In-Service Secondary School Teachers' Technology Integration Needs in an ICT-Enhanced Classroom

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ABSTRACT
The use of information and communication technology (ICT) is becoming an essential skill for teachers to enhance teaching and learning. Teachers' training on ICT utilisation in higher education institutions in South Africa has emerged as an important issue. However, limited research has been done on a needs analysis for teachers who plan to make use of ICT in their teaching. This article reports the findings of the training needs analysis as well as the attitudes of secondary school teachers about the use of ICT for purposes of teaching in an ICT-enhanced classroom environment. A survey was administered to a group of 21 in-service teachers from a secondary school in Pretoria in Gauteng Province, South Africa. A focus group interview was also conducted with this group of teachers. The findings reveal that the majority of teachers required to learn computing skills on software installation, web design software, creating database using MS Access and electronic resources for teaching; that only a few needed to learn basic computing skills such as e-mail and Internet; and that a more important issue was that this group of teachers has a positive attitude towards using ICT in their teaching activities and wanted to learn how to integrate ICT in classroom teaching effectively and efficiently. These findings are important as they could guide teacher trainers at higher educational institutions when planning training programmes in ICT and education.

Keywords: attitudes, ICT-enhanced classroom, ICT training, in-service secondary school teachers, procedural functional knowledge

INTRODUCTION

The purpose of this article is to report the findings of the training needs analysis training needs analysis as well as the attitudes of secondary school teachers who are planning to use ICT for purposes of teaching in an ICT-enhanced classroom environment. The study conducted is the initial phase of the planned intervention project that seeks to address secondary teachers' challenges about the use of ICT in an ICT-enhanced classroom in Gauteng Province of South Africa. It was deemed important to identify secondary school teachers' training needs in order to come up with an appropriate strategy for the intended intervention.

Recently, the introduction of ICT resources in secondary schools in South Africa was one of the most significant developments. There has been a large investment in ICT resources, yet it seems to have had relatively little effect on the ways that teachers make use of these resources for teaching and learning purposes (Adegbenro, Gumbo & Olugbara, 2015). It would seem that this investment is going to waste as teachers still struggle with basic computer skills, for example, MS Word, e-mailing and PowerPoint. Globally, a lack of ICT-basic knowledge and skills among teachers has been seen as a major obstacle to realising the ICT-related objectives of schools and colleges (Pelgrum & Anderson, 2001). Generally, teachers feel confident about their basic skills but less confident about addressing some technical applications. This claim is backed up by numerous challenges that exist in literature about the integration of technology in an ICT-enhanced classroom instruction (Adegbenro, et al 2015; Flanagan & Shoffner, 2011). Flanagan and Shoffner (2011) recently studied two in-service and pre-service English teachers' methods in solving computer technical problems. They discovered that teachers relied on trial-and-error methods and often avoided using ICT tools when they did not have access to technological skills and resources. Pelgrum and Anderson (2001) suggest that perhaps the most difficult challenge for teachers is lack of training and preparation for technology use in ICT-enhanced classroom instruction. Ruthven, Hennessy and Brindley (2004) report that teachers who are trained with obsolete technologies often lack in-service technological training. This seems to be the reality with secondary school teachers in Gauteng Province.

The present study forms part of a big project in which the researchers aim to train in-service teachers on how to integrate ICT in to the teaching and learning processes. In order to achieve this overarching aim, the investigation of the teachers' training needs as well as their attitudes towards using ICT tools in the classroom

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became an urgent study which needed to be carry out. In terms ICT training content, Xu & Song (2006) point out that there is a need to revisit the existing pre-service teachers training curriculum to fulfil the teachers' needs on the use of ICT in the classroom. In their opinion and within their context, a new training curriculum structure was deemed necessary in order to enhance both pre- and in-service teachers' literacy in ICT. Similarly, within the South Africa context, there is need for professional development programmes which will provide appropriate training for the in-service teachers on ICT integration into their teaching and learning processes. The role of teachers in the integration of ICT into the school curriculum is obviously very important. According to Cuban (2000), every educational reform programmes should take into consideration teachers' knowledge, skills, beliefs, and attitudes towards technology in general. Other studies such as Fullan (1982, 1993) also emphasise that the alteration of mindsets, such as pedagogical assumptions, values, and beliefs, is a key factor to any educational change effort. Sáncheza, Marcosb, Gonzáleza & GuanLina (2012) state that beliefs and attitudes play an essential role in the way in which teachers make use of ICT in the classroom. This is to say that dealing effectively with ICT relates not only to teachers' knowledge of the capability, limitations, applications, and implications of ICT, but it also involves individual teacher's attitudes and perceptions regarding ICT tools. A lot of government projects on ICT schools have not been successful because teachers' beliefs, skills, and attitudes were never taken into consideration when implanting those programmes (Musiyandaka, Ranga & Kiwa, 2013).

