DETERMINANTS OF CHOICE AND USE OF EDUCATIONAL TECHNOLOGY FOR TEACHER PREPARATION IN KENYAN UNIVERSITIES

Marcella Mwaka

School of Education, Moi University, Eldoret, Kenya

Okumu Bigambo

School of Human Resource Development, Moi University, Eldoret, Kenya

Abstract

Technology is continually evolving and improving, as students increasingly become very tech savvy. In response, teachers are beginning to integrate many different technologies into their daily lessons. They are finding that students are more motivated by combining technology and learning and this ultimately helps maximize a teacher's overall effectiveness. This approach does not come without drawbacks. Technology is not cheap or easy to maintain, but many would argue that the benefits of such an approach are well worth the money and the effort.

This paper presents findings from a study whose purpose was to examine the choice and use of educational technology for teacher preparation in Kenyan universities. The study was guided by the drive theory of motivation and adopted a descriptive survey research design. Data was collected from four universities selected from ten Kenyan universities engaged in teacher preparation programs. Two hundred and thirteen fourth year students, four Heads of Department, and forty lecturers from the selected universities participated in the study. Data on choice and use of educational technology in teacher preparation was collected using questionnaire, interview, and observation schedules and analyzed using both descriptive and inferential statistics.

This study established that lecturers were both inward- and outward- looking in their choice and use of educational technology with no difference between the two types of universities, lecturers are yet to be effective in the choice and use of new and emerging technologies and that lecturers encountered a variety of challenges in their choice and use of educational technology in teacher preparation. Based on these findings, the study recommends that

teacher education institutions need to have a far-reaching vision for the effective use of technology in education to help their graduates to be better educated and better prepared for the evolving demands of the new economy and changing society.

Keywords: Educational technology, choice and use, teacher education

Introduction

As Chickering and Ehrmann (1996) state, new communication and information technologies have become major resources for teaching and learning in higher education. Such technologies are tools with multiple capabilities. This is on the basis that programs that employ technology for teaching and learning yield positive results for students and teachers. Through the use of technology such as the internet, students have a wealth of information open to them and are enabled to research with ease.

Technology in education involves learning in, with, and through the use of educational technologies. It is integrated in education through research, online assessment, and creating a website. It is reasonable, therefore, to argue that teachers adequately trained in and by the use of educational technology would perform better in their use, or apply them more readily, than one not adequately trained or one not trained at all. These positive results suggest a future for education that could be more meaningful if institutions maintain their commitment to harnessing emerging technology for education.

The choice and use of conventional and new and emerging technologies by institutions is determined by a number of factors. For example, sufficient access and support enable lecturers to better use educational technology to help their students comprehend difficult-to-understand concepts and engage in learning, have access to information and resources, and have their individual needs met.

Statement of the Problem

In recent years, the quality and role of the teacher has become an issue of concern in Kenya (Digolo, 2006). The introduction of democracy in education, independent learning, and much more requires teachers who are independent, innovative, critical, and globally oriented. Since teacher training is one of the nerve centers of an education system, more needs to be done to raise the standards of the teachers' preparation.

African leaders and higher education experts who participated in seminars held in Accra, Ghana, in 1991 (UNESCO, 1992), and in Dakar, Senegal, in 1992 (UNESCO, 1993) identified major areas of concern about the status and future prospects of African higher education. Among these areas were mission of higher education - producing the kinds of

graduates who would not only be adaptable to the rapidly changing needs of African society but also contribute to innovation and development. Another area was the quality and content of education. Harmonization of curricula and academic mobility was also identified - institutions need to intensify information exchange.

