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RESEARCH ARTICLE

TEACHER PREPARATION FOR IMPLEMENTING E-LEARNING IN URBAN HIGH SCHOOLS IN ZIMBABWE: THE CASE OF MZILIKAZI DISTRICT IN THE BULAWAYO METROPOLITAN PROVINCE

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ABSTRACT

Whenever new innovations are introduced in the education system of any country it is absolutely necessary to prepare implementers so that they understand their new roles. Many a time, particularly in centralized systems, the teacher is left at the deep end trying to understand the innovation as well as the modalities for implementing it. Information Communication Technology was introduced in Zimbabwe high schools through a government directive. Consequently all high schools were expected to implement this innovation. One dimension which is key to innovation implementation is teacher preparation. This study explores, through a qualitative case study, how high school teachers in Mzilikazi district were prepared for implementing e-learning. The study established that teacher preparation for implementing this innovation was inadequate. Interventions which schools could utilize to enhance teachers' understanding and competence levels in implementing e- learning are proposed.

Key Words: Teacher preparation, E-learning, Implementation.

INTRODUCTION

The growth and development of technology in the 21st century has had adverse effects on the society. For instance advances in information and communications technologies which can be used to enhance teaching and learning have brought about emphasis on their integration and inclusion in teaching and learning, thereby immensely transforming the education sector globally. One outstanding development is e-learning which according to Tavangarian,Leypold and Nolting (2004) includes numerous types of media that deliver text, audio, images, animation and includes technology applications and processes such as audio or video tape, CD-ROM and computer based learning as well as local intranet /extranet and web-based learning. It can therefore be highlighted that e-learning as pointed out by Jamlan (2010) is a broadly inclusive term that describes educational technology that electronically or technically supports learning and teaching. The centre for Implementing Technology in Education (2010) noted that the adoption and inclusion of e-learning in the curriculum and its implementation has become a global priority in education. Therefore Bank *et al* (2009) attribute this paradigm shift towards the integration of technology in education as being a result of growth in internet characterised by the decreasing costs and increasing bandwidth which has facilitated the expansion and increased use of e-learning thereby availing formal and informal opportunities that were previously not possible to hundreds of millions of learners. As a result, the combination of fast internet and the spread of mobile communications across all sectors have caused easy access to information and knowledge overcoming geographical boundaries for learners, making the inclusion of e-learning imperative in curriculum implementation. This increased relevance of information and communication technologies has resulted in the global outcry for the adoption and application of e-learning in secondary schools as noted by Nwana (2012). As such it has become imperative for governments and policy makers to prioritise the adoption, inclusion and integration of e-learning in education. The concept of e-learning seems to be paving a way for new pedagogical methods of teaching and learning in the classroom. Khashush (2011) highlights that e-learning in education means the use of information and communications technology and the inclusion of the internet in teaching and learning. As such e-learning enhances the learning process by offering a different way of delivering education whereby learning can occur in or out of the classroom. Archer, Garrison and Anderson also (2008) posit that the existing and emerging e-learning technologies are enhancing intense and immediate transformations on the education system. Kabanda (2013:447) concurs by elucidating that the concept of e-learning has; grown exponentially with the technological era, there is a paradigm shift in the way education is viewed and delivered as such e-learning has become the most prominent delivery method in schools. Therefore this technology needs to be harnessed to promote and develop new learner centred methodologies which are in line with changes and technological advancement in this age of information and communication technologies. For instance e-learning can be viewed as an educational tool that can support or aid the teaching of traditional subjects although it can be pointed out that the curriculum especially in Zimbabwe has mainly focused on the teaching of computers as a subject and overlooked integration of e-learning into other subjects like History, English, Geography just to mention a few. However it is imperative to highlight that in response to the shift brought about by the introduction of e-learning in education, Kabanda

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(2013:446) notes that like other nations in the world, "Zimbabwe as a nation has aggressively embraced the introduction, diffusion and adoption of ICTs." Thus in response to the increased global call to integrate ICTs in education his Excellency the president of Zimbabwe cde R.G. Mugabe on the 29th of March 2012 introduced the computerisation programme in schools and also launched the national e-learning programme which spearheaded the integration of e-learning in schools. This presidential initiative and outlook has become the foundation for the national vision and educational policy direction in the adoption and inclusion of ICTs in Zimbabwean education which is now a priority that must be pursued by all schools whether primary or secondary. This perspective was also echoed by the permanent secretary in the ministry of education who was cited in the British Council Schools on line (2012) report as having said, "Our learners in both primary and secondary schools should be exposed to the world of computers through a sustainable e-learning programme. "Thus in Zimbabwe e-learning in education can be viewed as the wholesome integration of modern telecommunication equipment and ICT resources as noted by Nwana (2012).

