Journal of Continuing, Open and Distance Education

Volume 1, Issue 1, January 2010
ISSN 2074-4722

A Publication of the School of
Continuing and Distance Education
UNIVERSITY OF NAIROBI

Published by
The School of Continuing and Distance Education
University of Nairobi
P. O. Box 30197-00100
Nairobi KENYA
www.uonbi.ac.ke

Printed by the College of Education and External Studies
Kikuyu Campus, University of Nairobi
ISSN 2074-4722

Business Address:
The Editor
Journal of Continuing, Open and Distance Education
P. O. Box 30197-00100
Nairobi KENYA
dean_extestudies@uonbi.ac.ke

Editorial

This first issue of the Journal of Continuing, Open and Distance Education (JCODE) contains six articles covering various themes in continuing, open and distance education.

The first article focuses on the factors influencing the demand for distance learning mode of study. The findings indicate that gender, age, income level, admission criteria, employment status and source of finance have an influence on demand for distance learning programmes.

The second article presents the results of a study that assessed the effectiveness of WEDUSOFT as a Learning Management System (LMS). Results of the study indicated that WEDUSOFT is perceived as effective in terms of navigability by 83.3% of University teachers. This finding forms the basis for future initiatives regarding the development of a Learning Management System at the University of Nairobi.

Article number three looks at financing practices of distance learners. The findings show that distance learners finance their studies from either personal or institutional sources of funding. While financing from personal means was inadequate and unsustainable, institutional funding was inaccessible, unaffordable and also inadequate. The study recommends the need to amend the Higher Education Loans Board Act to allow for financing of distance learners; increase HELB's budget; strengthen Constituency Development Funds (CDF) and micro-finance programs; and encourage employers to support vulnerable learners.

In the fourth article we are presented with findings on the extent to which five selected secondary schools in Kenya use Information and Communications Technology (ICT) to deliver curriculum content. Using Bennett's Hierarchy of Evidence Model, the data indicates that all the five secondary schools are at different levels in their use of ICT in curriculum delivery, ranging from acquisition of physical and human resources to the learning stage. The results also show that schools' ICT integration is

influenced by the ownership of the school, its ICT policy and the school manager's level of ICT skills.

The fifth article focuses on the impact of learner support services on academic performance of distance learners in the University of Nairobi's External Degree programme. The problem under investigation was the relationship between learner support services and academic performance. The findings showed that poor academic performance was partly due to inadequate provision of learner support services to learners. It is recommended that the University of Nairobi enhances the production capacity of study materials, boosts library support and provides internet connectivity and related services at the regional centres.

The final article examines the attitudes held by first year College students of the Lesotho College of Education, towards technology. It investigates the relationship between students' attitudes toward technology and other factors such as teacher characteristics, students' learning and classroom environment, and student's gender. The findings suggest that attitude towards technology were predicted by the three study variables. However, no statistically significant gender differences were established.

Editor

Editorial Policy

(1) JCODE is a forum for scholars and practitioners for reflective thinking and the dissemination of results of their research in adult and continuing education; open, distance and e-learning.

(2) JCODE publishes articles that contribute to scholarly dialogue; the major criteria for choosing articles for publication will be their scholarly quality.

(3) All articles submitted for publication will be peer reviewed by scholars of proven competence. However, the final decision regarding publication shall reside with the Editorial Board.

(4) Views expressed in articles, which appear in JCODE, and responsibility for them is solely those of the authors and not the Editors.

(5) In addition to regular issues of the JCODE, special issues may be devoted to specific themes based on contributions solicited by the editors.

(6) Articles submitted, if not published, will not be returned to the authors. However, the editors will acknowledge all contributions.

(7) Authors of articles will receive two copies of the journal.

Call for Papers

The School of Continuing and Distance Education, University of Nairobi, Kenya wishes to call for research papers to be published in its Journal of Continuing, Open and Distance Education (JCODE). The vision of JCODE is to become the leading journal on current adult and continuing education; open and distance education discourse. To achieve this vision, the journal will publish high quality peer reviewed papers, which meet international standards. Recent empirical studies are encouraged on the following areas:

(1) Adult education and community development;

(2) Open and distance education policy and practice;

(3) E-learning, online learning and ICT integration in education;

(4) Cross-cutting issues in open, distance and e-learning – gender and socio-cultural factors.

The Journal will be published bi-annually, in January and June of every year.

Deadlines for Submission

(1) Deadline for submission of completed papers is 31st October of every year for the January issue, and 30th March for the June issue.

(2) The editorial board reserves the right to reject or accept contributions by authors and will communicate the decision to the respective author(s).

(3) Email your articles to the addresses below:

Dr. Harriet J. Kidombo – hkidombo@uonbi.ac.ke
harrietkidombo@yahoo.co.uk

Dr. Joyce Mbwesa – joycembwesa@yahoo.com

Dr. Omondi Bowa – bowa@uonbi.ac.ke
bowaom2004@yahoo.com

Notes to Contributors

The Journal of Continuing, Open and Distance Education accepts articles in English from all over the world, especially Africa, on issues related to the advancement of the state of knowledge and practice of adult and continuing education; open, distance and e-learning. Below is a summary of the basic information that potential contributors to the Journal must be aware of. These instructions apply to all future contributions of the Journal.

(1) The title should be brief (one line is best), and should begin with a word useful in indexing for information retrieval (not Effect or New). After the title, authors' names, institutional affiliation, telephone/fax number and e-mail should be given (corresponding author should be indicated if different from first author).

(2) An abstract not exceeding 250 words and additional 3 to 5 keywords (i.e. key words not mentioned in the title) should be provided on the second line following the abstract.

(3) Articles should not exceed 7000 words.

(4) The article should be typed in Times New Roman, Font size 12, double-spaced and the format should be compatible with Microsoft Word.

(5) The submitted full length papers should contain the following: title, name(s) of author(s) and affiliation, abstract, introduction, context, methods, findings, discussion, recommendations, conclusions and bibliography or references (choose one, but for an article, we suggest the former).

(6) All references should be done in the American Psychological Association (APA) style. They must be listed at the end of the manuscript. For citations, the APA style should be used, refering to the author's name (without initials) and the year of publication. Footnotes should not be used.

(7) A paper already published or under consideration for publication elsewhere (wholly or substantially) is not acceptable and should not be submitted.

(8) Manuscripts should be written in British English.

(9) Headings can be used up to a maximum of two levels. Only essential tables, diagrams and illustrations will be published.

(10) Tables and figures should be clearly captioned and numbered in Arabic numbers according to the sequence in the text, i.e. Table 1, Table 2 … avoid large tables: the book size will be 15 x 21 cm (A5). Use the tabulator (TAB) only.

(11) Tables should be clear without reading the text. Column heading should be brief and clear. Any necessary explanation essential for understanding the table should be given as a footnote at the bottom of the table.

(12) Diagrams produced by graphical computer programmes are only acceptable if their quality matches that of handmade diagrams.

(13) Formulae should be numbered in Arabic numbers serially at the right-hand side in parentheses. They should be typewritten. Give the meaning of all symbols immediately after the equation in which they are first used.

Editorial Board Members

List of Contributors

1. Dr. Omondi Bowa, Departmental Chairman and lecturer in distance education, Department of Educational Studies, University of Nairobi, P. O. Box 30197-00100, Nairobi, Kenya. bowa@uonbi.ac.ke

2. Dr. Joyce Mbwesa, Senior Lecturer, Curriculum and Instruction, Department of Educational Studies, University of Nairobi, P. O. Box 30197-00100, Nairobi, Kenya. jmbwesa@uonbi.ac.ke

3. Dr Harriet Kidombo, Associate Dean and Senior Lecturer, Human Resource Management, Department of Educational Studies, University of Nairobi, P. O. Box 30197-00100, Nairobi, Kenya. hkidombo@uonbi.ac.ke

4. Dr. Charles Rambo, Lecturer, Distance Education, Department of Extra Mural Studies, University of Nairobi, P. O. Box 30197-00100, Nairobi, Kenya. crambo@uonbi.ac.ke

5. Dr. Paul Odundo, Lecturer, Educational Management, Department of Educational and Communication Technology,

University of Nairobi, P. O. Box 30197-00100, Nairobi, Kenya. odundopaul@yahoo.com

6. Dr. Genevieve Wanjala, Dean and Senior Lecturer, Educational Planning, Department of Educational Planning and administration, University of Nairobi, P. O. Box 30197-00100, Nairobi, Kenya. gwanjala@uonbi.ac.ke

7. David Otigo Otieno, Tutor, Economics of Education, Thogoto Teachers College.

8. Dr. Christopher M. Gakuu, Chairman and Senior Lecturer, Distance Education, Department of Extra Mural Studies, University of Nairobi, P. O. Box 30197-00100, Nairobi, Kenya. cgakuu@uonbi.ac.ke

9. K. Kalanda, Lesotho College of Education, Maseru, Lesotho. carlokalanda@yahoo.com

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FACTORS INFLUENCING DEMAND FOR BACHELOR OF EDUCATION DEGREE BY DISTANCE LEARNING AT THE UNIVERSITY OF NAIROBI

Genevieve Wanjala & David Otigo Otieno

ABSTRACT

The development of the distance mode of teacher training can be characterized as an attempt to resolve the conflict between aspiration for more education by an ever increasing number of Kenyans and the need to broaden the base of high level human resources for national development and that of resource constraint – both human and financial. The purpose of this research study was to establish the factors influencing the demand for the Bachelor of Education (B.Ed.) (Arts) Degree Programme by Distance Learning mode at the University of Nairobi. It was a descriptive survey and had seven objectives and seven hypotheses to test. The target population for this research study comprised all the students enrolled in the B.Ed. (Arts) programme of the University of Nairobi, who were studying through the distance learning mode. Through stratified random sampling, the study focused on the 2002 cohort that was undergoing part six semester in the School of Continuing and Distance Education. Chi square tests were used to analyze the relationship between demand for distance learning, considered as a dependent variable, and the independent variables of gender, age, income level, admission criteria, employment status and source of finance. The 0.1 level of significance was used to determine the level of significance in all the hypotheses.

Key Words = Demand; Teacher Training; Distance Learning Mode.

INTRODUCTION

Educational decision-makers all over the world face growing demand for education, such that there has been disequilibrium between demand and budget allocations. The challenge is how to cope with the demand, reduce the average cost and maintain or improve educational standards. The UNESCO (1960) conference of African member states held in Addis Ababa and attended by thirty-nine member states and several European delegates emphasized the importance of education to national development. The Conference pointed out that the development of human resources is as urgent as the development of natural resources, and that special attention should be given to adult education as well as on-the-job-training. Since then, education has been regarded as a basic good. For instance, Kenya's development plan of 1979 – 1984 and subsequent planning documents, such as Vision 2030, have listed education as one of the basic needs of the population. Education is, therefore, a basic consumer good just like food, clothing, shelter and water. Most economists and educational planners, however, view education not merely as a consumer good but also as a policy instrument. This view was first proposed by Smith (1717) and supported by other human capital theorists, such as the Benthamites and more recently Vaizey (1962), Von Thunen (1968), Shultz (1972), Blaug (1974), Cohn (1978), Todaro (1982) and Wanjala (2001). Todaro in fact argued that the basic determinant of the supply of education is in itself its demand.

Concern over teacher education has been a worldwide phenomenon. In Kenya, the quality of teachers in both public and private schools has been a matter of discussion in various fora. Indeed, the debate over quality of teacher education has continued to be addressed in successive educational pronouncements by the Government. A good example is the Master Plan on Education and Technology for 1997 – 2010 (Republic of Kenya, 1997), which proposes that as a way of encouraging teachers to increase their academic knowledge, they be encouraged to study for higher academic qualifications, provided that such study does not adversely affect

performance of their official duties. This proposal was in effect advocating for the enhancement of the distance mode of learning. Elsewhere in the world, scholars have acknowledged the growing popularity of the distance mode. Halloway & Warren (1988), for instance, see distance education as a viable mode of providing education to more people than would be catered for in the conventional mode as demand for education increases. It was in this spirit that these researchers set out to establish the factors that influence the demand for the B.Ed. (Arts) degree by distance mode at the University of Nairobi.

DEMAND FOR EDUCATION

Factors influencing the demand for education in a given country are varied. They could be economic, such as the price of education, the level of disposable income as well as expected financial returns. They could also be socio-psychological, such as acquisition of higher standards of living, recognition or the peristaltic process as Anderson (1969) found out.

Campbell & Siegel (1967) were the first scholars to attempt the estimated demand function for higher education in the United States of America. They regressed to the function of the age group enrolled in institutions of higher learning over the period 1919 to 1964 on the time series data of real tuition costs and real disposable incomes per household. Apart from their rather unconvincing attempts to identify a demand rather than a supply function, they failed to include either foregone earnings or any measures of expected future earning in their independent variables in their regression. They ended up testing the standard consumption explanation rather than the human capital explanation of the demand for higher education. Although they obtained a good fit with an R2=0.93, it appears that the concept "education and investment" may have been less promising than was imagined. Galper & Dunn (1969) improved the above estimate by introducing distributed lags on their regressions. The only independent variables were school enrolment, household incomes and size of the

armed forces. Even without tuition costs, they obtained an excellent fit in data.

Fieldman & Hoerack (1969) observed that when enrolment data was taken state by state on a cross-section basis, good results were obtained using such independent variables as parental education, test scores, tuition fees and current earnings by level of education. This confirms a weak version of human capital explanation of the demand for higher education. Miller (1971) used a similar approach and found a significant difference between low and high achievers, with high achievers displaying few of the cost-consciousness characteristics of students in human capital image of the world.

Freeman (1971) shifted his attention away from the explanation of the total demand for higher education to the demand for specialized fields of study, in particular to career choices of engineers, educationists and scientists. He introduced five new elements into the analysis. First, he allowed for the fact that earnings today can only influence supply of graduates four years later. Secondly, he intended to discount expected lifetime incomes, thus, treating the present value of earnings as the relevant explanatory variables. Thirdly, he found in his research empirical counterparts for certain non-pecuniary factors affecting occupational choice. Fourthly, he took account of expected lifetime incomes in alternative occupations; and fifth, he allowed for the effect of employers' demand in the labour market by including the output of industries hiring scientists and engineers. His entire model formed a recursive structure that first explained the number of first year enrolment in, say, BSc. Engineering courses; then the number of engineers graduating with BSc. degrees four years later and finally the starting salaries of graduate engineers. Furthermore, the distributed lag structure of his equation made it possible to estimate the speed at which the model attained an equilibrium solution.

In later research, O'Connel concentrated attention on the supply of graduate engineers irrespective of the point at which students had

decided to study engineering. He also provided something like a fully specified demand function for engineers and estimated a simultaneous equation model rather than a recursive one.

Freider & Staaf (1973), predicted the pattern of subject changes by students in particular American colleges by applying the standard theory of consumer behavior. Following a book length by Mackenzie & Staaf (1974), they argued that the distribution of grades across major subjects changes much more frequently than do relative salaries. They, therefore, explained the switches between majors by the economic logic of consumer behaviour theory applied to students' choice between university subjects. Could subject combination be one of the factors influencing the demand for the B.Ed. (Arts) degree by distance at the University of Nairobi?

The Cost Function

According to Cohn (1979), the meaning of cost in educational circles differs from conventional usage in two important aspects. First, economic costs include all opportunity costs and therefore are more inclusive. The more important economic costs are the minimum costs necessary to produce a given level of output. It is easy to show that private entrepreneurs have necessary incentives to minimize costs so that all opportunity costs are included. It is likely that the minimum cost criteria will be satisfied. In education, however, the same incentives are lacking and it is not clear whether expenditures are synonymous with costs. Let me illustrate this using a generalized production function. This should include explicitly a school size variable [E]. The function will, therefore, be

F (Q I X1 E_S) = 0

Where f = function

Q = vector of output

X = vector of manipulative variables

S = vector of non-manipulative variables

We can estimate the prices of the X inputs, given by *P1, P2 … Px; accounting costs of x-inputs* are given by k Pi x Xi = P1X1 + P3X2 + ……Pk x Xk summation i = 1

To obtain a minimum cost for each level of output , it is necessary to follow the procedure by which the accounting costs are estimated for different combination of the Xs, all of which provide the same output (this requires that the inputs are substitutable in production). After a few manipulations, we can obtain the optimal input levels, X1, X2 and so forth, for which the economic costs of producing a given level of output are minimized. The economic costs are given by C = sum. Since the X1" can be shown to depend on the Q vector and so on school size E , it follows that C is a function of Q1E and the manipulative inputs and their prices

C = g (Q E Px P2 … PkX2 ….X2).

In practice, many of the input prices are identical in all schools and faculties, so there is no need to include them in a cross-sectional regression equation. Moreover , Levin (1970) points out that non-manipulative inputs should not be included on the cost equation as their effects on cost is transmitted through the effects they may have on output. It is unclear from the analysis what shape the last equation must take. Ferguson (1972) stressed that simple production function calculations all produce very complex cost formulae, so that a linear approximation might be entirely unsatisfactory. It is agreed, however, that the correct theoretical form from the last equation cannot be determined until the shape of the production function is established; and we are clearly not in a position to provide an uncontestable conclusion on the score. Supposing the pre-student cost function has the following formula:

$$\frac{C}{E} = a\_b\ Q + b\ Q + \ldots b1Q\ x1x1 + a2\ x\ 2 + \ldots akck + d1\ E + d2E2$$

Where x bs cs ds = co-efficient of cost function (constant) – assumed.

$\frac{C}{E}$ = per student cost.

Then it can be shown that the cost size relationship is s-shaped (when other things are equal) as school size increases. If we are dealing with the short near cost function (that is during a time too short to change the size of the university plant) then the explanation for the shape of cost function lies in the law of diminishing marginal returns. In other words, as we add more and more variable inputs to fixed input in the case of the university, the addition to output will offer same print be necessarily smaller.

In the long run, when it is possible to change all inputs including the fixed plant, the explanation for the u-shaped cost function has to do with economies and dis-economies of scale. That is, when cost per student under distance education declines, then we have diseconomies of scale; and when the cost per student increases, then we have dis-economies of scale. In this case there will be an optimal university size given by that size at which cost per pupil is at minimum given by –d2b.

$$\frac{C}{E}$$

It is possible, however, that a quadratic equation for E is appropriate. An alternative specification in which cost per student declines at all levels of college size (ignoring other variables included in the foregoing equation)

= a + … d3(I) where d3 is a constant.

The implied relationship between cost per student and college size is given by a rectangular hyperbola. In this case, the optimum school size is never attained as costs continue to decrease. To what extent is the cost function a factor in the demand for the B.Ed. (Arts) degree by distance at the University of Nairobi?

Other Factors Influencing Demand for Education

Apart from the cost function, there may be other factors that influence the demand for education in a given country. These may be social and psychological factors, such as; level of disposable income,

recognition, reduction in family size and acquisition of a higher standard of living. The most important psychological reason, which affects the demand for education, is what Anderson referred to as the ***peristatltic process,*** in a study that he carried out in 1967. This is a process in which parents are eager to let their children acquire a higher education level than they themselves reached.

It cannot be forgotten that David Ricardo and Robert Malthus (two of the outstanding economists in the twentieth century) drew the world's attention to the relationship between economic well-being of the masses, population size and education. They saw education as facilitating the development of attitudes and habits conducive to population control and maintenance of a certain level of liberty. Blaug (1968) stretched this argument further with the idea that people spend on themselves in diverse ways, not for the sake of present enjoyment, but for the sake of future pecuniary and non-pecuniary returns; they may purchase health care and information about better job opportunities, or migrate to take advantage of better employment opportunities.

In the developing world, education is largely seen by individuals and their families as the means to secure incomes, especially in the modern sector in urban centres. The prevalent expectation is that education will pay handsome dividends in terms of earnings and modern amenities commensurate with the economic and social position the holding of such jobs entails presently. This is the essence of the rate of return paradigm to planning education advanced by economists like Blaug (1974). They calculated the rate of return to education in India and proposed that it was prudent to give students loans and not free education so that they would pay for the big returns they would get in their lifetime.

Psacharopoulos (1974) went further and established that disposable income greatly affects the demand for primary, secondary and higher education. If the family disposable income increases, demand for education increases because tuition fees, books, uniform and stationery will be afforded. In essence, then, individuals demand for

goods and services such as the B.Ed. (Arts) Programme by Distance Learning mode due to private rates of return. These may include increased income, modernization, employment, prestige and status.

Maslow (1954) envisaged these returns in another way. According to Maslow's theory, there are five factors related to peoples' needs that motivate people to work. The five needs are:

(a) Physiological;
(b) Safety or security needs;
(c) Social affiliation needs;
(d) Esteem needs;
(e) Self-actualization.

Teachers who have satisfied all these needs become competent in their profession. Thus, they are promoted and earn higher incomes. Once the income is received from existing income and all household expenditure is met, the teachers remain with disposable income, which enables them to meet the cost of further education through effective demand for the B.Ed (Arts) Programme by Distance Learning mode of the University of Nairobi.