Therefore, as part of the needs identification and analysis exercise, the forms of skills needed for secondary school teachers to develop strategies to better prepare them to use the new technological tools effectively in an ICT-enhanced classroom had to be identified. The ICT, when used as a pedagogical tool, should include the use of ICT resources in the teaching and learning process, which involves the use of software applications to solve problems and provoke learners' capabilities as well as to communicate and share their perspectives with each other. Teachers' attitudes toward the use of ICT in teaching, and difficulties in using ICT in teaching were also investigated during the preliminary stage of the study.

In light with the above identified gap, this study attempts to answer the following questions:

- *What are the secondary schools teachers' technology integration needs in an ICT-enhanced classroom environment?*
- *What are the attitudes of the secondary schools teachers towards using ICT in the classroom?*
- *What are the difficulties that the secondary schools teachers encounter when they attempt to integrate ICT into the curriculum?*

BACKGROUND TO THE RESEARCH PROBLEM

In order to help teachers meet the challenges of effective teaching and learning, a number of secondary schools have been fully equipped with ICT resources by different organisations, including the South African telecommunications provider, Telkom, and Microsoft (South African Institute for Distance Education – SAIDE, 2009). The Telkom Foundation and Telkom's strategic partner, Thintana, has committed over R200m to support education and training in South Africa. The Teacher Laptop Initiative (TLI), launched in 2010, is part of the government's efforts to improve teachers' e-learning in the overall educational system in South Africa. The purpose is to help the 386 600 teachers in South African schools and further education colleges to effectively integrate ICT in their pedagogical content knowledge. This effort turned out to be a major investment of over R550m per annum for the next five years, to provide permanent teachers in South Africa with laptops (Ndlovu, 2009). The primary concern for the government, when it makes such a huge investment in ICTs, is whether the investment will positively influence teachers' teaching strategies particularly in an ICT-enhanced classroom environment.

SAIDE (2009) reported in its extensive investigation and evaluation of the use of ICT resources and emerging technologies for teaching and learning in schools and colleges, that effective teaching and learning with ICT has not taken place. SAIDE (2009) discovered that despite most schools owning between 30 to 60 computers in their computer laboratories, many teachers still lack adequate knowledge of and e-skills for the use of ICT resources for teaching and learning. Their findings further revealed that although most of the teachers interviewed admitted that they were aware of the potential benefits that learners could derive from using ICT resources, the majority still did not use their ICT resources effectively. The reason for this, according to SAIDE's report, is that teachers were set in their traditional ways of teaching and that for various reasons they did not find it easy to change or adapt their teaching methods (SAIDE, 2009). The authors of this article, however, did not want to act on the basis of a claim about teachers clinging to their traditional ways. The authors rather wanted to establish teachers' own perceptions and views which could otherwise stall their use of ICT in the classroom. The timing of this study is particularly right since large amounts of funding are currently being placed in South Africa schools in order to equip all classrooms with computers as well the use of mobile computers for teaching and learning. It is

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therefore imperative to determine specifically where the South African teachers stand in relation to computer technology to ensure that the integration of computers in schools is effective.