Quality education can be achieved through proper preparation of teachers using appropriate educational technology. Current training therefore needs a global outlook and approach which must be clearly expressed in the university curriculum, reflected in the objectives and technology applied during delivery. Yet the teacher preparation takes place within institutional environments which have both facilitators and inhibitors to the use of educational technology; these affect the quality of instruction (Consultation of Experts on Future Trends and Challenges of Higher Education in Africa. 1992). It would be expected that lecturers' choice and use of educational technology is determined by the needs of the learners, the advancements in information and communication technology (ICT) that are influencing instruction, and the lecturers' personal characteristics. However, the literature reviewed on studies carried on educational technology reveal that most of the studies have focused on availability, use, adoption and adaptation to, and attitude towards educational technology (Abenga, 2005; Odero-Musakali & Mutula, 2007; Wanyonyi 2007; Ngugi, 2008). Determinants of choice and use of educational technology for teacher preparation in Kenyan universities have not yet been established, making it difficult for policy makers to clearly identify them; this is a knowledge gap this study sets out to fill.

Purpose of the Study

The purpose of this study was to examine the choice and use of educational technology for teacher preparation in Kenyan universities. This was done with a view to establishing the driving force behind the lecturers' choice and use of educational technology – is it the need to produce graduates who will be adaptable to the rapidly changing needs of Kenyan society and can contribute to innovation and development, is it institutional coercion, or is it an inert drive? Such knowledge will help policy makers especially in the Ministry of Education, teacher trainers, education technologists and all those concerned with teacher preparation at university level in improving, innovating, and evaluating their teacher preparation programs.

The objectives of this study were to:

a) Identify the determinants of choice and use of educational technology for teacher preparation in Kenyan universities.

b) Establish the level of effectiveness of lecturers' choice and use of educational technology for teacher preparation in Kenyan universities.
c) Establish the relationship between the determinants of choice and use of educational technology and the type of university.
d) Determine the challenges lecturers face in their choice and use of educational technology for teacher preparation in Kenyan universities.

Research Hypothesis

$H_0$1 There is no significant difference in the factors influencing the choice and use of educational technology and the type of university.

Theoretical Framework for the Study

This study was based on the drive theory of motivation. According to this theory, people are motivated to take certain actions in order to reduce the internal tension that is caused by unmet needs. Motivation is the attribute that moves us to do or not to do something (Broussard & Garrison, 2004). It can either be intrinsic (motivation animated by personal enjoyment, interest, or pleasure, and which energizes and sustains activities through the spontaneous satisfaction inherent in effective volitional action) or extrinsic (motivation governed by reinforcement contingencies) (Deci et al, 1999).

Lecturers' choice and use of educational technology is done with a view to reducing internal tension caused by unmet needs. For example, the choice and use is as a result of the need to meet demands from changes in syllabus, curriculum review, labor market trends, technological changes, and communication needs in the classroom. As Broussard and Garrison (2004) observe in relation to motivation, the choice and use can be organized around three questions by the lecturers – "Can I do this task?", "Do I want to do this task and why?", and "What do I have to do to succeed in this task?". This organization was found relevant in the conduct of this study.

Educational Technology in Teacher Education

According to Wikipedia (http:/en.wikipedia.org/wiki/Teacher_education#Column-one) teacher education refers to the policies and procedures designed to equip teachers with the knowledge, attitudes, behaviors and skills they require to perform their tasks effectively in the school and classroom. It is, therefore, clear that teacher education is important in preparing teachers for their work and is expected to equip them with the necessary knowledge, skills, and attitudes for competent performance.

Robinson and Latchem (2003), Nzomo, Kariuki, and Guantai (2001), Ministry of Education, Science, and Technology, Kenya (2003), Orfield (2004), and Popkewitz (1993)

note that there is growing evidence that teacher education and development in Africa presents one of the greatest challenges to both governments and teacher education institutions. Some of the challenges relate to the increasing demand for better quality teachers and teacher educators, advances in ICTs and the resultant need for leveraging modern ICTs in the training of teachers, and pressure for national competitiveness in a globalized knowledge-based economy against an existing reservoir of untrained and undertrained teachers in many African countries. From the findings of these studies, it is noted that the challenge of advances in ICTs and the resultant need for leveraging modern ICTs in the training of teachers still remain a challenge in teacher education in Kenyan universities.