More recently, Ogada (2005) sought to establish motivational factors determining the enrolment of primary school teachers in the B.Ed. (Arts) Programme by Distance Learning mode of the University of Nairobi. Basing his study on Alderfer's ERG theory – particularly the frustration-regression principle, which impacts on workplace motivation - he investigated the relationship between teachers' decision to enroll in the programme and variables such as years of service, age, gender and responsibilities held. In his research, he discovered that most primary school teachers enrolled in the programme were those who had taught for a significantly long time and were of ages ranging from 31 to 40 years. In addition, the motivation of primary school teachers in enrolling in distance studies varied with age, responsibilities held and gender. Elderly teachers, for instance, were mostly motivated by the desire to raise their social status compared to their youthful counterparts.

STATEMENT OF THE PROBLEM

High enrolment in the various cohorts of students seeking teacher education using the distance learning mode has been of great concern to the University of Nairobi. The demand for teacher education programmes using the distance mode has continued to increase. This is despite an increase in fees for the programmes, compounded by an increase in the cost of living and unemployment problem rocking all sectors of the economy. To cope with increased enrolment, the University has had to look for alternative physical infrastructure to facilitate the teaching and learning process. The university has, for instance, had to hire lecture halls and additional staff to cope with increased enrolment.

Table 1 shows the pattern of student enrolment in the B.Ed. (Arts) by Distance Programme of the University of Nairobi from 2001 to 2006.

Table 1: Enrolment of Students in the B.Ed. (Arts) by Distance Learning, UON 2001-2006

Academic Year	Month	Student Enrolment
2001	April Intake	600
	December Intake	737
2002	April Intake	994
2003	December Intake	1,025
2004	April Intake	1,550
	December Intake	1,420
2005	August Intake	682
2006	April Intake	353

Table 1 shows that there has been a steady increase in enrolment of students in this programme. This raises the issue of why the trend has been on the upward movement. Is there a positive rate of return to investing in this programme? Is the increase a result of some kind of increase in the disposable income of the teaching force? Since the majority of applicants to this programme are already employed, do they anticipate increased earnings upon completion of this programme? These questions led us to establish the factors that influence demand for teacher education programmes using the distance mode of learning at the University of Nairobi. The research was carried out between November 2005 and July 2006.

RESEARCH METHODOLOGY

The research was carried out in the College of Education and External Studies, which is one of the six colleges of the University of Nairobi. The two Schools of this college basically deal with teacher training programmes while the Centre of Open and Distance Learning , also located in the College, facilitates the distance learning mode. The research study was confined to Nairobi, Central and Nyanza provinces where distance education has been carried out for more than a decade by the University of Nairobi.

Research Design

The design used in this research was descriptive survey. As a research design, a descriptive survey concerns itself with describing practices that prevail; beliefs, views, attitudes or perceptions that are held. Indeed Jacobs & Chesser (1996) have defined survey research methodology as a technique in which detailed information concerning social phenomena are collected by posing questions to respondents so that it becomes possible to find reasonable explanations. According to Ray (1988), the findings of a survey help researchers to explain social phenomena with confidence. A survey research aims at generating ideas and explanations, rather than testing them. A descriptive survey

method was found convenient in carrying out this research because its aim was to gather extensive opinions from students enrolled in the B.Ed. (Arts) programme, which is taught using the distance mode of learning.

Target Population

The target population for this research study comprised of all the students enrolled in the B.Ed. (Arts) programme of the University of Nairobi, who were studying through the distance learning mode. More specifically, the study focused on the 2002 cohort that was undergoing part six semester in the School of Continuing and Distance Education. The level was essential for the research because it consisted of learners with considerable experience in the mode of study.

Sampling Techniques and Sample Size

Stratified random sampling was used to choose both male and female respondents for this research study. In addition, the respondents were stratified according to their level of achievement. Part six of the 2002 cohort was then purposively sampled to yield a sample size of 274 out of 950 students.

Research Instruments

A questionnaire, which was administered to the learners, was used as the sole instrument for collecting data. The questionnaire was divided into Sections A and B. Section A comprised of students' demographic data or profile. Section B concentrated on questions aimed at collecting data on factors influencing the demand for the B.Ed. (Arts) by distance programme.

Instrument Validity and Reliability

To enhance the validity and reliability of the research instrument, a pilot study was conducted on 10 cases that were randomly sampled from the target population. The instrument was basically being tested

for both construct and content validity. The items found to be inadequate for measuring the variables were discarded or modified. Only those items which were correctly worded and free from misrepresentation were retained. Further, Spearman Brown's coefficient was computed to ascertain the reliability of the research instrument. The computation yielded a reliability coefficient of 0.7689, confirming the instrument as reliable, consistent and capable of measuring the variables identified for study.

RESEARCH OBJECTIVES AND HYPOTHESES

The objectives of the research were as follows:

(a) To find out whether there is any significant relationship between gender and the demand for the B.Ed. (Arts) Programme by Distance of the University of Nairobi;

(b) To establish whether there is a significant relationship between age and the demand for the B.Ed. (Arts) Programme by Distance of the University of Nairobi;

(c) To investigate whether there is a significant relationship between income and the demand for the B.Ed. (Arts) Programme by Distance of the University of Nairobi;

(d) To find out whether there is a significant relationship between admission criteria and the demand for the B.Ed. (Arts) Programme by Distance of the University of Nairobi;

(e) To establish whether there is a significant relationship between employment status and the demand for the B.Ed. (Arts) Programme by Distance of the University of Nairobi;

(f) To determine whether there is a significant relationship between source of finance and the demand for the B.Ed. (Arts) Programme by Distance of the University of Nairobi.

In order to meet the said research objectives, the following null hypotheses were formulated :

HO1: There is no significant relationship between gender and the demand for the B.Ed. (Arts) Programme by Distance of the University of Nairobi.

HO2: There is no significant relationship between age and the demand for the B.Ed. (Arts) Programme by Distance of the University of Nairobi.

HO3: There is no significant relationship between income and the demand for the B.Ed. (Arts) Programme by Distance of the University of Nairobi.

HO4: There is no significant relationship between admission criteria and the demand for the B.Ed. (Arts) Programme by Distance of the University of Nairobi.

HO5: There is no significant relationship between employment status and the demand for the B.Ed. (Arts) Programme by Distance of the University of Nairobi.

HO6: There is no significant relationship between source of finance and the demand for the B.Ed. (Arts) Programme by Distance of the University of Nairobi.

RESEARCH FINDINGS AND DISCUSSION

The questionnaire was administered to 274 respondents in the various regional centres of the University of Nairobi, through which the B.Ed. (Arts) programme is organized and administered. Out of the 274 questionnaires distributed, 10 were used for validating the instrument through pilot testing. A further, 76 questionnaires were not returned by the respondents within the required time leaving a total of 188 questionnaires that were usable. These were subsequently analysed and interpreted. Data was analyzed using appropriate descriptive statistics and the major findings of the research are as discussed in this section. The findings are corroborated with the information obtained from documents analyzed and literature reviewed and are reported on a hypothesis by hypothesis basis.

HO1: There is no significant relationship between gender and the demand for the B.Ed. (Arts) Programme by Distance of the University of Nairobi

The data pertaining to this hypothesis was analysed using a chi -square (X2) statistical technique and the results are as shown in table 2.

Table 2: Gender of Students Demanding for the B.Ed. (Arts) Degree by Distance

	Observed No.	Expected No.	Residual		Gender
Male	108	94.0	14.0	Chi-square	4.170
Female	80	94.0	-14.0	Df	1
Total	188			Asymptotic. Significance	0.041

From Table 2, it is clear that the number of males admitted to the programme was 108 against 80 for females during the year. The expected equal number for male and female was 94.0; there were more males than female students, indicating that one's gender may indeed influence the demand for the programme. The chi-square value reveals a 0.041 asymptotic significance at 1% degree of freedom. When P>0.1 level of confidence, the hypothesis is not rejected. In this case P=0.041 since P<0.1; therefore, there is enough evidence to reject the null hypothesis and accept that there is a significant relationship between gender of the student and the demand for the B.Ed. (Arts) degree by distance at the University of Nairobi.

HO2: There is no significant relationship between age and the demand for the B.Ed. (Arts) Programme by Distance of the University of Nairobi

Chi-square statistical tests were used to analyse data pertaining to this null hypothesis whose results are shown in Table 3.

Table 3: Age of the Students Demanding for the B.Ed. (Arts) Degree by Distance

	Observed No.	Expected No.	Residual		Age
40 years and below	135	47.0	88. 0	Chi-square	245.574
41 - 45 years	46	47.0	-1.0	Df	5
46 - 50 years	6	47.0	-4.1	Asympt.Sig	0.000
51 - 55 years	1	47.0	-46.0		
Total	188				

Table 3 shows that the expected distribution of responses between four age brackets was 47.0. However , it was observed that the majority of students who had effective demand for the programme were below 40 years old, followed by the 41 - 45 age bracket respectively. Apparently, age compelled the young to demand for the programme because they had more years to work and increase their earnings as opposed to the old who would be retired soon. Chi-square value obtained was 245.574 at 5% degree of freedom. The asymptotic level of significance was P=0.000. Since the P<0.1, the null hypothesis is rejected and we accept the fact that the age of the learners does affect their demand for Degree Programme by Distance Learning mode.

HO3 : There is no significant relationship between income and the demand for the B.Ed. (Arts) Programme by Distance of the University of Nairobi

A chi-square was used to test this null hypothesis and the results of the analysis are as reported in Table 4.

Table 4: Income and the Demand for the B.Ed. (Arts) Degree by Distance

KShs	Observed No.	Expected No.	Residual		Income when enrolling
10,000 and below	109	26.9	82.1	Chi- square	09.894
11,000	30	26.9	3.1	Df	6
12,000	18	26.9	8.9	Assympt. Significance	0.000
13,000	7	26.9	19.9		
14,000	12	26.9	14.9		
15,000	5	26.9	21.9		
16,000 and above	7	26.9	19.9		

From Table 4, it is clear that the majority of students enrolled in the programme had a monthly income of KShs. 10,000 and below. Effective demand provided by learners with this level could have been due to the fact that students enrolled in this programme because they expected their incomes to improve upon completion of their studies. The findings correspond to Ogada's (2005) findings in a study aimed at establishing the teachers' motives for enrolling in the B.Ed. (Arts) Programme by Distance learning. Elsewhere in the world, researchers also point to the fact that teachers were motivated to enroll for degree courses in education by career prospects and financial gain rather than to improve performance. Prescott & Robin (1993), for instance, noted that teachers were among the first entrants to the Open University in Britain between 1976 and 1977. They also observed that one of the reasons given for enrolling in degree programmes in the Open University was that

graduate status for teachers provided them with an automatic and significant salary increase and enhanced their prospects of promotion in an established career structure.

The chi-square value was 309.894 at 6% degree of freedom. Asymptotic value was 0.000. Since P<0.01 level of confidence, the null hypothesis is rejected. This suggests that there is indeed a significant relationship between one's income level and their demand for the B.Ed. degree by distance mode of learning.

HO4: There is no significant relationship between admission criteria and the demand for the B.Ed. (Arts) Programme by Distance of the University of Nairobi

A chi-square was used to test this null hypothesis and the results of the analysis are as reported in Table 5. A chi-square analysis uses both the observed and expected values to draw conclusions.

Table 5: Admission Criteria and the Demand for the B.Ed. (Arts) Degree by Distance

	Observed (N)	Expected (N)	Residual		Admission criteria (Qualification)
A – Level	29	62.7	33.7	Chi-square	143.947
Diploma	19	62.7	43.7	Df	2
P1	140	62.7	77.3	Asympt.Sig	0.000
Total	188				

Table 5 indicates that the expected demand for the programme against three qualifications shown was 62.7 equally divided. Due to admission criteria of students, the scores varied significantly. The P1s were the majority of the students enrolled in the programme at 140, followed by the A-Level certificate holders who numbered 29 and the

Diploma holders came third numbering 19. The P1 qualification showed more effective demand for the programme because they wanted to improve their low academic qualifications. So they were motivated to join the programme due to the nature of their job. The A-Level certificate holders on the other hand provided a less effective demand because they were undergoing extinction from the old system of education.

The chi-square value from the table was 143.947 at 2% degree of freedom producing P value of 0.000 level of confidence. Since P<0.1 level of confidence, the null hypothesis is rejected leaving us to conclude that the admission criteria influence the demand for the B.Ed. (Arts) Degree Programme by Distance learning. The P1 criterion was the most favourable to effective demand for teacher education using the distance learning mode of instruction.

HO5: There is no significant relationship between employment status and the demand for the B.Ed. (Arts) Programme by Distance of the University of Nairobi

Frequency counts were taken to determine the various occupations of the students enrolled in the B.Ed. (Arts) Degree Programme by Distance learning. In addition, the data on employment status was analyzed using chi-square and the results are as reported in reported in Table 6.

Table 6: Employment Status and Demand for the B.Ed. (Arts) Degree by Distance

Occupation	Observed (N)	Expected (N)	Residual		Employment Status
Teaching	177	47.0	130.00	Chi-square	479.787
Administration	7	47.0	-40.00	Df	3
Business	2	47.0	-45.00	Asympt. Sig	0.000
Others	2	47.0	-45.00		
TOTAL	188	47.0			

The expected number of students against each employment occupation was 47.00. Findings reveal that teachers formed the largest group of professionals enrolled in the B.Ed. (Arts) Degree Programme by Distance mode. Out of 188 respondents, 177 were teachers; 7 were administrators and 2 businessmen. Chi-square table values were 479.787 with 3% degree of freedom with an asymptotic value of P=0.000. Since P<0.1 level of confidence, the null hypothesis was rejected leaving the researchers to conclude that there is a significant relationship between employment status and the demand for the B.Ed. (Arts) degree by Distance Programme of the University of Nairobi.

HO6: There is no significant relationship between source of finance and the demand for the B.Ed. (Arts) Programme by Distance of the University of Nairobi

Hypothesis 6 sought to establish whether there was any relationship between source of finance and demand for teacher education using the distance mode of learning at the University of Nairobi. The data was analysed using a chi-square and the results are presented in Table 7.

Table 7: Source of Finance and Demand for the B.Ed. (Arts) Degree by Distance

	Observed (N)	Expected (N)	Residual		Source of Finance
Loans	160	31.3	128.7	Chi-square	640.319
Co-operative dividends	3	31.3	-28.3	Df	5
Donations	1	31.3	-30.3	Asympt.Sig	0.000
Business	2	31.3	-29.3		
Bursary	4	31.3	-27.3		
Savings	18	31.3	-13.3		
TOTAL	**188**				

Observations from Table 7 are that those who used loans to support their demand for the Degree Programme were 160, followed by Co-operative dividends (3), donations (1), bursaries (4) and savings (18), out of a total of 188 respondents and an expected equal value of 31.3. From table 7, the critical value obtained from the chi-square table at 5% degree of freedom was 640.319, producing P=0.000 level of significance. Since P<0.01 level of confidence, the null hypothesis is rejected leaving the researchers to conclude that there was a significant relationship between the source of financing and demand for the B.Ed. (Arts) degree by distance learning at the University of Nairobi. This is validated by the large number of respondents who secured loans to enroll in the programme. The availability of loans as a financial source, therefore, influences effective demand for the programme.

CONCLUSIONS OF THE STUDY

The purpose of this research study was to establish the factors which influence the demand for the B.Ed. (Arts) Degree Programme by Distance mode of learning of the University of Nairobi. After a thorough analysis of the data collected, the following conclusions were made:

(a) Gender of a student influenced and determined demand for the B.Ed. (Arts) Degree Programme by Distance Learning mode at the University of Nairobi. Majority of students enrolled in the programme were male;

(b) Age of a student influenced and determined demand for the B.Ed. (Arts) Degree Programme by Distance Learning mode at the University of Nairobi. Majority of those enrolled in the programme were those aged 40 years and below because they had more years to earn a living and make up for costs incurred;

(c) The income of a student influenced and determined effective demand for the B.Ed. (Arts) Degree Programme by Distance Learning mode at the University of Nairobi. Although many of the students enrolled had incomes below KShs. 10,000 , they still were able to pay fees for the programme due to delayed gratification;

(d) Admission criteria influenced and determined effective demand for the B.Ed. (Arts) Degree Programme by Distance Learning mode at the University of Nairobi. P1 certificate holders formed the majority of students who were eligible for admission into the programme;

(e) Employment status influenced and determined demand for the B.Ed. (Arts) Degree Programme by Distance Learning mode at the University of Nairobi. Unlike administrators and businessmen, teachers enrolled in the programme in large numbers due to their self motivation as well as expectations of better pay on completion;

(f) Availability of finance from banks as well as savings and co-operative societies influenced and determined effective demand for the B.Ed. (Arts) Degree Programme by Distance Learning mode at the University of Nairobi.

RECOMMENDATIONS FROM THE STUDY

The following recommendations were made:

(a) The University of Nairobi needs to work in collaboration with the government to improve the infrastructural support for the distance mode of learning as the demand for education using the distance mode of learning may increase over the years;

(b) The government of Kenya on the other hand needs to improve the terms of graduate teachers as a way of motivating them to seek further professional development.

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FACULTY PERCEPTIONS ON THE EFFECTIVENESS OF WEDUSOFT AS A LEARNING MANAGEMENT SYSTEM: A CASE STUDY OF THE UNIVERSITY OF NAIROBI, KENYA

Joyce Kanini Mbwesa

ABSTRACT

The extent to which teachers perceive a certain pedagogic approach as being effective will influence greatly the extent to which they appreciate and adopt new innovations. This paper summarizes the results of a study that that was conducted to assess the effectiveness of WEDUSOFT as a Learning Management System (LMS). WEDUSOFT is an acronym for Web Education Software. It is currently being used as a Learning Management system for e-content development and access of online courses by students and teachers at the University of Nairobi. Twenty two teachers currently using WEDUSOFT for instruction were purposively sampled to constitute the primary sample of the study. A five point measurement scale to rate the various attributes of the system was used. The range of indicators of the LMS effectiveness generated was grouped into five categories namely: Software indicators, Hardware indicators, didactical indicators, communication indicators and information indicators.

Results of the study indicated that WEDUSOFT as a learning management system is perceived as effective by the majority (83.3%) of teachers at the University of Nairobi. For instance navigatability of the system was rated quite highly. Navigatability here was defined as the capacity of the system to allow users to move about screen or pages and other aspects of the system without difficulty. 81.8% of the staff rated this aspect of the system as very good, with only 4.5% giving it a low rating. This is a very important finding upon which future

initiatives regarding the development of the learning management system in the university could be built upon among other underpinning factors. In conclusion, the researcher recommends that further complementary research be conducted to analyze other factors that may influence teachers' adoption of WEDUSOFT as a learning management system at the university.

Key Words: WEDUSOFT; Perceptions; Software indicators; Hardware indicators; Didactical indicators; Communication indicators; Information indicators.

INTRODUCTION

The development and provision of e-learning products and opportunities is one of the most rapidly expanding areas of education and training. Whether this is through an intranet, the internet, multimedia, interactive TV or computer based training, the growth of e-learning is accelerating. However, what is known about these innovative approaches to training has been limited by the shortage of scientifically credible evaluation. Is e-learning effective? In what contexts? For what groups of learners? How do different learners respond? Are there marked differences between different ICT platforms? Does the socio-cultural environment make a difference? Considering the costs of implementing ICT based training, is there a positive return on investment?

The term Learning Management System refers to software designed to provide a range of administrative and pedagogic services, related to formal education settings e.g. enrolment data, access to electronic course materials, faculty/student interaction, assessment, etc. The most common such systems worldwide are Blackboard and webCT. Other terms used to describe such applications include "virtual learning environments" and "course management systems". However, the term Learning Management System is used in this study to strictly refer to software designed to provide pedagogic services and specifically access to electronic course materials.

The effectiveness of any Learning Management System (LMS) depends on the presence of different variables regarding the system itself. These are variables that would make the process of learning more interesting and attractive, less technical and less complicated. The way teachers perceive the effectiveness of the LMS as an instructional delivery system will impact a lot on the usage and the extent of their adoption of the System. This study, therefore, sought to find out faculty or lecturers' perception of the effectiveness of WEDUSOFT as a learning management system. WEDUSOFT is an acronym for Web Education Software. This LMS was developed originally by Omwenga Elijah (2000) of the University of Nairobi, Kenya. It is currently in use as a platform for e-content development within the University.

PURPOSE OF THE STUDY

The general purpose of this study was to examine and analyze faculty perceptions of the effectiveness of WEDUSOFT as a LMS, with special reference to the University of Nairobi.

OBJECTIVES OF THE STUDY

The following were the specific objectives of this analysis:

1. To find out faculty perceptions about interoperability of WEDUSOFT as a LMS;
2. To establish faculty perceptions about the LMS hardware effectiveness;
3. To find out the extent to which the system is perceived to be effective in terms of didactical factors;
4. To find out faculty perceptions about the system's effectiveness in its communication strategy;
5. To establish faculty perceptions about the systems information value, usefulness and user satisfaction.