However it must be noted that since e-learning has been recently introduced in the curriculum it is imperative to consider its impact on the teachers who are the primary implementers of the curriculum. The primary purpose of implementation is to achieve the objectives of instruction and retention of knowledge transfer. E-learning is an instructional medium that permits alternative approaches like posting notes and assignments on blogs for teachers during curriculum implementation making teaching and learning relevant to the technologically oriented learner in the age of technology as noted by Nwana (2012).As an innovation e-learning has been included in the curriculum as a pedagogical tool to be used by teachers and learners during teaching and learning. Ornstein and Hunkins (2009) posit that the implementation of an innovation hinges on the implementation model used. For instance in Zimbabwe curriculum planning as noted by Gatawa (1998) is a centralised activity, meaning that implementation follows a top-down model. As such e-learning has been cascaded from the policy makers to the teachers at grassroots level. Kabanda (2013) notes with concern that the response to this national and presidential call to implement e-learning has been varied revealing that while some schools have already adhered to the call of the president and implemented e-learning some schools seem to be taking time and are struggling to do so. He captures his concerns when he says;

…the adoption and diffusion of the national e-learning programme exhibited disintegrated efforts in implementation of computerization
… (with) computer literacy rate for teachers ranging from 5% to 80% in some Schools, little evidence of integration of e-learning into the school curricula and shocking levels of networked computing facilities. Kabanda (2013:445).

It is such discrepancies postulated in the caption above which led to the undertaking of the study in a bid to investigate and reveal the experiences of teachers and their responses towards the implementation of e-learning in teaching and learning. UNESCO in its Global Information Technology Report (2005) has further revealed that the application, inclusion and integration of technologies such as e-learning in institutions differ in context because of the wide dimensions to the society, technological use and acceptance. It can be observed that in developed countries there has been a successful integration of these technologies. However Nwana (2012) argues that in developing countries such as Nigeria and Zimbabwe it has been a struggle to adopt, integrate and implement these new technologies Nwana (ibid) notes that factors like financial costs, techno-phobia, intercultural differences, and fear among others might appear as some of the variables in schools affecting the implementation of e-learning technologies. Kabanda (2013) notes that most of the schools in Zimbabwe are connected to the internet however regardless of this widespread access to computer technology there is a significant gap between the presence of technology and its usage in the classroom hence teachers still maintain the traditional face-to-face instructional methods. Royer (2002) also observes that while some type of technology is present in the classroom it is rarely used to its fullest potential and some of this discrepancy is due to a lack of comfort with using technology for teaching and learning. Price, Cates and Bodzin (2002) further cement this observation by stating that, even teachers who are using technology tend to use it in fairly rigid ways, such as searching for activities to use with students, communicating with other teachers and word processing. Therefore the main focus of the study was an investigation of teacher experiences in the implementation of e-learning as an educational tool.

Statement of the problem

In this age of Information and Communication Technology (ICT), there is growing concern for the use of resources like e-learning to make education relevant. It has become imperative in Zimbabwe for schools to adopt and integrate e-learning in the curriculum, regardless of the fact that e-learning as an aspect of technology is relatively new in the Zimbabwean educational system. The inclusion of e-learning introduces an immense paradigm shift in teaching and learning resulting in new and dynamic methods of teaching for teachers. It is against this background that the present study was carried out to investigate how high school teachers were prepared for the implementation of e-learning in high schools.

Research question

How were high school teachers prepared for the implementation of e-learning in the Mzilikazi district?

