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Preface

This second issue of the *Journal of Continuing, Open and Distance Education (JCODE)* contains nine articles covering various themes in the field of continuing, open and distance education. The first article by T.L. Adepoju focuses on managing non-formal education programmes towards improving employment rate in Nigeria. The findings revealed that there is a significant relationship between non-formal education programmes and employment rate.

The second article by J.G. Arowolo and Dangana I.A. presents results of a study on designing and usage of JAGA game and evaluating an experiment in attitudinal change and achievement among adult science students. Results showed that JAGA game did not only influence positive attitude but also enhanced students' knowledge of science. It was recommended that the use of JAGA game should be applied to all courses in tertiary institutions.

In the third article, O.Bowa explored the relationship between learner characteristics and academic performance of distance learners and reported that learner characteristics consisting of age, family size, entry academic qualification and supplementary income have a significant relationship with academic performance of learners. He recommends a review of the external degree curriculum, provision of educational support funds and enhancing the provision of guidance and counseling services to students.

The fourth article by B.Awe and D.Ofoha examined the perception of academics on quality assurance of academic programmes at the National Open University of Nigeria (NOUN). The results revealed that majority of academics were aware of the existence of internal quality assurance measures and a significant proportion rated NOUN as a quality-conscious institution but few believed the course materials were constantly reviewed, revised and updated. However, some academics were perceived to lack the competence to write course materials. The establishment of quality assurance committees in schools is recommended.

G.Mboroki presents a conceptual argument in the fifth article. He looks at distance education as both a product and a process. The author explores various reasons that have led countries to adopt distance education as a challenge to the now traditional mode of classroom delivery. He concludes by

first clarifying the actual purpose of education and then presents both product and process as reflections of sociological functionalism.

P.N. Keiyoro, C.M. Gakuu and H.J. Kidombo looked at the relationship between school environment and use of ICT in teaching science curriculum in Nepad and Cyber e-schools in Kenya in the sixth article. The results showed that the location of the school, source of power supply and physical factors had a significant relationship with use of ICT for teaching and learning science subjects. It is concluded that the location of the schools, access to internet, availability of electricity supply and the physical environment within the school, play a major role in the effective utilization of ICT in teaching and learning science subjects. It is recommended that schools invest in ICT infrastructure and a national ICT training strategy be developed to guide the improvement of the school environment to make it more supportive of ICT integration in learning and teaching science subjects.

The seventh article by R.O. Nyonje and N.D. Kyalo examined the factors influencing access to professional development of secondary school managers in Kenya and the prospects for distance education. The study established that although many school principals had accessed professional development programmes, a significant number had not. Most of those yet to access the programmes were female principals, who cited family responsibilities as a cause. An open and distance learning mode was recommended to enhance access for all principals of secondary schools in Kenya. This delivery mode was considered suitable due to its timelines, flexibility, cost-effectiveness, and learner friendly aspect.

C.M. Rambo and P.A. Odundo in the eighth article present results of a study on financing practices adopted by distance learners enrolled in the Bachelor of Education (Arts) programme at the University of Nairobi, Kenya. The findings showed that distance learners adopted two broad categories of financing practices: personal means and institutional funding. While financing from personal means was generally inadequate and unsustainable, institutional funding was largely inaccessible, unaffordable and inadequate. This crystallized the need for a dependable financing program for distance learners. A case is made to amend the Higher Education Loans Act to allow for financing of distance learners, strengthen Constituency Development Fund (CDF) and

micro-finance programmess and encourage employers to support vulnerable learners.

The ninth article by J.K. Mbvesa analyzed the instructional effectiveness of asynchronous e-learning environments with specific focus on the Wedusoft e-Platform at the University of Nairobi. The results indicated that Wedusoft is an effective learning management system. There were no significant differences in learning outcomes between students taking online classes and those engaged in conventional face-to-face tutoring. The study recommends the need to encourage institutions to adopt e-learning as an instructional tool, through building a community of e-learning adopters within the university; strengthening the technology infrastructure; adopting a clear institutional policy on e-learning; and encouraging appropriate staff development, collectively as well as individually, to facilitate the success of e-learning.

Editor

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

- Deadline for submission of completed papers is on 31st October of every year for the January issue and 30th March for the June issue.
- The editorial board reserves the right to reject or accept contributions by authors and will communicate the decision to the respective author (s).
- Email your articles to the addresses below:

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Notes to Contributors

JCODE 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.

- i. 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 mentioned (corresponding author should be indicated if different from first author).
- ii. 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.
- iii. Articles should not exceed 7,000 words.
- iv. The article should be typed in Times New Roman, Font size 12, double-spaced and the format should be compatible with Microsoft Word.
- v. The submitted full length papers should contain the following: title, names of authors and affiliation, abstract, introduction, context, methods, findings, discussion, recommendations, conclusions and Bibliography or References [Choose one, but for an article, we suggest the former]
- vi. Citations should be the American Psychological Association (APA). Footnotes should not be used.
- vii. A paper already published or under consideration for publication elsewhere (wholly or substantially) cannot be accepted.
- viii. Manuscript should be in British English.

- ix. Headings can be used up to a maximum of two levels. Only essential tables, diagrams and illustrations will be published.
- x. Tables and figures with their caption should be submitted separately from the text (on a separate page and at the end of the file), but captions must be included in the text at the appropriate place. They must be 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.
- xi. Tables should be clear without reading the text.
- xii. Column heading should be brief and clear. Vertical lines should not be used to separate columns. Any necessary explanation essential for understanding the table should be given as a footnote at the bottom of the table.
- xiii. Diagrams produced by graphical computer programmes are only acceptable if their quality matches that of handmade diagrams.
- xiv. Formulae should be numbered in Arabic numbers serially at the right-hand side in parentheses. They should be type written. Give the meaning of all symbols immediately after the equation in which they are first used.
- xv. All references cited in the text must be listed at the end of the manuscript. In the text, refer to the author's name (without initials) and the year of publication. The APA style of referencing is recommended.

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 and 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 those of 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 2 copies of the journal.

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MANAGING NON-FORMAL EDUCATION PROGRAMMES TOWARDS IMPROVING EMPLOYMENT RATE IN NIGERIA

T. L. Adepoju

Abstract

The study examined the relationship between the organization/implementation of non-formal education programmes (intervention programmes instituted by some international organizations) and unemployment rate in Osun State, Nigeria. This is with a view to determining the effectiveness of non-formal education programmes as an alternative approach to manpower development and reduction of unemployment in Nigeria. A descriptive survey research design was adopted for the study. The target population for the study consisted of 74 instructors and 1,555 participants in non-formal education programmes in the state under consideration. Stratified and proportionate sampling techniques were utilized to select 410 participants and 50 instructors for the study (this represents 26.4% and 67.6% of the total population, respectively). The major instrument used for the study was a questionnaire titled: 'Non-formal Education and Employment Rate Questionnaire (NEERQ)'. This was supported with a structured interview guide and available records in the vocational training centres. The reliability co-efficient of 0.72 was obtained for the research instrument at 0.05 alpha level, using Kuder Cronbach alpha formula. The three hypotheses generated for the study were tested using chi-square and t-test statistical methods at 0.05 alpha level. The findings of the study revealed the following: (i) There was a significant relationship between non-formal education programmes and employment rate.

Background of the Study

The need for countries all over the world to meet the global changes and accompanying challenges in recent times, has necessitated the adoption of several approaches and various methods of imparting appropriate skills to their citizenry, in order to earn a living. Several policies were also implemented in both developed and less developed nations in recent times towards realizing the World Education Goals; Education For All (EFA) set at Jomtien, Thailand; and Dakar Framework of Action, in Senegal, in 1990 and 2000 respectively, and more recently, the Millennium Development Goals (MDGs).

2 Managing Non-Formal Education Programmes

The establishment of several agencies and commissions in Nigeria, such as the National Commission for Mass Literacy (NCML) and the Adult and Non-Formal Education Commission (ANEC) by Decree 17 of 1990, with very clear mandates in the areas of monitoring, co-ordination and research on adult education, gave a new impetus to adult education activities in Nigeria. State agencies for mass education were also established in the 36 states of the federation and in Abuja (the nation's capital), to implement adult education programmes. Regarded as part of Nigeria's response to the Jomtien Declaration, the NCML provides the lead as envisaged in mobilizing support for the participants in mass literacy delivery. This paper presents the activities and programmes that have proceeded in adult and non-formal education, and documents the responses to emerging challenges in the field since 1999 (FME, 2003).

Emerging developments have expanded both the scope and target population of adult and non-formal education, introducing challenges to which policy must, of necessity, respond. Regional trends, for instance, have emerged which call on states to respond to peculiar realities. Adult and non-formal education programmes have therefore had to plan for the high drop-out rate among school boys in the southeast, low girl-child participation in education in the north, and integration of elements of basic education into Qur'anic schools, also in the north. The challenge of equipping these young people with literacy as well as marketable skills is a major gap which adult education programmes aim at filling.

According to Akintayo (2004), at the national level, the low learning achievement being recorded across the country among school children is fast expanding the task of providers and beneficiaries of adult education. Whereas it was easy in the past to assume that length of schooling correlated with literacy attainment, learning achievement tests tell us that it is no longer possible to do so as competencies have drastically dropped (Akintayo, 2004). With this increase in the number of "schooled" illiterates, as it were, adult education has to cater not only for the education of youths and adults but that of children as well.

In order to cater for the needs of these varied categories of clientele, adult and non-formal education programmes generally on offer are: basic literacy, post-literacy, women education, functional literacy, nomadic education, continuing

education, Arabic integrated education, literacy for the blind, worker's education, vocational education, literacy for the disabled and prison education. These programmes are offered in the various states under the supervision of the various State Agencies for Mass Education.

These various training systems took many forms depending on a particular environmental need and prevailing circumstances. About 100 years ago, lawyers, doctors and a host of others were not trained in the formal school system. Training was handled through apprenticeship programmes or under practitioners. It is also evident that various skills for job placement were organized outside the formal educational systems, such as skills for woodcarving, blacksmithing and making of various implements such as leather works. Pottery; weaving and so on (Umaru, 1985; World Bank, 1996; Anyanwu, 2000; Idowu, 2000; Akintayo, 2004) were acquired through non-formal educational processes.

Akintayo (2004) remarks that in Africa, and Nigeria in particular, non-formal education is not as new as often claimed by some people. It is on record that before Africa was colonized, she was able to satisfy her technical and vocational needs, prominent among which were the making of tools and the urge to acquire various forms of skill training to conquer human environment. The teaching and learning of such skills was socially defined in the past and it was through inheritance within the family circles as the case may be. But through historic neglect brought about by the colonial process, these ancient vocational skills are increasingly breaking away to be replaced by the "imported" 10th century vocational skills which were ill suited to the situation of the poor nations trying to modernize themselves (Coombs, 1990; Omolewa, 1997; Federal Ministry of Labour and Productivity, 1999).

