

Some Impediments in the Adoption and Use of Computer Technology at the University of Nairobi

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Abstract: *Although the title of this paper addresses the impediments in the adoption and use of computer at the University of Nairobi, it shifts attention to the Department of Linguistics and Languages (henceforth DLL) par excellence where I am a full time faculty member. The DLL at the University of Nairobi introduced a new programme leading to the award of Bachelor of Arts degree in Language and Communication in 1999. Two courses namely CLC 113(Computer Application in Information Communication) and CLC 311(Desktop publishing) relied heavily on the use of computers for instruction. Many studies about how computers are utilized in learning institutions reveals that although there have been many successes involving effective implementation of computer technology, a more sobering reality exists. Surveys indicate that computers are not fulfilling their potential to effect significant changes in education, are under-utilized, and are not being implemented in very effective or creative ways (Ginsberg & McCormack, 1998; Bennet, 1997; Miller & Olson, 1995). This is the case in the faculty of Arts computer laboratory at the main campus.*

At the University of Nairobi, there have been many impediments facing both the instructors and students towards proper implementation of computer technology during the instruction of the aforementioned courses.

The purpose of this paper is to investigate some of the issues that prevent regular University lecturers in the DLL and also the students (both Module I and Module II) from realizing the potential of computer technology. We have for example factors like availability of hardware, software issues, attitudes of administrators, pedagogical factors, student attitudes, personal familiarity, instructors training and time factor. The impediments affecting implementation and methods of implementation are examined in the context of personal experience in the Computer Laboratory at the main campus of the University of Nairobi.

A synopsis for consideration in effecting true implementation of computer technology in instructional process is presented in the conclusion.

1. INTRODUCTION

"Microcomputers offer exciting approaches to teaching that were not even dreamed of twenty years ago, but the extent to which the educational potential of microcomputer technology will be realized remains to be seen. Some teachers will use microcomputers to revolutionize their classrooms. Perhaps you will be one of them."(Geisert and Futrell, 1995:17)

Geisert and Furtrell express the view of educators and parents about the promise computer technology has to bring in educational reforms. Bennet (1997) echoes Geisert and Furtrell and offers an even more aspiringly detailed vision of the computer's potential in education. He says that today's technology, if used differently, could bring advances that would improve education dramatically. Ordinary students would make massive gains, and restraints on bright students would dissolve.

Though lecturers in the DLL agree on the potential that lies in computer technology to effect significant changes in education, more often than not, the full potential of the computer is not being exploited. The reality is that computers are most often employed to supplement traditional classroom pedagogy and have not been fully integrated into classroom learning activities (Ginsberg & McCormick, 1998). What are some of the impediments that prevent lecturers and students from implementing computers and realizing the full potential of the technology?

2. THE TIME FACTOR

The time factor surrounding the implementation process is viewed by lecturers as being a major barrier in their using computers. Stallard (1998) states that teachers are reluctant to embrace technology because of its potential to shorten learning time for students. Stallard contends that teachers face a number of potential interruptions during the typical hour-long class and that, consequently, the actual time spent teaching and learning is shortened significantly. Hence, if the implementation of computer technology involves a potential interruption to teaching and learning time, lecturers may avoid using the technology. Since time is short to begin with, many lecturers are reluctant to fiddle with any type of instructional technology if it is going to reduce learning time.

Lecturers who have taught with computers agree that - at least initially - most uses of computers make teaching more challenging. Individualized lessons, matching software to curriculum, scheduling student computer time, monitoring use, providing assistance, and troubleshooting - all adds burdens to the lecturer's time...The net effect is increased demand on lecturer's time and creativity.

A good example is during Desktop Publishing class in the computer laboratory. In CLC 311, the course outline contains use and function of Microsoft Publisher Toolbar window icons, the making and layout of a newsletter, the making of a brochure and the essential elements that make a brochure a business promotional tool, the use of word art and regular text box, resizing and cropping of images and the operation and preparation of Microsoft PowerPoint. If we take the example of Microsoft PowerPoint, many students make their presentations in the traditional way and they do not use PowerPoint. It consumes so much time to give individual attention to students who are not able to do a PowerPoint presentation. They have to be taught slide layouts and types, adding or changing background of the slides, insertion of pictures from different files, modification of Microsoft PowerPoint slide layouts, slide transitions, animation and animation schemes. But even for the lecturer, lack of adequate time leads to situations where a student could ask for a more complex solution to an operation and this could be very challenging to the lecturer.