ICT FOR EFFECTIVE TEACHING

The concept of ICT as an important development mechanism is still a fairly recent phenomenon in many developing countries. The demand for a highly skilled workforce that uses ICT tools for innovation, creativity, improved performance and societal transformation is enormous. The ability to use ICT in this manner is known as e-skills. The European e-skills forum defines e-skills and its associated competencies as the ability to develop and use ICTs within the context of a knowledge environment, which will enable the individual to successfully participate in a world in which ICT is an essential requirement for advancement in activities of government, civil society and business (Mitrovic, Sharif, Taylor & Wesso, 2012). Teachers today are expected to develop lessons that not only teach learners academic content knowledge but also equip them with 21st-century skills that will enable them to be effective and inventive thinkers, active problem-solvers and digitally literate citizens (Partnership for 21st Century Skills, 2004). In order to use ICT resources effectively in an ICT-enhanced classroom, Adegbenro, et al. (2015) concur that procedural functional pedagogical content knowledge (PrFPCK) in the context of the teachers' use of ICT for purposes of effective teaching becomes an imperative aspect to consider. Claro, Presis, Martin, Jara, Valenzuela and Nussbaum (2012), in their recent assessment of the 21st-century ICT skills in Chile defined functional knowledge and skill in an ICT-enhanced classroom as the mastery and understanding of ICT applications and the understanding of the general principles, rules and concepts of how to use computers. Functional knowledge is also referred to by other researchers as technology knowledge (Mishra & Koehler, 2006).

ICT comprises a complex set of applications and services used to produce, process, distribute and transform information (United Nations, 2005). The ICT sector consists of segments as diverse as telecommunications, television and radio broadcasting, computer hardware, software and services, print media and electronic media, including web technology such as the Internet. The term ICT has been used to encompass technological innovation and conveyance in information and communication leading to the development of information and knowledge societies with resulting changes in social interaction, economic and business practices, political engagement, education, health, leisure and entertainment (United Nations, 2005).

In an ICT-enhanced classroom, technology knowledge is much more than just knowing about technology or having the orientation to use technology, for example, having the orientation about how to use advanced search tools on the World Wide Web (WWW) but not being able to put the ability into action effectively and solve general problems without necessarily disrupting the lesson. Basjes (2002) argues that describing a step and procedure to follow with the rules without performing the action and solving basic technical problems effectively is less productive. Mishra and Koehler (2006) assert that technology knowledge includes not only computer literacy, but also productive application of technology at work and in everyday life. Niess (2006) explains functional and procedural knowledges through the bicycle scenario: knowing how to ride a bicycle can only be demonstrated by mounting and actually riding a bicycle. This author made a clear distinction between having the ability to describe a function (which is functional knowledge) and actually performing the action (effectively applying the skill in practical terms which is procedural). Teachers' lack of knowledge and skills to integrate ICT in their teaching could as well be informed by the attitudes that they have towards technology as a whole.

TEACHERS' ATTITUDE TOWARDS THE USE OF ICT

Bandura (1977) has shown that self-efficacy has an impact on an individual's psychological state, attitude and motivation. Individual teachers with low self-efficacy believe difficult tasks are beyond their capabilities; they are also likely to lose confidence in personal abilities. Attitudes are key factors in whether teachers accept computer as a teaching tool in their teaching practices. Research has shown that achieving a meaningful use of ICT tools in the field of education can be influenced by many factors which include teachers' attitudes towards the use of technology in teaching and learning process (Lau & Sim, 2008; Chigona & Chigona, 2010). It has also been established that teachers who do not feel ready and confident to use technology are unlikely to integrate it in their pedagogy (Lau & Sim, 2008; Chigona & Chigona, 2010). Attitudes could play themselves out as factors explaining a disinterest in the use of ICT by teachers and their inadequate knowledge to evaluate the role of ICT in teaching and learning, as well as lack of pedagogical skills to use the ICTs. According to Albirini, (2006), the success of technology use in the educational settings largely depends on teachers' attitudes toward technology use. This means that teachers' attitudes towards computers play an important role in the acceptance and actual use of computers. Furthermore, the study by Sáncheza et al (2012) on teachers' attitudes towards the use of ICT in the classroom revealed that teachers' attitudes are highly positive but their actual use of ICT tools in class is rare and is subjected to innovative processes. These authors suggest that teachers need to be trained on how to integrate ICT tools into their teaching and learning processes. Prior to training on ICT integration, Donnelly

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(2010) identifies teachers' beliefs and attitude towards ICT as necessary area that should be researched before commencing any training programme for teachers. It is therefore expected that the ICT training reported in this study, that teachers will get, will be implemented in such a way that it equips them with the relevant skills to be able to integrate ICT into their teaching practices. This article provides the report about an investigation of teachers' attitudes about ICT that inform their classroom practices within an ICT-enhances classroom.