Technology is becoming an important part of education and teachers are seen as a critical link in developing technology literacy among students (Phelps, 2002). The basis of the first developments in educational technology is the possibility of improving the efficiency or quality of learning in a given situation. Most scholars of educational technology (e.g. Aggarwal 2004; Romiszowski 1988; Heinich 1984; Galda 1984) argue that greater learning results are realized when educational technology is applied in teaching and learning, that equal amounts of learning are often accomplished in less time using educational technology, and that it generally facilitates learning and is preferred by learners when compared to traditional instruction.

The assumption that educational technology can increase interest, comprehension and retention is based on the hypothesis that the more abstract the learning content the more difficult it is to comprehend it. Thus the theoretical rationale lies in the educational technology's ability to add concreteness to any learning situation, therefore, the need for resource-based learning. It is therefore evident that any teacher education program needs to give careful consideration to the choice and use of educational technology.

Use of educational technology allows individuals to satisfy their interests, progress at their own pace, time, and at their own pace (Brunner, 1960). A variety of resources fulfil various needs at the same time. They allow greater levels of active participation by the learners, greater possibilities of interaction, and the use of a wider range of media. Examples would include the television, computer, teleconferencing, and photographs. The benefits of these technologies would be reaped not only by secondary school learners, but also by the student teachers at the university. Resource-based learning also allows a greater freedom to hear, see, and above all, to do. Traditional educational technology can never satisfy the needs of modern industrial society whose members require an education fitting them into a working

life (Tienne, 1994). With this justification, it is important to investigate factors determining university lecturers' choice and use of educational technology for teacher preparation.

Strategic management, therefore, provides a necessary linkage between internal school process and external environment; facilitates and adapts the internal institutional process to achieve multiple functions at different levels. This knowledge helps institutions establish the necessary mechanisms to be responsive to the changing environment, to learn, and to develop (Ndiku, 2007).

Citing challenges in teacher education in Kenya, Digolo (2006) notes that teacher educators tend to over-emphasize the textbook approach. He makes several recommendations on the specific improvements that would be necessary to improve the situation. Among these is the suggestion that the training of teachers in Kenya needs a scrutiny. He explains that in addition to equipping student teachers with the necessary knowledge and skills for their work, the teacher educators should make it possible for a student teacher to develop reasoning (intellectual) skills, values and ability to create and recreate new working habits and values for changing lives in a dynamic social environment.

Karugu (2007) asserts that from the beginning of graduate teacher education in Kenya in 1966 the challenge of teacher education has shifted from merely meeting manpower needs to issues of quality in graduate teacher education, professionalism, and unemployment of graduate teachers. In his tracing of development of graduate teacher education, he notes that as early as 1978, universities sought to improve the teacher training programs, to relate to, and satisfy the needs of the schools as well as those of the graduate teachers themselves (University of Nairobi 1979: iii).

Education is expected to be a process of preservation and transmission of cultural heritage, an instrument for transforming culture, and a means of individual development. This has been translated by the various levels of education in Kenya and according to the national objectives for university education contained in the Ministry of Education Master Plan for the period 1997-2010 the universities are expected to, among other things, nurture the internalization of universal knowledge, including key technological advances, with a view to harmonizing it for national development. It is true that appropriate application of educational technology contributes tremendously to the improvement and enhancing of effective teaching and learning.

Abenga (2005) and Maranga (1993) suggest that the trainee's educational technology needs should be matched to the requirements of the training objectives and the workplace

environment. Mukwa (2007) states that educational technology is dictated by the type of audience and objectives of a particular teacher education program.

The expansion of information and communication technology is presenting the educators of teachers with new issues and challenges. Two major challenges are identified by Collis (1996) as:

a) Educating teachers to use technology in educationally effective ways, including teaching them about the technology;
b) Incorporating technology with the delivery of teacher education.