LITERATURE REVIEW

Voluminous literature exists to explain the effectiveness of ICT in the provision of education. For instance, Hemphill (2000) notes that the complexities of instructional design can be greatly simplified by redesigning the elements of traditional design to:

1. Increase frequency of interaction between the learner and the online lesson materials;
2. Offer students substantial feedback on all tests and work products;
3. Balance comprehension and significance of content delivered.

Plotnick (1997) points out that an effective online instructional model must at least include:

1. An analysis of the setting and learner needs;
2. The design of an effective and relevant learner environment;
3. Development and management of all learner materials;
4. An evaluation of the development of the results, both formatively and summatively.

In a study, "using asynchronous learning in redesign: reaching and retaining the at risk student" Twigg Carols (2004) attempted to demonstrate how information technology and asynchronous learning strategies can be used to address the chronic problem of drop-failure-withdrawal (DFW) rates in USA colleges and universities. In her analysis, she argued that asynchronous learning has the capacity to reduce drop-failure-withdrawal (DFW) rates in institutions of higher learning. To analyze this phenomenon, Twigg used 30 projects to evaluate student learning and focused on comparing the outcomes of redesigned courses with those of courses with the same content delivered in traditional approaches.

The results of her study indicated that 22 out of the 30 projects (73%) showed statistically significant increases in student learning; the other 8 (26.6%) showed equivalent learning to traditional formats. Of the 24 projects, 22 reported a noticeable decrease in drop-failure-withdrawal rates ranging from 10 to 20 percent. In this same study, each of the 30 institutions developed a detailed cost analysis of both the traditional and the redesigned course formats using a spreadsheet–based course-planning tool. Results showed that all 30 projects used reduced costs by 40% in average with a range of 20%. The study generally showed how information technology and asynchronous learning strategies can be used to address the challenges of Drop–Failure–Withdrawal rates and cost problems faced by many universities today.

In conclusion, Twigg noted that there was need for colleges to use asynchronous learning strategies to redesign more flexible schedules for working adults, and serve the needs of at risk students more effectively.

Yet despite these new developments in the educational sector, the adoption of e-learning in African universities still remains embryonic. While the role of e-learning in higher education is appreciated (Achuna 2000, Twigg 2003), Africa is focusing almost exclusively on increasing space at its physical universities. Secondly, while many studies like Twigg's have contributed to further understanding of the concept of instructional technology as it can be used in education, most of these studies have been focused on the west. Very few studies have been conducted to analyze asynchronous learning in the African environment and more so in the Kenyan context, where there is a massive and insuperable demand for higher education. The present study therefore sought to assess the effectiveness of WEDUSOFT as a (LMS). The specific objectives of the study are essentially to examine and analyze the instructional effectiveness of the e- learning environment in Kenya with special reference to WEDUSOFT e-platform of the University of Nairobi.

CONCEPTUAL FRAMEWORK

The primary objective of this study was to examine and analyze faculty perceptions of the effectiveness of WEDUSOFT as a Learning Management System. The underlying assumption of the study was that the extents to which teachers perceive a certain pedagogic approach as being effective will greatly influence the extent to which they appreciate and adopt new innovations. Faculty perceptions in this study were centered on five key variables; faculty perceptions of the:

1. Systems effectiveness in terms of interoperability;
2. System's hardware;
3. Didactical value;
4. Communication strategy and information value;
5. Usefulness and user satisfaction.

It was assumed in this framework that if the faculty had good perceptions of these variables, then they would be more positive in adopting the system, which would translate to its use by both of the students and staff. Fig. 1shows this.

METHODOLOGY

Twenty two teachers, currently using WEDUSOFT for instruction, were purposively sampled to take part in this study. Using a five point measurement scale ranging from Very Poor (1) to Very Good (5), teachers were asked to rate the various attributes of the system. A number of indicators of LMS effectiveness were generated for this analysis. The range of indicators was grouped into five categories, namely:

1. Software indicators;
2. Hardware indicators;
3. Didactical indicators;
4. Communication indicators;
5. Information indicators.

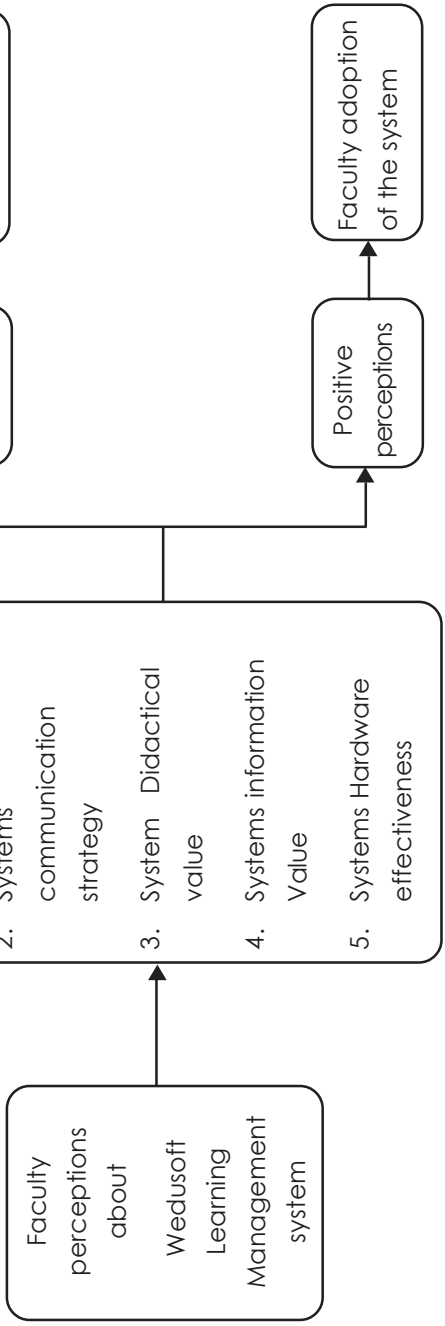

Fig.1: A conceptual framework depicting the assumed interrelationships of the variables investigated in this study.

These categories of indicators was further defined by other attributes whose sum total was expected to give the general score for each of the main category of indicators, as discussed in the methodology section of this report. Such indicators have been used in previous studies on Learning Management Systems (Colvin Clark, (2004) and Richard Mayer, (2003)). Results of this analysis are discussed next.

RESULTS AND DISCUSSIONS

Faculty Evaluation of software Indicators of WEDUSOFT Learning Management System

One of the categories of indicators of effectiveness of WEDUSOFT as a LMS was the software indicators. The systems software indicators were defined by the following attributes: interoperability, accessibility, navigatability, flexibility, reliability, portability, functionality, accountability, security and stability. Data was therefore collected on each of these attributes of the software indicators.

Interoperability

Interoperability in this study was operationally defined as the ability of the system to support content from different sources and support the main learning standards. This attribute of the WEDUSOFT LMS was rated very highly with 59% of the faculty rating this as very good, 18.2% as good and 22.7% rating it as fair. None of the subjects rated it as very poor or poor. This implies that many of the staff find WEDUSOFT LMS adequate in terms of interoperability of the system.

Accessibility

The attribute of accessibility of the system was also rated quite highly by the staff. Accessibility here was operationally defined as the extent to which the system is accessed, and that the delivery and presentation of the material is easy to use, intuitive and robust enough to serve the diversity of users. From the results, 77.3% of the staff rated this aspect of the system as good and only 22.7 % of the subjects rated it as fair.

Navigatability

Navigatability of the system was also rated quite highly. Navigatability here was defined as the capacity of the system to allow users to move about screen, pages and other aspects of the system without difficulty. 81.8% of staff rated this aspect of the system as very good, 4.5% rated this as very good and only 13.6 % of the staff rated it as fair. None of the subjects rated it as poor.

Flexibility

Another aspect of the software indicators assessed in this study was the flexibility of the system. Flexibility here was defined as the ability of the system to allow for opportunity for changes to be made in the content. 77.3% of the subjects rated this as good, while 22.7% of the subjects rated this as very good.

Reliability

Reliability of the system was rated fairly well in this analysis with 50% of the subjects rating it as good, while another 50 % of the subjects rated it as fair. Reliability here was defined as the systems ability to give acceptable results.

Portability

The attribute of portability of the system was rated quite highly in this analysis. Portability here was defined as the system's ability to be independent from the users' operating system, and its ability to be used by widespread browsers, such as internet explorer, Netscape, Communicator, etc. From the analysis, 72.7% of the subjects rated this aspect of the system as very good, while 27.3% rated it as good.

Functionality

Systems functionality was also rated quite well by the faculty. Functionality here was defined as the system's usefulness and relevance

to the various needs of the users. For instance, 72.8% of the staff rated this as good and only 27.3% rated this as fair.

Accountability

The systems accountability attribute was also rated well with 72.7% of the subjects rating it as good.

Security

The system's security attribute was given the lowest rating with 86.4% of the staff rating this as fair and 9.1% of the subjects rating it as poor. Only 4.5% of the subjects rated this as very good.

Cost

The system's cost was rated quite highly with 86.4% of the staff considering it as very good and 13.6% rating it as good. The system's cost here was defined as reasonable and affordable cost for purchasing the system. This high rating of the system's cost could be attributed to the fact that WEDUSOFT LMS is a home grown product developed by a PHD student. As at the time of this study, this system was not for sale and therefore has no purchasing costs implications. Table 1 summarizes these results.

Table 1: Faculty Evaluation of Software Indicators of WEDUSOFT Learning Management System

RESPONSES												
Indicators	**Very (1)**		**Poor Poor (2)**		**Fair (3)**		**Good (4)**		**Very (5)**		**Total Good**	
	F	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**
Interoperability	-	-	-	-	5	22.7	4	18.2	13	59	22	100
Accessibility	-	-	-	-	5	22.7	17	77.3	-	-	22	100
Navigability	-	-	-	-	3	13.6	18	81.8	1	4.5	22	100
Flexibility	-	-	-	-	-	-	17	77.3	5	22.7	22	100

Reliability	-	-	-	-	-	-	11	50	11	50	22	100
Portability	-	-	-	-	-	-	6	27.3	16	72.7	22	100
Functionality	-	-	-	-	6	27.3	13	59.1	3	13.6	22	100
Accountability	-	-	-	-	-	-	16	72.7	6	27.3	22	100
Security			2	9.1	19	86.4	1	4.5	-	-	22	100
Cost							3	13.6	19	86.4	22	100

HARDWARE INDICATORS

An effective LMS depends on the presence of different multimedia hardware components that give an opportunity for usage of multimedia application and make the process of learning more interesting and attractive. There is no way of supporting e-learning without including multimedia in the course material. In addition, there are many tools to create media elements, like images, sound and video, and thousands of media elements are already available over the internet. But, just putting all these media items together in the same document will not necessarily enhance the course quality. Those media should be synchronized to make a good presentation of a document and over time reflect the content used by the teachers like gestures, demonstrations and examples. This study therefore sought to establish the effectiveness of this aspect of the WEDUSOFT Learning Management System. The LMS hardware effectiveness was indicated by the following indicators: Parameters of the micro-processor, the memory capacity, the speed of the internet and the presence of input/output devises of multi-media data processing. Table 2 summarizes the faculty assessment of these attributes of the system.

Table 2: Faculty Evaluation of Hardware Indicators

RESPONSES												
Indicators	**Very Poor (1)**		**Poor (2)**		**Fair (3)**		**Good (4)**		**Very Good (5)**		**Total**	
	F	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**
Parameters of the micro-processor	-	-	-	-			9	40.9	13	59.1	22	100
Memory capacity	-	-	-	-			9	40.9	13	59.1	22	100
Internet speed	-	-	18	81.8	3	13.6	1	4.5	-	-	22	100
Presence of input output devices for multi media data processing	-	-	-	-	6	27.3	16	72.7	-	-	22	100

An analysis of these responses indicate that most faculty considered the micro-processor as very good while 40.9% of the staff also considered this as good. None actually rated this as average or poor. The same responses were elicited in the question about the memory capacity of the LMS with majority of the staff rating this as very good and 40.9% of the staff rating this as just good. However, speed of the internet was rated poorly with 81.8% of the staff rating this as poor, 13.6% rating it as average and only 4.5% of the staff rated this as good. The attribute of the presence of input/output devises for multi-media data processing was rated well with 72.7% of the staff rating it as good, while 27.3% of the staff rated it as average.

DIDACTICAL INDICATORS

It is very important, for the effectiveness of every e-learning environment, for the course material to be structured and projected

in a proper manner. This makes learning effective, taking into account the principles of effective organization of learning materials. Didactical indicators in this analysis were indicators that relate to the teaching–learning philosophy. These were defined by the following attributes:

1. Personalized teaching;
2. Good presentation of material;
3. Linkage of material to other sources;
4. Good illustration of subject matter;
5. Usage of illustrations, photographs, animations and other forms multimedia.

Results of this analysis are summarized in Table 3.

From this analysis, the systems attribute of providing for personalized teaching was rated very highly by the staff with 59% of the staff rating it as very good, while 18.2% of the staff rated it as good. Only 22.7% of the staff rated it as average and none rated it as poor. Majority of the staff (77.3%) also rated the systems ability to have a logical presentation of content as very good, while 22.7% rated it as good.

The attribute of content linkage to other sources was rated good by a majority of the faculty (68.2%), while 18.2% of staff rated it as very good. 13.6 % of staff rated it as average and there was no poor rating of this attribute. The systems ability to make provisions for material illustration by examples and case studies was also rated quite highly, with 81.8% of the staff rating this as very good and only 18.2% rated it as good. Also many of the staff (54.5%) indicated that the material is structured well enough to encourage critical thinking, while 40.9% of staff considered it good. The attribute of content relation to other material that students learn was also rated good by 86.4% of the faculty, while 13.6% rated as very good. The use of animations and other forms of multimedia was generally given an average rating with 54.5% of staff rating it average, while 45.5% rated it as good. None of members of staff rated it as very good. This implies that the

use of illustrations and animations in content development is still limited, although of course this is an area that can be improved through more training of course developers in multi-media use.

Table3: Faculty Evaluation of Didactical Indicators

RESPONSES												
Indicators	**Very Poor (1)**		**Poor (2)**		**Fair (3)**		**Good (4)**		**Very Good (5)**		**Total**	
	F	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**
Personalized teaching	-	-	-	-	5	22.7	4	18.2	13	59	22	100
Logical sequence presentation of material	-	-	-	-			3	22.7	17	77.2	22	100
Content linkage to other sources	-	-	-	-	3	13.6	15	68.2	4	18.2	22	100
Illustration of content	-	-	-	-	-	-	4	18.2	18	81.8	22	100
Content is well structured to encourage critical thinking	-	-	-	-	1	4.5	9	40.9	12	54.5	22	100
Content is related to other material that learners have studied	-	-	-	-	-	-	19	86.4	3	13.6	22	100
Usage of illustrations, animations and other forms of multimedia.	-	-	-	-	12	54.5	10	45.5	-	-	22	100

COMMUNICATION

One of the most important aspects of every e-learning environment is the communication strategy. In this study, communication was defined by the following quality indicators: the extent to which the system was thought of as providing opportunities for collaboration and team work, communication by e-mail, communication by online conferences, discussions ad chart and the extent of the system's ability to support multi-language usage. Results of this analysis are summarized in Table 4. The systems ability to provide opportunity for collaboration between learners and team work was rated as average by the majority of the faculty (72.2%) while the systems extent of providing opportunity for communication by e-mail was rated as good by many of the staff (81.8%). However , the systems ability to provide for opportunities for communication by online conferences and discussions, and its capacity to support multi language usage were both rated low, with 54,4% of staff rating this as poor while 50 % rated the latter as average.

Table 4: Faculty Evaluation of Communication Indicators

RESPONSES												
Indicators	**Very Poor (1)**		**Poor (2)**		**Fair (3)**		**Good (4)**		**Very Good (5)**		**Total**	
	F	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**
Provides opportunity for collaboration for team work	-	-	-	-	16	72.2	6	27.7	-	-	22	100
Provides opportunity for communication by e-mail	-	-	-	-	2	9	18	81.8	2	9	22	100

Provides opportunity for communication by online conferences, discussions , chart	-	-	12	54.5	6	27.7	4	18.1	-	-	22	100
Supports multi-language usage	-	-	9	40.9	11	50	2	9	-	-	22	100

INFORMATION INDICATORS

Another aspect of the e-learning environment that is of great significance is information. In this analysis, information was defined by the following information indicators:

1. Usefulness – depends on concrete goals, interests, motivation and knowledge of the student;

2. User satisfaction – the information is evaluated according to the user gratification;

3. Information value as indicated by the extent of its authenticity, actuality and clearness.

Results of this analysis are summarized in Table 5.

The extent of information usefulness in terms of having concrete goals was rated as very good by 63.6% of faculty, while 36.4% rated this as good. On the other hand, user satisfaction was rated as good by 63.6 % of the staff, while 31.8% of the faculty rated this as very good. Only 4.5% of the staff rated this as average. Lastly information value was rated as good by 77.3% of the staff with 22.7% rating this as indeed very good. This can be explained by the fact that much of the content that is online is usually based on course syllabuses that have undergone thorough vetting in the university structures before being adopted for teaching.

Table 5: Faculty Evaluation of Information Indicators

RESPONSES												
Indicators	**Very Poor (1)**		**Poor (2)**		**Fair (3)**		**Good (4)**		**Very Good (5)**		**Total**	
	F	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**	**F**	**%**
Usefulness-has clear goals	-	-	-	-	-	-	8	36.4	14	63.6	22	100
User satisfaction	-	-	-	-	1	4.5	14	63.6	7	31.8	22	100
Information Value-clearness actuality, authenticity	-	-	-	-	-	-	17	77.3	5	22.7	22	100

CONCLUSION

Designing for Learning will take place in the context of a preferred pedagogical approach, which in itself is highly dependent on the teachers. The extent to which teachers perceive a certain pedagogic approach as being effective will influence greatly the extent to which they appreciate and adopt new innovations. This study has demonstrated that WEDUSOFT, as a learning management system, is perceived as effective by the majority of teachers at the University of Nairobi. This is a very important finding upon which future initiatives regarding the development of the learning management system in the university could be built upon among other underpinning factors. It is recommended here that further complementary research be conducted to analyze other factors that may influence teachers' adoption of WEDUSOFT as a learning management system in the university.

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FINANCING PRACTICES ADOPTED BY DISTANCE LEARNERS: THE CASE OF BACHELOR OF EDUCATION (ARTS), UNIVERSITY OF NAIROBI, KENYA

Charles M. Rambo & Paul A. Odundo

ABSTRACT

Distance Learning provides people in employment with the opportunity to acquire degrees through a flexible and cost-effective process. Although the Higher Education Loans Board (HELB) finances higher education in Kenya, no provision has been created to finance distance learners. In view of this, over 70% of distance learners experience fee payment difficulties and another 34% drop out annually. In response to the situation, learners have adopted various financing practices, which remain unexplored and undocumented. Using a survey design, data were sourced from 446 active and 227 inactive learners, as well as 16 key informants. The study found that distance learners adopted two broad categories of financing practices, namely, personal means and institutional funding. While financing from personal means was generally inadequate and unsustainable, institutional funding was by large inaccessible, unaffordable and inadequate. This crystallized the need for a dependable financing program for distance learners. The study recommends the need to amend the HELB Act to allow for financing of distance learners; increase HELB's budget, strengthen Constituency Development Fund (CDF) and micro-finance programs, and encourage employers to support vulnerable learners.

INTRODUCTION

The demand for university education has increased since the 1950s as response to meet socio-economic and technological advancement (United Nations Educational, Scientific and Cultural Organization [UNESCO], 1998). In view of this, traditional universities are rapidly transforming themselves from single to multiple mode systems in terms of governance, organizational structure and operational activities, to cope with the rising demand for higher education through Distance Learning (DL) programs. The programs enable people in full-time or part-time employment to acquire university degrees in the most flexible and cost-effective manner. By doing so, DL programs address the weaknesses of mainstream education systems to cater for increasing popular demand for university education (UNESCO, 2002). Still, the flexibility of its delivery modes enables instructors to handle large groups of learners scattered in wide geographic areas (Dodds, 1972; UNESCO, 1998).

In Kenya, the origin of DL can be traced back to the mid 1960s, when the Board of Adult Education was established to facilitate the delivery of non-formal educational programs in subject areas such as health, agriculture, family planning, rural develop and environment, through mass media. Further, the University of Nairobi (UoN) through its Institute of Adult Studies initiated extra-mural education in 1973. The program covered professional subjects such as law, auditing, taxation, public and business administration through part-time classes. In the mid 1980s, the College of Adult and Distance Learning within the Faculty of External Degree Studies launched the Bachelor of Education (Arts), by DL program.

The first cohort of 400 learners enrolled for the program in 1986 and since then, additional cohorts have been enrolled at an interval of eight months. Learners study from home but come to campus for tuition, revision and examinations during the months of April, August and December each year. About 90% of distance learners hold Primary Teacher Certificate (P1), Science Grade 1 (S1), Approved Teacher Status (ATS) and Diploma qualifications. They also include Kenya Certificate

of Secondary Education (KCSE) holders and professionals in banking, accounting and business management. Under the program, learners are expected to meet the financial requirements of their studies from own resources (Juma, 2002).