Roszell (1995) cites a study by Pelgrum and Plomp (1991) whose world wide study of computers in education "identified 29 conditions that affected the implementation and use of IT [Instructional Technology] in education." This study found that one of the most frequently occurring and significant conditions affecting teachers' willingness to embrace computer technology in instruction was the lack of available preparation time for teachers to develop lessons that used computers.

3. AVAILABILITY OF HARDWARE

Ginsberg and McCormack (1998:2) conducted a survey of 1163 teachers to discern what barriers teachers encounter in using computers. The responses to their survey indicated that issues surrounding computer hardware were the most serious barriers affecting implementation.

Regarding hardware, lecturers in both DLL and other departments have reported "serious" to "very serious" concern with "too few computers" and "too few printers." Both lecturers and students in DLL have reported concerns about "computers being too limited". For example, the Computer laboratory used by students of CLC 311 and CLC 113 has 50 computers. Out of these, only about 30 are operational. Students who take CLC 311 and CLC 113 number about 300 in module I and another 200 in module II. The 30 computers have to be shared amongst them. Students then have to be divided into various groups due to the student-to-computer ratio problem.

Middleton, Flores and Knaupp (1997) view the hardware factor as an accessibility barrier. They contend that computer labs are an effective strategy for reducing the student-to-computer ratio in schools. However, at the University of Nairobi, the competition between lecturers and students for blocks of time in the faculty of arts computer lab has resulted in some lecturers giving up on scheduling time in the computer lab and thereby ceasing to implement computers in instruction. It is highly likely that the accessibility to computer hardware may also be dictated by the subject being taught. In addition, the physical location of the computers and the students needing access to them has acted as a barrier to lecturers implementing the technology.

Another important issue, according to Middleton et al, involves limitations of computer labs and issues of scheduling computer time. Middleton et al argue that computers need to be situated in classrooms where they can be easily accessed by students and used in a meaningful and pragmatic way. The barrier of poor or limited accessibility prevents true integration of the computer in the instructional process.

When large numbers of computers are in a room separate from classrooms, many students get hands-on experience occasionally, but no one gets to use the computer in a truly authentic way--that is, the way a scientist or mathematician might use it to solve a difficult, time consuming problem. In order to be true tools for learning, computers need to be on hand when the need arises, not next week when the lab is open.

4. SOFTWARE ISSUES

Newhouse's (1997: 2) evaluation of computer-saturated learning environments in part considers issues concerning teachers' implementation strategies for computers in the classroom. One factor that is identified by teacher respondents in Newhouse's study is the lack of availability and access to software that is subject content appropriate. This factor is a serious barrier that has a negative effect on their using computers in their classrooms.

Lockhart et al (cited in Mann, 1997:30) names the application of appropriate software and hardware to curricular specific computing, the process of "articulation". Primary to the implementation of the software is its assessment in terms of its use and appropriateness in the context of specific learning outcomes. Part of this articulation process is having curricular software and manuals catalogued and accessible for easy use by teachers. This is not the case in the DLL.

Ginsberg & McCormack (1998:253) list a number of teacher issues and potential barriers to implementation that are software resource related:

- matching courseware to curriculum
- evaluation, quality control
- acquisition, setting priorities
- security, placement
- appropriate use

Similar software issues that act as barriers to successful implementation can be found in Ginsberg & McCormack (1997) and Morton (1994).

5. ATTITUDES OF ADMINISTRATORS

Individual lecturer initiative accounts for much of the implementation of computer technology in the DLL at the University of Nairobi. Lack of support by administrators is identified as a significant barrier toward implementation of computers in classrooms (Morton 1997; Brand 1998). Arzt, (1991) and Lockard et al (cited in Mann, 1997) argue that successful implementation of computers can only occur if administrators offer teachers support and leadership. Persky (cited in Brand, 1998) states that in addition to administrators developing a philosophy to guide the implementation of computer technology, they can support the technological professional development of teachers by:

- encouraging and facilitating team teaching and peer coaching
- scheduling regular meetings among teachers using technology to plan and evaluate instruction.