This suggests that preparation of teachers should teach educational technology as the content and at the same use it as delivery resource. Collis (1996) and Cornu (1995) rightly note that teachers need to develop an overall awareness of how technologies can be used in education, and learn skills in handling these technologies. They also need to gain insight into how the context for the application of these technologies in a particular educational setting affects the implementation of the technologies and their influence on student learning.

Fahey and Narayanan (1986) suggest that an effective environmental scanning program should enable decision makers to understand current and potential changes taking place in their institutions' external environments. Scanning provides strategic intelligence useful in determining organizational strategies. The consequences of this activity include fostering an understanding of the effects of change on organizations, aiding in forecasting, and bringing expectations of change to bear on decision-making. College and university decision makers are therefore encouraged to use environmental scanning as part of their strategic planning model.

Methods and Materials

This study adopted a descriptive survey design. Out of the 17 Kenyan universities, 10 engaged in teacher education. From these ten universities that the study targeted, a sample of 4 (40%) - Masinde Muliro University of Science and Technology, Moi University, Catholic University of Eastern Africa, and University of Eastern Africa – Baraton participated in the study.

The study population comprised of Heads of department and lecturers in the selected universities in the Departments of Educational Communication and Technology, and fourth year Education students. The number of lecturers in the departments were Masinde Muliro University of Science and Technology (MMUST) 18, Moi University 26, Catholic University of Eastern Africa (CUEA) 15, and University of Eastern Africa, Baraton (UEAB) 12. The

total number of lecturers was 71. Heads of department were selected for their knowledge of the available technologies for use in instruction and procurement procedures. The lecturers were selected because they were the ones who trained student teachers in teaching subject methods and in the use of educational technology. Fourth year students were selected because they would have done most communication and technology courses and Teaching Practice (TP). Therefore, they were thought to be in a position to respond to the relevant questionnaire items. This study dealt with the Government Sponsored and evening category of students from the public universities and all numbers from the private universities. The fourth year students who participated were: Masinde Muliro University of Science and Technology (MMUST) 250, Moi University 830, Catholic University of Eastern Africa (CUEA) 70, and University of Eastern Africa, Baraton (UEAB) 157. The total number of students was 1307.

Stratified random sampling was used to select the universities that participated in the study. This allowed both private and public universities to participate in the study, thus presenting the researcher with information from both categories of universities. Two hundred and thirteen fourth year Education students participated in the study, and were selected using stratified then systematic sampling techniques. Stratified sampling was used because students take different teaching subjects, hence each group of students taking a particular subject combination formed a stratum. Systematic sampling was then used to select names of students from the lists. Forty lecturers participated in the study, and were selected using simple random sampling while a census of the Heads of participating departments were selected. These numbers were considered sufficiently large, as Boomsma (1987) suggests 200 as a bottom-line sample size while Floyd and Widaman (1995) suggest 5-10 participants per estimated parameter.

The instruments preferred for this study were the questionnaire, interview, and observation schedules. These instruments were developed by the researcher, and were meant to complement each other in terms of clarity and reliability of information gathered. Content validity of these instruments was ascertained through scrutiny by educational technology specialists selected from Moi University. Construct validity of the instruments was established through the scrutiny of educational technology and research specialists in Moi University, followed by a pilot study of the instruments. Reliability of the research instruments was established through a pilot study carried out in Kenyatta University and reliability established using Cronbach's Alpha. A reliability coefficient ranging from .896 for all questionnaire items was established. This was considered high enough to judge the

questionnaire reliable and served the purpose of assuring the researcher that research instruments were reliable.