Research design

The researchers used the qualitative research approach which according to Cresswell (2009) is defined as an inquiry process of understanding a social or human problem, based on building a complex, holistic picture, formed with words, reporting detailed views of informants, and conducted in a natural setting. Corroborating the foregoing Wisker (2013) opines that qualitative research is carried out when we wish to understand meanings, look at, describe and understand experience, ideas, beliefs and values, intangibles such as these. This type of research method was suitable for this research because it was an investigation which sought to understand the opinions and attitudes of teachers on how they were prepared for the implementation of e-learning. The research employed a qualitative case study which as noted by Merriam (1988) can be defined as an intensive, holistic description and analysis of a

single entity, phenomenon or social unit. Case studies are particularistic, descriptive and heuristic, and rely heavily on inductive reasoning in handling multiple data sources." This study adopted the qualitative case study research because such research focuses on discovery, insight and understanding from the perspectives of those being studied thereby offering the promise of making significant contributions to the knowledge base and practice of education in the training and preparation of teachers for e-learning implementation. The qualitative case study research approaches a problem of practice from a holistic perspective in order to gain an in-depth understanding of the situation and its meaning for those involved. As such this research method was best suited to this research because it gave room to investigate how high school teachers were prepared for implementing e-learning in Mzilikazi district in depth. The following participants were purposively sampled for this study: 5 school heads, 5 heads of computer science departments, 5 female teachers, 5 male teachers and 10 students per school were chosen to represent the population. Questionnaires, focus group interviews and observation were the data generation tools utilized in this study.

Findings

Demographic Data

This set of data was collected in a bid to describe demographic variables of the sample and assess whether they had any impact on the research findings. The relevant demographic data consisted of age, years of experience and area of specialization.

Age

The ages of the participants were of particular interest to the research in determining whether age had any influence in the attitude of teachers towards e-learning. Participants who were teachers were asked to tick the age category appropriate to them. All the participants responded to the question. The table below shows the age range of teachers and their frequency.

Table 4.1 Ages of Teachers

Age range of teachers n years	Frequency
21-30	15 (31%)
31-40	25 (51%)
41-50	6 (12%)
51-65	3 (6%)
Total	49

Responses from teachers indicated that 15 teachers were in the twenty-one (21) to thirty (30) age range. Twenty five teachers were in the thirty-one (31) to forty (40) years age category. Six teachers were in the 41-50 age range while 3 teachers were in the 51 to 65 age range. The relationship between age and implementation of e-learning has been of interest to various scholars. Varied conclusions have come out of the studies that attempted to relate age to acceptance and implementation of e-learning. Brandbur (2011) concludes that age interferes with teacher receptiveness towards new innovations like e-learning within the curriculum. According to his research younger teachers are supportive while older teachers are sceptical and are a bit reserved towards e-learning. Given that the respondent's majority ages are between thirty-one (31) and forty (40) years it can be observed that the response towards e-learning varied between acceptance and rejection.

For instance fifteen (15) teachers in this age range were receptive to e-learning stating that it was a welcome development in education. However six (6) teachers in the same age range of thirty-one (31) to forty (40) years were of the opinion that e-learning was there to replace teachers so they were rejecting it. While those in the fifty-one to sixty-five (51-65) age range were either indifferent or regarded e-learning as a hostile take -over of the role of the teacher because for them the traditional methods of teaching are what made the teacher important and relevant.

Educational Qualifications for Teachers

Teachers were asked to indicate their levels of education because these also were regarded as relevant to the research. All respondents indicated their educational qualifications and a response rate of hundred percent (100%) was achieved. Educational qualifications are summarised by the table below:

Table 4.2. Educational Qualifications for Teachers

Level of Education	Frequency
Master of Education degree	1 (3%)
Bachelors Honours degree	5(10%)
General degree	8 (16%)
Diploma in Education	32(65%)
Certificate in education	3 (6%)
Total	49

Interviews with teachers indicated that teachers who attained diplomas and certificates more than five years ago regardless of age were the ones who seemed to lack confidence in the use of information and communication technology materials. The reasons identified by teachers were that teacher training colleges had not included information and communication technology courses during teacher training thus resulting in the production of teachers who lacked the skills and competence for the implementation of e-learning. However teachers who received their diploma qualification three years ago up to date seemed to have attended information and communication technology courses and were the ones that are implementing e-learning.

Those teachers with degrees had confidence in using information and communication technology materials because they had been trained in the use of these materials at university as part of their studies. Paisi and Stan (2011) in their studies concluded that teacher levels of qualification had an impact on their response towards e-learning. For instance their findings revealed that teachers who underwent training 10 years ago in teacher training institutions were never prepared for e-learning integration and might therefore harbour prejudices. Those teachers with degrees seemed more confident and knowledgeable about the use of information and communication technology materials. What these results point to is that teachers require preparation if they are to buy into the use of e-learning in teaching and learning.