Financing Higher Education in Kenya

The Government of Kenya (GoK) has consistently directed public resources to establish and expand facilities; sustain human resource as well as improve accessibility and quality of university education. Besides, efforts have been made to encourage the private sector and other development partners to invest in the provision of university education to enhance accessibility to those in need of higher academic qualifications (Republic of Kenya, 2002). Nevertheless, the sudden increase in the demand for university education in the 1980s necessitated the introduction of a cost-sharing policy in December 1989. Cost-sharing in the education sector was first mooted in the 1984/88 *National Development Plan*.

In 1987, the World Bank conducted a study, which culminated in a publication titled *Education in Sub-Saharan Africa, Policies for Adjustment, Revitalization and Expansions* (World Bank, 1988). The publication influenced Sub-Saharan countries, including Kenya to initiate user fees in the social sector. The recommendations of the study were reflected in two successive policy documents - the *Kamunge Report* and *Sessional Paper No. 6 on Education and Training for the Next Decade and Beyond* (Republic of Kenya, 1988a; 1988b). The two documents provided a policy framework for the implementation of cost-sharing and the purpose was to spread education costs between the GoK and beneficiaries. According to Otieno (2002), the introduction of the cost-sharing policy in university education drastically reduced grants-in-aid and full scholarships, consequent upon which the GoK restricted its support to tuition and infrastructure, while parents and learners met the cost of accommodation and subsistence.

Even though equitable access to university education remains a key development agenda, inadequacy of financial support to the sub-

sector is one of the challenges, with which the wider education sector grapples (Musyoka, 1998). The GoK's ability to provide sufficient funding is strained by economic under-performance, poor economic governance and the effects of Structural Adjustment Programs (SAPs). Although SAPs were meant to open up the economy, reduce public sector expenditure and develop the private sector, they are recognised for reducing the effectiveness of public services, growing unemployment and a decline of private sector growth. Cost-sharing in the provision of social services was one of the SAPs that were introduced in December 1989 to enable public universities raise supplementary resources to bridge the financing gap of about 10%. Under the new system, learners were expected to meet up to 30% of their tuition and accommodation costs (Musyoka, 1998).

Nevertheless, public spending on university education has increased dramatically in the recent years. For instance, in 1960 it stood at 3.2%; in 1974 it was 4.8%; it rose to 5.7% in 1980, 6.2% in 1990; 8.8% in 1995 and to 12.0% in 2001 (World Bank, 1995; 2003). Personnel emoluments remain the largest component of the recurrent public expenditure on university education. It accounts for between 58% and 86% of the total expenditure (World Bank, 2003). To cope with financing gaps, public universities have embarked on diversification of revenue sources through the introduction of Income-Generating Activities (IGAs). In 2005, for instance, about a third of the UoN's total revenue was generated through IGAs such as research and consultancy, farming (horticulture, poultry, dairy, pig keeping, and sheep farming); morgue services; livestock clinics, food processing, as well as animal and agricultural equipment fabrication. Additional IGAs include diagnostic radiology, pharmacy practice centre, real estate, bookshop and printing press. Moreover, the university has ventured into parallel degree program that forms a significant source of revenue (UoN, 2005; 1995).

Financial support for university education began in the 1950s, in form of government grants, scholarships and bursaries. However, the initial step to establish a revolving fund program was the introduction of a

loans scheme for students in the early 1970s. The scheme was managed by the Higher Education Loans Fund (HELF). However, HELF lacked strong institutional control mechanisms, which led to poor recovery of funds advanced to learners. HELF was eventually disbandment in 1995, when a more effective funding strategy was adopted by creating HELB through an Act of Parliament (Odundo and Njeru, 2005). HELB was established to provide loans, bursaries and scholarships to needy learners pursuing university education, and to trace and recover outstanding loans advanced to learners since 1974.

In addition, HELB formulates policies to manage the education fund; sets criteria to guide awards; and ensures prudent investment of surplus funds (Odundo and Njeru, 2005). Besides, HELB is largely funded from the exchequer to the tune of KES 800 million (US$ 10 million) per year for loans and KES 82 million (US$ 1.03 million) per year for bursaries. The loans advanced to learners range between KES 35,000 (US$ 438) and KES 55,000 (US$ 688), based on the level of need. The loans attract an interest of 4% and 6% per annum for undergraduate and postgraduate levels, respectively. Bursaries range between KES 6,000 (US$ 75) and KES 8,000 (US$ 100). Besides allocations from the exchequer, HELB recovers between KES 700 million and 900 million (US$ 8.8 million to US$ 11.3 million) from past beneficiaries annually. The recovered funds are ploughed back to supplement the growing needs for university education (Odundo and Njeru, 2005).

In 2000, HELB expanded its funding coverage in favour of postgraduate applicants for loans, to enable them further their studies. By the 2005/06 academic year, HELB had spent a total of KES 231 million (US$ 2.9 million) in form of loans to benefit learners pursuing masters and doctorate studies in local universities (Odundo and Njeru, 2005). In 2004, HELB initiated a partial scholarship program for postgraduate learners. The scholarships are awarded on the basis of past academic achievement and are only available to candidates intending to pursue the programs on a full-time basis. For masters programs, the maximum value one can be awarded is

KES 200,000 (US$ 2,500), while for doctorate studies, candidates can receive a maximum of KES 450,000 (US$ 5,625).

Even though HELB is mandated to finance university education in Kenya, it does not have any financing scheme targeting distance learners. In addition, DL has not received adequate attention from other stakeholders in higher education. As a result, distance learners struggle to meet the costs of tuition, accommodation, transport and learning materials. HELB gives priority to needy Kenyan citizens pursuing university education in public or private chartered universities. HELB's full potential has been undermined by several challenges, which include the rising demand for funding that has outstripped available resources; graduate unemployment, which hampers the recovery of past loans, and declining budgetary allocations. In view of this, HELB has not been able to expand its scope to cover learners in parallel and DL programs (Odundo and Njeru, 2005; UoN, 2005). Data obtained from the University of Nairobi Enterprises Limited (UNES) shows that about 70% of distance learners experience difficulties in raising fees for their studies. Again, the data indicates that about 34% of distance learners drop out annually, the main reason being fee payment difficulties. The affected learners often defer their studies, leading to stagnation and delayed completion.

The Issues

The B.Ed (Arts), by DL provides a cost effective opportunity for individuals already in service, especially teachers to access university education, acquire advanced skills and develop careers (UNESCO, 2002). In this regard, DL expands access to university education to those who may not have been able to get direct admission (Juma, 2002). Learners under the DL program are expected to meet the cost of their studies entirely from own resources. Given that most learners are low income-earners, the program has been recording increasing incidences of dropouts and deferments. This is attributed to non-existence of an official financing program, as enjoyed by learners in

regular programs (UoN, 2005). Since its inception, HELB has not been able to expand the financing scheme to cover vulnerable learners in the distance mode (Odundo and Njeru, 2005). As a result, learners have adopted various financing practices to support themselves through the program. However, such financing practices remain undocumented through a systematic research process. Accordingly, this study explores financing practices adopted by distance learners and their effectiveness in terms of accessibility, affordability and adequacy. The findings of this study should stimulate debate on the need for a formal financing scheme targeting distance learners. The findings also serve as a resource material for higher education financing scholars.

METHODOLOGY

The study applied both quantitative and qualitative approaches to source, process and analyze the information. A survey design was applied because of its ability to elicit diverse information on financing practices (Bryman and Cramer, 1997). In-depth interviews were used to source information from key informants. In-depth interviews were appropriate for sourcing detailed information from selected key informants (Mwanje, 2001). The study targeted active and inactive learners enrolled for the B.Ed (Arts), by DL. From a sampling frame of 4,467 active and 2,270 inactive learners, convenience and stratified random sampling procedures were used to obtain a sample of 446 active learners and 227 inactive learners. Also targeted were key informants, which included officials of commercial banks, savings and credit co-operative (SACCO) societies, and CDF programs. A total of 16 key informants were sampled purposively on the basis of their respective organization's involvement in financing higher learning and by virtue of being incumbent dealing with students' finances at the time of the study.

The data were captured using two sets of survey questionnaires and an in-depth interview schedule. To ensure validity and reliability of the data, the instruments were pre-tested on 100 learners, two officials of

financial institutions and one official of a CDF program within the catchment area of the Kisumu Extra-Mural Centre. Data was collected between September and November 2006. The Statistical Package for Social Sciences (SPSS) facilitated univariate analyses to produce frequency distributions and percentages, while qualitative data were organized under key thematic areas, summarized into daily briefs, and described to produce interim reports, which were analyzed and interpreted systematically. The following publications support the methodology applied in this study: Nachmias and Nachmias, 1996; Bryman and Cramer, 1997; Mugenda and Mugenda, 1999; Best and Khan, 2004.

FINDINGS AND DISCUSSIONS

The study covered a total of 673 learners, out of which 56% were men, while 44% were women. Part of the data was sourced from 16 key informants drawn from commercial banks, SACCO societies and CDF programs. Data were analyzed using the SPSS program to produce frequency distributions and percentages. The subsequent thematic areas present and discuss the financing practices used by distance learners.

Financing Practices Adopted by Distance Learners

DL is still largely financed by the beneficiaries and their families. In his regard, the study found that distance learners had adopted various financing practices to sustain their studies. As indicated in Table 1, among the active learners, 35.1% mentioned personal savings as the main source of financing for their studies. This was followed closely by loans, which was cited by 20.5% of the learners, while 11.1% active learners indicated that bursaries from CDF programs played an important role in financing their studies. Further, 21.7% of the active learners stated that they disposed-off personal assets, such as livestock and farm produce, to raise fees.

Table 1: Financing Practices by Distance Learners

Financing practice	Active learners		Inactive learners	
	Freq.	***Percent***	***Freq.***	***Percent***
Loans	231	20.5	64	11.7
Personal savings	396	35.1	225	41.2
CDF bursaries	125	11.1	12	2.2
Donations (well wishers)	16	1.4	43	7.9
Donations (family)	64	5.7	65	11.9
Dispose personal assets	245	21.7	129	23.6
Dividends	9	0.8	3	0.5
Fundraisers	42	3.7	5	0.9
Total valid responses	**1,128**	**100.0**	**546**	**100.0**

Among the inactive learners, 41.2% reported that they depended on personal savings to finance their studies; 23.6% had disposed off personal properties to raise fees, while another 11.9% had used donations from family members. In addition, 64 (11.7%) respondents had acquired loans to meet costs of the program. The financing practices were adopted in anticipation that upon acquisition of degree qualifications, incomes would improve leading to better living standards.

Further assessment of the data revealed that loans to finance DL activities had been sourced from commercial banks, SACCO societies, micro-finance institutions and places of work. In this regard, Table 2 shows that 58.2% of the learners had secured loans from SACCO societies; 20.3% had been loaned money by micro-finance institutions; 12.6% were on loans from their respective places of work; and 8.9% had acquired loans from commercial banks.

Table 2: Sources of Loans for Distance Learners

Institutions	Active learners		Inactive learners	
	Freq.	*Percent*	*Freq.*	*Percent*
Teachers' SACCO societies	134	58.2	36	56.3
Commercial banks	21	8.9	2	3.1
Micro-finance	47	20.3	15	23.4
Place of work	29	12.6	11	17.2
Total valid responses	**231**	**100.0**	**64**	**100.0**

Of the 64 inactive learners who had acquired loans to finance their studies, 56.3% obtained loans from teachers SACCO societies, while 23.4% had been loaned money by micro-finance institutions. Further, 17.2% learners obtained loans from their places of work, while only 3.1% had borrowed from commercial banks. The study found that loans from SACCO societies and micro-finance programs were the most common institutional funding for distance learners. In particular, SACCO societies were most popular for providing loans that were accessible and affordable with relatively low interest rates. Based on these findings, the study further explored the role played by institutional programs in financing distance learning.

Financing Distance Learning through SACCO Societies

The findings indicated that all the SACCO societies involved in the study had established loan facilities for learners pursuing university education. The loan programs were designed to suit the economic status and financial needs of SACCO members. As illustrated in Figure 1, SACCO societies had registered varied levels of financial support to distance learners. Nevertheless, financial support offered by SACCO societies was rising steadily in response to an increasingly high demand

for financing. This implied that the demand for university education through DL was increasing annually, as learners sought to improve their academic qualifications, incomes and better living standards; as well as for self-actualization.

Figure 1: Trends of Financial Support by SACCO Societies (2001-2006)

The findings indicated that Mwalim
highest contribution to financing
national catchment. The amounts p
of saving. Although members of Ki
Teachers' (KATECO), Mwalimu, Nye
societies could borrow up to three
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regular savings was required. Appli
to have a minimum balance, ranging from KES 2,000 (US$ 25) for district level SACCO societies, to KES 5,000 (US$ 63) for the Mwalimu SACCO society, as stipulated by respective institutional financial regulations.

Further, interest rates varied with respective institutions, ranging between 10% and 11% per annum for all the seven SACCO societies involved in the study. In addition, loans were repayable at different

time scales as requested by clients, but guided by SACCO regulations. This was further determined by the ability of clients to repay effectively without financial stress. Additional findings indicated that repayment duration varied from 12 to 48 months with flexible monthly repayments determined by loan amounts advanced. Although SACCO societies played a crucial role in financing distance learners, 100.0% of the key informants hinted that SACCO societies were constrained by inadequacy of funds to effectively meet all the needs expressed through application. In this regard, Table 3 presents the number of applications for loans received by SACCO societies in the 2005/06 academic year and the number of successful applicants.

Table 3: Applications for Funding Received by SACCO Societies in 2005/06

SACCOs	No. of Applicants	No. Awarded	Percent Awarded
Nakuru SACCO	4,351	1,400	32.2
Mombasa SACCO	2,959	1,200	40.6
Nyeri SACCO	3,591	800	22.3
KATECO	2,645	860	32.5
Kite	4,523	1,200	26.5
Kimute	42,513	12,000	28.2
Mwalimu	67,445	24,600	36.5

The data indicates that all the SACCO societies involved in the study received at least twice the number of applications they could fund. The Mombasa SACCO financed up to 40% of all the applications, while the Nyeri SACCO could only finance up to 22%. This shows that the bulk of financial needs were not addressed because of limited resources and inability of some learners to meet financing pre-conditions. Nevertheless, the data availed by SACCO societies could

not clearly indicate the proportion of loan applicants whose purpose was to finance distance learning. This is a subject on which future investigations should focus.

According to 85.7% of the key informants from the targeted SACCO societies, the need for financial support was increasing faster than the institutions were able to effectively address. Only one key informant felt that the need for financial support was increasing gradually. Due to the overwhelming need for financial support, all the targeted SACCO societies deferred cases to such time as funds became available. In this regard, qualified applicants were often put on stand-by. This prompted learners to also defer their studies till such time as funds became available. In addition, learners resorted to loans from commercial banks, micro-finance institutions, CDF bursaries and IGAs to raise supplementary resources to finance their studies.

Commercial Banks and Access to Distance Learning

Of the commercial banks involved in the study, the National Bank of Kenya (NBK) and the Co-operative Bank of Kenya (Co-op Bank) had initiated loan facilities for learners pursuing higher education in both public and private universities. The amount of funds advanced varied from KES 50,000 (US$ 625) to 500,000 (US$ 6,250) depending on the ability of a client to repay advanced loans comfortably within agreed timeframes. Table 4 shows that of the 21 active learners who had secured loans from commercial banks, 38.1% were clients of NBK, while 61.9% had been funded by Co-op Bank. Besides, all the inactive learners had obtained loans from Co-op Bank.

Table 4: Active and Inactive Learners Funded by Commercial Banks

Bank	Active learners		Inactive learners	
	Frequency	*Percent*	*Frequency*	*Percent*
NBK	8	38.1	0	0.0
Co-op Bank	13	61.9	2	100.0
Total	**21**	**100.0**	**2**	**100.0**

Nevertheless, the Kenya Commercial Bank (KCB) did not have a special loan product to meet the financial needs of learners in institutions of higher learning. The loans available were advanced to all clients so long as they qualified in line with respective institutional financial rules and regulations. To qualify for financial support from KCB, an applicant was required to:

1. Be aged 18 years or over;
2. Demonstrate an ability to repay the loan as per schedule;
3. Be a customer of the bank with his or her salary being processed through the same institution;
4. Be on permanent terms of employment or on contract so long as the remaining contract time was sufficient to cover the loan period.

Besides, unemployed applicants were required to provide suitable collaterals.

At the Co-op Bank, applicants were required to produce their three latest pay slips, copies of identification documents, a copy of personal identification number, and be an account holder with the bank. The duration of payment varied from 12 months to 36 months depending on an applicant's financial ability. Nevertheless, the longer the duration, the higher the interest payable, ranging between 11% and 12%. The study found that funding from commercial banks was not easily accessible

because of pre-conditions that most learners could not meet. In view of this, funding from commercial banks was mostly accessed by privileged learners. Key informants hinted that financing for distance learners could be improved if public resources were decentralized to rural areas through the CDF kitty for easier access by potential learners.

The Role of CDF Programs in Financing Distance Learning

The study found that CDF programs were increasingly becoming a crucial source of funding for distance learners. All the CDF programs involved in the study provided bursaries to learners enrolled in recognized public and private institutions of higher learning. The data presented in Table 5, indicates that between 2004 and 2008, Kisumu Town West CDF program had funded 709 learners, Nakuru Town CDF had supported 497 learners, while Starehe CDF had provided bursaries to 950 learners. In Lurambi Constituency, 563 learners had been funded; Nyeri CDF had financed 760 learners, while in Kisauni, 450 learners had benefited. Of the reported 3,929 beneficiaries, Starehe Constituency had supported the highest proportion of learners at 24.2%, followed by Nyeri Town Constituency, which had supported 19.3% of all the CDF beneficiaries; Kisumu Town West 18.0%; Lurambi with 14.3%; Nakuru Town with 12.6% and Kisauni with 11.5%. However, the data provided by CDF programs could not be segregated to determine the exact proportion of distance learners forming the list beneficiaries.

Table 5: Beneficiaries of CDF Programs, 2004-2008

CDF program	No. of beneficiaries	Percent
Nakuru Town	497	12.6
Kisauni	450	11.5
Nyeri Town	760	19.3
Lurambi	563	14.3
Starehe	950	24.2
Kisumu Town West	709	18.0
Total	**3,929**	**100.0**

Further analysis, revealed that the amount of bursaries provided varied from KES 5,000 (US$ 63) to KES 25,000 (US$ 313) per learner. However, arithmetical procedure yielded an average of KES 5,167 (US$ 65) to KES 18,333 (US$ 229) per learner. The level of funding through CDF programs reflected the priority accorded to university education. Although CDF programs played a crucial role in financing DL, the amount provided only supplemented funding from other sources, including loans from SACCO societies, commercial and micro-finance institutions. Distance learners could not entirely depend on CDF funding because it could not effectively meet all the financial needs of learners. Nevertheless, most CDF programs were still in developmental stages and were not reliable sources of funding.

Micro-finance Institutions and Access to Distance Learning

Micro-finance promotes development aspirations of the poor by providing opportunities for low income-earners to access affordable financial services, which are often beyond reach. Women form the bulk of low income-earners in poor countries; hence micro-finance services provide them with opportunities for academic and economic

empowerment. The findings revealed that 20.3% of the active learners and 23.4% of the inactive learners had obtained loans from micro-finance institutions such as Kenya Women Finance Trust (KWFT), Jitegemee and Jamii Bora Trust. By gender, 40.4% of the active learners were men, while 59.6% were women. Among the inactive learners, men constituted 26.7%, while 73.3% were women. This is an indication that micro-finance had benefited more women than men through affordable loan facilities. Micro-finance loans ranged between KES 5,000 (US$ 63) and KES 60,000 (US$ 750). Micro-finance institutions worked in partnership with women groups as contact points through which the financial needs of women were addressed. Women groups also provided social collateral for members to secure financial support towards their education. The loans were repayable within 12, 24 or 36 months, depending on the amount granted and agreed terms. The loans attracted interest at the rate of 6 to 10% per annum.

Role of Employers in Financing Distance Learning

The study found that some employers played a crucial role in financing higher education by distance. Out of 460 active learners, 6.3% had received financial support from their employers in form of loans. Further, of the 29 learners, 82.8% were employed in the private sector, while the remaining 17.2% were employed by community-based institutions. Among the inactive learners, no learner reported financial support from employers to finance their studies. Of the 673 active and non-active learners involved in the study, 84.5% were employees of the GoK through the Teachers' Service Commission (TSC). Out of this proportion, 94.0% indicated that TSC had not developed policies to permit financial support for staff development among its employees.

