



The Potentials of Information and Communication Technology in the Department of Teacher Development: Zimbabwe Open University's Post Graduate Diploma in Education Students' Perceptions

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ABSTRACT

Teacher Development programmes seem not to be dealing with the challenges of integrating technology in their curricular. The issue of potentials of information and communication technology in teacher preparation needs to be debated, critiqued and examined. The paper surveys the potentials of ICT in teacher development with particular reference to 20 Postgraduate Diploma in Education (PGDE) Intakes 8 and 9 students at the Zimbabwe Open University (ZOU). Questionnaires were administered on a convenience sample of 20 respondents. A mixed method approach was employed to gather, analyse and interpret data. Findings highlighted great potentials of ICT in teacher development. Most respondents indicated that ICT helps them to research and become better students and practitioners. A general negative attitude, fear and anxiety among tutors and students was viewed as drawback to the potentials of ICT in the teacher development by some respondents. The study concluded that the module for teaching computers need to be complemented with a lot of practice. It recommended the need to thoroughly train tutors and student teachers in ICT for the benefit of learners in schools. ZOU needs to mobilize resources to build adequate ICT infrastructure and purchase enough hardware and software for use by PGDE students.

Keywords:

ICT, ICT potentials, teacher development, PGDE students

BACKGROUND TO THE STUDY

Information and communication technology (ICT) has taken centre stage in all levels of education let alone the Open and Distance Learning Situations. The search of quality education has been a result of many innovations in the field of education. Quality educational outcomes have been refined by the use of ICT in teacher education (Prensky, 2003 in Papert, 2004).

Clifford and Friesen (2008) note that the process of teaching and learning with technology is still in its early enough stages that teachers and university faculty are starting to come to grips with changes to pedagogy required to engage students in technology-rich learning environment. By the same token, LaGrange and Foulkes (2004) posit that technological change has been so rapid and its implications for teaching and learning so profound, that the faculties of education have not yet fully considered or understood the best ways to proceed in teacher preparation in the digital world.

ICT in teacher education could be associated with progressive educational outcomes or regressive educational outcomes consequent upon how it is implemented. Consistent with this opinion, Mitra, Willyard, Plat and Parsons (2006) found out that access to the internet is becoming ubiquitous in institutions of higher learning. Literature shows that higher education students could use websites to gather data that are relevant to the areas of their special interests, expertise and needs (Keith, 2006).

Patterns of ICT usage in teacher education show that students use the facility for different reasons. ICT usage through the internet manifests itself through messaging (communication), downloading and information retrieval (Thompson, 2000 in Owston, 2004). ICT is associated with teacher preparation programme as noted by Bullock (2004) who claims that ICT gives teachers the opportunity to see whether or not they can apply what they have learned in the university classroom to real life situations as an essential part of their preparation. In Kovalik's (2003) research the school selected for pre-service teachers had adequate technology skills implying that pre-service teachers made use of ICT to create instructional units that integrated technology.

A perusal of the above literature review observations tends to indicate that ICT plays a cardinal role in teacher development. In the interests of this study, what remains to be examined is the degree to which ICT potentials in teacher development are obtaining in the department of teacher development at the Zimbabwe Open University (ZOU).

Statement of the Problem

As teacher preparation programmes grapple with efforts to produce a 21st century compliant, Teacher Education Institution seem to have a long way to go in terms of realizing the potentials that ICT offer to the process of preparing teachers. The study sought to determine the potentials of ICT in the Department of

Teacher Development with particular reference to the Postgraduate Diploma in Education (PGDE) students' perceptions at the ZOU.

Research Questions

The background and statement of the problem raise questions like;

1. How does ICT help prepare PGDE students at the ZOU's Department of Teacher Development?
2. What factors mitigate the potentials of ICT at the ZOU's Department of the Teacher Development?
3. What are the factors that tend to draw back the potentials of ICT in Teacher Development at the ZOU?
4. What advice could be given to the policy makers at the ZOU in the pursuit of ICT potentials in the Department of Teacher Development?