Work Experience

Participants were asked to state the length of service. All participants comprising teachers and school heads responded to the question The participants' work experience is summarised in the table below.

Table 3. Work Experience of Teachers

Experience	Frequency
1-5 years	13(27%)
6-10 years	21(43%)
11-15 years	9(18%)
Over 15 years	6(12%)
Total	49

Paisi and Stan (2011) posit that from their research they noticed a reticent and even hostile attitude from teachers with over twenty-five (25) years of experience while teachers with ten (10) years and less work experience seem excited about these new methods of teaching that include e-learning. Therefore the data on length of teaching experience seemed relevant to the study and as such was collected through the questionnaire.

Area of specialisation

Participants were asked to indicate their areas of specialisation by filling in the space provided. All fifty-five (55) participants comprising teachers and school heads (100%) responded. The responses comprised of Arts, Sciences and Commercials. Below is a pie chart of respondent's areas of specialization.

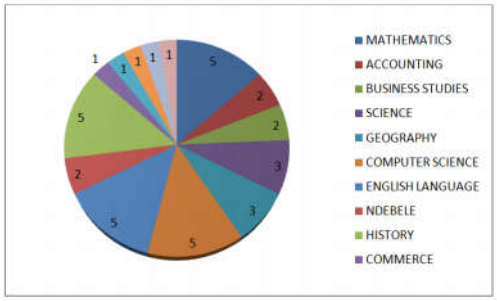

Fig 1. Areas of Specialisation for Teachers

The pie chart above shows the areas of subject specialisation revealing that of the forty-nine (49) teachers that responded five (5) specialise in Mathematics, two (2) in Accounting, two (2) in Business studies, three (3) in Science, three (3) in Geography, five (5) in Computer science, five (5) in English language, two (2) in Ndebele, five (5) in History, one (1) in Commerce, two (2) in Divinity, one (1) in Home economics, one (1) in Agriculture, two (2) in English literature. **V**aried conclusions exist on the relationship between the subjects taught and the attitude towards the implementation of e-learning in the curriculum. Becker (1999) cited in Kasse and Balunywa (2012) explains that the area of specialisation cannot be overlooked when considering teacher response to e-learning.

This conclusion was reached after discovering that teachers who teach arts and practical subjects were of the view that e-learning was a preserve of computer science teachers. Jamlan (2004) highlighted that the relationship between area of specialisation and attitude towards e-learning varies significantly from one subject to another. In the case of subject specialisation twenty-one (21) teachers who taught sciences and commercials highlighted in their responses on how they used e-learning that they are expected to implement e-learning more frequently in the teaching and learning situations because they rely on case studies and simulations to teach concepts. However in the Arts the responses of the fifteen (15) teachers who teach Arts subjects were that once in a while pupils could watch movies especially in subjects like literature where there were movies made out of the set-books. This section on areas of specialisation clearly illustrates that teachers in some disciplines tend to use e-learning more than teachers in other disciplines. Consequently it is necessary that preparation programmes be mounted for all teachers if e- learning is to take root in high schools.

Preparation of teachers for e-learning

Teacher preparation begins with attempts to clarify the concept e-learning to teachers. In this respect a hundred percent (100%) of the forty-nine (49) teachers gave correct definitions of e-learning showing that they had an idea of what e-learning is.

School policy on ICT

Question two (2) of the questionnaire asked the teachers what the school policy was on e-learning. Sixty percent (60%) of the teachers responded by saying "yes the school has an ICT policy which is concerned with teaching pupils computer skills" while thirty-four percent (34%) said "there is no such policy" and six percent (6%) responded with an "l don't know". These findings mean that Sixty percent (60%) of the teachers were aware of the school policies towards e-learning and thirty-four percent (34%) of the teachers believed that there was no ICT policy in their schools. However six percent (6%) did not know if there was such a policy within the school. Findings also revealed that out of the five (5) schools chosen to be part of the research sample only three (3) schools had a clear school policy towards the implementation of e-learning as revealed in the interviews carried out with the school heads. It was important for the study to find out whether the school had any information and communication technology policies and to establish if the teachers knew them. However in their response to this question two (2) most teachers revealed that the school policy on ICT favoured the development of pupil skills mainly and nothing was said about the equipping and training of teachers.