Even though learners pursuing full-time studies were entitled to study leaves of up to 4 years with full salary, there was no similar consideration in the distance mode. As a result, distance learners were expected to finance their educational initiatives from own resources. Moreover, 6.7% of the learners were employed in the private sector. Of this proportion, 26.7% were aware of private sector employers who

provided loan facilities for university education. Regarding the limited participation of private sector employers in financing further education, 57.8% of the learners felt that some private sector institutions were young and could not afford to support employees to acquire university education, while 20.0% of them were of the view that some employers discouraged employees from pursuing further education for fear that after such training, qualified employees would either ask for higher payments or seek transfer to better-paying jobs.

Financing Distance Learning through Income-Generating Activities (IGAs)

The study found that of the 460 active learners, 72.6% engaged in various economic activities to supplement their incomes. The IGAs cited included barbershops (6.9%), grocery shops (24.3%), computing services (4.4%), *jua kali* welding (11.1%), tailoring (4.0%) and video shows (7.8%). In addition, housing investments was cited by 6.5% of the learners, while farming activities was cited by another 35% of the respondents. Farming activities included horticulture, growing maize, wheat, dairy and poultry keeping. Among the inactive learners, 87.2% affirmed that they had engaged in IGAs to generate additional resources. In this regard, 2.8% operated barber shops, while 17.9% run grocery shops.

Table 6: Type of IGAs Initiated by Distance Learners

IGA type	Active learners		Inactive learners	
	Frequency	*Percent*	*Frequency*	*Percent*
Barber shop	33	6.9	12	3.8
Grocery shop	116	24.3	56	17.9
Computing	21	4.4	2	0.6
Welding	53	11.1	8	2.6
Tailoring	19	4.0	13	4.2
Video shows	37	7.8	4	1.3
Housing	31	6.5	1	0.3
Farming	167	35.0	216	69.2
Total valid responses	**477**	**100.0**	**312**	**100.0**

The study noted that IGAs enabled learners to raise fees as well as meet the needs of their families. However, engagement in IGAs was limited by inadequate access to capital, which in turn, minimized returns. In most cases, men had better opportunities to engage in IGAs because they had greater access to production factors such as land and capital, through institutional loans, which they could secure using title deeds as collateral. In most Kenyan communities, women are not allowed to claim ownership of ancestral land. Women and men have been socialized to believe that the right to own land is a preserve for men. Even though over 80% of women derive their livelihoods from farming, only less than 5% are registered landholders (African Women and Children's Information Network [AWCIN], 2004).

The active learners were then requested to indicate the proportion of fees covered by incomes from IGAs. According to Figure 2, out of 334 active respondents who engaged in IGAs, 42.0% reported that IGA proceeds covered less than a quarter of the DL costs. Further, 38.0% of the respondents were of the view that IGA incomes covered up to a quarter of the DL program costs, while 14.0% supplemented half of the costs with IGA proceeds.

Figure 2: The Proportion of Distance Learning Fees Covered by IGA Proceeds

Those who financed up to three-quarters of the costs using IGAs formed 6.0%, while only one person admitted paying all the DL costs from IGA proceeds, which formed part of the incomes for distance learners. Since over 70% of the learners could only finance up to a quarter of DL costs from IGA proceeds, this implies that the majority of IGA ventures were small-scale and could not effectively sustain higher learning through DL. Naturally, learners financed the gap through other means including loans, personal savings and fundraisers among others.

Accessibility, Affordability and Adequacy of Institutional Funding

The findings revealed four crucial sources of institutional funding for distance learners, which included loans from SACCO societies, commercial banks, and the micro-finance sub-sector, and bursaries from CDF programs. In regular academic programs, over 80% of learners are financially supported by the GoK through HELB loans and bursaries. The GoK funding covers up to 70% of the program costs, while the university provides 15% and learners another 15% (UoN, 2005). However, in the DL program, only about 32% of active learners and 14% of inactive learners had benefited from funding provided by commercial banks, SACCO societies and CDF programs. In view of this, learners were requested to indicate their opinions regarding accessibility, affordability and adequacy of the funds provided.

While opinions on accessibility of financial services were based on the nature of conditions that applicants must satisfy to qualify for financial support, affordability of institutional financial services was judged by the amount of interest charged on loans. Besides, the adequacy of funds was considered in terms of the ability of funds provided by institutions to effectively meet the cost of tuition, accommodation, subsistence and learning materials.

Table 7 shows that out of the 219 learners who provided their opinions, 1.4% indicated that SACCO society loans were very accessible, 3.7% felt that the loans were accessible, while 10.5% believed the loans were fairly accessible. On the opposite side of the Likert scale, whereas

35.2% of the learners were of the view that SACCO society loans were inaccessible; another 49.3% thought that the loans were very inaccessible. Further, none of the learners felt that commercial banks loans were very accessible. However, 1.8% of them stated that the commercial bank loans were accessible, while 13.2% opined that they were fairly accessible. The majority, 46.6%, felt that such loans were inaccessible, while 38.4% believed that commercial bank loans were very inaccessible.

Table 7: Rating Accessibility of Institutional Financial Services

Learners' opinion	**SACCO societies**		**Commercial banks**		**CDF programs**		**Micro-finance**	
	F	*%*	*F*	*%*	*F*	*%*	*F*	*%*
Very accessible	3	1.4	0	0.0	5	2.3	41	18.7
Accessible	8	3.7	4	1.8	19	8.7	65	29.7
Fairly accessible	23	10.5	29	13.2	55	25.1	95	43.4
Inaccessible	77	35.2	102	46.6	115	52.5	12	5.5
Very Inaccessible	108	49.3	84	38.4	25	11.4	6	2.7
Total	**219**	**100.0**	**219**	**100.0**	**219**	**100.0**	**219**	**100.0**

More still, 2.3% of the learners reported that CDF bursaries were very accessible, 8.7% felt that such bursaries were accessible, while 25.1% believed they were fairly accessible. While more than half, 52.5%, opined that CDF bursaries were inaccessible, 11.4% believed they were very inaccessible. Further, 18.7% of them were of the view that micro-finance loans were very accessible, 29.7% felt that such loans were accessible, while the majority, 43.4%, said the loans were fairly accessible. By comparison, 5.5% opined that micro-finance loans were inaccessible; while another 2.7% believed that such loans were very inaccessible.

Generally, micro-finance loans were the most accessible followed by CDF bursaries, SACCO society and commercial bank loans in second, third and fourth positions respectively. In view of this, micro-finance financing services were the most user-friendly. This was because micro-finance services are designed to work with and to empower low income-earners at the grass-roots level. However, most institutional financing services were not easily accessible to most applicants, because of stringent pre-conditions attached to financial support.

Regarding affordability of institutional financial services, Table 8 indicates that no learner thought that SACCO society loans were affordable, 3.7% indicated that such loans were affordable, while 24.7% believed that the services were fairly affordable. However, 44.7% felt they were unaffordable, while 26.9% thought such loans were very unaffordable. On commercial bank loans, again no learner felt the financial services were very affordable, however one person stated that commercial bank loans were affordable, while 4.6% noted that they were fairly affordable. To the majority, 59.4%, commercial bank loans were unaffordable, while 35.6% thought that the services were very unaffordable. In addition, whereas 13.2% of learners were of the view that micro-finance loans were very affordable, 24.7% thought such loans were affordable, while an overwhelming, 43.8% opined that the loans were fairly affordable. By comparison, 10.5% said micro-finance loans were unaffordable, while 7.8% believed the services were very unaffordable.

Table 8: Rating Affordability of Institutional Financial Services

Learners' opinion	SACCO societies		Commercial banks		CDF programs		Micro-finance	
	F	*%*	*F*	*%*	*F*	*%*	*F*	*%*
Very affordable	0	0.0	0	0.0	86	39.3	29	13.2
Affordable	8	3.7	1	0.5	45	20.5	54	24.7
Fairly affordable	54	24.7	10	4.6	49	22.4	96	43.8
Unaffordable	98	44.7	130	59.4	21	9.6	23	10.5
Very unaffordable	59	26.9	78	35.6	18	8.2	17	7.8
Total	**219**	**100.0**	**219**	**100.0**	**219**	**100.0**	**219**	**100.0**

The study noted that micro-finance loans were the most affordable, followed by SACCO society loans and commercial bank loans. Financial services offered by CDF programs did not attract any interest. Besides, more than 70% of learners in each case affirmed that commercial bank and SACCO society loans were expensive for many learners. While commercial bank interests ranged between 10% and 21%, SACCO societies changed between 10% and 11%, while micro-finance institutions charged 6 to 10%. By comparison, HELB charged between 4% and 6%. Interests charged by commercial banks and SACCO societies increased the cost of the DL program. Over 60% of learners were not able to afford the services, especially given their socio-economic backgrounds in terms of low monthly incomes and heavy dependence.

In addition, institutional financial services were inadequate in meeting the financial requirements of distance learners. As indicated in Table 9, only one person affirmed that SACCO society loans were very adequate to meet the cost of their studies; another 0.9% said the loans were adequate, while 23.3% felt the loans were fairly adequate.

On the opposite side of the scale, 43.8% said the loans were inadequate while 31.5% were of the view that SACCO society loans were very inadequate. Further, no learner felt that commercial bank loans were adequate for the needs of distance learners. However, one person indicated that commercial bank loans were adequate, while 5.9% indicated that commercial bank funds were fairly adequate. By comparison, 45.2% of the learners believed that commercial bank loans were inadequate; while an overwhelming 48.4% opined that the loans were very inadequate. Regarding CDF programs, while no respondent felt that bursaries were very adequate or adequate, 1.4% of the learners believed that CDF bursaries were fairly adequate, 23.3% indicated that the bursaries were inadequate, while the majority of the respondents, 75.3%, hinted that CDF bursaries were very inadequate.

Table 9: Rating Adequacy of Institutional Financial Services

Learners' opinion	SACCO societies		Commercial banks		CDF programs		Micro-finance	
	F	*%*	*F*	*%*	*F*	*%*	*F*	*%*
Very adequate	1	0.5	0	0.0	0	0.0	7	3.2
Adequate	2	0.9	1	0.5	0	0.0	31	14.2
Fairly adequate	51	23.3	13	5.9	3	1.4	133	60.7
Inadequate	96	43.8	99	45.2	51	23.3	35	16.0
Very inadequate	69	31.5	106	48.4	165	75.3	13	5.9
Total	**219**	**100.0**	**219**	**100.0**	**219**	**100.0**	**219**	**100.0**

More still, 3.2% of the learners affirmed that micro-finance loans were very adequate, 14.2% were of the view that the loans were adequate, while the majority, 60.7%, said the loans were fairly adequate. By contrast, 16.0% felt that micro-finance loans were inadequate, while another 5.9% thought the loans were very inadequate. In this regard,

more than half of the learners affirmed that SACCO society and commercial bank loans, as well as CDF bursaries, were generally inadequate to meet the cost of their studies. The need for such funding outstripped the available resources, thereby making institutional funding supplementary rather than comprehensive. In this regard, most applicants qualified for small amounts only, which barely sufficed their educational needs. However, in the case of micro-finance loans, about 80% of learners believed the loans were adequate.

CONCLUSIONS

The financing practices adopted by learners could be broadly categorized as personal means and institutional funding. Personal means included; own savings; disposal of assets, such as livestock and farm produce; donations from well-wishers and family members; dividends from stocks, as well as fundraisers. On the other hand, institutional funding included loans from SACCO societies, commercial banks, micro-finance institutions and CDF bursaries. Although financing from personal means was important in enhancing access to university education through the distance mode, such sources were grossly inadequate and unsustainable. The capacity of learners to raise financial resources through personal means was undermined by low incomes, heavy dependence and rampant poverty. In view of this, about a third of learners were at risk of dropping out from the DL program each year. This raises the need for more reliable financing schemes targeting distance learners.

In addition, although SACCO societies played a crucial role in education financing, the contribution was constrained by a limited capital base that could not match the escalating need for financial support. Hence, SACCO society loans were largely inaccessible, unaffordable and inadequate to effectively address the program costs. Further, the services provided by commercial banks were mainly accessible to privileged learners, who were considered credit-worthy. Most distance learners were kept at bay by stringent pre-conditions

and high interest rates. In this regard, commercial bank loans were largely inaccessible, unaffordable and inadequate. The services were not tailored to suit low income-earners. CDF bursaries were popular at the grass-roots level. Although the services were generally accessible to many distance learners, the amounts awarded were inadequate. This undermined dependability of CDF bursaries. The loans provided by micro-finance institutions were generally the most accessible, affordable and adequate. Micro-finance financial services, however, were skewed in favour of women because they form the bulk of low income-earners. Again, this crystallized the need for an accessible, affordable, adequate and dependable financing program for distance learners.

IMPLICATIONS FOR POLICY AND PRACTISE

Based on the findings, the study has identified the following implications for policy and practise of higher education financing in the country. Even though HELB was established to further educational interests of Kenyans, distance learners have not benefited from this opportunity. HELB should be authorized to extend financial support to cover distance learners through the amendment of its Act. This should enable the institution to review its funding policy to address the needs of distance learners. Further, HELB's role in financing distance learners may be enhanced by increasing annual budgetary allocations from the exchequer. This may enable HELB to extend its services to distance learners more effectively.

Decentralised funds, such as the CDF, play a crucial role in financing distance learners. However, their contribution may be enhanced through additional budget and policy guidelines on the utilization of funds. This would ensure that potential distance learners in peripheral regions access funding easily. Also important in financing distance learners are micro-finance institutions. In this regard, development partners should be encouraged to initiate and operate micro-finance programs, especially

in marginalized regions of the country. Micro-finance services are likely to supplement financing needs of distance learners in the country.

Staff development is an indispensable component of performance management both in the public and non-public sectors. Employers should therefore be encouraged through advocacy to establish revolving funds and support their staff members improve their skills through DL. The sustainability of such schemes may be ensured through a check-off system. In this regard, facilitating the formulation of appropriate policy frameworks would enable employers, such TSC, to address the financing needs of their employees.

RECOMMENDATIONS FOR FURTHER RESEARCH

This section makes recommendations for further research to shed more light on financing practices adopted by distance learners in the country.

1. The data availed by SACCO societies and CDF programs could not clearly indicate the proportion of distance learners forming database of beneficiaries. In this regard, future studies should break down the data to determine the exact proportion of beneficiaries accessing the funds to finance distance learning.

2. There is need for further research that would comprehensively explore the role of employers in financing DL in the country. Such a study should establish the gaps and measures that should be taken to effectively involve employers in the process.

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PEDAGOGICAL INTEGRATION OF ICT IN SELECTED KENYAN SECONDARY SCHOOLS: APPLICATION OF BENNETT'S HIERARCHY

Christopher M. Gakuu & Harriet J. Kidombo

ABSTRACT

This article presents findings on the extent to which selected secondary schools in Kenya use Information and Communications Technology (ICT) to deliver curriculum content. Qualitative and quantitative methods were used to collect the data. Five secondary schools in urban and rural areas were targeted for study. Using Bennett's Hierarchy of Evidence Model, the data indicates that all the five secondary schools are at different levels in their use of ICT in curriculum delivery. While some are at the level of acquiring the physical and human resources, others are at the learning stage. The results also show that the integration of ICT in curriculum delivery is influenced by the ownership of the school, its ICT policy and the school manager's level of ICT skills. While private schools seem to have a clear policy on ICT integration, public schools have none. This implies that the Kenya Government should develop and implement an ICT policy on education. Secondly, head teachers should have ICT skills because they can act as change agents by encouraging and driving the adoption of ICT in teaching and learning processes in their schools.

Keywords: ICT Integration in Education; Bennett's Hierarchy of Evidence; Adoption of ICT; Teaching and Learning; ICT Policy; Curriculum Delivery

INTRODUCTION

Education is a prerequisite for achieving developmental goals globally. This is supported by evidence from developmental research, which has shown that education is positively associated with human welfare issues. One such study was by Lockhead et al. (1980), which found that in a modernizing environment, four years of education improved agricultural productivity by 10 %. A World Bank report (*World Bank*, 1995, p.1) indicates that education is crucial to effective poverty reduction strategies. Tilack (2002, p.198) concluded that there is sufficient research to support the hypothesis that education and poverty are inversely related. A study by the Global Campaign for Education (2004) suggested that if Universal Primary Education (UPE) is realized, then an estimated 700,000 young people could be prevented from contracting HIV/AIDS. Wims and Lawler (2007, p.2) also suggest that educating females has enormous potential to create a virtuous circle, as children of educated mothers are more likely to receive an education. Glewwe (1999) in his study on health in Morocco found that mothers with numeracy and literacy skills attained through school possessed greater health knowledge and consequently had healthier children.

It is, therefore, generally agreed that access to knowledge provides individuals with a competitive advantage in whichever environmental situation they may find themselves. ICT promises to be one way of accessing information and hence empowering people to compete effectively in society. Unfortunately, most developing countries find themselves in a situation of ICT deprivation. This leads to low access to information and invariably low competitiveness. Prahalad and Hart (2002, p.9) regard information poverty as probably the single biggest roadblock to sustainable development.

Technology enhanced learning in secondary schools is a rare experience in educational systems in most African schools. The Southern African Department of Education uses "Technology Enhanced Learning" as a phrase to describe the use of technologies in teaching

and learning environments for any education-related purpose (*SAIDE Report*, 2001). This is the perception this study will adopt to describe the use of ICT in teaching.

In developing countries, particularly Sub-Saharan Africa, the quality of education has been negatively affected by factors such as low economic growth rates, political and ethnic conflicts, and HIV/AIDS, to mention a few. The high levels of debt in these countries have also aggravated the low level of development, particularly in education. The basic instructional tool in most primary and secondary schools is the blackboard and chalk (Alade, 2005, p.135).

Studies on integration of ICT in teaching and learning at secondary school level in Africa are scanty. A cursory glance, however, appears to show that although some secondary schools in Kenya have ICT facilities supplied by either the donor community, for example, School-Net, Computers for Schools Kenya (CFSK), parents and other well-wishers, it is not yet scientifically established how the ICT facilities are used for effective instructional purposes. There is a difference between the physical and the pedagogical integration of ICT in teaching. The computers are in schools, but of what instructional value are they for the implementation of the curriculum? This is a question that educationists need to address.

The purpose of this paper is to highlight how teachers in selected secondary schools in Kenya are using ICT to deliver secondary school curriculum. Answers were sought to the following questions:

1. What type of software is used in secondary schools for teaching and learning?

2. What are the main challenges hindering the integration of ICT in delivery of curriculum?

3. What factors differentiate schools that integrate ICT from those that do not?

Four objectives guided the study. These were:

1. To evaluate the extent to which secondary schools use ICT to deliver curriculum content;

2. To establish the specific computer software used;

3. To investigate the main challenges faced in integrating ICT in the delivery of curriculum content;

4. To identify the factors that differentiate the schools that integrate ICT from those that do not.

LITERATURE REVIEW

ICT utilization appears to be more widespread in African secondary schools than is widely believed. According to PanAf, (2006, p.13), both teachers and students use it in the learning process. It is observable that certain disciplines have developed ICT–related practices. The report goes further to point out that ICT integration in learning activities in secondary schools is important since it goes beyond interpersonal communication and integrates several dimensions, such as interactive learning and collaborative learning (PanAf, 2006, p.13).

The *SAIDE Report* (2001) identified three types of technology used in schools in developing countries:

1. Technologies to support the provision of course materials to learners made up predominantly of ICT, for example, printed materials, television, radio, multimedia computers and the Internet;

2. Technologies to support other teaching and learning processes such as white boards, overhead projectors, woodwork equipment, language laboratories, pen, paper, and computerized simulations;

3. Technologies to support management and administration, such as telephones, filling cabinets and so on (pp1-2).

The SAIDE Report goes further to provide some principles for integrating technologies into teaching and learning environments. Making learning needs and desired outcomes from which learning objectives are derived the starting point for decisions about what to teach and how planning for the appropriate use of technology in the learning systems as a whole and placing people, learners and educators at the center of the learning process would ensure that the chosen technology serves their teaching and learning goals. The report also cautions institutions to resist the tendency to see technology as a solution to education and training needs because the value of technology in enhancing learning depends on how people integrate it into the learning process.

Where technology is introduced, the users should be trained on how to use the resource appropriately. Some of the tenets that would ensure successful implementation of ICT in teaching and learning include:

1. Planning for the development of appropriate infrastructure networks;
2. Providing learners with choice about learning routes;
3. Helping teachers and educators develop their own ability to learn;
4. Integrating evaluative and impact assessment into the learning systems from the start;
5. Adopting a learning orientation to the use of technology in education;
6. Training and providing affordable and cost-effective technological resources.

It is in light of these principles that effective use of ICT by teachers in secondary schools in Kenya should be evaluated.

According to Baylor and Ritchie (2002), regardless of the amount of technology and its sophistication, technology will not be used unless Faculty members have skills, knowledge and attitudes necessary to

infuse it into the curriculum. This is consistent with the findings of Gakuu (2006). He found no significant difference in University lecturers' attitude towards the adoption of ICT between the various university disciplines. In addition, he found that the adoption rate would be enhanced if the lecturers' issues of concern were addressed. Karsenti and Larose (2001) stated that a major obstacle to adequate use of technology across all grade levels and the curriculum is the lack of a critical mass of teachers who feel comfortable in using the technology, and who can provide support and exemplary instances of good practice to those who are still not well versed with technology.