Furthermore, various studies (UNDP, 1997; Akintayo, 1998) have shown that the use of non-formal education, including vocational education for poverty and mass unemployment reduction, dates back to the period of the first and second world wars. The United Nations Development Programme (UNDP, 1997) reported that the labour exchange and employment offices were established to train people in vocational skills for meaningful employment after the wars in both developed and developing countries. However, observations show that attempts by successive governments in Nigeria at reducing poverty, hunger and unemployment syndromes remain futile due to

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the peoples' lack of skills and apathy to non-formal education that can provide vocational skills for self-reliance (Akintayo, 1998).

Non-formal education as a major way for providing vocational education is not only a means of acquiring occupational skills for work but also a means of acquiring other productive assets (UNDP, 1996). In the same vein, the International Labour Organization (ILO, 1995) and the World Bank (1995) attributed frequent labour turnover, inefficient use of industrial technology and the delay in eradicating unemployment syndrome, poverty and illiteracy in Sub-Saharan Africa, and especially in Nigeria, to peoples' lack of skills and repudiation of non-formal education, which promoted vocational education. It is perhaps in the realization of the goal of non-formal education to provide people with technical knowledge and vocational skills required for employment, that the UNDP supported a variety of vocational skills acquisition and training programmes for mass unemployment and poverty within the last one decade in different parts of the country (Ojo-Ajibare, 2002).

According to Adepoju, Akande and Adeyemi (2010), there is high correlation between education and economic growth, the world over. This connect could however be explained in terms of the level of development being recorded in such countries (see Table 1).

Table 1 illustrates that education is one of the factors that explains economic growth, but the explanation varies depending on the level of development a country has attained. For instance, in Table 1, except for Canada, Ghana, Argentina, Nigeria, South Korea and the United States, there seems to be a low relationship between economic growth rate and education. The higher the economic level of the country, the smaller the contribution of education to economic development (Morote, nd). Over the years, there seems to be a remarkable contribution of education to economic growth and national development in Nigeria as shown in Table 2.

Table 1: Percent of the Economic Growth Rate (by Country) Explained by Education

Country	Growth Rate Explained by Education Until 1970s	Country	Growth Rate Explained by Education Until 1970s
Europe		North America	
Belgium	14	Canada	25
United Kingdom	12	United States	15
Denmark	4		
Germany	2		
Latin America		Asia	
		South Korea	15.9
		Malaysia	14.7
Argentina	16.5	Japan	3.3
Honduras	6.5		
Ecuador	4.9		
Chile	4.5		
Colombia	4.1		
Peru	2.5		
		Africa	
		Ghana	23.2
		Nigeria	16.0
		Kenya	12.4

Source: Psacharopoulos (1988)

Table 2: Trends in the Contribution of Higher Education to Economic Growth and National Development

Year	Education's Contribution to National GDP		University's Contribution to National Productivity	Non-University
	Actual	% Contribution	% Contribution	% Contribution
1990/91	4,955.15	1.33	0.12	1.21
1991/92	4,979.64	1.33	0.20	1.13
1992/93	5,046.82	1.33	0.17	1.16
1993/94	5,116.40	1.33	0.08	1.25
1994/95	5,151.69	1.34	0.06	1.28
1995/96	5,150.22	1.31	0.06	1.25
1996/97	5,222.77	1.28	0.13	1.15
1997/98	5,267.37	1.26	0.08	1.18
1998/99	5,311.97	1.24	0.09	1.15
1999/2000	5,356.57	1.24	NA	NA
2000/2001	5,401.18	1.20	NA	NA
2001/2002	5,445.78	1.13	NA	NA
2002/2003	5,490.38	1.12	NA	NA

Source: Babalola (2007).

Table 2 shows the trends in the contribution of higher education to economic growth and national productivity in Nigeria. From Table 2, except in 1991/92, when the percentage contribution of higher education to national productivity rose to 0.20, the succeeding years recorded downward trends. In 1996/97, the contribution rose again to 0.13, from 0.06 in the preceding year. The story in the case of the percentage contribution of non-university was different. Throughout the period under consideration, there seemed to be a predominant increase in the percentage contribution of this sector over that of the university sector. While that of the university contribution is less than 1 (<1), non-university recorded more than 1 (>1). The implication of this scenario is that, over the years, the Nigerian government's educational priority had long shifted from higher education to lower levels, particularly since the 1990s. This fact was also expressed by Babalola (2007) and Adepoju and Fadokun (2009).

Despite the growth and national development recorded over the years, with regard to education, as shown in Table 2, the period, 1990-2000 witnessed a great decline in the growth of employment in the manufacturing industries. However, a fast growth rate in the output of these industries was achieved. Table 3 shows the Nigerian experience in employment decline.

Table 3: Percentage of Growth, Rate of Employment and Value Added of Nigeria Manufacturing Industries

Year	Number Employed (in Thousands)	% Rate of Growth	Value Added	% Rate of Growth
1990	108.1	-	300.6	-
1991	126.5	24.3	386.4	35.6
1992	135.3	12.3	436.0	12.0
1993	162.4	14.3	488.6	11.3
1994	160.2	-0.8	620.4	18.6
1995	168.7	4.7	626.3	16.3
1996	194.6	32.7	2,111.2	66.3
1997	233.2	9.8	2,621.4	41.8
1998	294.6	14.3	2,886.1	6.3
1999/2000	308.1	-3.6	3,748.6	30.7

Source: Federal Office of Statistics (2001).

Table 3 indicates that the growth rate of employment in the manufacturing industries ranged from -0.8% in 1993 to 32.7% in 1995. On average therefore, employment grew by about 10% . On the other hand, the rate of growth of value added ranged from 6.3% in 1997 to 66.3% in 1995. The average rate of growth was 18% . These figures clearly show that output grew at an impressive rate. However, much cannot be said of employment opportunities for young graduates (Akintayo, 2004).

There has been a steady increase in enrolment for adult education from the 696,367 figure of 1990 and 503,071 of 1991 (SAPA, 1993). NMEC reports an enrolment figure of 546,256 in 1991 and 1,143,737 in 1996 (consisting of 603,906 males and 539,831 females). Generally, from 1991 to 1996, the Comprehensive Education Analysis (CEA) observed an increase in enrolment by gender from 310,113 for males and 236,143 for females in 1991, to 603,3099 for males and 539,831 for females in 1996. The NNMC Statistical Digest (2001) published the following enrolment figures for 1997-2000.

Table 4: Enrolment in Literacy Classes (1997-2000)

Year	M	F	Total
1997	598,166	557,366	1,555,532
1998	666,131	598,130	1,264,289
1999	712,326	605,370	1,317,696
2000	701,798	705,156	1,406,955

Source: NNMC Statistical Digest (2001)

The figures in Table 4 show a progressive increase in enrolment, from a total of 1,155,532 participants in 1997 to 1,406,954, in 2000. Among the states, the highest enrolment for 2000 came from Edo, which recorded 144,250 while the lowest came from Bayelsa with 400 participants, followed by Enugu State, with 3000 participants (FME, 2003).

Although the 2000 figures did not provide actual graduation figures, other NNMC publications show a total basic literacy output of 3,073,983 between 1995 and 1997. A summary table of successful completion of mass literacy programmes from 1990 to 1997 shows a progression of 543,020 in 1997, from

a figure of 382,520 in 1990. The CEA lauds the increase in female participants from 37.3% in 1990, to 44.6% in 1997. But mobilization efforts are still required to maintain the momentum.

Quoting the Manufacturers Association of Nigeria (MAN), Ogidan (2001) reported that 11,907 workers from 18 registered industrial unions lost their jobs between 1994-1999 due to the interactive effects of obsolete skills and redundancy, poor nutrition, ill health and low productivity. Kale (1996) contends that some Non-Governmental Organizations (NGOs) such as Global Zoo, the World Health Organization (WHO), and the United Nations Children Fund (UNICEF) made available US \$14 million for treating about 653,620 cases of ailing individuals, unemployed and underemployed people, as well as people who lost their jobs due to lack of adequate vocational skills that could enhance their chances for better employment or self employment.

A programme of the government with serious repercussions on employment is education (FME, 2003). The primary objective of education in a developing country like Nigeria should be to meet the manpower requirements of the country. The Ashby Commission Report of 1960 apparently had this in mind when it remarked: "It would be a short-sighted policy to allow the educational system of a country to be controlled by consumer needs for manpower." Observation from the assessment of the situation shows that this objective of education has been perverted and excessive emphasis has been placed on formal education, devoid of much vocational training and skills.

Statement of the Problem

Non-formal education is a major way of providing vocational education and a means of acquiring occupational skills and other productive assets. In the same vein, some organizations (International Labour Organization, 1995; World Bank, 1995) have attributed frequent labour turnover, inefficient use of industrial technology and the delay in eradicating the unemployment syndrome, poverty and illiteracy in Sub-Saharan Africa, and especially in Nigeria, to peoples' lack of skills and repudiation of non-formal education, which promoted vocational education. It is perhaps in realization of the goal of non-formal education to provide people with technical knowledge and vocational skills required for employment that the UNDP supported a variety of vocational skills acquisition and training programmes for mass unemployment and poverty within the last one decade in Nigeria. Despite

some of the intervention programmes instituted by some of these organizations (the United Nations Development Programme [UNDP]; National Directorate of Employment [NDE]; the International Labour Organization [ILO]; Family Support Programmes [FSP]; and Poverty Alleviation Programme [PAP]), the rate of unemployment in Osun State has been a serious concern over the years. This study therefore aims at establishing the relationship that exists between the organization/implementation of non-formal education programmes (intervention programmes instituted by the organizations mentioned above) and unemployment rate in Osun State, Nigeria. This is with a view to determining the effectiveness in the way these programmes have been managed as an alternative approach to manpower development and reduction of unemployment in the state.

Objectives of the Study

This study has the following specific objectives.

1. To examine the relationship between non-formal education and rate of unemployment in Osun State, Nigeria.
2. To establish the relationship between non-formal education and occupational mobility in Osun State, Nigeria.
3. To determine whether there is a difference between the quality of life of the participants and non-participants in non-formal education programmes in Osun State, Nigeria.

Hypotheses

The following null hypotheses were formulated to pilot the study.

- H0₁:** There is no significant relationship between non-formal education and reduction in the rate of unemployment in Osun State, Nigeria.
- H0₂:** There is no significant relationship between non-formal education programmes and occupational mobility in Osun State, Nigeria.
- H0₃:** There is no significant difference between the quality of life of the participants and non-participants in non-formal education programmes in Osun State, Nigeria.