Training

Through interviews teachers revealed that eighty percent (80%) were self-trained in the use of ICT materials and fifteen percent (15%) were computer science teachers who had undergone professional training but five percent (5) had no knowledge of Information and communication technology. As discussed in the introduction, it is necessary to prepare teachers for an innovation by training them so that they can have the required expertise to implement the new innovation.

In response to the question on training of teachers during interviews two (2) school heads responded thus:

School head 1: "Sixty percent (60%) of the teachers do have basic knowledge on how to use computers, l have seen them play games and research on the internet but senior teachers seem to be challenged in this area"

School head 2: "Teachers especially the senior ones hardly use e-learning technology during their lessons mainly because the lack the technical know- how, most of them have never been

trained on how to use information and communication technology materials in class l*et al*one a computer."These two (2) school heads revealed that most senior teachers were not trained in the use of information and communication technologies. During an interview one school head explained that most of the teachers seemed to have basic ideas on how to use materials like laptops and desktops for research, playing games and downloading things like music. The response from four (4) school heads was the same highlighting that teachers lack the technical knowledge required to implement e-learning using these technologies. The four (4) school heads explained that the government had introduced e-learning in schools but no training was done to prepare teachers and one (1) school head also noted that even the heads had not been prepared for this innovation. Actually 80% of the school heads seemed to think that acquiring information and communication technologies like desktops, printers, installing the internet meant that the school had implemented e-learning.

School initiatives to prepare teachers for e-learning

It was important for the research to investigate what the schools had done to prepare teachers for e-learning. The table below shows the programmes initiated by schools to prepare teachers:

Table 4. Programmes implemented by the schools to prepare teachers

PROGRAMMES	FREQUENCY
In-service training through the computer science department (optional)	15 (31%)
Sending Mathematics and Science teachers to attend national workshops to NUST and Bindura universities respectively	15 (31%)
Acquisition of ICT materials like projectors, TVs, DVDs, Laptops, Desktops, and Printers.	19 (38%)

The table above reveals that fifteen (15) teachers who make up thirty-one percent (31%) of the participants identified in-service training through the computer science department which was optional. Fifteen (15) more teachers who also make up another thirty-one percent (31%) of the participants identified workshops where Mathematics and Science teachers were sent to attend workshops at NUST and Bindura State Universities. The other nineteen (19) teachers who consist of thirty-eight percent (38%) noted the acquisition of information and communication technology materials like projectors, TVs, DVDs, desktops and printers as one way of preparing teachers. These findings reveal that schools implemented some programmes so as to prepare teachers to effectively implement e-learning in secondary schools. However the next question that was asked was on whether these identified programmes were adequate.

The following were the responses to the foregoing question: eighty-five percent (85%) of the teachers said the few programmes that had been introduced were not adequate and more effective plans for workshops had been mentioned but had not been implemented yet and fifteen percent (15%) said they had been sent to attend workshops and these resulted in more use of e-learning by Science and Mathematics teachers. According to eighty-five percent (85%) of the teachers plans to prepare teachers for e-learning were almost non-existent in schools, they were only statements mentioned during staff meetings but never implemented except in the form of acquiring ICT materials and installation of the internet. To quote one response from a teacher "it has become a slogan during staff meetings that teachers will be staff developed and trained for the use of ICT materials." There was an outcry from eighty-five percent (85%) of the teachers about the lack of adequate training. Additionally, eighty-five percent (85%) of the teachers revealed that all these initiatives were optional therefore a few teachers had voluntarily accepted training therefore there was need to set up measures or instruments that would ensure that all teachers attended training in the use of information and communication technologies. Also forty percent (40%) of the teachers pointed out that the lack of strict measures reduced the importance of e-learning such that most teachers thought if it was important, binding regulations making training mandatory would have been put in place. As such to them knowing how to use information and communication technologies was optional

Possible Initiatives for the Preparation of Teachers

Teachers were asked to identify various ways of preparing teachers for the implementation of e-learning in the teaching and learning situation. The table below shows the suggested possible initiatives that can be adopted by schools in preparation of teachers.

