e-learning delivery. The ability of educators to properly utilise the computer as a tool for e-learning remains an important measure of e-learning effectiveness.

E-learning and Smart Phones

If the goal of e-learning is to provide training to learners when they are ready, using the devices they have access to, it is very important to create content that works on all devices, and browsers and in all environments, making learning accessible to the widest possible group of learners. Web course content must recognise the capabilities and limitations of a current very popular device: the smart phone (Rosen 2009: 134). Rosen (2009: 139) advises that, since many smart phones have access to only low bandwidth services; ranging from 19.2-kilobyte-second (kbps) to 56-kbps, while others can access Wi-Fi broadband, e-learning course application should not require high bandwidth and there should be no streaming content.

Mobile phones are one of the most successful technologies of the past two decades, with ownership estimated at 95 percent among students. Using mobile phones as an interactive tool in the education setting requires minimal technical and financial support. study (2006: 283) examined the use of mobile phones, the short message service (SMS) and the interactive potential of SMS. SMS is a low threshold application that can be used by students to send messages in real time, in class, via their personal phones. Using a modern interface with customised software to provide SMS files, the lecturer can view the message and start a verbal discussion with the student in the classroom.

E-learning and Interactive Whiteboards

An interactive whiteboard is a piece of a hardware that looks much like a standard whiteboard but connects to a computer and a projector in the classroom to provide a very powerful tool.

When connected, the interactive whiteboard becomes a giant, touch-sensitive version of the computer screen. Instead of using a mouse, one can control the computer through the interactive whiteboard screen simply by touching it with a special pen to access word documents, PowerPoint presentations, photographs, websites or online material (Smith and Peck 2010: 4802).

Using the special software included with the interactive whiteboard, it is easy to interact with and manipulate the images and text projected on the board, rearrange them, and change the size and colour. This offers a much more interactive experience than a standard whiteboard or data projector.

E-learning and Clickers

Clickers are also known as a classroom response or audience response system. These small transmitters send the selected answers to the receiver when the appropriate buttons are pressed. The responses are then displayed on the projection monitor, usually in a form of a bar chart. They are easily self-studied or learned with minimal technical assistance (De Gagne 2011: e34). Clickers help create an engaging and stimulating classroom environment where students' learning experiences are more enjoyable and participative and are therefore more likely to be successful.

E-learning and the Internet

Many classrooms are now wireless and provide connections to the web, allowing faculty and students to access the web for information and knowledge resources (Skiba et al. 2008: 225). Online learning refers to learning and other supportive resources available through a computer on the internet (Caliner 2004: 1). Carliner's (2004: 6) study shows that online courses are taught exclusively asynchronously (the instructor and learner are not on line at the same time).

Schools are beginning to use a variety of tools associated with the emergence of web 2.0. The web is transforming from an information dissemination platform to a web platform that is more interactive, customisable and media intensive.

Learners' E-readiness

As noted earlier, mobile phones are one of the most successful technologies of the past two decades, with ownership estimated at 95 percent among students. In the education setting, using mobile phones as an interactive tool requires minimal technical and financial support. The availability of this device contributes to learners' readiness to utilise e-learning. The current generation of learners is generally referred to as the Net Generation (Internet Generation). Holmes and Gardner (2007: 62) argue that the unstoppable impact of the Net Generation will ultimately undermine prevailing absolutes in the educational, government, business and community sectors of society and will cause those in authority to re-evaluate their beliefs and activities. The Republic of South Africa White Paper on E-education (2003) states that, three critical elements will determine the effective use of ICT: cost-effectiveness; sustainability; and efficient utilisation. The use of smart phones is arguably more cost effective than other devices that could be used in e-learning.

Blended Learning

Blended learning can be described as the combined use of traditional classroom teaching and e-learning resources like the computer, internet research engines and others outside the classroom. Blended learning can also be achieved in the classroom through the effective use of interactive whiteboards and other electronic devices to complement traditional learning. At home, blended learning uses electronic storage devices and the internet to access educational material, educators and fellow students anytime, anywhere.

When a learning programme involves a combination of classroom and online components, it is said to be blended (Carliner 2004: 36, 37) According to Tyson (2006: 232), this allows the lecturer and students to have the best of both worlds. Kerres and de Witt (2003: 112) define blended learning as the mix of different didactic methods and delivery formats. Mason and Rennie (2008: 26) use the term 'distributed learning' to describe distance education and e-learning. With blended learning, learners need not take notes in class and therefore tap their verbal and visual spatial working memory (Limpopo Tourism Agency 2014: 14; Tyson 2006: 232). Blended learning is therefore an attempt to create synergy by combining the strengths of both traditional learning and e-learning.

METHODOLOGY

This paper evaluates the use and application of e-learning to enhance knowledge sharing. The data collected was qualitative, which necessitated a descriptive study. The study covered the Nokotlou and Lebowakgomo circuits of the Mogodumo and Polokwane clusters.

Population and Sample

Nokotlou circuit has 10 secondary schools, while Lebowakgomo circuit has 10 and Pietersburg circuit has 26. These 46 schools formed the total population for this research study. Stratified random sampling was employed in order to ensure that different levels of respondents are represented in the data collected. A sample of five schools from Nokotlou and Lebowakgomo circuits, respectively, and seven schools from Pietersburg circuit was randomly selected using simple probability techniques. This yielded a representative sample for rural schools in Nokotlou circuit, semi-urban schools in Lebowakgomo circuit and urban schools in Pietersburg circuit. A total of 17 schools therefore formed the total sample for this research, representing 37 percent of the total population. Out of the 17 schools, 12 are public schools, while the remaining five are private schools. The sample size was stratified into two circuit managers, five subject specialists (subject advisors), 12 principals, 16 deputy principals and 71 educators. The responses were organised into frequency tables and analysed and interpreted through frequency polygons. Measures of central tendency and inferential statistics were used to analyse and interpret the data in order to establish how closely the sample statistics approximate the parameters of the overall population.