Literature Review

A number of researches have been carried out in an attempt to demonstrate the potentials of ICT in Teacher Development. From their research, Mills and Tincher (2003) confirmed that 'technology integration is a development process'. They further claim that to prepare teachers to be technology integrators require a professional education curriculum that is infused with opportunities for teacher candidates to learn with technology and model technology use throughout and preparation. Clifford and Friesen (2008) hail ICT for its ability to enhance online learning as a deliberate means of reaching out all pre-service teachers in need of training. Eifler, Green and Carroll (2001) underline the value of ICT in teacher preparation by observing that technology is something you apply to an otherwise static curriculum. In another study to show challenges to ICT, Peck, Cuban and Kirkpatrick (2002) found that teachers most frequently used technology to support, rather than alter their existing teacher-centred practices. They found the use of technology in core academic subjects to be exception and not the norm. It was not used in innovation way and had limited impact on student school learning experience. Becker (2006) argues that most schools could not yet be described as well-equipped because they did not permit routine integration of computer technology in to the learning activities of most classes.

forgone literature review managed to highlight some of the potentials of ICT in teacher development together with the same challenges. They however did not succeed in relating the findings to the open and distance learning (ODL) settings. Also, the findings appear to be culture bound as they observed in the developed world, thus, they were not particular to the developing world. The current study seeks to critique the potential of ICT in teacher development at the ZOU with a special interest in the PGDE's Intakes 8 and 9 students.

RESEARCH METHODOLOGY

Research Design

The study adopted a descriptive survey. A descriptive survey was used chiefly because of its ability to gather views, perception and opinion of respondents (Thomas and Nelson, 2001). It was the suitable design to describe the demographic characteristics of the ZOU's PGDE Intakes 8 and 9 students and their perceptions of the potentials of ICT in the teacher development.

Population and Sampling

The population of this study was made up of intakes 8 and 9 PGDE students in 2011. The study settled for a convenience sampling design to raise the 20 respondents (N=20) from those who were present and voluntarily accepted to complete the questionnaire after the tutorials. The number of respondents (N=20) is adequate enough for the variables (demographic data, academic background potentials of ICT challenges to ICT potentials and advice to policy makers in the field of teacher development) to be normally distributed, hence, the findings can be generalized.

Procedure

A five item questionnaire was designed by the researchers for this study. It was pilot tested on a group (N=5) of students at the Harare Regional Centre. After analysing the data, a few adjustments were done before 20 questionnaires were produced. Five were sent to and administered by a colleague in Mashonaland Central regional Centre and we personally administered 15 questionnaires to the Harare Regional Centre.

Data Analysis

All questionnaires were completed and returned. That was a 100% return rates. Data were analysed using percentages facilitate variable comparison because a sample of 20 was rather small and insignificant to permit hypothesis testing.

FINDINGS AND DISCUSSION

The findings for this paper are presented using tables, described and discussed. We begin this section by the presentation, description of demographic data.

Respondents were distributed by Gender and Age as shown by table 1 below (N=20)

Table 1: Age and gender of PGDE students (N=20)

Table 1 age	Age and gender	PGDE	Students	N=(20)	
Age in years	21-30	31-40	41-50	51 plus	Total
Males	2	3	4	4	12(60%)
Females	3	1	2	1	8(40%)
Totals	5 (25%)	4(20%)	6(30%)	5(25%)	20(100%)

The majority of respondents are male (60%), while female respondents constitute (40%). This could be attributed to the natural distribution of student population by gender. In spite of a small sample size one can deduce from the distribution that more males are studying PGDE, a programme which is preparing them to be professional teachers. Still in Table 1 the majority of the respondents are middle aged as (30%)

of them fall within the range (41 – 50 years). This group appears to be mature and responsible enough to appreciate the potentials of ICT in the teacher development in ODL settings.