Research Methodology

The present study is a descriptive survey, and for this purpose, a descriptive research design was adopted. The target population of the study consisted of the 1, 555 participants, 510 non-participants and 74 instructors, who were directly involved in non-formal education programmes in Osun State. The

sample of the study consisted of 200 non-participants, 410 participants and 50 instructors. A total of 660 subjects were involved.

The selection of the sample was based on the stratified sampling method. The stratification was based on the 5 organizations earlier identified, which were directly involved in the study (see Table 5). One set of instruments was employed to collect data in the study. The investigator specifically developed a questionnaire entitled “Non-formal Education and Employment Rate Questionnaire (NEERQ)”. The NEERQ was developed to elicit personal information in Section A, and information on vocational training opportunities from the respective respondents in Section B. The questionnaire was supported with a structured interview guide and available records in the vocational training centres. The instruments were validated by 5 research experts. The reliability of the instruments was done using the Kuder Cronbach alpha formula and the reliability coefficient obtained was 0.72.

Table 5 (A): The Stratification of the Participants and Instructors by Organization
N=460

S/N	Organization	Programmes	Non-Participants Population	Sample Size	%
1	National Directorate Employment (NDE)	Vocational Training Programme	147	127	86.4
2	International Labour Organization (ILO)	National Open Apprenticeship Scheme	110	90	81.8
3	United Nations Development Programme (UNDP)	Integrated Rural Fishing Development Training	55	35	63.6
4	Family Support Programme (FSP)	Vocational Training Programme	121	101	83.5
5	Poverty Alleviation Programme	Vocational Training Programme	77	57	74.0
	TOTAL		510	410	80.4

All the participants returned their questionnaires and responded positively to the questions. This represents a return rate of 100%. Data collected was analyzed using chi-square and t-test statistics. The significance level adopted

for accepting or rejecting the hypotheses was 0.5 alpha level. If the calculated chi-square value is greater than the critical value, then the hypothesis would be rejected and if otherwise, the hypothesis stands to be accepted.

Table 5 (B): Stratification of the Non- Participants by Organization N=200

Organization	Programme	Participant Population	Sample Size	%	Instructors	Sample Size	%
National Directorate Employment (NDE)	Vocational Training Programme	438	127	29.0	20	13	65.0
International Labour Organization (ILO)	National Open Apprenticeship Scheme	311	78	25.1	15	12	80.0
United Nations Development Programme (UNDP)	Integrated Rural Fishing Development	130	30	23.1	9	6	66.7
Family Support Programme (FSP)	Vocational Training Programme	402	108	26.9	18	12	66.7
Poverty Alleviation Programme	Vocational Training Programme	274	67	24.5	12	7	58.3
TOTAL		1,555	410	26.37	74	50	67.57

Study Findings

H0₁: There is no significant relationship between non-formal education and reduction in the rate of unemployment in Osun State, Nigeria.

Table 6: Chi-square Statistic of Relationship between Non-formal Education and Rate of Unemployment

Variable	Non-formal Education	Rate of Unemployment	df	X ² – cal	X ² – Crit.	P
Observed	201	315	2	42.57*	5.99	S
Expected	159	145				

* Significance P < 0.05

The analysis in Table 6 shows that the chi-square value of 42.57 is greater than the critical value of 5.99 at P < 0.05 alpha level. By this result, the null hypothesis earlier formulated, that there is no significant relationship between non-formal education and reduction in the rate of unemployment in Osun State, Nigeria was rejected.

H₀₂: There is no significant relationship between non-formal education programmes and occupational mobility.

Table 7: Chi-square Statistic of Relationship between Non-formal Education Programmes and Occupation Mobility in Osun State

Variable	Non-formal Education Programme	Occupational Mobility	df	X ² – Cal	X ² - Crit	P
Observed	264	278	2	34.81*	5.99	S
Expected	196	182				

* Significance at P < 0.05

Table 7 shows that the chi-square calculated value of 34.81 is greater than the critical value of 5.99 at P < 0.05 level. The analysis shows that a significant relationship existed between non-formal education programmes and occupational mobility, on the part of the participants. The earlier hypothesis formulated, which states that there is no significant relationship between non-formal education programmes and occupational mobility in Osun State, was therefore rejected. The findings of the study show that occupational mobility and non-formal education programmes in the state are significantly related. The participants were able to move from one occupation to a better occupation, having completed such programmes.

H0₃: There is no significant difference between the quality of life of the participants and non-participants in non-formal education programmes.

Table 8: T-test Statistic of the Difference between Quality of Life of the Participants and Non-participants of the Non-formal Education Programmes

Variable	N	X	Sd	df	t-cal	t-crit	P
Participants	410	56.4	16.7	608	14.12*	1.96	S
Non-participants	200	32.8	24.4				

* Significant at P <0.05

Table 8 shows that the calculated t-test value (t-cal) of 14.12 is higher than the critical (t-crit) value of 1.96 at P <0.05. This reveals that a significant difference existed between the quality of life of the participants and non-participants of the non-formal education programmes in Osun State. The earlier hypothesis, that there is no significant difference between the quality of life of the participants of non-formal education programmes in Osun State was rejected. The findings have shown that the quality of life of the participants of non-formal education programmes improved tremendously, having completed the programmes, because they were able to change their occupations to a better one.

Summary of Findings

1. There was a significant relationship between non-formal education programmes and employment rate in Osun Sate (X^2 -cal = 42.57; X-crit = 5.99; df = 2; p <0.05),
2. There was a significant relationship between non-formal education programmes and occupational mobility (X^2 -cal = 34.81; X-crit = 5.99; df = 2 P <0.05).
3. There was significant difference between the quality of life of the participants and non-participants in non-formal education programmes (t-cal = 14.12; t-crit = 1.96; df = 608; P <0.05).

Discussion of Findings

The findings of the present study reveal that non-formal education programmes played a significant role in reducing the rate of unemployment in Osun State, Nigeria, over the years. The implication of this finding is that the vocational and technical education of the non-formal education programmes

has increased the level of competency and provided the participants with much-needed skills and expertise. Thus, the observed imbalance in the demand and supply of labour in the state has reduced tremendously. This finding supports the study conducted by Adeyeye (2002) 'The influence of apprentice training on skill development in printing industries, in Lagos State' who found that functional skills are capable of providing opportunities for self-reliance, Ojo-Ajibare (2002) 'Poverty reduction through vocational education. A study of UNDP assisted programmes in southwestern Nigeria' who found that vocational education is capable of reducing poverty level and Akintayo (2004) 'The influence of non-formal education programmes on reduction in the rate of unemployment in Oyo State' who established some relationships between vocational education programmes and employment .

In their respective studies, non-formal education was found to have provided functional skills, which are capable of providing opportunities for self-reliance. The finding of the study has also increased the chance of the participants embarking on small-scale productive, this corroborates the finding of Idowu (2000) who found out that some Intervention education programmes are useful for the reduction of street children in Oyo State.

The findings of the present study indicated that there is a correlation between non-formal education and occupational mobility of the participants in Osun State. This finding is in agreement with the findings of Zymelman (2003) and Akintayo (2004), who established some relationships between non-formal education and occupational mobility of the participants. In their respective studies, due to the job-oriented nature of non-formal education, this has contributed to the occupational mobility of participants.

The findings also show that non-formal education is professionally oriented and is capable of developing the skills required for industrialization. The quality of life of the participants in non-formal education programmes is many moves tending towards getting good employment, getting good salaries and living a comfortable life than the non-participants. This finding corroborates the findings of Idowu (2000), Zymelman (2003), Akintayo (2004) and Anyanwu (2000). In their separate studies, they argue that non-formal education programmes have far-reaching effects on citizens and are capable of enhancing socioeconomic development and the welfare of the community.

Conclusion and Recommendations

The study has examined the relationship between organization and implementation of non-formal education programmes and rate of unemployment in Osun State, Nigeria. It has been established in the study that organization and implementation of non-formal education programmes facilitated the establishment of small-scale businesses by the majority of unemployed graduates who participated in non-formal education programmes in the state over the years. The study has also submitted that non-formal education could possibly serve as an alternative approach to manpower development programmes that are focused on vocational training for the adult population in the developing countries of the world.

The study recommends that the support of both governmental and non-governmental organizations, in cash and kind, for reflective implementation of non-formal education programmes for self-reliance should be persistent and encouraged for sustainable socioeconomic development. Further, the curriculum for non-formal education should be focused more on vocational education and be subjected to continuous review, in order to afford the participants the chance of occupational mobility and meet the challenges of constant changes in the industrial environment in Nigeria and other developing countries.

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DESIGNING JAGA GAME AND EVALUATING AN EXPERIMENT IN ATTITUDINAL CHANGE AND ACHIEVEMENT AMONG ADULT SCIENCE STUDENTS

J.G. Arowolo and I.A. Dangana

Abstract

This paper reports that certain activities are performed by people together, or singly, for fun. Fun as it applies here, connotes something that provides a feeling of enjoyment. These forms of activities are games in the real sense. Introducing something which people love to do into the learning environment, it is believed, can strengthen manpower development. This underpinned the designing and usage of JAGA game for enhancing adult students' knowledge in a science course. A total of 189 students (male and female) randomly selected from the Integrated Science department in 4 Colleges of Education participated in the study. Two instruments, ARQ and SRE, were developed, validated and used for data collection. The study lasted for an entire second semester of the 2009/2010 academic year. A research question and a hypothesis were answered and tested, respectively. A chi-square and t-test were employed as statistical tools. Results showed that JAGA game did not only influence positive attitude but also enhanced students' knowledge of science ($t\text{-test}=7.89 > t\text{-value}=1.97; P<.05$). It was recommended, among others, that the use of JAGA game should be applied to all courses in tertiary institutions as well as following an arrangement which enhances extrinsic and intrinsic motivation.

Key words: game, knowledge, learning environment, players, umpires.

Introduction

Adult participation in science courses is increasing internationally. However, current science courses often stand in the way of understanding, by featuring fleeting coverage of numerous topics, a barrage of esoteric vocabulary and tests that assess isolated scientific information (Linn, 1992). Investigation of students' beliefs about scientific knowledge revealed large individual differences. While some students have a realistic view of science and recognize the relationship between scientific knowledge as well as the complex scientific problems, others believe that the best way to learn science is to memorize rather than to understand (Bauiro, 2006). This second category of students

sees no relationship between the science they study in their science classes and the scientific debates in news media (Linn, Songer & Lewis, 1991). Equity and effectiveness go hand in hand, in science courses. To teach science effectively, therefore, to adult students, courses ought to:

- (a) Emphasize understanding, not memorization.
- (b) Respect students' ideas rather than labeling them as misconceptions.
- (c) Impart a view of science as dynamic rather than static.