OBSERVATIONS AND DISCUSSION

Digital media have revolutionised the information society. Advances in ICT have dramatically changed the learning and teaching process and have created new learning opportunities and access to educational resources beyond those traditionally available. The provision of telecommunication infrastructure for learning and teaching is gradually increasing, and many schools are exploiting the benefits of ICT to enhance the quality of teaching (White paper on E-Education 2003). In order to realise the benefits of ICT, South Africa needs to develop and produce a pool of ICT- proficient youth and students from which trainee ICT engineers, programmers and software developers can be drawn. In pursuit of this objective, the country should urgently establish a network of training and research institutions to build high-level personal knowledge and accelerate existing projects to connect schools and youth centres (White Paper on E-Education 2003).

CONCLUSION

This paper examined the effective application of e-learning in schools in the Nokotlou, Lebowakgoma and Polokwane circuits of the Department of Education. It found that the most significant obstacle to the effective application of e-learning is educators' inability to apply e-learning technology. It is thus recommended that younger and more energetic educators be trained by the Department of Education to implement e-learning. The lack of financial resources to implement e-learning in these schools remain an obstacle. The current relatively high cost of internet access in South Africa also hinders the effective application of e-learning in schools. This is particularly true for schools in poor rural areas. The literature review revealed that smart phones are an integral component of e-learning. The Department of Education is therefore advised to formulate a policy that allows educators and scholars to use smart phones at school. Educators should monitor the use of smart phones by learners as part of the e-learning experience. The study also concluded that physical location has a significant impact on the implementation of e-leaning. Urban respondents were in a better position to use e-learning methods, followed by semi-urban respondents. The rural respondents were least well-positioned to utilise e-learning. The study also found a fairly balanced use of e-learning equipment by male and female respondents.

RECOMMENDATIONS

This study found that ongoing training of educators in IT is imperative. The Department of Education needs to ensure that teacher training at tertiary institutions includes IT as a module for all aspiring educators. A commitment to

producing educators with IT training would gradually change the face of the teaching staff at national schools. There is a definite need to effectively implement e-learning at schools in the Capricorn district. The Limpopo Department of Education is advised to apply best practices from other provinces that have made significant strides in e-learning, like Gauteng province. In these provinces, most educators hold permanent posts and produce excellent matric results.

Further recommendations:

Digital Divide

According to the Department of Education White Paper on E-education (2003) the Ministry of Education is realistic about the fiscal constraints affecting Government. It also accepts that bridging the digital divine and building an integrated e-education system will require greater investment in the education sector. The researcher recommends that this commitment to addressing the digital divide be implemented. Continual postponement of the implementation of this plan of action has led to the failure of e-education thus far.

Internet

It is recommended that the Department of Education lobby for reduced internet costs, as the high cost of this medium acts as a barrier to teaching and learning using e-learning practices. Reduced internet costs would have a multiplier effect on the use of the internet and the purchase of internet-related equipment.

Smart Phones

The Department of Education is advised to design a policy that allows for the managed use of smart phones at school by both learners and educators. This policy should emphasise educator involvement in learners' use of smart phones. This is important because, as the literature review revealed, smart phones are an integral component of e-learning.

Rewards System

It is recommended that the Department of Education adopt a well-defined process to identify employee innovation, creativity and achievement in knowledge-sharing. The current reward process for best educators and best schools has been criticised for its lack of transparency and well-defined procedure for the selection of the winners.

Younger Educators

Younger and more energetic educators need to be trained by the Department of Education to implement e-learning. Training the many serving educators who are nearing retirement age would be unproductive and unsustainable. Young educators need to be attracted to the teaching profession by offering a competitive remuneration package.

E-learning Equipment

The research findings show that, while the respondents had access to some e-learning equipment, it appeared that this was not sufficient to roll out a serious and complete e-learning programme in the three circuits under investigation. The researcher therefore concluded that there was less than the desirable level of e-learning equipment available for e-learning purposes in the Nokotlou, Lebowakgomo and Polokwane circuits of the Department of Education. It was further concluded that the availability of e-learning equipment should be complemented by training on the use of such equipment. The respondents had generally positive perceptions of the use of e-learning to enhance knowledge sharing. Most indicated a positive correlation between e-learning and knowledge sharing. The findings of this research study indicate that most respondents viewed e-learning as a necessary tool to improve teaching and learning delivery in the Department of Education in the Capricorn district, especially in Polokwane, Lebokgomo and Nokotlou circuits.

LIMITATIONS

This study examined the extent to which e-learning has been integrated into the formal school system to improve knowledge sharing and behavior. To render the study manageable, only two correlates of e-learning were considered, namely, availability and application. Furthermore, to ensure a high rate of returned questionnaires and the collection of quality data, the

study was limited to an area that could be physically visited to distribute and collect the questionnaires. While this approach was expected to yield a high response rate and good quality data, the study's findings are not directly statistically generalisable to a larger population. Furthermore, since the study was cross-sectional and correlational, it cannot be used to determine the cause-effect relationship among the variables studied. Other factors that may negatively affect the study are social desirable bias and, because all instruments are distributed as one package, common method bias. Despite these limitations, the study provides useful insight into the relationships among the variables considered, and thus makes an important contribution to the literature.

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