A research study by Wims and Lawler (2007), that used both quantitative and qualitative surveys in three secondary schools in the expansive Rift Valley Province in Kenya, revealed that there was an absence of educational software, internet access and use of e-mail in the schools. Some 35-40% of secondary school teachers had never used a computer. The study revealed that exposure to computers in schools influenced the career choices of former students. The main issues of concern that came out of the study included staff training, mainstreaming of ICT across the curriculum and provision of adequate ICT equipment.

Another study by Bakar and Mohamed (2008) on assessment of trainee teachers' confidence to integrate ICT in teaching, found out that trainee teachers in general were quite confident with their ability to integrate ICT training. However, male trainee teachers were more confident compared to their female counterparts. Trainee teachers who had taught previously in schools and vocational trainee teachers also felt more confident with their ability to integrate ICT in teaching. They found no significant correlation between academic performance and levels of confidence in the integration of ICT in teaching.

Several researchers, academicians and policy makers have suggested several ways in which ICT can contribute to solving educational problems in developing countries (Whims and Lawler, 2007, p.3). The shortage of qualified teachers in Sub-Saharan Africa, estimated at 25% by GeSCI

(2004), can be addressed by the use of ICT to accelerate teacher training. The Imfundo Report (Unwin, 2004) concluded that ICT in education has most potential in pre- and in-service teacher training. ICT can also be used to enhance learning. ICT can minimize some of the negative factors endemic in many schools in developing countries such as high pupil-teacher ratios, shortage of basic instructional materials and poor physical infrastructure.

High dropout rates are a common feature in schools in developing countries. ICT can be used to make the school curriculum more interesting. Studies by Hepp et al., (2004): Osin, (2003) found out that children enjoy learning using technology. Gomez and Martinez (2001) descriptively shows how using internet in education programmes for street children in Columbia enticed a higher than usual number of the children back to school. ICT can also play a significant role in providing teachers and students with access to educational content and updated resources (Wims and Lawler, 2007 p.3). Open and distance learning methods, which have traditionally been used to reach learners in remote geographical areas, can be improved through ICT. This would be appropriate for learners in the conflict zones of Africa, such as Somalia, South Sudan, Chad and Sierra Leone.

It is, therefore, apparent that ICT has enormous opportunities in enabling access to learning. ICT can be used to solve many of the educational challenges faced by education systems in most of the developing countries. In particular, teachers can use ICT to improve their instructional delivery and hence make learning more effective. However, for this to happen, teachers must be ready to learn to use the technology. More so, educational policy makers need to appreciate the need to motivate teachers to use ICT in the learning process. ICT has penetrated all facets of people's lives and educational curriculum content delivery in Africa, and particularly in secondary schools in Kenya, and cannot therefore be left behind.

METHODOLOGY

The mixed method approach where both qualitative and quantitative methods are used to collect data was chosen for this study. The selection of subjects was based on a multi-case approach as opposed to a single case study. Five secondary schools in urban and rural areas were targeted for study. Selection was not based on a statistical model, but on the significance of the case for the objectives of the study, which in this case was the presence of computers in the institution. Diversity factors taken into consideration for the selection of schools included, gender, type of institution, geographical location and ownership.

The indicators of ICT integration in curriculum delivery were: the frequency of ICT use by the teachers for academic purposes; types of ICT used by teachers; types of software and number of courses taught using ICT. For every indicator, triangulation was employed by seeking views from the school managers, educators and learners on the same indicator. The following qualitative and quantitative data collection instruments were used:

1. Semi directed interviews with school directors, administrators, pedagogical advisors, and parents;
2. Focus group discussions with pupils and teachers;
3. Audiotapes of discussions, videotaped classroom observations and photographs of school environments;
4. Review of school documents on ICT and teacher and student productions;
5. Questionnaires for quantitative data from pupils and teachers on access, usage and training.

By applying similar procedures for data collection, comparison between subjects was possible. Data collection procedures involved four visits to each institution. The first visit was made to ascertain if the school had computers. The second visit involved completing survey

questionnaires, whose purpose was to collect quantitative data from the school manager and educators on connectivity, access, training and gender. The third visit was made by all researchers and the aim was to conduct focus group discussions with teachers and learners. These sessions were tape recorded and videotaped and later transcribed. Finally, the data collected was edited and uploaded onto the Pan African Research Agenda on the Pedagogical Integration of ICT in Education (PanAf) Observatory. Data analysis was done qualitatively using narratives guided by the research objectives and quantitative data was analyzed descriptively and presented in bar graphs.

THEORETICAL FRAMEWORK

In order to establish the effectiveness of the integration of ICT in curriculum delivery, the evaluation approach developed by Bennett (1975) was applied. *Bennett's Hierarchy* encourages evaluators to look at how well goals have been achieved. This approach measures the impact of a programme using a system of criteria, usually referred to as Bennett's Hierarchy of Evidence Model. This model has been used from the 1970s to evaluate extension programmes, and it has continued to be updated and used for planning and evaluation of broad-based development programmes. It is therefore ideal for evaluating educational programmes.

Bennett's Hierarchy is a list of the types of evidence that may be examined by an evaluator to determine the overall impact of a programme. Information from lower levels helps to explain the results from the higher levels, which are more long term. As an evaluator moves up the ladder, the evidence becomes more difficult and expensive to obtain. For example, evidence of actions such as behavioural changes in the target audience may require focus groups and interviews, while evidence of resource use may simply require an observation of existing infrastructure. Evidence from higher up the ladder provides a stronger indication of whether the programme has achieved its larger goals.

The Bennett's Hierarchy of Evidence Model is based on a logical progression of evidence required to conduct an evaluation. The model has seven stages, as explained in Table 1. According to Bennett's thesis, collecting data at several stages of the hierarchy usually strengthens evaluations.

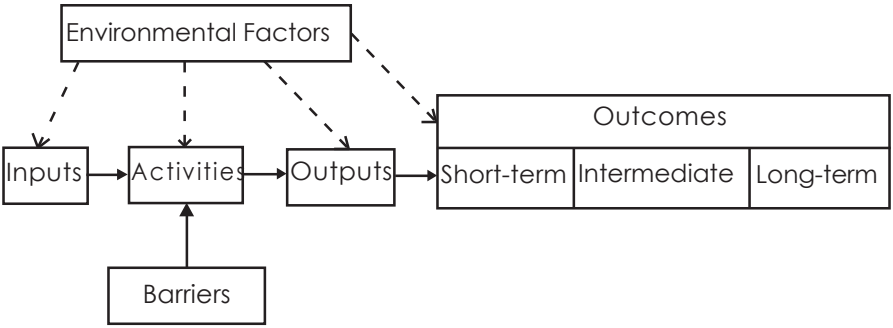
Table 1 Illustration of the Link between the Logic Model and Bennett's Hierarchy

Logic Model	Bennett's Hierarchy	Effective Delivery of Curriculum Content Using ICT
Outcomes (Long-term)	7. Impact	Represents end results, impact or benefit of a programme e.g. Improvements in quality of teaching and learning, better academic performance, positive impact on national development, achievement of national educational goals.
Outcomes (Intermediate)	6. Actions	If the target audience is students, evidence of their ability to search and use ICT information or teachers actually integrating ICT in teaching using various software.
Outcomes (Short-term)	5. Learning	Change in knowledge, attitudes and skills acquired, aspirations, ambitions and hopes in relation to students' and teachers' understanding of the importance of

		ICT integration in teaching and learning.
Outputs	4. Reactions	Reaction of teachers in terms of degree of interest, as well as positive or negative feelings toward ICT integration in teaching and learning.
	3. Participation	Number of teachers and students reached within a school, characteristics of teachers and students; extent and intensity of exposure to programme etc.
Activities	2. Activities	Development of performance measures; formulation of ICT policy, maintenance, acquisition of ICT skills and competencies, subject matter taught and methods used.
Inputs	1. Resources	Human resources e.g. ICT advisors, computer laboratories, funds and related infrastructure.

To enhance understanding of the effectiveness of ICT integration in secondary schools, Bennett's Hierarchy was paired with the generic logic model used in project planning. A logic model explains the elements and causal linkages that exist within a programme. Although logic models may vary in design, they typically include six major elements. These are shown in Figure 1.

Figure 1: General Logic Model



Environmental factors and barriers are the external factors that act on a programme. **Inputs** include the resources that are used for the project, such as ICT equipment, human and financial resources and physical buildings. The **activities** are the actions taken by school managers to achieve the goals of the project, for example purchase of computer software, professional training of teachers in ICT, and providing learners with computer literacy. **Outputs** are the immediate results of the initiative, such as the number of teachers who are able to integrate ICT in their subjects. Outputs provide evidence that an activity has occurred, though not necessarily that a program has achieved its purpose.

Outcomes are the desired accomplishments or changes that show movement toward the program's ultimate objectives. Outcomes typically are divided into short-term, intermediate and long-term subsets. In the case of ICT integration in education, **short-term outcome** might be teacher's heightened awareness of importance of ICT; an **intermediate outcome** might be development of study material to deliver through ICT and a **long-term outcome**, often the ultimate goal of the initiative, might be improved academic performance by learners and consequently better educational outcomes.

Logic models also include information on the program's environment and barriers. **Environmental factors** describe the context in which the program operates. In an educational logic model, one environmental

factor would be that rewards to teachers do not take into account the extra workload resulting from preparation of ICT teaching materials.

Barriers are a subset of environmental factors; they are hindrances to the achievement of ICT integration goals of a school. Identifying barriers in the logic model allows school managers to identify the necessary steps that must be taken to achieve successful results. A barrier might be resistance to change of teaching methods by teachers or inadequate ICT skills among teachers.

FINDINGS AND DISCUSSION

Five secondary schools were surveyed in the study:

1. St. Joseph's High School, Githunguri

St. Joseph's High School, Githunguri is a rural based government assisted public boy's school with 14 computers and 800 learners. The school has 32 teachers of whom 25 are female and 7 are male. While all the 32 teachers have access to the computers, only two use them for academic purposes. It was also apparent that only the subject of Computer Studies is taught using computers. This confirms an earlier observation by Wims and Lawler (2007) that the computer is the object of study rather than a tool for teaching and learning in most schools in Africa. Except for preparing lesson plans, there is no integration of ICT in the teaching and learning of other subjects.

2. Musa Gitau Secondary School

Musa Gitau Secondary School is also a rural based, mixed government assisted public school, with 21 teachers, 11 female and 10 male. The school has 20 computers and none of them is dedicated to the teachers. All 426 students have access to the computers. The school has allocated 15 hours per week for computer studies where the computer is the object of study. Only one female teacher had completed 1-50 hours of professional development, which included

ICT training. Out of the eight subjects offered in the school, none of them is taught using any form of ICT. Although the teachers are free to use the 20 computers, none uses them for teaching purposes. This could also be due to competing with the learners for the same computers as none are dedicated for teachers.

3. Uthiru Girls Secondary School

The scenario changes at Uthiru Girls Secondary School, where ICT integration in teaching and learning is evident. Uthiru Girls is a semi-urban school with 18 functional computers, 2 of which are exclusively for teachers. The school has 500 learners and 35 teachers: 25 female and 10 male. Fourteen teachers have more than 50 hours of professional development that include ICT training. The Principal, Deputy Principal and Heads of Departments have had some ICT training. Unlike in most schools, the school principal is competent in ICT and holds a Higher National Diploma in Information Technology. The school also has a fully qualified computer teacher. The teachers use computers to prepare lesson plans, teaching notes and to evaluate students' academic performance in class. The School is connected to the Internet and this enables the teachers to access teaching materials, hence enriching their teaching. The students are encouraged to use the local network to share questions and answers with the teachers. Power point presentations are used and according to the Principal, this has made teaching and learning more exciting and easy. The school downloads the most current teaching materials from the Internet hence saving on the cost of purchasing textbooks. The main computer software used include MS-word, MS- Excel, MS-power point, MS-Quick Books and Encarta Encyclopedia. Here, five subjects have been integrated with ICT.

4. Aga Khan High School

Aga Khan High School is a private secondary school with 350 learners and 23 teachers; 11 male and 12 females, all of whom have completed at least 1-50 hours of professional development, which included ICT training. The school has 31 computers that are all accessible by

teachers and students. To teach in this school, a teacher is required to be computer literate. It is apparent that teachers use computers to prepare lesson plans, lesson notes, evaluate students academic performance and for general database. Cyber School software is used to teach science subjects and mathematics.

5. Enna School

Enna School is a private girl's secondary school in a semi–urban location. The school has 100 female students with 30 computers, 25 of which are accessible by teachers. It has 10 teachers, six males and 4 females, and all have completed 1-50 hours of professional development, which included ICT training. Two male teachers have completed over 50 hours of professional ICT-related training. The school teaches 12 subjects, one of them being Computer Studies. The teachers use the computers to prepare lesson plans and notes, evaluate students' academic performance and to search information from the internet. To perform these tasks, the school has installed MS-word, MS- Excel, Encarta and MS PowerPoint software. The teachers indicated that PowerPoint presentations have made teaching and learning easy and enjoyable. For a teacher to be hired to teach in the school, he or she must be computer literate.

Discussions

From these findings, the five schools that participated in this study are at different stages in the integration of ICT in teaching and learning. There is an apparent difference between private and public schools. Aga Khan High School and The Enna School have deliberate policy for integration of ICT in teaching. Teachers must be computer literate before they can be hired. In both schools it is evident that ICT is used in a more versatile manner. More software is used compared to the public schools, with the exception of Uthiru Girls High School where the Principal offers clear leadership in use and investment in ICT skills and infrastructure. It is also clear that the Principal supports professional

development of teachers in ICT. It is not surprising, then, that unlike the other public schools, integration of ICT in teaching and learning is higher. These findings concur with those of Tearle (2003, p.576) who observed that strong departments with enthusiastic and capable staff result in positive outcomes that provide a good model for others and create a favourable climate for the implementation of ICT.

The findings from the five schools indicate differences related to ownership of the school, its location, and professional training of the teachers that include ICT and ICT skills of the school manager. A comparison between the privately owned schools (Aga Khan and Enna) and the publicly owned (St. Joseph's and Musa Gitau) indicates that private schools have deliberate policies to integrate ICT in curriculum development. Aga Khan, for example, hires teachers with ICT skills because they are expected as a matter of policy to integrate ICT in their teaching. Enna on the other hand attracts students by adding value to their teaching hence ICT integration is encouraged as a matter of policy to improve performance and attract students. As in Aga Khan High school, a teacher must be computer literate to teach at Enna School.

Except for Uthiru Girls, the other two public schools have not integrated ICT in their teaching and learning processes although they have computers. This suggests that there is a lack of clear policy or will to integrate ICT. Other challenges could be lack of training opportunities, lack of encouragement from the school management and technophobia.

However, the high level of ICT integration at Uthiru Girls, which is also a public school, seems to be as a result of the School Principal, whose ICT skills are high. It appears, therefore, that when the school manager is conversant with ICT, they encourage its use in many areas including teaching and learning, irrespective of whether the government has given a clear policy or not. This underscores the importance of leadership in implementing change.

The Bennett's Hierarchy of Evidence Model (1975) can be applied to evaluate each of the five institutions. It is evident that teachers and learners are at different stages in the use of computers and learning. In most cases the learners are ahead of the teachers! At Githunguri High School, for example, it is observable that teachers are at the first stage of implementing the use of ICT. Only two teachers out of 32 use the computers for teaching purposes. On the other hand, the learners who take computer studies as a subject appear to be at level six, which is the action stage. The learners use the computers not only for Computer Studies as a subject but to access information for other subjects and even to prepare Science Congress Projects in various subjects. It is, however, noticeable that the computer teacher has reached the impact stage, which is the seventh stage. She is involved in training other teachers in the district on how to integrate computers in teaching during their Strengthening Mathematics and Sciences in Education (SMASE) training seminars. Unfortunately, the teachers in the school do not seem enthusiastic to learn. This can perhaps be explained by the fact that no time has been set aside for them to be trained or to use the computers. They also do not have a computer in the staff room dedicated for their use. They feel that the computers are for learners and they have nothing to do with them.

Ironically, the situation changes in Uthiru Girls High School, a public school. Both teachers and learners are at the action stage, which is level six of Bennett's model. Teachers, including the Principal and the Deputy Principal, use the computers to prepare lesson plans, source teaching information, and sharing information among both teachers and students. According to the teachers and learners, this usage of the computers has helped to improve the general performance of the school in academic and other co-curricular activities.

At Musa Gitau Secondary school, the learners appear to have reached the learning stage, which is level 5 in the model. Though the computers have been in the school for barely nine months, their awareness level is

high and growing. They can solve problems in various curriculum subjects using computers. In the interviews, the learners showed evidence of positive attitude and ambition to acquire computer skills. However, with the exception of the Principal, who has over 50 hours of professional development, which includes ICT, and the school computer teacher, the other teachers are generally at the resources level, which is the first stage in the Bennett's model. The majority of them shy away from the computer laboratory insisting that there is no time to use them and that there are no computers made exclusively available to them. They appear to be suffering from technophobia.

Aga Khan High School and Enna Girls, which are private schools, can be rated at level six, which is the action stage. This is the case for both the teachers and the learners. As mentioned earlier in this paper, a teacher is expected to have ICT skills at entry level. Therefore, naturally, the learners and teachers are expected to use computers in teaching and learning. The teachers use them to prepare lesson plans, access information for teaching and evaluate learners. To achieve their aims, a variety of software is used. The learners use the computers to access information, communicate with teachers and solve some problems like preparing projects for the annual science congress competition.

IMPLICATIONS FOR POLICY, PRACTICE AND FUTURE RESEARCH

The results show that the integration of ICT in curriculum delivery in Kenyan secondary schools is influenced by the ownership of the school, the professional training of teachers in ICT, the location of the school and the school manager's level of ICT skills. While private schools seem to have a clear policy on ICT integration, public ones have none.

The government seems to be lagging behind because, whereas the subject Computer Studies has been introduced in secondary schools as part of the national curriculum, it has not kept up with the provision of the necessary infrastructure, both physical and human resources. Private schools, however, are ahead in ICT use because they have control

over their own resources. They also use ICT to maintain a competitive edge in the market because parents tend to associate the use of ICT with good academic performance.

This implies that the Kenya Government should develop and implement an ICT in education national policy to streamline this important area of learning. This so far has not been developed, although it is one of the objectives in the Education Strategy on ICT of 2006. The Ministry of Education needs to provide ICT teachers to schools and reward those who have the skills and are already offering services so as to motivate them. It might also help to include integration of ICT in teaching as part of the teachers' annual performance appraisal to encourage them to acquire the skills. It is also important to equip head teachers of secondary with ICT skills because they can act as change agents by encouraging and driving the adoption of ICT in teaching and learning processes. Future research should focus on the attitudes of learners and parents on the use and impact of ICT on learning.

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THE IMPACT OF LEARNER SUPPORT SERVICES ON ACHIEVEMENT OF BACHELOR OF EDUCATION (ARTS) STUDENTS IN THE EXTERNAL DEGREE PROGRAMME OF THE UNIVERSITY OF NAIROBI IN KENYA

Omondi Bowa

ABSTRACT

This article presents findings of a study on the impact of learner support services on academic performance of distance learners in the University of Nairobi's External Degree programme. Learner support services were defined in the study as the cognitive and systemic support provided through tutoring, modern information communication technology (ICT), and administrative support that are provided to students in the study programme. Academic performance, on the other hand, was defined as the grades obtained by a learner in university examinations, consisting of coursework and semester examinations. The problem under investigation was that academic performance of External Degree students remained poor in spite of the learner support services that were provided to the learners by the institution.

Qualitative and quantitative methods were used to collect data. Selected learners in Parts II to V of the programme were targeted for the study. The distance learning programme was then studied in the light of two research questions that aimed at finding out the contribution of learner support services to academic performance of learners in coursework and semester examinations.

The findings were that learner support services contributed immensely to the academic performance of learners. The poor academic performance was partly due to inadequate provision of learner support services to learners in the External Degree programme. On the basis of the findings, it was recommended that the University of Nairobi enhance the production capacity of study materials, boost library

support at the regional centres and provide internet connectivity and related services at the regional centres. It was also recommended that the Government of Kenya provide a favourable ICT policy to facilitate provision of internet services to students in the regional centres within the country.

INTRODUCTION

Distance Education (DE) is now recognized all over the world as a mode of education which helps large numbers of learners to access quality education (Koul and Jenkins, 1990). Through this mode, quality education is made accessible at very low costs to people whose work, family responsibilities or even personal preferences would bar them from attending college on a full time basis (Moore et al., 1990; Verduin and Clerk, 1991). It also provides opportunities to design flexible curricula for a wide spectrum of clientele who may take courses at their own time depending on their ability and convenience.