Respondents were also distributed by their Academic Qualification as indicated in the table 2 below (N=20)

Table 2: Academic qualification of PGDE students (N=20)

Academic qualification	Frequency	Frequency (%)
Bachelor of Arts Degree (BA)	9	45
Bachelor of Science Degree (BSc)	7	35
Honours Degree (Hons)	2	20
Total	20	100

Results in table 2 shows that respondents had the following academic qualifications: Bachelor of Arts (BA) 9 (45%), Bachelor of Science 7 (35%) and Hons 4 (20%). The majority of the respondents are BA

holders. Such a distribution could be a result of the fact that most graduate holders could be working as temporary teachers on the grounds that they possess relevant content to teach pupils in spite of their lack of

knowledge of methodology. Their exposure to PGDE could open opportunities for them to be prepared as teachers with the help of ICT.

The implications of the findings on the contents and the teaching-learning process at the ZOU include reviewing PGDE regulations and modules by revisiting the content such that it includes areas which respondents could apply ICT in their pedagogy and content. These findings could be supporting Becker (2001) who found out that in secondary schools - Science, Mathematics, Social Studies and other academic areas where computer technology could have an impact on acquiring, analysing and communicating information was used in "only small minority secondary school academic classes". If such

findings are particular to secondary schools in Zimbabwe and in the SADC Region, then ZOU has an onerous task to consciously make the PGDE curriculum ICT complaint so that PGDE students would be prepared as teachers with an appreciation of ICT in their education for the benefit of learners in schools.

Potentials of ICT in Teacher Development

Respondents' perceptions of the potentials of ICT in teacher development can also be expressed in regard to how well ICT helps to prepare PGDE students at the ZOU. The potentials that respondents put forward are presented by the table 3 below.

Table 3: PGDE students' perceptions of the potentials of ICT in teacher development (N=20)

Variable	Frequency	Frequency (%)
Video- taping	18	90
Researching for assignments and dissertations	20	100
Engagement in rich learning environments	20	100
Preparation of qualified and competent teachers	20	100
ICT revamps teachers' ways of doing things	19	95
It prepares the teacher to prepare learners for the digital world	19	95

In Table 3, 19 (95%) respondents identified video-taping as one of the potentials of ICT in the PGDE teacher development programme at the ZOU. In their open responses, 25% of the respondents substantiated the above finding by exhorting that:

Because contemporary teacher education must not be found wanting in terms of meeting the needs of the 21st century, teacher development methodology should involve ICT. These effective practices involving ICT are imminently inclusive of video-taping which is very helpful in the overall teacher development process.

As researchers, we could advance two reasons for this finding; first, being aware of the benefits of ICT through video-taping, teacher developers could use videos to tape students delivering or presenting lessons during teaching practise. This would result in what Albee (2003) calls this kind of teaching reflective teaching in which student teachers could replay their lessons and learn from their mistakes, while at the same time building on their strengths. Second, PGDE student teachers could capitalize on the benefits of video taping to tape students learning as part of their Action Research Projects. Here, students could present findings that are presented in a written report and an accompanying DVD that comprise an edited video-

tape that demonstrates and interprets in detail the theme that emerge from the Action Research Project.

All the respondents indicated engagement of learners in technology-rich learning environment. This finding is compatible with Grange and Foulkes (2004) who found out that faculties of education acknowledge the ubiquitous presence of technology in all environments where people communicate, create and acquire knowledge. We can advance one reason to support the present finding. We feel that it is through the internet as a mode of ICT ably prepares PGDE students to become versatile teachers who can teach with or without ICT. On the contrary, Karsenti et al (2002) note that however, the process of teaching and learning with technology is still in early enough stages that teachers and university faculty are only starting to come to grips with the changes to pedagogy required to engage in technology – rich learning environments. Only 1 (5%) respondent appears to subscribe to the preceding rebuttal by pointing out that:

We do not make use of ICT in our tutorials. We rely on the printed mode of learning most of the time. We wish that one day we will be given the opportunity to use ICT during tutorials in our courses.