Summary of Findings

Data was gathered from respondents from four universities engaged in teacher education in Kenya (two private and two public) using the questionnaire, interview schedule, and from the observational techniques. Out of the 213 student respondents, 105 (49.3%) were male while 108 (50.7%) were female. The distribution of students by gender was: Public 89 male and 72 female, and private 16 male and 36 female. Out of the 40 lecturers who participated in this study, 27 were male (17 –Public universities, 10 –Private universities) and 13 were female (8 –Public universities, 5 –Private universities). The summary of the findings is as follows:

a) Determinants of Lecturers' Choice and Use of Educational Technology for Teacher Preparation

Lecturers choose and use educational technology in teacher preparation based on certain convictions. These convictions are as a result of their professional training, experience, interaction within and without their institutions and the communication needs in their classrooms. In this study, lecturers were requested to rate the influence of certain factors in their choice and use of educational technology. Table 1 shows the frequencies and means of their responses.

Table 1 Determinants of Lecturers' Choice and Use of Educational Technology in Teacher Preparation

Determinants	Frequencies					Means	
	Very strong	Strong	Mode -rate	Weak	Very weak		
	F %	F %	F %	F %	F %	Mean	SD
Recommendations due to changes in syllabus	9 22.5	18 45.0	10 25.0	3 7.5	0 0	3.8250	.8738
Focus on aims and goals as a result of curriculum review	11 27.5	21 52.5	5 12.5	3 7.5	0 0	4.000	.8478
Labour market demands	12 30.0	17 42.5	9 22.5	2 5.0	0 0	3.9750	.8619
Technological changes in the society	11 27.5	16 4.0	8 20.0	5 12.5	0 0	3.8250	.9842
Communication needs in the classroom	14 35.0	12 30.0	9 2.5	5 12.5	0 0	3.8750	1.0424

From the means in Table 1, it was noted that lecturers' choice and use of educational technology was influenced by curriculum review, labor market demands, communications needs in the classroom, syllabus change, and technological changes in the society; these

factors are stated in order from the strongest to the weakest. The mean scores also depict each as major influences of choice and use of educational technology in teacher education. The findings indicate that lecturers focused not only on communication needs in their classroom, but also on changes taking place in their students' work environment.

b) The Level of Effectiveness of Lecturers' Choice and Use of Educational Technology in Teacher Preparation in Kenyan Universities

Both students and lecturers were asked to rate the effectiveness of the lecturers' choice and use of educational technology for teacher preparation. The findings are presented in Table 2 and Table 3.

As can be seen from Table 2, the students indicated that printed texts (83.1%), and chalkboard and talk (89.1%) were effectively used by lecturers in preparing students for effective performance in the use of the same technologies. The effectiveness of the choice and use of computer (56.5%), realia (55.2%), and photographs (51.7%) was reported as remarkable. Other technologies reported as effectively used by less than 50% of the student respondents were: whiteboard (48.9%), overhead projector (45.1), LCD projector (43.7%), slide projector (42.1%), film projector (40.5%), radio (37.1%), T.V. (37.1%), tape recorder (33.8%), opaque projector (33.3%), internet (28.7%), e-mail (25.8%), videoconferencing (24.0%), and e-curriculum (15.9%). The use of computer, realia, and photographs is commendable. This would mean that the students find the same technologies easier to use later in their profession. Notably low in effectiveness is the lecturers' choice and use of e-curriculum, videoconferencing, email, internet, opaque projector, tape recorder, T.V., and radio. The use of the tape recorder and radio could be as a result of lecturers imagining that they need to focus on new technologies. This notwithstanding, schools would find these technologies easily available and affordable, or may still have them in good working condition. In addition, the use of e-curriculum, videoconferencing, email, and internet may be affected by availability, cost, and technical competence of lecturers compounded by time availability. The implication of such a scenario would be to have universities invest more in educational technology as the graduate teacher working environment knows no limit, nor should he be expected to work in schools that have none of the technologies.