Individual lecturers from the DLL have had to reschedule their teaching plans because some administrators have refused the possibility of establishing flexible schedules so that lecturers can use the computers. In addition, the administrators do not inform and invite the lecturers to visit the computer laboratory to observe the implementation of a new software. For instance, the transition of Microsoft Publisher version 2003 to 2007 was implemented within a day. The lecturer

concerned had not been informed and this scenario can lead to unnecessary anxiety and embarrassment to both the lecturer and the students and further waste valuable time.

6. PEDAGOGICAL FACTORS

Galligan (1997:1) emphasizes the role of individual teachers in implementation of computers and how teachers can affect the educational appropriateness of the technology. He says that it is the teachers choices of how, when, where, why and by whom computers are used that determine whether or not the technological pull is educationally beneficial.

The versatility in the ways computers can be employed for instructional purposes is varied, sometimes within the context of the software itself. Effective teachers, states Galligan (1997:3) are teachers who make effective choices about why they are facilitating any particular computer-based learning experience.

Becker (cited in Galligan, 1997:3) provides a number of variables that complicate the pedagogy of implementing the computer in instruction. He argues that although computer availability is important, the most important factors determining whether teachers use computers effectively are planning time and teacher attitudes, style and background.

Drury (1995:3) states that changes surrounding pedagogy are necessary if teachers are to be successful in implementing technology to support learning. He states that the lack of sound pedagogical basis for integration of technology within the school has led to a narrow and unimaginative usage. He argues that teachers and schools focus the use of computers on classes such as "computer studies" rather than in other subject areas and thus "most study is of the technology rather than with the technology". He contends that this practice has the "effect of marginalizing" computers in education. Drury predicts a change in pedagogy and teacher role. He says that emphasis in our classrooms will shift increasingly from the product of learning to the process of learning and good teachers will be regarded as those who instill in students the skills required to navigate successfully through an information rich world.

Galligan (1997:4) expresses a similar view about teacher roles and the pedagogy of computer technology. His argument is that the outcomes of computer use at the classroom level are shaped by the theoretical framework and beliefs of individual teachers; the range of their pedagogical repertoire; and their sensitivity and responsiveness to the structure, potential and limitations of particular software programs.

7. TEACHER ATTITUDES

Lecturer attitudes toward computer technology may be a significant factor in the implementation of computers in the teaching of CLC 311 and CLC 113. Griswold (1984), Stevens (1984) and Stephenson and deLandsheere (1985) cited in Madden (1989: 16) express a concern that computer literate individuals will reap greater benefits than their counterparts who lack that knowledge. Their concern is that the development of computer literate individuals is dependent on computer literate teachers who have in general demonstrated a resistance to learning about computers.

Lidtke (cited in Madden, 1989) attribute the reluctance of teachers to embrace computer technology to a number of factors that include: anxiety from dealing with equipment, a sense of loss of control over the teaching situation, hardware and software availability, lack of technical support, time and effort for training, remaining current in the field, and appropriately implementing the technology in the classroom.

Results indicated that while teachers did not feel that their own jobs were threatened by computers, they still saw them as dehumanizing, isolating, prone to error and possibly as a violation of the right to privacy. Similar results were reported by Tetenbaum and Mulkeen (1984:13).

A more recent study by Newhouse (1995:5) found that some teachers do not believe that computers have a useful educational objective and that they are nonessential and supplemental to their teaching and classrooms.

Dupagne and Krendal (cited in Morton, 1996:5) completed a review of literature on teacher attitudes towards computers. They are able to identify twenty aspects related to teachers'

perceptions of computers, the impact of computer use and the impact of personal and learning environment characteristics affecting a teacher's intention to use computers as teaching learning strategies.

Kazlauskas and Koop (1995:2), in their examination of the barriers to the implementation of computers, observe that a critical factor that all staff needed to recognize and understand that integrating computers into classroom practice is a complex innovation which requires change to the whole school's practices and culture, to the curriculum, and in teacher's attitudes and classroom practice. Such change is achieved incrementally over a long period of time.

8. PERSONAL FAMILIARITY WITH COMPUTERS

A study by Morton (1996) draws some important conclusions surrounding teachers' personal familiarity with computers and how lack of personal familiarity and experience may act as a barrier:

- the acquisition of computer expertise and skills is generally left to teacher initiative
- high levels of anxiety in using computers is experienced by teachers wanting to use computers and have few role models to follow
- teachers view the use of computers as promoting learning in students
- teachers are aware that increasing the frequency of computer use will lead to changes in pedagogy
- teachers are critical of lack of computer resources to implement change
- administrators have created a major barrier to implementation because they are focused on learning about the computer instead of using the computer for learning (p.1).