As researchers, we are of the opinion that opportunities for the use of ICT during tutorials could be availed upon request. We feel that ICT advances

PGDE students learning capacities if students are exposed to technology during their training. Also, non-use of ICT to train teachers is a curse to the future generation because a nation's children will be denied ever-fast changing knowledge obtaining in the globe. In fact, their pace of development as a people of a nation might be appallingly and ridiculously slow, not because of their liking, but due to non-availability of technological resources.

In regard to the aspect of preparing of qualified and competent teachers, all respondents were agreeable that ICT had the second to none potential to prepare qualified and competent teachers. This finding is echoed by Oppenheimer (2003) who noted that if the way we think of change is limited by imagining things very much like the ones we know (even if better) or by confining ourselves to doing things that we know to implement, then we deprive ourselves of participation in the evolution of the future. It will creep up on us and take us unaware. As researchers for this study, we put forward two reasons to support the above findings. First, ICT usage in teacher preparation could be the bedrock on which effective and competent teachers could be developed because it makes teacher educators and student teachers aware of the dynamic and evolving standard practices in teacher education and general education world over. Second, ICT assists teacher educators to produce teachers who are durable (long lasting), utilitarian (useful all the time), meritocratic (beneficial to the society every time) and malleable (flexible and versatile enough to be able teach in different circumstances). These findings are however disputed by Larose et al (1999) who observed the disturbing scenario in which developing countries behind in technological advances in the field of teacher development. To underscore this unfortunate situation, the same authors go on to indicate that another study that situated technology use by faculty at the University of Sherbrooke within the context of national and international research, discovered that the lowest level of technology use occurs in faculties of education, where teachers are prepared to meet the challenges of the new millennium. There, the same authors discovered education faculty displayed much more favourable attitudes to teaching with technology than their colleagues in other faculties and

experienced a significant that is the case at the ZOU, the tutors need to be trained in ICT so that it can produce teachers who are appreciative of the potentials of ICT in teacher development.

Ninty-five percent of the respondents indicated that ICT revamps teachers ways of doing things. This observation dovetails with Clifford and Friesen's (2008) findings in that it emphasise technology as, "a way of doing things, the process tools technique that alter human activity." We give two reasons to support this finding. First, ICT curriculum for PGDE student provides a broad perspective on the nature of technology, how to use and apply a variety of technology and the impact on self and society; second, ICT would assist ZOU to produce teachers who are genuinely creative and effective in their use of technology for learning challenges associated with negative mind-set of fixed, dogmatic and pedantic teachers.

On the last potential of ICT in teacher development, researchers registered a (95%) positive response to contend that ICT prepares student teachers to prepare learners at school for the digital world. Supportive of this finding, Prensky (2003) in Clifford and Friesen (2008) notes that there are important, never before seen differences between the generations that grew up with digital natives are to a large extent misunderstood and ignored by the previous generation of educators. From Prensky's observation, we feel that ZOU tutors and PGDE students have a big challenge ahead of them. They need to be catching up with the young generation. Terms of ICT compliance, sustainability and comfort these findings seem to be contested by Breiter (2012) who argues that while acknowledge that there are demonstrably good things happening with technology in Canadian and indeed international classrooms, Breiter emphasis that schools are fundamentally stuck in their thinking.

Factors that Tend to Mitigate Potentials of ICT

Repondents also came up with some of the factors they felt to mitigate potentials of ICT in Teacher Development

These factors are presented in Table 4 below.

Table 4 factors mitigating potentials of ICT in teacher development (N=20).

Factor	Frequency	Frequency (%)
Availability of a module to teach computers	17	85
Availability of computer laboratories in the regional course	20	100
Library internet facilities	15	75
Availability of tutors for ICT	14	70

Respondents cited four factors that tend to mitigate potentials of ICT in PGDE teacher development at the ZOU. First, 17 (85%) respondents noted that availability of a module to teach computers to the

PGDE students was promoting teacher development. To underscore this finding, 1 (15%) respondents remarked: Availability of a module to teach computers at the ZOU was one of the steps in the right direction

as far as production of teacher development at the ZOU was concerned. This finding seems consistent with the observation of Alberta Learning (1997) who noted that:

Through the modules, student teachers know how to use technology and how to engage students in using these technologies to present and deliver content, communicate effectively with others, find and secure information research, word process, manage information and keep records.