METHODOLOGY

Sample

Twenty-three in-service teachers from two selected secondary schools which are fully equipped with a computer system and an interactive whiteboard with an overhead data projector participated in the study. This group of in-service teachers volunteered to participate in the training programme to aim at enhancing the teachers' knowledge and skills in integrating ICT tools in teaching and learning. The training contents are organised in five modules over a period of six weeks: (1) Input and output devices/ Input skills (keyboarding and use of mouse), (2) Windows Operating System Skills, (3) Word-processing Skills, (4) A graphic productivity tool (Microsoft PowerPoint), (5) A numeric productivity tool (Microsoft Excel), (6) Using internet resources for preparing teaching materials. The average age of teachers is 36.4 years old, ranging between 24 and 65. Their years of experience range from 0 to 29 years, of which 60.86% are female while 39.13% are male.

Data collection and analysis

In this study, a survey was employed to collect data. A computer literacy questionnaire developed by Son, Robb and Charismiadji (2011) was adapted in this study. The survey included knowledge and e-skills in specific domains such as Microsoft word processing, spreadsheets, computer keyboarding, PowerPoint presentation, a data projector, Internet and Web technology. This is in line with the new curriculum standard and ICT White Paper Policy (Department of Education, 2004). The two parts of the questionnaire immediately after the demographical information included items that measure teachers' basic computer skills and teachers' knowledge about computer-related tools. The last part makes use of a 5-Likert scale to assess teachers' attitudes towards using ICT in the classroom (SA=strongly agree, A= Agree, UN = Uncertain, D=Disagree, SD = Strongly disagree). In terms of trustworthiness, the researchers spent time designing and deliberating on the survey. The response rate was pleasing, i.e. 100%. Data from the survey were triangulated with the focus group data. Thus, triangulation ensured rigorous, empirically grounded claims and assertions (Cobb, Confrey, diSessa, Richards & Schauble, 2003). The collected data were analysed using mixed-method approach. Descriptive statistical analyses were done for the Likert type questions (i.e. frequency analysis, measures of central tendency and dispersion) and content analysis for the focus group interviews.

FINDINGS

The results of the study are discussed below according to the research questions. Meanwhile, the participating teachers' profiles are presented blow.

Teachers' profile

Table 1 presents the participating teachers' profiles in terms of gender, age range and their accessibility to computers. Out of the 23 teachers that participated in the study, 9 (39.13%) were male, while 14 (60.87%) were female. Their ages ranged from 21 to 65. Seventeen (73.91%) of the teachers were aged between 21 and 50 while 6 (26.09%) of them were aged between 51 and 65. Turning to their accessibility to computer, almost all the teachers, i.e. 21 (91.30%), had access to computers to use in their practice.

Table 1: Participant profile

Variables	Categories	Frequency	Percentage
Gender	Male	9	39.13%
	Female	14	60.87%
Age range	21–50	17	73.91%
	51–65	6	26.09%
Access to computers by teachers	Yes	21	91.30%
	No	2	8.70%

Teachers' basic computer skills

In order to determine the participating teachers' basic computer skills, 21 items in table 2 were used for this. The teachers were able to indicate their capability to use the computer by responding to the "Can you" questions listed in table 2. While most teachers indicated that they were able to do various computer-based tasks such as turning on and shutting down a computer, starting and exiting a computer program, minimising, maximising and moving windows on the desktop, about 50% of the teachers indicated that they were not able to install a software

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program on their computers, record and edit sounds, create a simple database using MS Access, create a simple Web page, and use a video conference tool on the Web.