Learning opportunities need to be extended over the whole life span and the need for new skills poses challenges that are not easily met by conventional structures and institutions. This deduction culminated into redefining the role of teachers, from being the sole source of knowledge as "an oasis in the desert", to being the facilitators of knowledge, and the active students' involvement in activities that attract their attention as well as motivates them. Like any medium, games are channels of communication with varying effects, with respect to the content of the game. Playing violent video games has being identified to have a role in increasing aggression, hostility and aggressive thoughts (Lachlan, Smith & Tamborini, 2005; Walsh, 2006). However, games with positive content help to reinforce habit strength. The *British Journal Nature* reported researchers' findings in 1998 that the brain releases dopamine which is a pleasure chemical during playing of video games.

Games are mental or physical in context and played according to rules. Games are usually played for fun but can also provide excitement, challenge and relaxation. Many games help to develop mental, physical and social skills. To play a game, a player may need a good memory, physical ability or an understanding of probabilities. Games may also require skills at guessing what players think or an ability to visualize changing patterns of items on a board. Games are categorized into: children's solitaire, cooperative, sports etc. Some games are designed for educational purposes. Such games may help participants to acquire specific skills. They can also teach adults to be skilled in performing a job adequately. According to the Encyclopedia Americana International (2003) and the World Book Encyclopedia (2006) games are grouped by the equipment used for playing into:

- (1) **Board:** players throw dice and move pieces around a track.
- (2) **Card:** played with only part of a standard 52-card deck (19 rot decks), which contains many symbolic face cards and is based on combination of skill and luck.

- (3) **Tile:** games of chance based on the random roll of objects called discs.
- (4) **Target:** involves propelling objects toward a target.
- (5) **Dice:** uses marked tiles made of wood, ivory, bone, stone or plastic and is played with dominoes.
- (6) **Table:** involves girding or striking a ball disk over a flat surface toward a goal.
- (7) **Paper and pencil:** developed from board games such as tic-tac-tie.
- (8) **Electronic:** consists of software sold in the form of cartridges or discs and requires additional equipment to be played such as video, computer, handheld and arcade games.
- (9) **Internet games:** have emerged with the popularity of the internet and going online. A player can participate in many kinds of game activities.

Game theorists have identified many types of games, which include **zero-sum games** (where players have opposite interests); **non-zero sum games** or **mixed-motive games** (where players have some interests in common); **cooperative games** (when players can agree on a plan of action) and **non-cooperative games** (when players cannot coordinate their choices). They propounded that game theory is a method of studying decision-making situations in which the choice of 2 or more individuals or groups influence one another. The situations here are the games while the decision-makers are the players.

Our (researcher and adult students) aim in this study was to focus on how educational delivery could be made more convenient by playing games. Instructional games have been devised for all areas of the school curriculum. Some of these games in social sciences at the elementary and secondary school levels relate to the labour market, elections or family interpersonal relationships, which are certain features of our social life. Gaming is an enjoyable teaching and learning exercise, however serious, and involves competition for special objectives and observed rules (NTI, 2008). The main features of a game in educational delivery are the presence of a fixed number of players, goal achievement and rule compliance. Abdulsalam and Arowolo (2010) identified the following factors as the role of games as instructional devices in the learning environment, amongst others:

- (a) Games have a powerful motivating effect that fulfills a function that may be missing in the classroom.
- (b) Games give the classroom a different feel of atmosphere.
- (c) Students (young and old) learn by themselves.

- (d) Games help to free the teacher from the task of disciplinarian judgment of students' performance.

Relying on the aforementioned, a JAGA game was designed and efforts were made to experiment upon its use in the teaching and learning of some concepts in a course by adult science students in selected Colleges of Education in Nigeria (north-central zone).

Objectives

The specific objectives of the experiment are meant to test the concept of using a game in the classroom:

- To extend learning opportunities over a whole life span for everyone using the game.
- To make teachers facilitators of knowledge, rather than being the source of knowledge.
- To actively involve students in learning science.
- To overcome mass failure in the course over time.
- To improve teamwork and time management skills.

The Problem

Studies that have analyzed the efficacy of teaching have highlighted the necessity of active students' participation in different disciplines. Didactical games in mathematics, interactive computer programme learning and video games have been proposed, in addition to specific methodologies. Innovative though these approaches may appear, they result in violence, hostility, aggressive behaviour, addiction and immorality, in some way. This study, conceding yet the crucial role of games in active participation of students in the learning environment, was carried out in comparison with the conventional lecture method.

Research Question

Can JAGA game influence adult students' positive attitudes towards the teaching and learning of a science course (ISC 226)?

Hypothesis

JAGA game improves adult students' knowledge of science concepts in ISC 226.

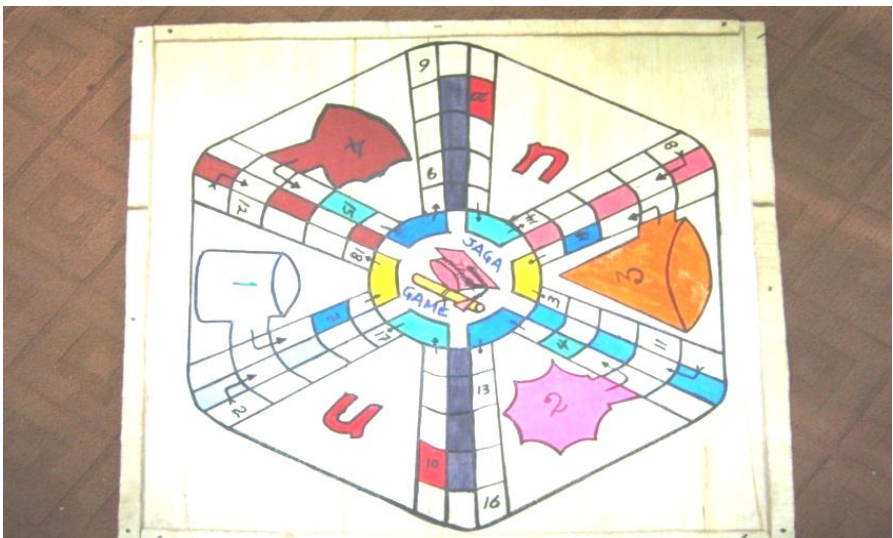
Methods

For some years, less than 30% of the students learning ISC 226 (magnetism, electrostatics, current electricity, mains electrical circuit and costing electric energy) had a credit pass and above. In the second semester of the 2009/2010 academic year, a JAGA game was designed as an instructional model to enhance students’ understanding of the course content at one federal and three state Colleges of Education in the north-central region of Nigeria. The participants were 189 randomly selected male and female students. Students’ interaction across gender is restricted in this part of the country. The learning prerequisites were for the students to gather materials and construct a board, then study the rules, and thereafter form groups.

JAGA Game Board

This is constructed by cutting a 50cm-square plywood. One of the surfaces of the board is painted with white colour for the background. Four homes are created on it and a number of cells drawn for tallies to move through. Each home has its peculiar colour with its tallies such as pink, blue, brown and orange. Three tallies are contained in each home. Some of the cells contain specific colours and numbers. Two dice made from wood are required and a dice case (film case).

Figure 1: JAGA Game Board (Arowolo, 2010)



Procedure

Students arrange themselves into groups of 6 each and pick numbers by balloting. The first 4 become the players while the remaining 2 serve as umpires (U). The umpires share the questions (up to 20, at least) equally based on the course contents. The players pick homes and take turns to play by throwing the dice. A player moves one of the tallies out of home only when at least one of the dices shows 1 dot face-up, and moves from there forward with surplus dots onto the second dice. In the course of moving, if a tally lands on a number, the umpire in possession of a question corresponding to the number asks the question. The player is expected to respond verbally to the question. If the question is on a red cell and the player gets it right, he/she scores 5 marks; if it is on a blue cell, he/she scores 3 marks; on green, 2 marks and on cells with number without colour, 1 mark. If, however, the player fails to give a correct answer to a question, and his/her tally lands on red, he/she returns home; if on blue, the tally is moved 5 steps backward; green, 2 steps backward and on no colour, 1 step backward. If the backward movement necessitates landing on a number, the procedure applies. Once a question has been answered correctly, it is not repeated again. The scores of each player are totaled to determine the winner.

Instruments

Two instruments were developed and used in this study. Adult Reaction Questionnaire (ARQ) was constructed to measure participants' attitude towards the teaching and learning of the course (ISC 226, Appendix 1). It contained 15-item statements with 4 different opinion options: A, B, C and D, from which participants were to make a choice. It was administered at the beginning and at the end of the course lecture. The results of the participants' responses for the 2 attempts were compared. The second instrument was the Success Rewarding Evaluation (SRE). It contained 5 short structured questions drafted by the researcher, based on the course content, with mixed up fill in the gaps as well as an alternative to a practical test, for 30 marks. It tested overall understanding of the course content, with respect to students' acquired ability in description, calculation, application, recall, understanding, analysis and drawing.

Validation of Instruments

The questionnaire (ARQ) was presented to one science lecturer at a university in the southwest of Nigeria as well as 2 psychologists, for its suitability. The

inter-rater reliability was determined by Scott’s π to be 0.83. A refined copy of the draft was administered on 50 physics students of equivalent category as the participants. Its reliability coefficient was 0.69 using Cronbach alpha. SRE was also made available to 2 university dons for moderation and was trial tested on the same 50 physics students. Its difficulty index was 0.48 while the reliability coefficient was 0.77 using KR 20.

Results and Discussions

The data collected with ARQ were analysed through Chi-Square (X^2), whereas the scores from SRE were subjected to a t-test analysis to test the hypothesis.

Table 1.1: Chi-Square Test of Pre and Post JAGA Game Participants’ Scores on Attitude

Administration	A	B	C	D	X^2
Pre	452(544.96)	555(483.53)	799(587.31)	108(248.20)	
Post	1072(884.04)	647(718.47)	661(872.69)	509(368.80)	335.28

*Expected frequency in parenthesis

Table 1.2: Chi-square Test of Pre and Post Non-JAGA Game (Lecture) Participants’ Scores on Attitude

Administration	A	B	C	D	X^2
Pre	736(744.58)	740(744.58)	718(735.01)	311(310.62)	
Post	743(734.42)	739(734.42)	742(724.99)	306(306.38)	0.735

*Expected frequency in parenthesis

Table 1.3: t-test of the Significance of JAGA Game on Participants’ Knowledge

Group	N	X	SD	t.cal	t.crit	Sig (P)
JAGA Game	87	45.07	14.27	7.89	1.97	S
Lecture	102	33.16	6.45			

The result of the analysis of the pre- and post-intervention scores in Tables 1.1 and 1.2 above reveal a significant difference in adult students' attitude between pre- and post-intervention in the group that played JAGA game ($\chi^2\text{-cal} = 335.28 > \chi^2\text{-crit} = 7.815$; $df = 3$). There was not much difference registered in these adult students' attitude between pre- and post-intervention in the group that used the conventional method ($\chi^2\text{-cal} = 0.735 < \chi^2\text{-crit} = 7.815$; $df = 3$). These findings indicate that the use of JAGA game can influence adult students' positive attitude towards ISC 226, teaching and learning, than is the case with the conventional method. Similarly, results in Table 1.3 indicate that a significant difference of adult students' knowledge of concepts in ISC 226 existed between those that played JAGA game and those who study via the conventional method ($t\text{-cal} = 7.89 > t\text{-cal} = 1.97$; $p > .05$). As a result, the hypothesis was not rejected. This means that JAGA game has created an enabling environment, which allows sharing of ideas that culminated in improvement in the knowledge of concepts in ISC 226 than in the conventional group. These findings indicate that JAGA game did not only improve participants' fact differentiation and recall processes, but equally promoted problem-solving skills by recognizing multiple solutions to problems. Though, both groups learned the course, the experimental group (JAGA gaming) had a better understanding of factual materials and concepts due to the fact that they had to commit details to memory, despite the fact that they were just playing a game.