Table 5. Possible initiatives that can be adopted to prepare teachers for e-learning identified by teachers

Initiatives	Frequency
In-service training by computer science department	11
Staff development workshops at school, district and national levels	16
Attitude change	7
Acquisition of relevant ICT materials	6
Teachers to enrol for professional courses in ICT	9

The table above shows that eleven (11) teachers identified in-service training by the computer science department as one of the initiatives to be adopted by schools for teacher preparation, while sixteen (16) teachers identified staff development workshops at school , district and national level to be facilitated to prepare teachers for e-learning. However seven (7) teachers saw the need for attitude change as a preparation for the implementation of e-learning and six (6) teachers mentioned the acquisition of information and communication technology materials in order to prepare teachers for e-learning. Lastly nine (9) teachers suggested that teachers should enrol for professional courses in information and communication technology to equip themselves for the implementation of e-learning. The school heads were also asked a question on the school initiatives to prepare teachers for e-learning and their responses were as follows:

Table 4.7 Possible initiatives that can be adopted to prepare teachers for e-learning identified by school heads

Initiatives	Frequency
In-service training by computer science department	10 (ALL)
Staff development workshops at school, district and national levels	10 (ALL)
Attitude change	8 (SOM E)
Acquisition of relevant ICT materials	10 (ALL)

The table shows the responses of the school heads on the initiatives to be taken to ensure adequate teacher preparation for e-learning. All the school heads identified in-service training by the computer science as ideal for the preparation of teachers for e-learning. Also ten (10) or all school heads suggested staff development workshops at school, district and national levels as part of adequate preparation. However eight (8) of the school heads noted that there was need for attitude change yet ten (10) or all school heads identified acquisition of information and communication technology as adequate for the preparation of teachers for the implementation of e-learning.

The data presented in the two tables shows that there is need for schools to take up the initiative in training teachers for the integration of e-learning in the school curriculum. According to Mason (2001) comprehensive staff training initiatives are necessary to allow those involved to become proficient in the technical and educational aspect of e-learning However interviews held with four (4) school heads that were not given questionnaires revealed that on the ground there are no clear programmes in place for the development of teacher ICT skills to ensure that they implement e-learning. Only one school head explained that the school had drafted a new policy stipulating that by 2015 teachers must be using e-learning in their teaching and learning sessions. Nevertheless all school heads were saying that the computer science department had been tasked with the role of training those teachers that are interested.

Conclusion

The research findings reveal that urban high school teachers were not adequately prepared for the implementation of e-learning thus resulting in their failure to implement it in teaching and learning. Most teachers who possess minimal knowledge on how to use information and communication technologies are self -taught. Research findings revealed that the existing government initiatives on teacher preparation for e-learning were inadequate and partial because they tend to favour sciences and mathematics teachers only overlooking the fact that e-learning should be implemented in all subjects.

A case in point is that the teachers mentioned that science teachers went to Bindura State University or a national workshop while Mathematics teachers attended a workshop at NUST. This lack of preparation of teachers has resulted in lack of technological confidence and commitment to use the technology. Therefore training is necessary because it will act as a change agent to prepare the minds of teachers to adopt e-learning, build confidence and commitment that they can use the technology, thereby overcoming challenges related to lack of necessary skills.

Recommendations

Based on the research findings and conclusions, it is imperative to highlight the necessary recommendations that will ensure effective teacher participation in the implementation of e-learning.

- Professional development is a critical component of teaching and learning. It is also an essential component of any school change effort, but it is particularly useful in the implementation of educational technology. The government should embark on a massive computer literacy training program nation-wide particularly for teachers and also provide facilities and necessary infrastructures for the promotion of ICT and e-learning.
- Teachers in Zimbabwe should be motivated and encouraged to develop and use multimedia courseware and software relevant to teaching and learning. This should be accomplished through in-service training of teachers, workshops, seminars, and conferences.
- There is a need for policy makers to abandon selective training of teachers from sciences and mathematics department but the government must adopt a holistic approach that promotes the inclusion of teachers from all subjects in national, provincial, district and cluster workshops.
- In order to effectively implement e-learning schools should begin by determining the needs of their staff, gathering this information through planning meetings, teacher surveys, and collection of student data. Using this data, schools need to draw up ICT policies that have set clear goals and purposes for their staff development program.
- The teaching profession is constantly changing, so it is important for teachers to be continuous learners. Effective professional development should occur throughout the school year, not just during one workshop or seminar.
- Teacher preparation must integrate hands-on learning on how to use the technological devices and tools to teach. Teachers therefore must be encouraged to become active participants in the designing and implementation of e-learning processes, instead of having it imposed upon them. Involving teachers in the design and implementation phases compels them to become proactively involved, and more importantly, supportive of e-learning initiatives. This will help also to create attitude change.

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