Table 2 Students' Ranking of Effectiveness of Lecturers' Choice and Use of Educational Technologies

Educational Technology	Frequencies										Means	
	Very effective		Effective		Un-decided		Slightly effective		Not effective			
	F	%	F	%	F	%	F	%	F	%	Mean	SD
Chalkboard	118	55.4	74	34.7	5	2.3	10	4.7	6	2.8	4.3521	.9482
Whiteboard	27	12.7	77	36.2	57	26.8	13	6.1	39	18.3	3.1878	1.2784
Printed texts	83	39.0	94	44.1	9	4.2	13	6.1	14	6.6	4.0282	1.1282
Radio	43	20.2	36	16.9	36	6.9	58	27.2	40	18.8	2.9249	1.4155
Tape recorder	20	9.4	52	24.4	49	3.0	34	16.0	58	27.2	2.7277	1.3427
T.V.	26	12.2	53	24.9	47	22.1	28	13.1	59	27.7	2.8075	1.3959
Computer programmes	59	27.7	55	25.8	29	13.6	23	10.8	47	22.1	3.2629	1.5161
Internet	40	18.8	21	9.9	25	11.7	55	25.8	72	33.8	2.5399	1.5030
E-mail	13	6.1	42	19.7	44	20.7	37	17.4	77	36.2	2.4225	1.3175
E-curriculum	24	11.3	31	4.6	53	24.9	33	15.5	72	33.8	2.5399	1.3786
Videocon-ferencing	24	11.3	27	12.7	48	22.5	39	18.3	75	35.2	2.4648	1.3763
Photographs	40	18.8	70	32.9	41	19.2	17	8.0	45	21.1	3.2019	1.4047
Realia (objects, specimens)	70	32.9	48	22.5	33	15.5	17	8.0	45	21.1	3.3803	1.5288
LCD projector	43	20.2	50	23.5	49	23.0	18	8.5	53	24.9	3.0563	1.4591
Slide projector	39	18.3	55	25.8	45	21.1	16	7.5	58	27.2	3.0047	1.4714
Film projector	36	16.6	51	23.9	51	23.9	16	7.5	59	27.7	2.9484	1.4511
Overhead projector	50	23.5	46	21.6	42	19.7	24	11.3	51	23.9	3.0939	1.4923
Opaque projector	35	16.4	36	16.9	59	27.7	16	7.5	67	31.5	2.7834	1.4584

Table 3 shows how lecturers ranked their choice and use of educational technologies on how effectively the technologies prepare students for effective performance as graduate teachers. The responses showed chalkboard (87%) and printed texts (85%) as the most effectively used. This agrees with the students' ranking of the same technologies. Other technologies reported as being effectively used are overhead projector (72.5%), slide projector (70%), internet (70%), and computer (67.5%). There is a commendable use of the internet and computer, but the difference in ranking between students and lecturers could be as a result of the use. Lecturers may be using these two forms of technologies at preparation stage, and not going beyond to have students also use the computers and internet for learning. The study noted here the difference between learning with technology and learning about technology. Access to internet services and computers, occasioned by a large number of students especially in the public universities, could explain this. The ranking of overhead and slide projectors by lecturers differs greatly from how the students rank the same technologies. This could be explained by the fact that lecturers would use technologies that enable them effectively reach out to the large number of students. This could also mean that as lecturers meet communication needs of their classrooms, they at times fail to meet the students'

technological needs of their profession. This way, the lecturers need to incorporate a practical aspect of the technologies they themselves use. Table 3 also reflects high percentages of effectiveness of the technologies. This is not unusual as what is eventually put on chalkboard by a lecturer is a result of many sources.