The findings in this study corroborated the submission of Brooker (2000) and Vankus (2005), that psychological effects of didactical games had an influence on pupils' mathematical knowledge. The use of JAGA game as revealed from the findings agrees favourably with the aim of the study. The game was responsible for increased adult students' inner motivation as well as proportional knowledge improvement and their positive changes in attitude towards the course. This was apparent since all the students became aware that they were free to interact with one another in a fun-filled atmosphere, while learning at the same time. Thus, playing the game outside class hours became the order of the day.

Furthermore, considering Skinner's postulate on the many principles of a powerful learning paradigm termed as "operant condition", Neumann and Morgenstern (1980) take credence from the Energization Theory of Motivation and Emotion (ETME). They opine that games can predict effort

and provide energy mobilization for a difficult but not impossible task, where success is rewarded. Braun and Giroux (1989) as well as Dill and Dill (1998) have reported in their studies that video games use mostly positive reinforcement on a schedule that is known to reinforce habit strength. This correlation supports the outcome of an experiment by Burgess, Stermer, Burgess, Brown, Dill and Collins (2007) which showed that exposure to a video game with African-American characters, increased recognition of violent stimuli as compared to exposure to a video game without African-American characters. The findings of this study support these submissions. JAGA game, as revealed in this study, became an interactive media for various units of the course that provided an excellent model for learning. The use of JAGA game is an excellent instance of what ETME purports to be the most highly motivating tasks. Students' participation increased their knowledge acquisition, culminating in their making an easy strategy for understanding the likely fearful concepts in the course.

Conclusion

Different from other research studies that investigated video games (computer-based), this study confined itself to the impact of JAGA game on students' attitude towards, and knowledge of concepts in ISC 226. It could be deduced from the findings of this study that JAGA game entrenched a significant attitudinal change and improvement in knowledge of concepts in the course. This result has provided experimental support for the use of JAGA game as a necessary model that facilitates students' learning processes. The game is worth it, in that it exposes students to fact differentiation as well as recall, analysis and comparison, understanding and problem-solving, affection and free will among others. With these results, JAGA game is advocated as an instructional model that improves students' high-order thinking and favourable interactions of human and material resources in a fun-filled atmosphere.

Recommendations

1. The use of JAGA game should be applied to all courses for adult learners in tertiary institutions since it can help them to recall important facts about a concept even outside the classroom.
2. A close-to-optimal combination of massed versus distributed practices should be carried out by students with JAGA game. This is necessary

because their active involvement can influence positive attitude and enhancement of knowledge of the course.

3. The playing of JAGA game should be organized such that it enhances extrinsic and intrinsic motivation on the part of the players. This will help to portray the teacher as a facilitator, who guides from behind and not commands from front.
4. Players should set clear objectives, with adaptable difficulty levels in line with the rules of playing, as they apply to the course contents, in order to help them focus on specific and relevant concepts at a time which could increase their level of understanding.
5. Players should manage time consciously and ensure avoidance of monopoly so as to strengthen the spirit of curiosity and teamwork.

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THE RELATIONSHIP BETWEEN LEARNER CHARACTERISTICS AND ACADEMIC PERFORMANCE OF DISTANCE LEARNERS: THE CASE OF EXTERNAL DEGREE PROGRAMME OF THE UNIVERSITY OF NAIROBI

Omondi Bowa

Abstract

This article presents findings of a study on the relationship between learner characteristics and academic performance of distance learners of the University of Nairobi in Kenya. Learner characteristics were defined as the personal circumstances of the learner that may affect his/her studies such as age, gender, marital status, size of family, educational background and income status. On the other hand, academic performance was defined as grades obtained by a learner in university examinations, consisting of coursework and semester examinations. The problem under investigation was that academic performance remained poor, in spite of the study courseware and learner support services provided to learners by the university. Qualitative and quantitative methods were used to collect data. The study targeted learners in parts II to V of the Bachelor of Education (Arts) distance study programme. The programme was then studied on the basis of the research question that aimed at finding out the relationship between learner characteristics and learner's academic performance in coursework and semester examinations. The findings were that learner characteristics consisting of age, family size, entry academic qualification and supplementary income have a significant relationship with academic performance of learners in the course. Recommendations were made to review the external degree curriculum, provide educational support funds and enhance the provision of guidance and counseling services to students.

Key words: learner characteristics, learner support services, academic performance, distance education, open learning.

Introduction

Distance Education is now recognized all over the world as a mode of education that 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 abilities and convenience factors.

The delivery of distance education depends on information and communication technology (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 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 the internet. The need to provide learner support services is born out of the notion that individual learning of a student needs to be supported, for quality learning to take place.

The University of Nairobi has provided distance education in the School of Continuing and Distance education (SCDE) since 1986 when the first group of 600 students was admitted to the Bachelor of Education (Arts) course from all regions of Kenya (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, 3 times in one semester of 8 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 6 existing extra-mural centres to reinforce learner support

services in various parts of the country. The centres were located in the towns of Nairobi, Nakuru, Kakamega, Kisumu, Nyeri and Mombasa.

An evaluation study carried out in 1984 (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 in 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 (plan are underway to provide)
Recruiting centre for students	Good and effective
Storage of equipment for practical work	None
Residential and weekend sessions	Good and effective
Opportunity for students to interact with each other and reduce isolation	Good and effective
Facilities for workshops and seminars	Inadequate
Private study centres	Good and effective
Training facilities for tutors, e.g. teleconference System	Good but not effective since some facilities such as teleconference system have not been used in instruction.
Centre for regional exams 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)

It should be noted that findings of this study are now over 20 years old and may not reflect the reality on the ground.

In spite of these efforts by the University of Nairobi, assessment records indicate that academic performance of learners in the Bachelor of Education (Arts)

programme has remained poor in coursework 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
Maths	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, with 63% of the students scoring less than 40% in examinations. Other subjects with high failure rates were Economics, Kiswahili, Mathematics and Business Studies that had 51%, 28%, 21% and 20% of the students failing to attain the pass mark, respectively.

The purpose of this study was to investigate the relationship between learner characteristics and academic performance of the distance learners in terms of their scores in examinations. This could help in alleviating the problem of poor academic performance of the distance learners in examinations.

The general objective of this study was to find out the extent to which learner characteristics affect academic performance of learners in the Bachelor of Education

(Arts) external degree programme of the University of Nairobi. The specific objective was to find out the extent to which age, gender, marital status, size of family, educational background and income status of the learner influence the grades attained in examinations.

The study was guided by the following research question: What is the relationship between personal characteristics of distance learners (namely, educational background, employment/income status, age, gender, marital status and size of family) and their academic performance in coursework and examinations?

Literature Review

Distance learning is, by nature, learner-centred. Learner characteristics and demographics can therefore greatly influence the participation of prospective learners and success of enrolled students. Galusha (1997) has observed that student motivation has a powerful influence on completion and attrition rates, regardless of institutional setting. Knowles (1990) has also noted that learner behaviour is influenced by a combination of learner's needs, situation and personal characteristics. Learner's personal circumstances can therefore greatly affect participation and success in distance learning.

Knox (1977) in his developmental-stage orientation of adult life model emphasized the importance of understanding an individual learner's contextual situation. He believed that family, work and community roles; personality; physical condition; and income all affect the ability and willingness of the adult to participate in adult education.

In 1984, a survey of tele-course participants in the United States of America (USA), found that about two-thirds were women and about half of the students were aged 30 years and above. Over half had at least one dependant and two-thirds were married. Eighty per cent were employed, and over half of these were working full-time while pursuing their studies (Sheets, 1992). In another study, Wood (1996) seemed to confirm these statistics when he found that over 70% of recent graduates who had studied by the distance mode were in full-time employment.

Educational level before enrollment in a distance course has also been found to be significantly related to persistence (Rekkedal, 1983). The educational background of distance learners ranges from below high school to completion of a university degree. In the case of the USA tele-course programme, 20% of the students had at least an

associate degree (Sheets, 1992). Galusha (1997) believed that these students had an edge over new students since they already had the study habits necessary for success in any academic setting. Indeed, researchers have found that students who have prior experience with non-traditional education were more likely to persist than those with an exclusively conventional experience (Rekkedal, 1983).

Besides prior level of education and experience, personal factors and academic information can also influence motivation and success of the distance learner. Woodley and Parlett found that socio-demographic factors such as educational level, age and gender are associated with persistence in distance education. Another study by Rekkedal (1983) found that older students of over 50 years appear to have higher completion rates. This is probably because older students have greater coping skills in dealing with challenges of distance learning. Carr and Ledwith (1980) also found that housewives tended to drop out at a lower rate than the distance learner population. On the other hand, the course drop-out for students engaged in manual trades as an occupation was 50% higher than the overall rate (Cookson, 1989). Using a broader spectrum of variables, Siqueira and Lynch (1986) found that persistence of students in distance education could be explained by student satisfaction with the course, frequency of visits to student drop-in centres, socioeconomic status and perception of course materials.

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 students' "predisposing characteristics" in regard to their chances of successfully completing their first Athabasca University course, found 9 variables to be significantly related to success. The canonical discriminant function coefficients they obtained suggest that the 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.

From the foregoing review, distance education research investigating the role of learner characteristics and demographic factors in distance education seem to agree that the factors are critical in regard to retention and success of the distance learner. The purpose of this study is to go a step further and investigate how these factors affect academic performance of the distance learner in terms of scores in course grades.

Theoretical Framework

The influence of learner characteristics on learning processes and outcomes is anchored on the theories of learning. The andragogical theory of learning developed by Knowles (1975, 1978) explains how characteristics of learners can influence their learning. The theory states that in adults, the self concept moves from dependence towards self-direction or independence. There is a reservoir of accumulated experience, which becomes an increasing resource for learning; readiness to learn is increasingly associated with social roles at the workplace, neighbourhood, parenting, and so on; and that the orientation towards learning becomes less subject-centred and more problem-centred. The most significant of these principles is that adults already have a very significant store of experiences and knowledge, which can be re-structured or used as building blocks for new learning. However, these experiences are complex because adults are so diverse in age; employment; social and economic status; marital status; educational level or attainment; mode of learning and ability to learn; and orientation to learning (CYP, 2007).