These expressed sentiments could easily justify the need for a vibrant PGDE curriculum that pervades ICT in all courses. This would help student teachers to develop interest in ICT, thereby, rubbing on the ICT appreciation to their learners at schools.

All respondents revealed that the Regional Centres had computers laboratories. This finding is in sync with Fulton Glenn, and Valdez (2003) who claim that from their research the: Most important driving force for technology use by pre service and in service teachers is the need to grapple with how to design learning environments that integrate technology in a way that enhances the learning experience.

With the establishment of computers laboratories at the ZOU's Regional Centres we are content that in not so distant future, the production of ICT compliant teachers would be reality rather than a

dream. Related to the availability of computer laboratories, is the availability of library internet facilities. Seventy five percent of the respondent indicated that their Regional Centres had internet facilities. Researchers in the study consider this observation as plausible enough since the study's purpose was to investigate the potentials of ICT in teacher development. Respondents and researchers perceptions appear to be buttressed by Emmanoukides and Hammond (2000) who have studied the internet usage for years (since 1995) to present, have observed that communication was the most popular use and most recently information seeking and service have emerged as popular cities as well. As present investigators, we feel that library internet services help learners to research for their assignment, research work and seminar presentation papers.

Seventy percent of the respondents were of the perception that they tutor for ICT who teach them computers. One respondent pointed out that while we have a tutor for computers we appreciate his /her ability to teach ICT theory. We hope he/she is able to do the same with the practical computer teaching.

Factors that Inhibit ICT Potentials in Teacher Development.

Table 5 presents factors that inhibit ICT potentials in teacher development.

Table 5: Factors that inhibit ICT potentials in teacher development (N=20).

Factor	Frequency	Frequency (%)
ICT course module that is divorced from other PGDE courses	17	85
Limited training opportunities to complement the module content	16	80
Lack of commitment to integrate ICT within are curses PGDE course	17	85
Lack of technology use of proficiency	19	95
Lack of professional development opportunities	20	100

Respondents put forward six factors they perceived as factors that inhibit ICT in teacher development at the ZOU. To begin with, 18 (90%) respondents cited lack of adequate ICT infrastructure as one of the factors that tend to drawback ICT potentials in teacher development. In concurrence with this finding, Duhaney (2 0 0 1) and Grabe and Grabe (2001) surmise that technological infrastructure access to digital and network technologies within programmes and in field experience, maintenance and availability of

current hardware and limited funding for training and technical support impact how pre-service teachers are prepared to integrate technology. These authorities have gone beyond the respondents' perception. By implication, ZOU may need to provide not only adequate ICT infrastructure, but technical support and current hardware and software to boost ICT potentials in teacher development.

Eighty five percent of the respondents hinted that ICT course module content is rather divorced from

other PGDE modules' content. Three researchers underline the impact of this funding. First, stand alone introductory course does not adequately prepare educators for the classroom (Pierson and McNeil, 2000 in Papert, 2004). Second, teacher educators basic technology skills do not sufficiently prepare them to appropriately integrate technology in the classrooms (US Congress Office Technology Assessment, 1995) cited in Clifford and Friesen (2008). Third, Abbat and Faris (2000) concur that successful technology training without pedagogical grounding tends not to lead to the integration of technology in teaching practice. Researchers in this study are largely certain that it cannot be said any better than what the preceding scholars have observed.