Table 3 Lecturers' Ranking of Effectiveness of Their Choice and Use of Educational Technologies

Educational Technology	Rating of Effectiveness of Choice and Use										Means	
	Very effective		Effective		Un-decided		Slightly effective		Not effective			
	F	%	F	%	F	%	F	%	F	%	Mean	SD
Chalkboard and talk	19	47.5	16	40.0	1	2.5	4	10.0	0	0	4.2500	.9268
Whiteboard	12	30.0	18	45.0	4	10.0	4	10.0	2	5.0	3.8500	1.1220
Printed texts	16	40.0	19	47.5	3	7.5	2	5.0	0	0	4.2250	.8002
Radio	1	2.5	22	55.0	4	10.0	8	20.0	5	12.5	3.1500	1.1668
Tape recorder	6	15.0	11	27.5	9	22.5	10	25.0	4	10.0	3.1250	1.2442
T.V.	6	15.0	15	37.5	7	17.5	10	25.0	2	5.0	3.3250	1.1633
Computer programmes	12	30.0	15	37.5	7	17.5	2	5.0	4	10.0	3.7250	1.2401
Internet	16	40.0	12	30.0	7	17.5	4	10.0	1	2.5	3.9500	1.1082
E-mail	10	25.0	12	30.0	9	22.5	5	12.5	4	10.0	3.4750	1.2808
E-curriculum	3	7.5	13	32.5	13	32.5	6	15.0	5	12.5	3.0750	1.1410
Videocon-ferencing	9	22.5	14	35.0	9	22.5	4	10.0	4	10.0	3.5000	1.2403
Photographs	11	27.5	15	37.5	8	20.0	3	7.5	3	7.5	3.7000	1.1810
Realia (objects, specimens)	15	37.5	10	25.0	5	12.5	6	15.0	4	10.0	3.6500	1.3877
LCD projector	9	22.5	15	37.5	9	22.5	6	15.0	1	2.5	3.6250	1.0786
Slide projector	8	20.0	20	50.0	9	22.5	2	5.0	1	2.5	3.8000	.9115
Film projector	11	27.5	11	27.5	7	17.5	9	22.5	2	5.0	3.5000	1.2609
Overhead projector	6	15.0	23	57.5	6	15.0	4	10.0	1	2.5	3.7250	.9334
Opaque projector	4	10.0	12	30.0	18	45.0	4	10.0	2	5.0	3.3000	.9661

c) The Relationship Between the Determinants of Choice and Use of Educational Technology and the Type of University

A Kruskal-Wallis test was conducted comparing choice and use of educational technology with different types of universities. The output of the test is displayed in Table 3. From the output in Table 3, no significant difference between choice and use of technology and type of university was found, indicating that the public and private universities were influenced by similar factors in their choice and use of educational technology. Hypothesis H_o1, which stated that there is no significant difference in factors influencing the choice and use of educational technology and the type of university, was therefore accepted.

Table 2 Kruskal-Wallis Test: Lecturers Choice and Use of Technology and Type of University

Determinants of choice and use of educational technology	Chi-Square	df	Asymp. Sign
Recommendations due to change in syllabus	.037	1	.847
Focus on aims and goals as a result of curriculum review	.002	1	.963
Labour market demands	1.341	1	.247
Technological changes in the society	.001	1	.977
Communication needs in the classroom	2.912	1	.088

d) The Challenges Lecturers Face in Their Choice and Use of Educational Technology for Teacher Preparation in Kenyan Universities

It was noted that students and lecturers experienced challenges related to choice and use of educational technology which hinder their effective use of educational technology. The said challenges act as barriers to their choice and use of technology. In this study, the respondents were asked to rate 11 challenges in order of their level of influence. The mean scores of their responses are shown in Table 4. From the findings presented in Table 4, time availability, technical competence, attitude, accessibility, and cost of equipment were cited as major challenges to the choice and use of appropriate educational technology. These findings agree with the BECTA Report (2003) which identifies lack of access to appropriate technology, lack of time, negative attitude towards technology in education, anxiety and lack of confidence, unreliable equipment, and lack of technical, administrative, and institutional support. In this study, peer influence and portability of the technology is not a major challenge. While students do not find technical quality and level of sophistication a major challenge, lecturers do. This may be as a result of lack of exposure, so that students do not have or access the technologies. Similarly, while lecturers do not find class size and workload a major challenge, students do.