The delivery of DE depends on ICT, namely, print correspondence, telephone, audio conferencing and radio, video and computer-based technology (Willis, 2003; Moore et al., 1990; Verduin and Clerk, 1991; Keegan, 1986; 1988; Parraton, 1988; Holmberg, 1986; Rumajogee, 2002). It also depends on the provision of learner support services, which complement the mass produced learning materials (Tait, 1995). According to Tait (1995) and Reid (1995), learner support services are made up of tutoring; counseling; administrative and library services that are provided to learners. Today, some of these services are provided through computer-based technology, including internet services. The need to provide learner support services is born out of the notion that individual learning of a student needs to be facilitated for quality learning to take place.

The University of Nairobi has provided DE in the School of Continuing and Distance education (SCDE) since 1986, when the first group of 600 students from all the regions of Kenya was admitted to the Bachelor

of Education (Arts) course (Faculty of External Studies, 2005; Department of Educational studies, 2005; University of Nairobi, 1990; Odumbe and Kamau, 1986; Odumbe, 1992). Since then, the student population has risen gradually to over 3,000. A relatively new programme of Bachelor of Education (Science) was also launched in 2003. The School uses print and audio materials for instruction. It also provides support services to learners in the form of face-to-face tutorials, counseling, administrative and centralised library support. Face-to-face tutorial sessions are conducted for all groups of students three times in one semester of eight months. Tutorial sessions are conducted at the central campus in Nairobi City and are attended by all active students. Counseling and administrative support services are provided throughout the semester at the central campus and Regional Study Centres across the country (Bowa, 2008).

When the SCDE started offering the distance study programme, especially at the degree level, a number of challenges were encountered in the provision of learner support services, such as tutoring and counseling, distribution of learning materials, management of residential sessions, establishment of resource centres, provision of equipment for practical work, management of fee payments, dissemination of study skills, management of private studies and keeping of student records. Consequently, the SCDE decided to use six existing Extra-Mural Centres in Nairobi, Nakuru, Kakamega, Kisumu, Nyeri and Mombasa to reinforce learner support services in various parts of the country.

An evaluation study carried out by Odumbe (1984) to establish the effectiveness of the Extra-Mural Centres in providing the learner support services found out that there were areas of strength and weakness, as shown on Table 1.

Table 1: Effectiveness of Provision of Learner Support Services

Support Service	Performance
Field coordination	Good and effective
Tutoring and Counselling	Good and effective
Distribution of learning materials	Good and effective
Keeping Student Records	Good, but needs to be computerised
Sharpening study skills	Facilities are inadequate
Library and learning resources	None (plans are under way to provide)
Recruiting Centre for Students	Good and effective
Practical work equipment Storage	None
Residential and weekend sessions	Good and effective
Opportunity for students to interact with one another and reduce isolation	Good and effective
Facilities for workshops and seminars	Facilities not adequate
Private Study Centres	Good and effective
Training facilities for tutors, such as teleconference system not been used for teaching	Good but not effective since some facilities like teleconference system have
Centre for regional examinations such as Continuous Assessment Tests	Good and effective
Motivation of students	Good and effective
Opportunity for monthly briefing meetings	Good and effective
Collection of tuition fees	Good and effective
Telephone service	Good and effective

Source: Odumbe, (1984)

The findings of that study are now over 20 years old and may not reflect the reality on the ground. Recent assessment records indicate that academic performance of learners in the Bachelor of Education (Arts) programme has remained poor in coursework tests and end of semester examinations as illustrated by Table 2.

Table 2: Pass and Failure Rates for Part IV April, 2001 Intake

SUBJECT	No. of Students	No. of Candidates	Pass	Fail	Percent Pass	Percent Fail
Education	344	344	291	53	85	15
English	94	84	31	53	37	63
Literature	122	122	106	16	87	13
Kiswahili	107	105	76	29	72	28
Mathematics	28	28	22	6	79	21
Economics	34	34	18	16	49	51
Business Studies	35	35	28	7	80	20
Religious Studies	108	107	93	14	87	13
Geography	60	57	56	1	98	2
History	70	70	70	0	100	0

Source: SCDE records

Table 2 shows a summary of Part IV examination results for students who were admitted in April 2001. It can be seen that the highest failure rate was in English subject with 63% of the students scoring less than the pass mark of 40%. Other subjects with high failure rates were Economics, Kiwahili, Mathematics and Business Studies that had 51%, 28%, 21% and 20% of the students failing to reach the pass mark, respectively.

The general objective of this study was to find out the impact of learner support services on academic performance of learners in the external degree programme of the University of Nairobi. The specific objectives were:

1. To find out the extent to which tutoring and use of self-study time influences the grades scored by learners in examinations;

2. To find out the extent to which year of study in the course influences the grades scored by learners in examinations.

Literature Review

Research on effectiveness of DE has focused on four domains, namely:Student attitude and satisfaction regarding delivery of coursework:

1. Interactions of students and faculty during delivery of coursework;

2. Student outcomes in DE coursework;

3. Faculty satisfaction with delivery and coursework (Gallagher and McCormick, 1999; Schachar and Neumann, 2003).

In addition, Spooner et al. (1999) have analyzed many studies based on such comparative factors as:

1. Cognitive factors, namely, amount of learning, academic performance, achievement and examination and assignment grades;

2. Other factors, namely, student satisfaction, comfort, convenience and communication with instructor, interaction and collaboration between students, independence and perceptions of effectiveness.

Over the past two decades, a number of studies have examined student success and persistence in DE. Some studies have reported that students who withdraw usually cite job and domestic reasons for their decision (Woodley et al. 1980; Pythian and Clements, 1982)

although others have suggested that self-delusion may bias such after-the-fact reporting (Woodley and Parlett, 1983). In contrast, Kennedy and Powell (1976) expressed doubts that changes in life circumstances would cause withdrawal from courses except in combination with other factors related to withdrawal.

Other studies have concentrated on motivation as an important predictor of success. Woodley and Parlett (1983) found that socio-demographic factors such as previous educational level, age, gender and occupation are associated with persistence. Rekkedal (1982) and Taylor (1986) also reported that student success was associated with such factors as assignment turn around time and the nature of student tutor interaction and course quality.

Recent studies have attempted to link together some of these perspectives on student success and persistence behaviour using multivariate approaches. Sweet (1986) reported that such factors as goal satisfaction, institutional commitment and tutor contact contributed significantly to success. Siqueira and Lynch (1986), using a broader spectrum of variables found that student satisfaction with the course, frequency of visits to student drop-in centers, socioeconomic status, and perceptions of course materials were significant in explaining persistence.

Similarly, Chacon-Duque (1985) reported that persistence was affected by such factors as quality of course materials, variety of media and planned student support, while previous education and age were not related. Sung (1986), when studying programme and environment-based student perceptions along with entry motivation and educational preparation, found that availability of time was the best predictor of retention, followed by adequacy of course materials and support services as important predictors.

In contrast to other studies, Sung (1986) reported motivation to be an insignificant predictor of retention. Powell et al. (1990), while exploring the predictive capability of student's "predisposing characteristics"

in regard to their chances of successfully completing their first Athabasca University course, found nine variables to be significantly related to success. The canonical discriminant function coefficients they obtained suggested that primary variables responsible for discriminating between students who pass and those who fail/ withdraw were persistence, marital status, need for success, need for support, student's literacy score, financial stability, study habits, gender and student's rating of previous educational preparation. Variables that made no significant contribution to the discriminant function included current level of education, educational commitment, level of support, attitudes towards studying, number of children and student's age.

More recent studies have focused on specific characteristics in DE, namely:

1. Student satisfaction (Allen et al, 2002);
2. Instructional features affecting learner achievement (Machtmes and Asher, 2000);
3. Educational technologies in K12 learning (Cavanaugh, 2001).

From the foregoing review, DE research investigating various aspects of learner support services seem to agree that the services are critical in regard to retention and success of the distance learner. The purpose of this study is to go a step further to investigate the influence of these services on performance of the distance learner in terms of scores in course grades. The study helps to explore further the general objective of effectiveness pertaining to the quality of DE programmes.

Theoretical Framework

To understand the role of learner support services in distance education, it is important to examine the theories of learning. There are many theories of learning that have been postulated to explain the learning process. Three of these have dominated educational explanation for over a century, namely, behaviourist, cognitivist and constructivist theories.

1. Behaviourist Theory

Behaviourist theorists, influenced by the works of Thorndike (1913) and Skinner (1974), see learning as a change in observable behaviour caused by external stimuli in the environment. They contend that it is the observable behaviour of the learner that shows whether he has learned something and not what is going on in his mind. However, some educators who believe that there is more to learning than just a change in behaviour have postulated a cognitivist theory of learning.

2. Cognitivist Theory

Cognitivist psychologists conceive of learning as an internal process that involves the use of memory, motivation, thinking and meta-cognition. They contend that the amount of learning that takes place depends on the processing capacity of the learner, the amount of effort expended during the learning process, the depth of processing and the learner's knowledge structure (Cralk and Lockhart, 1972; Ausubel, 1974; and Cralk and Tulving, 1975).

3. Constructivist Theory

In recent times, there has been a move by education theorists towards constructivism. Constructivists claim that learners interpret information and the world in the light of their personal reality and that they learn by observation, processing and interpretation, and then convert the information into personal knowledge (Cooper, 1993; Wilson, 1997; Terry and Fadhi, 2004). Constructivist theorists contend that learners learn best when they can contextualize what they learn for immediate application and to acquire personal meaning (Terry and Fadhi, 2004).

It should be noted that none of these theories can be used exclusively to explain all learning processes. Each one of them makes a contribution to the understanding of the learning processes. Learning strategies should therefore be selected that motivate learners, facilitate deep processing, build the whole person, cater for individual

differences, promote meaningful learning, encourage interaction, provide feedback, facilitate contextual learning and provide support during the learning process. Thus learner support services characterised by these qualities can facilitate learning in ways that are envisaged by the theories of learning.

Methodology

Data and other information were obtained by fieldwork through a cross-sectional survey research design. The study targeted 3,278 students of the External Degree programme of the University of Nairobi, from where a stratified random sample was drawn. The targeted students were stratified by year of admission and a proportional sample drawn from each stratum. A total of 212 students were finally drawn from all strata to represent learners in the programme. A questionnaire was used to collect information from learners in the sample. Questions were designed that aimed at acquiring information on the vital aspects of learner support services. Secondary data was also obtained from the School's examinations records. This provided information on the academic performance of the students in the sample. Data and other information obtained were then arranged into groups of independent and dependent variables.

Independent variables consisted of academic tutoring, use of self-study time and year of study. Dependent variables, on the other hand, consisted of, for instance, performance of learners in examinations. Qualitative and quantitative techniques were then used to analyze the data. Qualitative methods were used to summarize the mass of data collected from the field into a few numbers that measured, in some way, the various aspects of learner support services of interest to the study. These included averages, standard deviation and percentage. Tables were also constructed to illustrate distributions of some important features of learner support services and grades obtained in examinations. Quantitative methods were used to analyze

the data so as to answer the research questions. Three techniques were used, namely, correlation analysis, independent samples t-test and one-way between groups ANOVA, with post hoc tests (Cohen, 1988, Dooley, 2004, Fraenkel et al. 2000, Nachmias et al. 2002, Pellant, 2005). The techniques were used to answer two research questions, namely:

1. To what extent do distance learners who receive more hours of tuition and spend more hours on self-study score higher grades in examinations than those who spend a shorter time?
2. To what extent does the year of study influence the grades scored by learners in examinations?

Findings and Discussion

The study came out with a number of findings relating to the two research questions. These findings are reported below.

Academic Tutoring and Use of Self-Study Time

Academic tutoring and use of self-study time were also considered as processes likely to influence the academic performance of learners. The specific factors that were considered under this category were; length of stay in residential sessions in a semester; hours of tuition attended per course unit in a residential session; hours of study spent on course units during home study; course books and audio-cassettes issued; libraries used and availability of books required in the libraries; satisfaction with provision of study materials; duration and quality of residential tuition; quality of course books; quality of audio-cassette materials; and quality of examinations.

Analysis of length of stay in residential sessions revealed that 208 (98%) students stayed the full length of four weeks in residential sessions in a semester (Table 3).

Table 3: Length of Stay in Residential Session in a Semester and Examination Score

Length of Stay	Frequency	Percent	Mean Exam Score	Mean Coursework Score
Valid 2 weeks	2	.9	33.0	15.4
3 Weeks	2	.9	37.2	16.9
4 Weeks	208	98.1	37.2	18.1
Total	212	100.0		

Thus, almost all students attended the residential sessions for the full length of the sessions. This showed the important role played by residential sessions for face-to-face teaching, examination and other forms of interaction.

Further analysis using Pearson's product moment correlation and one-way ANOVA test showed that the length of stay in residential tuition session by learners had no significant influence on their academic performance in the External Degree programme. This was partly because of the uniformity in attendance of the residential sessions by learners and partly because academic performance of learners depended not on attendance of residential sessions per se but on the learning that took place during the tuition sessions. This in turn has been shown to depend to a large extent on learners' personal circumstances or characteristics and accessibility of learning resources and support services.

Hours of Tuition Attended and Examination Score

Similarly, attendance of lectures was very good with a mean rate of 4.4 hours per course unit during one week of residential tuition. Table 4 shows a summary of tuition hours attended by learners for every course unit during one residential session. The attendance rate showed that students who attended residential sessions also attended most

of the lectures given. The high attendance rate of lectures could have a favourable influence on the learning process, and thereby boost academic performance of the learner.

Table 4: Hours of Tuition Attended per Course Unit per Residential Session and Examination Score

Hours of Tuition Attended		Frequency	Percent	Mean Exam Score	Mean Coursework Score
Valid	**2**	1	.5	37.0	20.1
	3	4	1.9	33.4	17.9
	4	106	50.0	37.4	18.2
	5	84	39.6	37.8	18.1
	6	2	.9	36.3	18.8
	Total	197	92.9		
Missing	**System**	15	7.1		
	Total	212	100.0		

However, further analysis by Pearson's product moment correlation and one-way ANOVA test showed that the tuition hours attended by students per course unit had no significant influence on their academic performance in the External Degree programme. This was interpreted to mean that academic performance of learners depended not on the tuition hours attended per se but on the learning that took place during the tuition sessions. This, in turn, is influenced to a large extent by learners' personal circumstances or characteristics, accessibility of learning resources and support services. Scarcity of learning materials and learner support services could therefore have hampered the full realization of the benefits of attending tuition sessions by learners in the programme.

Hours of Study and Examination Score

Similar investigations on the time spent on studies during home-study time showed that while some students spent up to 4 hours studying one course unit in one week, others did not study at all during that time. It was also noted that the average time spent on studies was 2 hours, which is lower than the institution's recommended average of 2½ hours (Table 5). This could make it difficult for learners to cover the course content and reduce their chances of performing well in examinations.

Table 5: Study Hours per Course Unit a Week in Home Study and Examination Score

Hours of Tuition Attended		Frequency	Percent	Mean Exam Score	Mean Coursework Score
Valid	.0	1	.5	34.2	15.8
	1.0	32	15.1	36.7	17.2
	1.5	36	17.0	36.2	18.2
	2.0	76	35.8	32.2	18.1
	2.5	15	7.1	34.6	17.2
	3.0	47	22.2	37.6	18.7
	3.5	2	.9	38.0	18.8
	4.0	1	.5	37.2	15.6
	Total	210	99.1		
Missing	System		2	.9	
	Total	212	100.0		

Further analysis by Pearson's product moment correlation and one-way ANOVA test showed that hours of study did not have significant

influence on academic performance of learners in the External Degree programme. This was attributed to inadequate time spent on studies, the scarcity of learning resources and inadequate learner support services in the programme.

Provision of Course Books and Examination Score

Analysis of provision of course books showed that only 9 (4.2%) students were issued with the 8 course books required while 76 (38.8%) students were not issued with any book at all (Table 6).

Table 6: Course Books Issued in April-December, 2004 Semester and Examination Score

Course Books Issued		Frequency	Percent	Mean Exam Score	Mean Coursework Score
Valid	**0**	76	35.8	37.1	18.0
	1	5	2.4	39.3	17.6
	2	6	2.8	41.3	19.9
	3	22	10.4	37.5	18.1
	4	20	9.4	35.3	18.1
	5	25	11.8	36.7	18.8
	6	29	13.7	38.5	17.7
	7	20	9.4	35.5	17.5
	8	9	4.2	38.3	18.5
	Total	212	100.0		

The average number of course books issued was only 3.2 books per student. This means that most students used borrowed course books or

relied mainly on the limited face-to-face tuition sessions for interactive learning experience (Mboroki, 2007). This shortfall in provision of course books was partly because the books were issued only to students who had paid full fees and partly because the production of books did not match the demand for the materials. Lack of course books is a serious problem in a distance learning programme, which relies heavily on the print medium. Their absence could mean that learners are not able to obtain structured instruction for the better part of their studies, and this may affect the quality of learning, and thereby, academic performance of learners.

Further analysis by Pearson's product moment correlation and one-way ANOVA test showed that course books issued did not have significant influence on academic performance of learners in the External Degree programme. This was attributed to the scarcity of course books in the programme. Learners seem to share the little resources among themselves with everyone suffering from the scarcity in equal measure. Limited complementary support services in the programme also seem to hamper the full realization of learning experience from studying the course books.

Provision of Audio-Cassettes and Examination Score

Provision of audiocassette materials was equally scanty, with 185 (87.3%) students lacking the cassettes, while the rest received a maximum of only 3 out of 8 cassettes (Table 7).

Table 7: Course Cassettes Issued in April-December, 2004 Semester and Examination Score

Course Cassettes Issued	Frequency	Percent	Mean Exam Score	Mean Coursework Score
Valid No of Audio Cassettes	185	87.3	37.2	18.1
1. Audio-Cassette	11	5.2	35.4	18.2
2. Audio Cassettes	11	5.2	37.4	19.3
3. Audio Cassettes	5	2.4	36.4	16.9
Total	212	100.0		

Most students, therefore, do not benefit from the audio-instructional support from the cassette tapes and have to rely mainly on the limited face-to-face tuition. This could affect the learning process adversely and curtail academic performance of learners.

Further analysis by one-way ANOVA test showed that the audiocassette materials issued did not have significant influence on academic performance of learners in the External Degree programme. This could be due to the scarcity of audiocassettes whereby 87% of the students lacked the materials while the rest only had three or less audiocassette materials.

Use of Libraries and Examination Score

The use of libraries was also analysed to show the extent to which this learning resource was utilized to improve performance of learners. It was found out that 155 (73%) students used one to three different libraries

while 23 (10%) used four to six different libraries. The rest of the learners numbering 34 (16%) did not use any library at all (Table 8).

Table 8: Libraries Used and Examination Score

Number of Libraries Used		Frequency	Percent	Mean Exam Score	Mean Coursework Score
Valid	**0**	34	16.0	36.6	18.2
	1	78	36.8	37.2	18.2
	2	45	21.2	36.7	17.9
	3	32	15.1	38.9	18.2
	4	12	5.7	38.1	17.4
	5	9	4.2	34.9	17.9
	6	2	.9	34.4	19.5
Total	212	100.0			

Use of libraries by the learner could translate into better academic performance where it enables the learner to study a rich collection of study materials. In such cases learners who visit many libraries would be expected to perform better than their counterparts who do not.

Further analysis by Pearson's product moment correlation showed that the number of libraries used had no significant influence on academic performance of learners in the External Degree programme. This could have been due to the failure of library visits to yield more study materials. It could also have been that academic performance of learners depended not on the number of libraries visited per se but on the learning that took place as a result of studying in the libraries.

Analysis of Table 9 also shows that of the students who used the libraries, 52 (24%) visited libraries once a week, 83 (39%) visited once a month, 26 (12%) visited once in 4 months and 17 (8%) visited only once in 8 months (one semester). Only one student visited libraries daily. The frequency of visits to libraries could also be expected to enhance the learning process if it enables the learner to study more effectively due to constant contact with learning materials.

Table 9: Visits to Libraries to Study and Examination Score

Number of Libraries Used		Frequency	Percent	Mean Exam Score	Mean Coursework Score
Valid	Never	33	15.6	36.6	18.1
	Once in 8 Months	17	8.0	37.6	17.2
	Once in 4 Months	26	12.3	39.3	18.6
	Once in a Month	83	39.2	36.2	17.9
	Once in a Week	52	24.5	38.2	18.4
	Daily	1	.5	35.0	18.1
	Total	212	100.0		

Nevertheless, further analysis by one-way ANOVA test showed that frequency of visits to libraries had no significant influence on academic performance of learners in the External Degree programme. This was interpreted to mean that academic performance of learners depended not on the frequency of visits to libraries per se but on the learning that took place as a result of studying in the libraries.

It was also discovered that of the students who visited libraries, 116 (65%) often failed to find the books they needed while only 62 (35%)

often found the books they needed to study (Table 10). Learners who found the books they needed in libraries were expected to perform better in academic work than their counterparts who did not because of greater contact with study materials.