Van Lengen (cited in Morton, 1996:8) finds that for the most part all teachers are willing to implement the computer but the problem was that many [teachers] were either infrequent users or they didn't know how to use them. The University of Nairobi through the ICT department has, in the past, organized some courses in computer technology. However, there is need for infrequent lecturer users to have structured opportunities to develop and practice computer skills. In addition is the startling revelation that those that do not know how to use them [computers] have successfully avoided the many basic staff development activities that have run over the years. This is particularly rampant amongst senior academic staff. Appropriate role models are required for infrequent users to implement and manage computers.

Newhouse (1995:5) identifies teachers' lack of computer literacy as being an obstacle to their using computers in classrooms. Newhouse draws a conclusion about the number of years of experience with computers teachers have and the impact it makes on the implementation process. He observes that most teachers need two or three additional years of experience using computers to become significant users of computers in classrooms...teachers need up to five years solid experience in using computers to become proficient at integrating them [computers] in the curriculum.

Newhouse's findings are shared by Roszell (1995) who states that the most commonly identified factor, in the literature affecting IT use by teachers, was their level of knowledge and skill in using computers.

9. TEACHER TRAINING

Seidman (1996:145) has conducted a study into issues surrounding teacher training and its relationship with the successful implementation of computers. Along with the statistical analysis, Seidman finds that the handwritten comments by teacher respondents "overwhelmingly expressed a need for teacher training on basic computer skills". Seidman also states that teacher training should not be limited to teachers who teach computing. Seidman refers to an international trend on the part of educators to train all teachers on the use of computers:

This need for teacher training is explained by the fact that most of the presently senior faculty members like senior lecturers, associate and full professors received little or no training in their formal education. It could also be a reflection of the need to update teachers' knowledge in the

world of fast moving technology of communication. Training all lecturers on the educational use of computers gains special importance when considering integrating the computer into regular curriculum.

Mintz (1997:3) echoes Seidmen's view that teachers are unprepared to use computers in their classrooms and they lack support and educational guidance. Mintz points to professional development and training as a solution to successful implementation. He says that the next crucial step [in successful computer implementation] is the professional development for teacher that will provide them with materials, strategies and new understanding to meet the learning goals.

10. CONCLUSION

The use of computers have the potential to enrich the teaching and learning process of communication courses in the DLL but only under certain related conditions. There is need to have adequate lecturer training in the skills needed to operate the technology. Secondly, a clear vision and understanding among educators of state-of-the-art development and applications.

There is need for the University to provide adequate lecturer training. Lecturers will need continuing in-service programs as technology changes, as more effective uses of technology are developed, and as research provide a better understanding of how students learn.

The lecturer is central to the implementation of computers in the classroom. Adequate lecturer training is necessary if that is to occur. Essential to lecturer training is drawing a link between pedagogy and technology. It is important to investigate how regular lecturers at the University of Nairobi implement computer technology. In addition, it will be important to examine in the context of a University and from the personal perspective of regular lecture sessions, the factors affecting implementation of computers. Another important factor is to have teachers discuss their personal views, issues and experiences involving computer technology.

Professional development like In-service for lecturers is a vital component in the process of effective implementation of computers in universities. Current in-service strategies must move away from a limited single concept approach to professional development. There should be trend towards alternate and longer term professional development opportunities for lecturers.

Concerning pedagogical issues, there should be change in the awareness level of lecturers regarding the educational potential of computers. Lecturers will develop their pedagogical capacity to implement the computer in a variety of educationally effective ways. Components of the plan should include such issues as educationally appropriate uses of computer technology, technology requirements, teacher training, and support. All these components have the potential to change traditional pedagogy and lecturer roles.

Lecturers realize the tremendous potential computer technology can bring to teaching and learning. Lecturers will continue to use computers in their classrooms despite the many factors affecting implementation. The challenges facing lecturers in their initiative are vast and complicated and affect them on a personal and professional level. Lecturers are expected to develop their technological skills and knowledge and use computers in their classrooms.

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