A fourth drawback of ICT potentials in teacher development concerned limited training opportunities complement the ICT module content. Eighty percent of the respondents indicated that limited training opportunities to complement the module content were a drawback to ICT potentials in teacher development at the ZOU. Four authorities support this funding. First, ICT tends to be marginalized within teacher education programmes (Karsenti, Brodeur, Deaudelin, Larose and Tardif, 2002). Second, Grabe and Grabe (2001) claim that teacher educators may not be able to use appropriately and effectively technology in their teaching because of their own lack of preparation, anxiety or disinterest. Further, Cherly Leinke, Executive Director of the Milken Exchange on Education Technology argues 'there is inconsistency between what teacher training faculty knows about technology and what they are training teachers to do in their course. Fourth, we can be confident that there is more technology awareness and experience out there, but it is not being used in teacher training to the large extent nor in the manner we think necessary (Milken Family Foundation, 2003). As researchers, the preceding observation make us infer that marginalization lack of models and lack of awareness of clients, technological knowledge and skills set may have a negative impact on how PGDE students learn how to use and how to incorporate ICT into new and innovative ways. Thus, modular course content needs to be put into practice throughout the programme.

Related to the hindrance of ICT course module that is divorced from other PGDE courses, is lack of commitment to integrate ICT within and across PGDE courses. Seventeen (85%) respondents were content with the preceding perception. Two scholars seem to support the finding. First, teacher educators need professional development opportunities to learn how to effectively integrate technology into their teaching practice and curriculum (Pierson and Mc Neil, 2000 in Papert, 2004). This observation is tandem with a 100% respondents' sixth perception that shows that lack of professional development opportunities tends to inhibit ICT teacher development at the ZOU. To emphasize these two findings, Oppenheimer(2003) reported that professional development tended to be technology training in how to use specific software through to course development.

In the final factor that inhabits ICT potential teacher development, 19 (95%) respondents regarded

lack of technology use and proficiency. Two previous observations back this finding. First, pre-service teachers expressed frustration over lack of effective technology utilization and proficiency Owston (2004). Second, Monke (2004) reported that 5 out of 21 Canadian teacher preparation programmes did not take into consideration pre-science teachers' interest in ICT when placing students in their practicum. The current researchers seem to be certain that lack of technology use and proficiency on the part of teacher educators is a recipe for producing teachers who are ICT phobia in their teaching.

Advice to Policy Makers at the ZOU

In their free response to the open-ended questionnaire, respondents suggested the following advice to policy makers at the ZOU.

- The Department of Education needs to integrate ICT in all PGDE courses.
- PGDE courses need a firm practical base.
- PGDE tutors used thorough training to help them appreciate ICT in their training to their training of teachers.
- PGDE students need to be trained in ICT throughout their programme.

SUMMARY OF FINDINGS

The study found:

- Video-taping, researching for assignment and research project engagement in technology rich learning environment, preparation of qualified and competent teachers and preparation of teachers to enable them to prepare learners for the digital world as potentials of ICT in teacher development.
- Availability of adequate ICT infrastructure and module to teach computers, computer laboratories, internet facilities and tutors to teach computers as factors that mitigate ICT [potentials in teacher development],
- Lack of ICT space, ICT course module that is divorced from other PGDE course limited training opportunities to complement module content, lack of commitment to integrate ICT within and across PGDE course lack of technology use and proficiency and lack of professional development opportunities as some of the factors that inhibit potentials of ICT in teacher development.
- Integration of ICT in all PGDE course giving PGDE courses a firm practical base and thorough training of teachers as some of the advice to policy makers

CONCLUSION

In view of the forgone findings, we draw the following conclusions.

- ICT is a cornerstone on which teacher development could be rested on.
- ICT is gateway to quality teacher development at the ZOU.
- Potentials of ICT in teacher development are dependent on the availability of the number of factors.
- Potentials of ICT in teacher development are also mitigated and inhibited by a number of factors.

RECOMMENDATIONS

The ensuing is a list of our recommendations for the present study.

- ZOU needs to train tutors so that they would train teachers who appreciate ICT in their teaching.
- ZOU policy makers need to solicit for support from stakeholders to mobilise resources to put up ICT infrastructure in which PGDE and other students will not scramble for use.
- The Department of Teacher of Development needs to revamp, revitalize and rebrand PGDE curriculum such that ICT practicum takes an integral precedence over theoretical courses.

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