Table 2: Teachers' basic computer skills

Items	Yes (%)	No (%)
Can you properly turn on and shut down a computer?	22 (95.65%)	1 (4.35%)
Can you start and exit a computer program?	22 (95.65%)	1 (4.35%)
Can you change monitor brightness and contrast?	12 (52.17%)	11 (47.83%)
Can you minimise, maximise and move windows on the desktop?	18 (78.26%)	5 (21.74%)
Can you perform file management, including deleting and renaming files, etc.?	14 (60.87%)	9 (39.13%)
Can you use a "search" command to locate a file?	14 (60.87%)	9 (39.13%)
Can you install a software program?	5 (21.74%)	18 (78.26%)
Can you scan disks for viruses?	12 (52.17%)	11 (47.83%)
Can you move a file from a hard drive to a USB drive?	13 (56.52%)	10 (43.48%)
Can you record and edit sounds?	8 (34.78%)	15 (65.22%)
Can you print a document using a printer?	21 (91.30%)	2 (8.70%)
Can you create a basic Word document?	17 (73.91%)	6 (26.09%)
Can you copy, cut and paste text in a document?	14 (60.87%)	9 (39.13%)
Can you change font style and size in a document?	18 (78.26%)	5 (21.74%)
Can you create a basic Excel spreadsheet?	10 (43.48%)	13 (56.52%)
Can you create a simple database using Access?	4 (17.39%)	19 (82.61%)
Can you create a simple presentation using PowerPoint?	8 (34.78%)	15 (65.22%)
Can you send and receive attachments through e-mail messages?	17 (73.91%)	6 (26.09%)
Can you search for information online using a Web search engine?	14 (60.87%)	9 (39.13%)
Can you use a video conferencing tool on the Web?	5 (21.73%)	18 (78.27%)
Can you use Blackboard Learn to support your teaching?	4 (17.39%)	19 (82.61%)

Teachers' basic knowledge about the use of computer-related tools in the classroom

Table 3 presents findings on teachers' basic understanding of computer-related tools and how to use them for teaching and learning purposes. Looking at table 3, 17 (73.91%) teachers thought that they understood the basic functions of the computer hardware components while 6 (26.09%) of them thought that they did not understand. In terms of the basic function of the software, 15 (65.22%) teachers also thought that they did understand the basic function of the software, while the remaining 8 (34.78 %) teachers responded that they did not understand. When it comes to integrating computers into teaching and learning, only 6 (26.09%) teachers were using computers in their teaching at the moment, while the remaining 17 (73.91%) teachers were not doing so. Thirteen (56.52%) teachers used a computer connected to the Internet at school, 19 (82.61%) teachers found it easy to learn something by reading it from the computer screen, and 3 (13.04%) teachers used CD-ROMs to supplement their teaching/learning activities. It is interesting to note that 15 (65.22%) teachers were using Websites to supplement their teaching/learning activities (see table 3).

Table 3: Teachers' basic knowledge about computer-related tools

Items	Yes	No
Do you understand the basic functions of computer hardware components?	17 (73.91%)	6 (26.09%)
Do you understand the basic function of computer software?	15 (65.22%)	8 (34.78%)
Do you use a computer for teaching purposes?	6 (26.09%)	17 (73.91%)
Do you use a computer connected to the Internet at school?	13 (56.52%)	10 (43.48)
Do you find it easy to learn something by reading it from a computer screen?	19 (82.61%)	4 (17.39%)
Do you use video clips, CD-ROMs to supplement your learning/teaching?	3 (13.04%)	20 (86.96%)
Do you use Websites to supplement your learning/teaching?	15 (65.22%)	8 (34.78%)
Do you use an overhead data projector for your teaching?	6 (26.09%)	17 (73.91%)
Do you use an interactive whiteboard for your teaching?	3 (13.04%)	20 (86.96%)

Teachers' attitudes towards using computers for teaching and learning purposes

Eight-item variables from the adapted questionnaire were used to assess the teachers' attitude towards using computers in their classrooms. Teachers used a 5-point rating scale of strongly agree (SA) to strongly disagree

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(SD) to answer the questions shown in table 2 *(SA=strongly agree, A= Agree, UN = Uncertain, D=Disagree, SD = Strongly disagree).* The higher the variable's value, the more positive teachers felt about using computers for teaching and learning purposes.