Knowles (1975, 1978) stresses that adults are characterized by strong existing motivations in the form of clear life goals. These inner sources of self-drive can create a basis for a broader set of learning motivations. This may influence the adult towards an interest in formal learning in a way that is distinct from children. When adults decide to learn, they seek to satisfy often personally felt needs, which may initially be imposed by changes and demands from outside of self, such as seeking promotion in one's job or getting divorced for reasons related to social status in the society. Once the need is established, this generates clear goals and encourages them to sustain the activity until the goals are attained.

Learners' orientation may also have a big influence on the initial ability to learn something. Learning orientation is strongly affected by the result we want. CYP

(2007) has noted that the essence of adult learning theory is not only that adults build new learning onto previous schemata, but that their true learning orientation is towards an intrinsic interest in what is being learned. Houle (1984) has identified three types of general orientation in adult learning. He notes that some adult learners are goal-oriented for accomplishing fairly clear objectives. When need or interest arises, they satisfy it by taking a course, reading a book or going on a trip. Other adult learners are activity oriented. For them, participation and social contact are the goals rather than obtaining a qualification. There are also adult learners who are learning-oriented. They may participate in higher education to develop understanding rather than for qualifications.

All learning theorists, especially Piaget (1970) and Gagne (1971, 1977), argue that prior learning facilitates subsequent learning. They note that it is important to learn pre-requisite skills and knowledge before moving on to the levels above, and finally to problem-solving and other high order learning skills. These theories are useful in assessing what people can learn next and what may be going wrong for an adult learner. It is also recognized that physical, psychological and health factors may also be crucial in the academic performance of older learners. Poor health and debility arising from age may prevent a person from learning, despite strong motivation and experience.

Methodology

Data and other information were obtained through fieldwork by 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 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 learner characteristics, which were defined as the personal circumstances of the learner that may affect his/her studies, namely, age, gender, marital status, size of family, educational background and income. Dependent variables, on the other hand, consisted of the performance of learners in

coursework and examinations. Descriptive and inferential statistical methods were then used to analyze the data. Descriptive statistical methods were used to summarize the data collected from the field into a few numbers that measured, in some way, the various aspects of learner characteristics and academic performance. These included averages, standard deviations and percentages. Tables were also constructed to illustrate distribution of some important features of learner characteristics and grades obtained in examinations. Inferential statistical 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, Pallant, 2005). The techniques were used to answer the following research question:

What is the relationship between personal characteristics of distance learners (namely, educational background, employment/income status, age, gender, marital status and size of family) and their academic performance in coursework and examinations?

Findings and Discussion

The study yielded a number of findings relating to the research question. These findings are reported in the following section.

Learners' Personal Characteristics

Personal characteristics of the distance learners which were considered as likely to impact on their academic performance consisted of age, gender, marital status, family size, entry academic qualifications and income. Field data and other information relating to these aspects of the learners are analysed in this section, to show the personal characteristics of learners in the external degree programme, and how they influence the scores obtained in coursework and examinations.

Age and Examination Score

The age of external degree students ranged from 20 to 51 years, with a mean of 36 years (Table 3). This is a reflection of distance education at the tertiary level, where learners tend to be older than in the conventional system, after taking a break from studies to attend to other engagements before resuming their studies.

Table 3: Age and Examination Score

Age Category	Frequency	Percent	Mean Exam Score out of 70	Mean Coursework Score out of 30
Valid 20-31	34	16	40.8	18.5
32-40	127	60	36.9	18.2
Above 40	45	21	35.7	17.5
TOTAL	206	97		
Missing System	6	3		
TOTAL	212	100		

The relationship between age of student and academic performance (as measured by semester examination grades) was investigated using Pearson's product moment correlation (Table 3). There was a weak negative correlation between the two variables [$r = -0.23$, $n = 202$, $p < 0.001$], with higher age associated with lower semester examination grades. This means that older students tend to score lower grades in semester examinations than their younger counterparts. On the other hand, the relationship between age and coursework grades was found not to be statistically significant.

Further investigation was conducted using one-way between groups ANOVA test, to explore the relationship between age and semester examination grades. Subjects were divided into 3 groups according to their age (Group 1: 20-31; Group 2: 32-40; Group 3: 41 and above). There was a statistically significant difference at the $p < 0.05$ level in semester examination scores for the 3 age groups [$F(2, 199) = 6.96$, $p < 0.001$]. Despite reaching statistical significance, the actual difference in mean scores between the groups was small. The effect size, calculated using eta squared was 0.065 [Eta squared = sum of squares between groups (SSB) / total sum of squares (SST), i.e. $447.268 / 6839.565$]. In Cohen's (1988) guidelines for interpreting eta squared values, 0.01 = small effect, 0.06 = moderate effect and 0.14 = large effect. Thus, the effect size was moderate as 6.5 per cent (0.065×100) of the variance in semester examination scores was explained by age of student. In other words, 6.5% of the variation in semester examination scores could be explained by differences in the age of students.

Post-hoc comparisons using the Tukey Honest Significant Difference (HSD) test indicated that the mean score for Group 1 ($M = 40.43$, $SD = 5.87$), was significantly different from Group 2 ($M = 36.95$, $SD = 5.62$) and Group 3 ($M = 35.74$, $SD = 5.63$). However, Group 2 and Group 3 were not significantly different from each

other. From these results, it can be interpreted that younger students in the external degree programme perform slightly better in semester examinations but are at par with their older counterparts in coursework (which consists of assignments and timed tests). This is possibly because younger students are better able to devote more quality time to their studies probably because they have fewer extra-curricula and social commitments, compared to their older colleagues. This explanation is supported by the fact that age was also found to be positively and significantly correlated with marital status [$r = 0.406$, $n = 206$, $p < 0.00$] and family size [$r = 0.512$, $n = 202$, $p < 0.00$]. Older students tend to be married with more children than their younger counterparts.

Gender and Examination Score

In terms of gender, only 76 (35.8%) out of the 212 learners sampled were females while the rest were males (Table 4). This means that males were almost twice as many as females in the programme. This reflects the national trend where there are higher enrolments of males than females, especially in post-primary education in Kenya (UNESCO, 2005).

Table 4: Gender and Examination Score

Gender	Frequency	Percent	Mean Exam Score out of 70	Mean Coursework Score out of 30
Valid Male	76	35.8	36.7	18.1
Female	136	64.2	37.5	18.1
TOTAL	212	100.0		

Investigations were conducted to show the relationship between gender and academic performance of students. Product moment correlation analysis and the t-test for correlation coefficient, both showed no significant relationship between gender and academic performance. This means that there were no disparities in the performance of the external degree students on the basis of their gender.

Marital Status and Examination Score

Analysis of marital status showed that 181 learners (85.4%) were married, 28 (13.2%) were single while the rest were widowed (Table 5).

Table 5: Marital Status and Examination Score

Marital Status	Frequency	Percent	Mean Exam Score	Mean Coursework Score
Valid Single	28	13.2	39.1	18.7
Married	181	85.4	36.8	18.0
Widow	1	0.5	46.0	17.1
Widower	2	0.9	38.3	15.8
TOTAL	212	100.0		

Investigations were conducted to show how marital status affects academic performance of students. One-way between groups ANOVA test showed no significant relationship with academic performance of the learners. This means that there were no disparities in the performance of the external degree students on the basis of their marital status alone.

Family Size and Examination Score

The mean family size, on the other hand, was 5, with the smallest being one and the largest being 24, in the case of students in multiple marriages (Table 6).

Table 6: Family Size and Examination Score

Family Size Category	Frequency	Percent	Mean Exam Score	Mean Coursework Score
Valid 1-5	167	78.8	37.3	18.1
6-10	37	17.5	36.8	18.3
11-24	4	1.9	32.3	15.1
TOTAL	208	98.2		
Missing System	4	1.8		
TOTAL	212	100.0		

Further investigations were done on the relationship between family size and academic performance (as measured by semester examination grades), using Pearson's product moment correlation. The analysis showed a weak negative correlation between the 2 variables [$r = -0.181$, $n = 204$, $p < 0.010$], with large family size associated with low semester examination grades. There was also a weak but statistically significant negative correlation between family size and coursework grades scored in marked assignments and timed tests [$r = -0.14$, $n = 205$, $p < 0.045$].

Thus, students with large families tended to score low grades in semester examinations and coursework.

More investigations were conducted by one-way between groups ANOVA test, to explore how family size affects academic performance. Subjects were divided into 3 groups according to the size of their families (Group 1: 1-5; Group 2: 6-10; Group 3: 11 and above). In the first case, there was no statistically significant difference at $p < 0.05$ in semester examination scores for the 3 family size groups. Thus, the variation in semester examination scores could not be associated with differences in family size of learners. In the second test, however, there was statistically significant differences at $p < 0.05$ level in coursework scores for the 3 family size groups [$F(2, 202) = 3.6, p = 0.028$]. The effect size, calculated using eta squared was 0.035 (eta squared = SSB/SST , i.e. $35.783/1030.138$). Thus, despite reaching statistical significance, the actual difference in mean scores between the groups was small. In other words, differences in the size of a learner's family could only explain 3.5% of the variation in scores for coursework.

Post-hoc comparisons using the Tukey HSD test indicated that the mean score for Group 3 ($M = 15.12, SD = 1.28$) was significantly different from Group 1 ($M = 18.06, SD = 2.11$) and Group 2 ($M = 18.25, SD = 2.71$). However, Group 2 was not significantly different from Group 1. These results indicate that a large family is to some extent, a hindrance to academic performance of the external degree student. It seems to put more burdens on the student in terms of competing demands on time and resources, thereby leaving very little to spend on studies.

Entry Academic Qualification and Examination Score

Regarding academic qualification of the learner at the time of admission to the course, 2 distinct levels in the Kenyan education system were observed. One was the 12 years of education qualification known as the East Africa Certificate of Education (EACE) or Kenya Certificate of Education (KCE) and the other was the 14 years of education qualification known as the East Africa Advanced Certificate of Education (EAACE) or Kenya Advanced Certificate of Education (KACE). It was found out that 158 (74%) of the learners had EACE or KCE qualifications while 53 (25%) had EAACE or KACE qualifications (Table 7).