Class size failed to be a major challenge to lecturers because certain technologies such as LCD projector, overhead projector, and film projector can be used to reach a large number of students in a relatively short time; the challenge here would be the cost of such technologies. The workload was also not a major challenge because the lecturers use the technologies to prepare. Students cited class size and workload as major challenges because

the equipment available may not be enough for the large number of students, and given that they have a lot of work, they do not find time to scramble for the equipment.

Table 4.17 Analysis of Challenges in the Use of Appropriate Educational Technologies

Challenges	Students			Lecturers		
	N	Mean	SD	N	Mean	SD
Time availability	213	4.4601	.9390	40	4.4000	.7442
Technical competence	213	4.2441	1.0031	40	4.3500	.8638
Technical quality	213	3.9906	1.0461	40	4.0250	.8912
Level of sophistication	213	3.6479	1.1505	40	4.0750	.9167
Attitude	213	4.2676	1.0227	40	4.1500	.9213
Workload	213	4.1549	.9807	40	3.7750	1.1655
Peer influence	213	3.6291	1.2880	40	3.8250	1.1068
Accessibility	213	4.0469	1.1192	40	4.3250	.9971
Portability of the technology	213	3.7324	1.2659	40	3.9250	1.0473
Class size	213	4.1408	1.1691	40	3.8000	1.1140
Cost of the technology/equipment	213	4.0000	1.2362	40	4.1750	1.1522

A chi-square (χ^2) test on the challenges experienced by lecturers showed high levels of significance Except for time availability and workload which had significance of .001 and .002 respectively, all the rest had a significance of .000. At the significance level of .05, all listed challenges were significant. Similarly, a chi-square (χ^2) test on the challenges experienced by students revealed high levels of significance.

Conclusion

In this study, lecturers' choice and use of educational technology was found to be influenced by changes in the syllabus, curriculum review, labor market, technological changes in the society, and communication needs in the classroom. These factors were found to be similar in both public and private universities. No significant difference was found when a Kruskal-Wallis test was calculated, thus hypothesis $H_0 1$ which stated that there was no significant difference in the factors influencing the choice and use of educational technology and the type of university was accepted. This meant that lecturers in both private and public universities were guided by the same criteria in their choice and use of educational technology.

The findings also revealed that lecturers were not guided by the communication needs in their classrooms, but also by other factors in the universities' environment. It could therefore be reported that lecturers were both inward- and outward- looking, thus the existence of information needs. This meant that choice and use of educational technology in teacher education was a factor of both internal and external forces which need constant monitoring for the universities to be responsive. These findings indicate information needs of the teacher education universities which require to be satisfied. These needs remain dynamic

owing to the nature of the society they emanate from, therefore the need to constantly monitor the environment.

Both lecturers and students indicated that printed texts and chalkboard and talk were effectively used by lecturers in preparing students for effective performance in the use of the same technologies. This indicated that lecturers are yet to be effective in the choice and use of new and emerging technologies as the results show perfection in convectional technologies. It was also found that lecturers encountered a variety of challenges in their choice and use of educational technology in teacher preparation. Until the higher education system embraces technology and integrates it seamlessly into their instruction, graduate teachers will continue to struggle with educational technology. As a measure to achieving this, this study recommends that universities:

a) Improve the quality of teaching and learning in the universities by enhancing the capacity of lecturers in the use of Information Communication and Technologies (ICTs), as well as developing and making available a range of open content resources for use by student teachers and teacher educators.
b) Establish and strengthen relevant partnerships with other teacher education initiatives in Africa and globally that would facilitate achievement of training objectives while at the same time promoting efficient utilization of resources by initiatives with similar goals.
c) Maintain a watchful alertness of all changes taking place in the universities' environment. This will assure universities of appropriate transformation processes for their graduate teachers and consequently outputs that are acceptable in the labor market.
d) Boost the motivation of lecturers in using educational technology through institution recognition and support.

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