Table 10: Availability of Study Materials in Libraries Visited and Examination Score

Availability of Study Materials		Frequency	Percent	Mean Exam Score	Mean Coursework Score
Valid	Rarely	66	31.1	36.5	17.8
	Not Often	50	23.6	37.3	17.9
	Often	57	26.9	38.5	18.4
	Very Often	5	2.4	37.2	19.3
	Total	178	84.0		
Missing	System	34	16.0		
	Total	212	100.0		

Further analysis using Pearson's product moment correlation showed that availability of study materials in libraries used had a significant influence on academic performance of learners in the External Degree programme. There was a weak but statistically significant positive correlation with performance, specifically, with coursework grades [$r = 0.153$, $n = 175$, $p < 0.043$]. This meant that students performed better when they were able to find the books they needed for their studies in the libraries. The weakness of the relationship was interpreted to mean that the ability to learn from the library materials was also affected by other factors, like the learners' personal circumstances or characteristics and scarcity of complementary learner support services in the programme.

These findings show that most of the factors associated with academic tutoring and use of self-study time do not have a significant influence on academic performance. These consisted of length of stay in residential sessions, hours of tuition attended per course unit, hours of study spent on course units during home study, number and quality of course books and audio cassette materials issued, duration and quality of residential tuition and quality of examinations. Only two factors had a significant influence on academic performance of learners; availability of study materials in libraries visited and satisfaction with provision of study materials.

Part of Study and Examination Score

Analysis of the distribution of learners by semesters or parts of study showed that 67students (31.6%) were in Part One, 46 (21.7%) were in Part Two, 45 (21.2%) were in Part Three, 29 (13.7%) were in Part Four and 25 (11.8%) were in Part Five of study (Table 11).

Table 11: Part of Study and Examination Score

Part of Study		Frequency	Percent	Mean Exam Score	Mean Coursework Score
Valid	1	67	31.6	34.1	17.0
	2	46	21.7	37.8	18.7
	3	45	21.2	39.0	19.2
	4	29	13.7	36.9	17.9
	5	25	11.8	41.7	18.3
	Total	212	100.0		

This distribution was partly due to attrition and partly the result of increasing demand for higher education by adults in Kenya over time

The relationship between semester of study (also known as part of study) and academic performance (as measured by examination grades) was also investigated using Pearson's product moment correlation. In the first instance, there was a medium positive correlation between Part of Study and semester examination grades [r = 0.365, n = 208, p < 0.000], with higher Parts of Study associated with higher semester examination grades. In the second instance, there was a small positive correlation between coursework grades and Part of Study [r = 0.158, n = 209, p < 0.022]. Thus, learners who had been in the programme for a longer time tended to score higher grades in semester examinations and coursework than their newer counterparts.

Further investigation was conducted using one-way between groups ANOVA test to explore the influence of Part of Study on coursework and semester examination grades. Subjects were divided into five groups according to Parts of Study (Group 1: Part I; Group 2: Part II; Group 3: Part III; Group 4: Part IV; and Group 5: Part V). In the first instance, there was a statistically significant difference at the p < 0.05 level in semester examination scores for the five Parts of Study [F(4, 203) = 11.1, p = 0.000]. Apart from reaching statistical significance, the actual difference was large, as evidenced by the effect size, calculated using eta squared, which was equal to 0.179 (Eta squared = SSB"SST, i.e. 1260.107 " 7035.96). This means that 17.9 per cent of the variance in semester examination scores was explained by Part of Study (i.e; 0.179 × 100). In other words, the length of stay of a learner in the programme could explain 17.9% of the variation in semester examination scores.

Post-hoc comparisons using the Tukey HSD test indicated that the mean score for Group 1 (M = 34.14, SD = 5.16) was significantly different from Group 2 (M = 37.37, SD = 5.90), Group 3 (M = 39.03, SD = 5.91) and Group 5 (M = 41.73, SD = 4.01). Group 2 was significantly different from Group 1 and 5 while Group 3 was significantly different from Group 1. Group 4 (M = 36.94, SD = 4.72) was significantly different from Group 5 while Group 5 was significantly different from Groups 1, 2 and 4.

Similarly, there was a statistically significant difference at the $p < 0.05$ level in coursework grades for the five parts of study [$F(4, 204) = 7.8$, $p = 0.000$]. Apart from reaching statistical significance, the actual difference was moderate as evidenced by the effect size value, calculated using eta squared which was equal to 0.133 (Eta squared = SSB " SST, i.e. 139.201 " 1049.66). This means that 13.3 per cent of the variance in coursework grades was explained by the Part of Study of a learner (that is, 0.133 × 100). In other words, the length of stay of a learner in the programme could explain 13.3% of the variation in coursework grades.

These results mean that Part of Study affects academic performance of the External Degree students substantially, with students in parts 4 and 5 performing better than their counterparts in parts 1, 2 and 3. This is clearly exhibited in semester examination and coursework grades.

The reason for this finding is that in the early parts of study, students require a lot of cognitive, affective and systemic support for effective learning to take place. At that stage, students tend to rely heavily on face-to-face residential tuition, distance learning study materials, guidance and counseling by tutors and administrative staff, on-campus libraries, and others. In later years when students are well established in the programme, they tend to be less dependent on support services from the institution as they realise the inadequacies of the services and discover alternative sources of learner support outside the institution.

Since the services are not well developed at the University of Nairobi, students tend to have difficulty coping with their academic work in the early years of study. This is because; study materials are usually in short supply; internet-based resources not available for External Degree students; home study time is not adequately used; services are denied to those who do not pay required fees in time. Furthermore, students admitted with 12 years pre-university education tend to lack study skills, yet those courses are still not taught to the newly admitted

External Degree students for reasons already stated. Consequently, students in early years of study perform poorly as compared to those in later years.

Recommendations

The findings of this study have practical and policy implications for the External Degree programme. It was noted that the academic performance of External Degree students is influenced by their year of study, with students in advanced years of study performing better than their junior counterparts. This was due to scarcity of services to students. It was noted further that students performed better when they were able to find the books they needed in the libraries for their studies. It was also noted that students who feel dissatisfied with inadequate provision of study materials turned to other sources and performed better than their contented counterparts.

It is recommended, therefore, that the University of Nairobi enhance its learner support services, especially to students in the formative years of their studies. The printing and audio-production capacity for study materials should be increased to ensure that study units and pre-recorded audio-cassettes are made available to all students in good time. Library support services should also be provided to External degree students, especially at the Regional Centres, which they can easily access during home study. The University should also ensure that libraries at Regional Centres are well-stocked with books relevant to the courses in the programme. It should also provide internet connectivity and services at the Regional Centres and Sub-Centres, so that learners can access study materials from the internet close to their homes during home study.

In order to facilitate the provision of internet connectivity and services, there should be a supportive government policy and strategy framework. The Government of Kenya has already recognized the need to develop a comprehensive ICT policy to be entrenched by an Act of Parliament

(Republic of Kenya, 2005). This will enable it to deal with challenges facing access to ICT in Kenya, such as limited rural electrification, frequent power disruptions, high cost of internet service provision, high cost of ICT equipment, infrastructure and support services.

It is therefore recommended that the government speed up the enactment of the ICT policy by Parliament so as to provide a supportive environment, in which the University of Nairobi can provide related services to its distance learners at the Regional Centres and Sub-Centres.

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FACTORS INFLUENCING

STUDENTS' ATTITUDE TOWARDS TECHNOLOGY

K. Kalanda

ABSTRACT

This study examines the attitudes held by the first year College students of the Lesotho College of Education, toward technology. It investigates the relationship between students' attitudes toward technology and some other factors such as teacher characteristics, students' learning and classroom environment. It also explores whether student gender affects attitudes toward technology. A sample of 200 first year students from all the three programmes (Diploma in Secondary Education, Diploma in Primary education and Diploma in Technology Education) was randomly selected. Attitudes were measured by a questionnaire survey using the five point Likert type scale and interview. The findings suggest that attitudes towards technology were predicted by the three study variables. However, no statistically significant gender differences were established.

INTRODUCTION

From home to the workplace, technological tools have become apart of our day-to-day life. In many circles, computer literacy and technological competence are perceived as essential skills. Thus, schools are responding to a higher demand for graduates by enhancing their course offerings to include classes in technology. Also, as technologies become prevalent in every part of our daily lives, the need for training on how to use those technologies augments.

However, prior to educating youth, efforts must be committed to preparing teachers who can tie together the educational possibilities of using technological tools in the classroom.

Thus, talking about the twenty-first century, House (1988:634) argues "The children we educate for life in that world will need new coping skills if they are to live as productive citizens".

Furthermore, accelerated changes of the last decade in technology have brought discipline, curriculum and philosophical changes which are evident throughout many of the programs. This makes the deployment of technology in Lesotho an almost irresistible force. Accordingly, it is now important to give careful, systematic consideration to details that will have lasting impacts on the country's educational system; careful consideration given to all aspects of learning and technology that may impact the quality, efficiency, equity, and educational choices available to all students in Lesotho.

In this paper we confine ourselves to a consideration of information and communication technology. This is in essence a sub-set of the total field of technology. It is important to provide the context within which the research was completed. Lesotho is a landlocked country within the geographical area of the Republic of South Africa. It gained independence from Britain in 1966. Its present population is about two million people and its per capita income is approximately US$2000. It is a constitutional monarchy with a democratic form of government.

It has a relatively high literacy rate and the government emphasises the strategic importance of education in the socio-economic development of the country.

THEORETICAL FRAMEWORK & LITERATURE REVIEW

Like in most of the developing countries, the teaching of technology in Lesotho is currently falling behind the technological changes. This is in spite of the government's reform efforts in the development of intangible based learning activities in science and technology for all students in the country. These reforms are being introduced through the offering of Technology as a subject at College level. De Klerk Wolters (quoted by Kurt et al 2002:1) indicated that learning the concepts of technology is necessary and should be required for all students. This statement is supported by House (1988:634) when she maintained:

> *"These new bases are need by all students… not only tomorrow's scientists, - not only the talented and the fortunate – not only the few for whom excellence is a social and economic tradition. All students need a firm ground in mathematics, science and technology"*.

It is evident that understanding of technology is just as important for students in Lesotho as it is for those in other countries.

Chrita (2002:1) indicates that students are graduating into a world that necessitates knowledge of Information Technology skills. This is essential as the ability to manage, organize, analyse, and present information using technology as a tool is what will provide students with a competitive edge in the job market.

It was evident now, as it was then, that students are graduating into that world where success depends on their ability to use and understand Information technology. Regardless of where they will work

or what they will do, it will be necessary to use Information Technology to gather, analyse and exchange information quickly and accurately.

In view of all this, there is a growing consensus, importantly in the field of education, that it is essential for all students at any level to be technologically literate.

Consequently, to help students develop such literacy, de Klerk Wolters suggested that it is important to take into account their interests, opinions, and needs when developing a technological curriculum. It is equally important for an effective teaching of information technology that teachers have an understanding of students' knowledge of/and attitude toward technology (Kurt, et al., 2002:1).

THE STUDY

This study is a step in an attempt to gain a deeper understanding of the way in which some factors, such as classroom environment, teachers and students themselves, influence students' attitude toward information technology at the Lesotho College of Education. In effect, it is almost impossible to develop technological skills when factors that are related to the students' attitude toward technology as a subject are not identified as a mater of urgency, and feasible strategies and intervention programmes organised. These strategies might address the problem and encourage students in displaying a good attitude toward technology as a subject.

These views are supported by Oosthuizen(1994:57) who argues that teachers often have little knowledge about their students' feelings. She further observes that they are also not well informed concerning factors that influence and affect the students' attitudes and performance.

METHODOLOGY

RESEARCH DESIGN

It was decided that the case study approach be adopted. It was felt that it would more effective to study the attitudes of students at the main teacher training college in the country, as it would be more likely to yield additional accurate information. As the researcher is in the College of Education and has an intimate knowledge of its workings, it was considered that this advantage could be exploited in the collection of data. The case employed a questionnaire survey and an interview schedule to collect the data.

SAMPLE

For this study, three programmes were identified, as follows:

- Diploma in primary education students (DPE);
- Diploma in secondary education students (DSE); and
- Diploma in technology education (DIPTECH).

The methodology for this study was a stratified random sample of first year students registered for the 2003-2004 academic year across all these programmes, this is because of the non-homogeneity of its population and the sub-groups that are very different in size.

INSTRUMENTATION

For the purpose of this study, students responded to a combination of two self-report instruments, the Classroom Learning Environment Survey (CLES) and Attitudes Toward Science Scale (ATSS). The CLES was developed to assess constructive learning environments (Taylor & Fraser, 1991). Although the ATSS was originally targeted at middle school students (Misiti, Shrigley, &Hanson, 1991), it was adapted for the purposes of the present study; this was similarly done on the CLES.

Students indicated their responses on a five point Likert-type scale, anchored by 1 = Almost Always, and 5 = Almost Never. In modifying the two scales, an example was substituting the word science with technology. The CLES has been reported to comprise three subscales, namely, the classroom environment, students' characteristics, teachers' characteristics and attitude toward technology. Each of these had positive and negative items and this was considered in scoring, before data analysis. Table 3.1 shows typical questions relating to each subscale of the CLES as well as an example from the ATSS.

The qualitative phase involved interviews in which five students participated. Interviews were conducted in students' lecture rooms. This was intended to allow them to feel free in a familiar environment rather than, say, the researcher's office, which could be intimidating. Procedures were clearly explained to all the interviewees and they were allowed to ask any questions that may have concerned them. Based on the questions, the researcher assured students that any information provided would only be used for research purposes and that such information would not impact on their studies.

RELIABILITY AND VALIDITY OF THE INSTRUMENT

The Cronbach-alpha value of 0.82 for the complete attitude toward technology instrument was well above the recommended criterion of 0.70 (Gable 1986). In effect, it should be noted that a reliability coefficient of 0.80 or higher is considered as "acceptable" in most Social Science applications. The internal consistency values (Cronbach-alpha) computed, using data reported in this study, for all the sub-scales of the instrument are detailed in table below.

Table 1: Cronbach's Alpha Reliability

Scale	N	Cronbach's Alpha Reliability
Teacher characteristics	8	0.74
Student Characteristics	7	0.74
Classroom environment	27	0.65
Attitude toward technology	8	0.76

N= number of items in a scale

RESULTS

Participants in this empirical investigation to determine factors that influence students' attitudes toward technology at the Lesotho College of Education were 240 students of these, 200 responded by completing the questionnaire. This is a response rate of 83%, which can be considered a satisfactory result.They comprised, 116 (58%) DPE, 72 (36%) DSE and 12 (6%) DEPTEC students. There were 105 (53%) females and 95 (47%) males whose ages ranged between 21 and 35 years (M = 28, SD = 24).

The results were analysed by the use of two statistical analytical techniques, namely:

- The Pearson correlation technique;
- The regression technique.

These results were obtained by the SPSS package.

Correlation Analysis

The initial analysis involved establishing relationships between attitudes towards technology and teacher characteristics, student characteristics as well as the classroom environment. Table 2 shows the relationships

among these variables. It may be observed from the table that all the variables were moderately positively related with attitudes to technology ($p < .01$). This suggests that in situations where teacher characteristics, student characteristics and the classroom environment were perceived to be good then students had positive attitudes toward technology.

Table 2: Correlations between Attitudes towards Technology with Teacher Characteristics, Student Characteristics and the Classroom Environment (N = 200)

Variable	r
Teacher characteristics	0,41*
Student Characteristics	0,36*
Classroom environment	0,320

* $p < .01$

In order to have a better sense of the relationships established here, the factors defining the variables were then checked for their relationships with attitudes towards technology. In doing this, (a) teacher characteristics, defined by methods of teaching, teacher effectiveness and teacher support were correlated with attitudes towards technology. Similarly this was also carried out for (b) student characteristics, defined by student self-confidence, learning styles and student enjoyment, and (c) classroom environment, defined by satisfaction, friendship and support. Table 3 shows the relationship between attitudes towards technology and the factors defining teacher characteristics. The table indicates that attitudes towards technology were positively correlated with these factors although the relationship was weak.

Table 3: Correlations between Attitudes towards Technology with the Factors Defining Teacher Characteristics (N = 200)

Variable	r
Method	0.14*
Effectiveness	0.11*
Support	0.11*

* p < .05

Table 4 shows the relationship between attitudes towards technology and the factors defining student characteristics. Here, attitudes towards technology were found to be positively correlated with these factors although the relationship was weak. This suggests that students following good learning styles, who have self confidence and enjoy technology lectures, are likely to have good attitudes toward the subject compared with those who lack these defining factors.

Table 4: Correlations between Attitudes towards Technology with the Factors Defining Student Characteristics (N = 200)

Variable	r
Self Confidence	0.11*
Learning style	0.14*
Enjoyment	0.14*

* p < .05

Table 5: Correlations between Attitudes towards Technology with the Factors Defining the Classroom Environment (N = 200)

Variable	r
Satisfaction	0.17*
Friendship	0.11*
Support	0.18*

* $p < .05$

Classroom environment is a function of how satisfactory, friendly, and supportive the students perceive it to be. Correlation analysis indicated that the relationship between these factors and students' attitudes toward technology was also positive albeit weak (see Table 5). These findings suggest that a perceived supportive, friendly, and satisfactory classroom environment is linked to positive attitudes toward technology.

Regression Analysis

The correlation statistical analysis was followed by regression analysis. The latter is a statistical technique that enables the researcher to examine the relationship between the dependent variable and other independents variables.

This helped the researcher to determine how much variance was caused in the dependent variable "attitude toward technology" by one or a combination of other independent variables "classroom environment, teachers' characteristics, and students' characteristics".

Moreover, regression analysis helped determine which of the above independent variables is significant and a predictor of students' attitude toward technology.

Table 6

Variable	Coefficients	t-statistics
Attitude (y)		
Classroom environment (X_1)	0.312	2.958
Students' Characteristics (X_2)	0.344	4.415
Teachers' Characteristics (X_3)	0.253	3.874
Constant	0.423	1.038

$R^2 = 0.267$

$F = 23.845$

Reg: $R^2 = 0.256$

According to the regression analysis, as the above table shows, it can be observed that the explanatory variables; classroom environment (X_1), student characteristics (X_2), and teachers characteristics (X_3), have some power, to a reasonable extent, to influence the dependent variable- student attitude toward technology (Y), albeit moderately. This is reflected by the R square and adjusted R square of 0.27 and 0.26 respectively. Theoretically, this means that the variables account for between 26 and 27 percent variation in the student attitude toward technology.

The coefficients of the model indicate that the three regressors can be ranked in order to quantify their influence on the dependent, by starting with student characteristics (0.344), classroom environment (0.312), and then teachers' characteristics (0.253). Simply put, student characteristics account for 34 percent variation in their attitude toward technology, while 31 percent and 25 percent can be attributed to classroom environment and teachers characteristics respectively. Therefore, it can be concluded that if good student characteristics are harnessed along with a favourable classroom environment, this

can go a long way in improving students' attitude toward technology. It also goes without saying that, teachers' characteristics as a variable cannot be ignored as its effect to student attitude toward technology amounts to 25 percent.

It is interesting that the regression results are in line with the correlation results discussed earlier, although these display a different ordering. They further highlight the importance of classroom environment and the students' own characteristics in explaining how their attitude toward technology can be improved.

The constant term is quite significant as well at (0.42). This indicates that other variables that have not been included in the model account for 42 percent of the variation in the dependent (Y). In other words, even if the combined effect of all the variables that have been included in the model is negligible (zero), student attitude would still change as far as 42 percent.

Interview Objectives and Significant Observations

The purpose of the interviews was to "add on" what had been established from the quantitative study. The following are significant observations gleaned by the researcher. It was observed from the interviews that students' attitudes toward technology were not generally different from what the quantitative study had indicated. In fact, almost all interviewees acknowledged the importance of technology in their day-to-day lives. For example Thabo (a pseudonym) pointed out: "We live in a technology era, even if you don't like it you have to learn about and use it." There did not seem to be differences between females and males about how they saw and related to technology. For example, on the question: do you think males understand and use technology much more than females? Puleng (a pseudonym) retorted, "... not in this 21st century, there is no technology for man and another for woman."

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

Both the empirical research and the literature review conclude that the empirical study and the literature study on students' characteristics variables indicate that all three variables teachers, student characteristics and classroom environment, might play a significant role in influencing students' attitude toward technology as a subject.

The literature review and the empirical research also reported no significant relationship between gender and students' attitude toward technology as subject.

On gender roles, they revealed that the availability of female role models in scientific careers might remove existing gender role label and influence girls' attitude toward technology.

Recommendations for Future Investigation

Future investigation should replicate this study with respondents from other institutions of high learning in order to evaluate the generalization of these findings to all students;

Future investigation should further probe the influence of students' age on students' attitude toward technology;

It is recommended that future investigation further explore the influence of students' socio-economic and cultural background on their attitude toward technology;

It is also recommended that future research investigate the influence of students' prior knowledge and understanding of technology on the students' attitude toward technology.

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