Table 7: Entry Academic Qualification and Examination Score

Pre-University Qualification	Frequency	Percent	Mean Exam Score	Mean Coursework Score
Valid EACE-KCE	158	74.5	36.7	18.0
EAACE/KACE	53	25.0	38.9	18.3
TOTAL	211	99.5		
Missing System	1	0.5		
TOTAL	212	100.0		

The relationship between entry academic qualification of the student at the time of admission to the programme and academic performance (as measured by semester examination grades) was also investigated, first, by using Pearson's product moment correlation. There was a weak but statistically significant positive correlation between the 2 variables in the first case [$r = 0.167$, $n = 207$, $p < 0.016$], with higher entry academic qualification associated with higher semester examination grades. Thus, learners with higher entry qualifications tended to score higher semester grades. In the second case, there was no statistically significant correlation between entry academic qualification and coursework grades scored in assignments and timed tests.

Further analysis was conducted using independent samples t-test to compare semester examination mean scores for students with EACE/KCE entry qualification and those with EAACE/KACE (Pallant, 2005). There was no significant difference in scores for the EACE/KCE students ($M = 36.63$, $SD = 5.84$) and EAACE/KACE students [$M = 38.88$, $SD = 5.47$; $t(205) = -2.427$, $p = 0.02$]. The magnitude of the differences in the means was small [$\eta^2 = 0.03$; i.e., $\eta^2 = t^2 / (t^2 + (N_1 + N_2 - 2))$, thus, $-2.43^2 / (-2.43^2 + (156 + 51 - 2)) = 0.03$]. Thus, only 3% (0.03×100) of the variance in semester examination scores was explained by entry academic qualification. In other words, entry academic qualification explained only 3% of the variation in semester examination scores.

These results mean that students who had had 14 years of learning before university admission (EAACE/KACE) performed better in semester examinations than those who had had only 12 years (EACE/KCE). This suggests that students who had had more years of learning previously were better prepared to cope with university work. In fact, the new curriculum that leads to the EACE/KCE qualification is considered by the university as lacking in some key areas of academic competence. As a result,

the university has introduced additional courses known as common core courses to bridge this gap. For arts-based faculties, the courses include Communication Skills, Elements of Philosophy, Elements of Economics, Environmental Science, Science and Technology in Development, Fundamentals of Development and their Application in Kenya and HIV/AIDS (Dean of Students, 2006). However, these courses had not been introduced in the external degree programme because their distance learning course books had not been developed. This may explain the difference in academic performance of the 2 groups of students who had gone through different educational systems before joining the university.

It is also important to note that since the former education system that required 14 years of learning was replaced by the 12-year education system, students who had gone through it tended to be older. Yet it has been shown in earlier analysis that age of a student was negatively correlated with academic performance. It therefore means that although age is a drawback in academic performance of the external degree students due to the additional social responsibilities, its negative influences are overcome when students are adequately prepared academically.

Income and Examination Score

Another personal situation of the learners examined was their income status. It was found out that 190 (89.6%) students had salaried employments mainly as primary school teachers with mean consolidated monthly salary of Kenya Shillings (KSh.) 15,376.60, with 73% earning between KSh. 10,000 and KSh. 20,000 in a month (Table 8).

Table 8: Salary Category and Examination Score

Salary Category KES	Frequency	Percent	Mean Exam Score	Mean Coursework Score
Valid Below 10,000	13	6.1	38.2	18.2
10,000-15,000	113	53.3	37.7	18.3
15,001-20,000	43	20.3	36.2	18.0
Above 20,000	21	9.9	36.2	17.1
TOTAL	190	89.6		
Missing System	22	10.4		
TOTAL	212	100.0		

Income can affect learning in the external degree programme by determining the ability of the learner to pay fees and be eligible to receive learner support services provided by the university. Thus, learners with large incomes may be able to obtain the requisite learning materials and study more effectively for better academic performance.

However, further investigation using Pearson's product moment correlation analysis showed that there was no correlation between income and course grades in examinations. Analysis by one-way ANOVA test also showed that salaried income did not have a significant bearing on academic performance of learners. These results were probably because most students in the programme are primary school teachers, with about the same incomes earned from salaries. Their ability to pay fees and be eligible to obtain learner support services is therefore largely the same, hence lack of statistical correlation.

It was also found that 80 (38%) students were operating small-scale businesses with a mean profit of KES 1,304 per month (Table 9).

Table 9: Other Income and Examination Score

Other Income Category	Frequency	Percent	Mean Exam Score	Mean Coursework Score
Valid Below 1,000	145	68.4	37.1	18.2
1000-3,000	42	19.8	37.9	18.2
3,001-8,000	13	6.1	35.7	17.9
Above 8,000	7	3.3	37.2	16.8
TOTAL	207	97.6		
Missing System	5	2.4		
TOTAL	212	100.0		

Like salaries, business income can have a positive influence on academic performance if the learner uses it to obtain learning resources and to pay fees to access learning materials and learner support services from the university.

Nevertheless, there was a weak but significant negative correlation between "other income" (income earned from small-scale business activities) and coursework grades [$r = -0.139$, $n = 204$, $p < 0.043$], with higher business income associated with lower coursework grades. Thus, learners with high business income had a tendency to score

lower coursework grades than their less business-minded counterparts. The business activities included farming, fishing, grocery, flour milling, passenger and other forms of transportation, hairdressing, auto repair, dry-cleaning, bar and restaurant trade, tailoring and metal crafts. Students who engaged in these income-generating activities to supplement income from their primary occupations tended to have little time for their studies, thereby doing poorly in examinations.

Summary of Findings and Discussion

The study found out that learner characteristics have an influence on academic performance of distance learners. Correlation analysis, two-sample t-tests and One-way ANOVA, with post hoc tests showed that age, family size, entry academic qualification, semester of study and business income affected the grades of learners, in varying degrees.

There was a significant negative correlation between age of student and semester examination grades [$r = -0.23$, $n = 202$, $p < 0.001$], with a higher age associated with lower examination grades. ANOVA, with post hoc tests also showed that younger students in the external degree programme generally performed better in semester examinations than their older counterparts. The study also found a weak, negative correlation between family size and semester examination grades [$r = -0.181$, $n = 204$, $p < 0.010$], with large family size associated with low semester examination grades. Similarly, there was a weak negative correlation between family size and coursework grades [$r = -0.14$, $n = 205$, $p < 0.045$], with large family size associated with low coursework grades. One-way between groups ANOVA with post hoc tests also confirmed that students with large families tend to score lower grades in coursework than their counterparts with smaller families. Thus, large families were found to be a hindrance to good academic performance among external degree students. Large families seem to place a heavier burden on students as they demand more time and resources, thereby leaving little time to devote to studies.

The study also found a significant positive correlation between entry academic qualification and academic performance [$r = 0.167$, $n = 207$, $p < 0.016$], with higher entry academic qualifications being associated with higher semester examination grades. Further analysis by two samples t-test confirmed that there was a significant difference in scores for the EACE/KCE and EAACE/KACE students. The findings showed that students who had had 14 years of learning before joining the university (EAACE/KACE) performed better in semester examinations than those who had

had only 12 years (EACE/KCE). Thus, students who had had more years of previous learning were better prepared to cope with university studies.

It was also noted that since the former education system that required 14 years of learning was replaced by the 12-year pre-university education system, students who went through it tended to be older. Yet it was also noted that age of a student tends to be negatively correlated with academic performance. It, therefore, means that although age is a hindrance to good academic performance of the external degree student, because of the associated additional responsibilities, its negative influences can be overcome by adequate academic preparation.

The study also found a significant negative correlation between academic performance and supplementary income earned from small-scale business activities [$r = -0.139$, $n = 204$, $p < 0.043$], with higher supplementary income associated with lower coursework grades. The small-scale business activities included commercial farming, fishing, grocery, flour milling, transportation, hairdressing, auto repair, dry cleaning, bar and restaurant trading, tailoring and metal crafts. It seems that students who engaged in these activities to supplement income from their primary occupations had limited time for their studies and therefore tended to perform poorly in examinations.

Recommendations

The findings of this study have practical and policy implications for the external degree programme. It was noted that learner characteristics consisting of age, family size, entry academic qualification and business income have an impact on grades of learners, in various ways. Older students tend to perform poorly in examinations because they also tend to have large families with heavy financial and time commitments. However, older students with higher entry qualifications to the university tend to perform better in examinations than their younger counterparts, even when they have large families.

It is, therefore, recommended that students, especially those who are admitted with 12 years of pre-university education, be exposed to key core courses in the early part of their studies. These courses should cover study skills and basic knowledge areas such as Communication Skills, Basic Mathematics, Elements of Philosophy, Elements of Economics, Environmental Science, Science and Technology in Development, and Fundamentals of Development and their Application in Kenya. It was noted that these courses are already being offered to full-time students but not to

external degree students because they have not been developed into distance study materials. It is, therefore, also recommended that the courses be integrated into distance instructional materials as a matter of priority. This will enable the students to prepare adequately for university.

It was noted that supplementary income from small-scale business activities has an adverse influence on academic performance. The activities included commercial farming, fishing, grocery, flour milling, transportation, hairdressing, auto repair, dry cleaning, bar and restaurant trade, tailoring and metal crafts. It was observed that students who engaged in these activities to supplement income from their primary occupations have limited time for their studies and, therefore perform poorly in examinations.

It is, therefore, recommended that distance learners be given easy access to education support funds. The government, through the Higher Education Loans Board (HELB) and other stakeholders should prioritise needy external degree students for disbursement of loans for fees payment.

It was noted that students with 12 years of pre-university education in the external degree programme tend to lack certain skills necessary for coping with university work. It has also been recommended that the university should introduce additional courses to prepare such students for university work. Further, the School of Continuing and Distance Education should review the curriculum of the external degree programme, with a view of bridging the gap with the secondary school curriculum. This will enable learners with 12 years of secondary education to cope with university studies more easily. This is especially so because the current curriculum of the external degree programme was designed for learners with 14 years of pre-university education.

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PERCEPTION OF ACADEMICS ON QUALITY ASSURANCE OF ACADEMIC PROGRAMMES AT THE NATIONAL OPEN UNIVERSITY OF NIGERIA

Dorothy Ofoha and Bolupe Awe

Abstract

One of the innovations that has taken place in the field of higher education in Africa is the emergence of Open and Distance Learning (ODL). It is well recognized that the success and sustainability of ODL programmes depends largely on the quality of academic programmes. However, this superior quality could be influenced to a large extent by academics' perceptions of the system. Academics are major stakeholders in teaching and learning process, hence their perceptions about the quality of academic programmes may have enormous effects on the successful implementation of ODL programmes. This paper reports the opinions of academic staff of the National Open University of Nigeria (NOUN) on the quality assurance of academic programmes, with a specific objective to gauge the level of awareness, the viability, extent of compliance as well as constraints which hinder effective implementation of the internal quality assurance mechanisms. The study utilized both quantitative and qualitative techniques in data collection and analyses. A research instrument tagged "Academics' Perception Scale on Internal Quality Assurance Measures (APSIQAM) was used to collect data from 106 NOUN academic staff, in addition with the use of observation. The descriptive survey research design was adopted and data gathered were analyzed using basic descriptive statistics. Results revealed that majority of the academics were aware of the existence of internal quality assurance measures. A significant proportion rated NOUN as a quality-conscious institution but a few believed the course materials were constantly reviewed, revised and updated. Some academics were perceived to lack competence required to write course materials. On the basis of this, it was recommended, amongst others, the establishment of quality assurance committees in each academic school to coordinate implementation of recommended internal quality assurance policies.