Overall, it was observed that teachers had positive attitudes towards using computers in their classrooms. Looking at the teachers' responses to the first and the third statements in table 4, it shows that all the teachers who participated in this study enjoyed using computers in their classrooms and were willing to learn more about how to integrate computers in the teaching and learning processes. Table 4 shows that only 3 teachers (13.04%) expressed uncertainty about their willingness to learn more about computers and how to use computers as pedagogical tools in the classroom. Item 2 reveals that 18 teachers (78.26%) felt comfortable about using a computer in their classrooms, 4 (17.39%) were uncertain about the statement, while 1 teacher (4.35%) disagreed with the statement. To the statement, "I think that computers are difficult to use", having 82.60% of the teachers disagreeing and strongly disagreeing with the statement means that the teachers believed that computers are not too difficult for them to use in the classroom. Only 2 teachers (8.70%) thought that computers are difficult tools to use in the classroom. On the other hand, 2 (8.70%) teachers were uncertain about the statement. Furthermore, the statement, "I feel threatened when others talk about computers", with 78.26% of the teachers disagreeing and strongly disagreeing with the statement, suggests that this group of teachers felt comfortable to discuss computers among themselves. Moreover, table 4 reveals that all the teachers (100%) agreed and strongly agreed that it is important for them to learn how to use computers and they would like to use computers in their classrooms. In conclusion, all the teachers (100%) agreed that using computers for teaching and learning will have a positive impact on their teaching strategies and enhance their learners' learning processes.

Furthermore, during the initial focus group interview with the teachers about their major motivations and attitude towards using computers for teaching and learning processes, two male and one female in-service teachers with 21 and 25 years teaching experience respectively commented as follows:

Teacher A: Yes….. *ICT are just here and they are essential for learning. You cannot fall behind. You have to embrace it and learn how to use it in your classroom.*

Teacher B on the other expressed her feelings regarding the components of attitude: cognitive, emotional and behavioural.

Teacher B: Using *ICT in the classroom makes the motivation towards learning bigger than in the convention settings. For me it is the main motivation, not for being part of the curriculum. The motivation towards learning is bigger. Both for children and even for me as their teacher, I learn new things every day.*

Table 4: Teachers' attitudes towards the use of computers in the classroom

Attitude items	SA	A	UN	D	SD
I enjoy using computers.	17 (73.91%)	6 (26.09%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
I feel comfortable using computers.	13 (56.52%)	5 (21.74%)	4 (17.39%)	1 (4.35%)	0 (0.0%)
I am willing to learn more about computers.	19 (82.61%)	1 (4.35%)	3 (13.04%)	0 (0.0%)	0 (0.0%)
I think that computers are difficult to use.	1 (4.35%)	1 (4.35%)	2 (8.70%)	8 (34.78%)	11 (47.82%)
I feel threatened when others talk about computers.	1 (4.35%)	1 (4.35%)	3 (13.04%)	8 (34.78%)	10 (43.48%)
I believe that it is important for me to learn how to use computers.	21 (91.3%)	2 (8.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
I would like to use computers in the classroom.	21 (91.3%)	2 (8.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
I think that my teaching can be improved by using computers.	21 (91.3%)	2 (8.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)
I believe ICT enhances learners' understanding	21 (91.3%)	2 (8.7%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

The teachers' comments concur with Lau and Sim (2008), Chigona and Chigona (2010), who report that teachers who do not feel confident to use technology are unlikely to integrate it in their pedagogy.

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Difficulties in the implementation of ICT in the classroom

When teachers were asked about the difficulties they encountered when they attempt to implement ICT into their classroom practices, most of them felt that practical implementation was difficult, mainly had inadequate knowledge and lacked skills to use ICT in their pedagogical practices. This finding is evident in Teacher C's comments during the focus group interview below.

Teacher C: *Despite the fact that l really like to teach with ICT resources with adequate knowledge in the use of ICTs because we are in the computer age, I always feel incompetent and inept in the use of ICTs. I believe, l do not have adequate knowledge to use the equipment. My hands are so stiff on the keyboards and l finds it difficult to move my fingers flexibly on the keyboards. I like to have sufficient training that will enable my fingers to be flexible on the keyboards*

This finding is in agreement with Albirini (2006) who opines that teachers' attitude towards technology is considered the major predictor of the use of technologies in educational settings. Therefore, it is expected that the planned training intervention for the teachers by our research group will be helpful in changing all the teachers' negative beliefs and attitudes in the use of ICT resources as pedagogical tools in their practices.

DISCUSSION OF FINDINGS

This study reports the findings of the training needs analysis and attitudes of secondary school teachers about their use of ICT tools for the purposes of teaching in an ICT-enhanced classroom environment. Looking at the teachers' responses to their basic computer skills, the "Can you" questions enabled us to investigate what the teachers can do with ICT tools at the moment. A total of 95.65% of the teachers can turn on and shut down a computer properly and they can maximise, minimise and move windows on the desktop. On the other hand, the teachers seem to have little or no knowledge of how to use databases, video-conference and learning management tools like Blackboard in their teaching practices. This means that for the successful implementation of the intervention programme, teachers' actual competence should be carefully considered in the design and implementation of ICT integration training programmes. These results are consistent with the previous findings (Ruthven, et al. 2004; Sáncheza, et al. 2012).

As shown in table 3 on the teachers' use of computer-related tools, more than half (73.91%) of the teachers had very diverse experiences with computer applications. There were also individual differences in the level of computer literacy; some teachers were very comfortable with using computers for teaching while others expressed their feelings about choosing appropriate software, videos and CD-ROMS for their teaching. Knowing these differences in the teachers' ability to use ICT tools brings about a need for a different approach to teacher training for a group of teachers with a different background. This will allow teachers to improve their personal level of computer literacy and competency and gain various experiences contextually relevant to their teaching practices.

The results show that all the teachers who participated in this study had a positive attitude towards using computers in their classrooms. Also, teachers' responses during the focus group interview showed that they are willing and ready to integrate ICT tools in the teaching and learning processes. This situation can be explained by the fact that 73.91% of the teachers are below the age of 51. We expect that younger teachers will be open to the use of ICT and might have experienced ICT during their education. This result is in agreement with the previous study by Sáncheza, et al. (2012), who emphasise that in order to integrate technology in the classroom practices effectively, teachers' attitudes towards technology should be positive and they should be trained in using modern technologies in the field of education. However, teachers mentioned some of the factors inhibiting them from using ICT in the classroom during the focus group interview. These factors include insufficient ICT tools, teachers' lack of computer confidence in teaching and lack of professional teacher development programmes on ICT integration in the classroom. Based on these findings, it can be said that this group of teachers' positive attitudes are very promising as it suggests their willingness to be developed further in the ICT areas where they are still lacking. Even though positive attitudes do not always mean high competency, this study would enable the authors to take the teachers' comfort, confidence and competency into consideration during the planned teachers' training programmes on how to integrate ICT tools into the classroom practices.

In this study, the training needs analysis of a group of teachers in Gauteng Province of South Africa have been presented. The outcome of the needs analysis investigation shows that for learners to benefit from the implementation of learner-centred instruction in an ICT-enhanced classroom, it is essential that teachers receive training *in situ* to fully integrate technology in their teaching practice. The teachers who participated in this study represent South Africa's teachers who are interested in computer technology and can share their experiences and challenges with the research group, i.e. authors of this article. In order to respond to these teachers' contextual

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demand for improving their computer literacy and competency, more provision of computer facilities should be made and more teacher training programmes should be developed. This research group is picking up on this challenge through a series of planned training programmes for the teachers on how to integrate ICT tools into their teaching practice.

CONCLUSION AND RECOMMENDATION

In conclusion, it is noteworthy that teachers would benefit from future training and structured support that not only demonstrate how to more effectively incorporate ICT tools in their curriculum but that work to shift their mindset to more student-centred philosophies in order to leverage the potentials of computers in teaching and learning processes. As one of the first studies to investigate the training needs analysis of teachers in using ICT tools in South Africa, the current study provides novel insights and a starting point for more empirical research on the impact of ICT tools on the conceptual understanding of learners in various learning areas. In order to achieve the overarching aim of this project, teachers need to be well trained on how to incorporate the technology in innovative and creative ways for fostering learning while integrating computers into the curriculum.

The authors' future research will investigate the specific interventions that can be used in helping to increase teachers' attitudes and the perceived usefulness of computers in the classroom. Moreover, longitudinal studies may be designed to determine the effect of using computers for teaching and learning purposes. The authors intend embarking on the second phase of the project on ICT integration through a series of classroom implementation and observations ICT usage in the classroom.

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