Key words: course materials, internal quality assurance measures, ODL

Background of the Study

In Nigeria as elsewhere in the world, the importance of education in the development of the individual and the nation is highly recognized. Education, according to United Nations Children's Fund (UNICEF), is a fundamental human right and the key factor to promoting sustainable development. One of the innovations that has taken place in the field of higher education in Africa is the emergence of Open and Distance Learning (ODL). It is well recognized that higher education including ODL is an instrument of social and economic transformation. However, one cannot think of this transformation without a quality-conscious education system. As rightly pointed out, education without quality is no education at all (Gandhe, 2009).

In Nigeria, there is a high demand for higher education as the majority of youth who are qualified for admission to the conventional system could not proceed because of lack of space. It is also obvious that due to limitations in both human and material resources, conventional institutions can no longer satisfy the snowballing population of a country like Nigeria, which has an estimated population of 140 million people and an average annual population growth rate of 2.38% (World Fact Book, 2006). Therefore, with the increasing acceptance of ODL as a major channel of widening access to higher education, it has become increasingly necessary that quality assurance processes be developed and maintained if the ODL provision is to be relevant and recognized as complimentary to conventional higher education.

Quality remains a key issue in education. The quality of university education depends on the productivity of its output in the labour market. This productivity in turn rests on the effectiveness of teaching and learning which has remained the highest priority area for quality assurance practitioners in higher institutions across the globe. Over the past few years, there has been significant growth of quality assurance activities aimed at improving higher education at the institutional, national, regional, and global levels.

Concepts of Quality and Quality Assurance

Quality as noted by Osuji (2008) is a complex concept that constitutes different aspects, input, process and output. These dimensions of quality, according to Osuji, should be taken into consideration when looking at quality assurance especially in the ODL. Quality in education is defined as a combination of exceptional high standards, perfection and consistency, fitness

for purpose, value for money, and transformation capabilities. In the ODL system, quality means attainment of the expected levels of knowledge and skills, which are tools for further learning by actual work experience necessary for managing the learner's personal and social transaction in day-to-day life (Gandhe, 2009).

Quality assurance is the systematic internal review of educational programmes to ensure that acceptable standards of education, scholarship and infrastructure are being maintained (Varoglu, 2005). According to Uvah (2005), quality is the level of value in a product or a level of achievement, a standard against which to judge others. Quality assurance which is the process for determining this, is defined as both fitness for purpose and fitness of purpose. While fitness for purpose is related to the university's missions, that is, what the universities have set for themselves, fitness of purpose refers to their capacity to satisfy the national goals of higher education (Odejide, 2007).

Within the university system, quality assurance is considered to have a three-pronged approach: internal quality assurance mechanism (self-appraisal), evaluation by peers, and accreditation by an independent and competent organization. However, as Woodhouse and Carmichael (2005) pointed out, internal mechanisms rather than external hold the ace for quality assurance in the university system. Various scholars (Akinkugbe, 2001; Patil, 2003; Gonzalez, 2005; Woodhouse and Carmichael, 2005) have also emphasized that internal evaluation is fundamental to quality assurance process. Odejide (2007) contends that the principal responsibility for quality assurance rests with the institutions themselves, adding that it is in the interest of the institutions to carry out periodic audits of their programmes, during which they identify their strengths and weaknesses. Audit, according to Odejide, should cover teaching effectiveness, assessment of courses and lecturers, textbook facilities, and capacity development, as the purpose to institutionalize self-regulation and ensure continuous improvement and innovation. Therefore, an internal quality assurance system is a system under which students, staff and management satisfy themselves that control mechanisms are working to maintain and enhance quality (Mani and Uma Devi, 2009).

Perception of Academics on Quality Assurance in ODL System

Perception is the psychological ability to process or use information received through the sense organs. It is the cognitive impression that is formed out of

“reality” which in turn influences the individual’s actions and behavior towards that object (<http://www.marketingnews.co.in/glossary/4>). The literature has established a strong connection between an individual’s perception and attitude towards a particular issue, event, or object. According to Luthan (1998), the behavioural end of perception is that of reaction or response, whether overt or covert, which is necessary if perception is to be considered a behavioural event and thus a psychological process. As a result of perception, an individual may move rapidly or slowly (overt) or develop an attitude (covert) towards an object. This implies that the perception of academic staff on quality assurance may influence their attitude towards implementation of quality assurance mechanisms. This may be a favourable attitude that triggers action or a lukewarm attitude that results in negligence or lack of concern for quality assurance. Eggen and Kauchak (2001) gave cognitive dimension of perception; they see perception as the process by which people attach meaning to experiences. They explained that after people attend to certain stimuli in their sensory memories, processing continues with perception. Perception is critical because it influences the information that enters working memory.

As pointed out by Seyoum (2008), different people perceive the advantages of ODL differently and their perceptions have influenced their attitudes towards the acceptance and use of ODL in the system. According to Seyoum, out of the various problems facing distance education today, a very important one, is how it is perceived by the individuals involved in it. This is because the success of the open and distance education system could be affected by how it’s viewed by the individuals involved in it.

The focus of the study is justified on the grounds that the success of ODL could be influenced to a large extent by academics’ perceptions of the system. Academics are major stakeholders in ODL teaching-learning activities hence their perceptions on various internal quality assurance mechanisms may have an enormous effect on the successful implementation of the system.

Statement of the Problem

ODL institutions have faced a number of challenges over the years, the most contentious, according to Braimoh (2010), being the public perception regarding the quality of ODL programmes. Distance learning is a form of structured learning in which the instructor and students are separated by time and space, and which uses the latest technology to bridge the gap between

learners and instructors. Despite the rapid growth in technology-mediated learning to meet the increased learner demand, the quality of distance learning has been questioned (Helland, 2002). Specifically, there is a common perception among the public that distance learning is not as effective as the traditional face-to-face education (Harrison, 2001, as cited in Adeoye and Salawu, 2010). Another issue of concern is the challenge of acceptability of ODL certificate by labour market because of fear of quality compromise. These challenges are capable of distorting the intended gains of ODL programmes. Although public perception is un-informed and misguided, it is likely to make the ODL practitioner/educator uncomfortable and may likely affect their perception about ODL. This study was borne out of the need to set the records straight by “hearing from the horse’s mouth” on how they perceive the quality of academic programmes. Perception by the individuals involved in ODL is considered a crucial factor in determining the successful implementation of the programme.

On the other hand, empirical evidence abounds indicating no significant difference in the quality of education received through distance learning versus classroom learning (Russell, 2002; Sukati, Magagula, Chandraiah, Simelane and Sithole, 2010). However, there is a dearth of research on the perception of academic programmes by the academic staff of National Open University of Nigeria.

National Open University of Nigeria: Quality Assurance Concerns

The springboard of tertiary institution for ODL in Nigeria is the National Open University of Nigeria (NOUN) which was established by the National Assembly Act of 1983. It got suspended and later resuscitated in 2002 while functional activities commenced in 2003. Establishment of NOUN was timely for the thousands of otherwise qualified Nigerians who needed a university education but were denied access to the existing conventional universities. For instance reports by the Joint Admissions and Matriculation Board (JAMB), which conducts the selection examinations to higher institutions in Nigeria, show that the nation is still unable to meet the social demands for universities, notwithstanding the 104 available universities (27 federal, 36 state and 41 private). JAMB has reported that 61 percent of the 1,375,652 candidates who wrote the examinations in the 2010/2011 academic session scored 180 (required minimum score) out of 400, which means 839,147 candidates are eligible for admission into conventional higher institutions. It is common

knowledge that all the tertiary institutions combined cannot accommodate more than about 500,000 new students. This means there is an excess of about 339,147 candidates who are qualified but will not be admitted because there is no space, plus another estimated 370,000 who did not make up to 180. It is sad to know that more than half of those who sat for the examinations, about 700,000 will be left in the cold. Bello-Osagie (2010) has aptly described the scenario with the right phrase “what a waste” and noted that similar statistics has been on a yearly basis in the past 5 years. It is quite obvious that these young people have been deprived access to education because they are required to be present in the 4 walls of a conventional classroom. It is also obvious that due to limitations in both human and material resources, conventional institutions can no longer satisfy the snowballing population of a country like Nigeria, which has an estimated population of 140 million people and an average annual population growth rate of 2.38% (World Fact Book, 2006).

NOUN is a first full-fledged university in Nigeria that operates an exclusively ODL mode of education. NOUN’s vision is to be regarded as the foremost university providing highly accessible and enhanced quality education anchored by social justice, equity, equality and national cohesion, through a comprehensive reach that transcends all barriers. Its mission is to provide functional, cost effective, flexible learning, which adds lifelong value to quality education for all who seek knowledge. Specifically, NOUN’s vision and mission depict the mandate of providing access and ensuring quality in the educational services that are rendered to learners. As a quality-conscious institution, NOUN is affiliated to a number of international organizations including African Council of Distance Education (ACDE), Commonwealth of Learning (COL), as well as International Council of Distance Learning (ICDL). The ACDE also granted NOUN the right to host the Quality Assurance and Accreditation Agency which is specifically created to ensure uniformity of standard among ODL higher education institutions across Africa. Presently, ACDE-Quality Assurance and Accreditation Agency concentrates on assisting all the ACDE member institutions to assure the quality of their academic programmes.

NOUN relies primarily on delivering education through the media like study materials and instructional facilitation provided to learners through its study centres spread across the country. Various support systems are also put in

place to help learners. The academic staff occupies key positions in the instructional delivery process through development of instructional materials and setting of examination questions among other academic responsibilities. It is incontestable that the success and sustainability of ODL depends largely on the quality of learning materials supported by good quality assurance systems. NOUN has evolved systems and concerns for ensuring quality and continued to set in place various mechanisms that allow for regular checks and quality maintenance in all aspects of its academic activities including development of course materials, which are delivered via print in conjunction with information and communication technology (ICT), as the operation of quality assurance in the tertiary ODL higher institutions in the modern day cannot be carried out without the application of technology (Jegede, 2009). Therefore, in view of the fact that quality in ODL is frequently judged in terms of learning materials, it is considered important to ascertain the standard of quality assurance embedded in the design and development of course materials used by NOUN learners. Again, considering the primacy of academic staff in teaching-learning activities, they appear to be one of the principal actors best suited to assess the various internal quality control mechanisms. Therefore, opinion of the academic staff about the viability and effectiveness as well as extent of compliance with these mechanisms is taken as indication of the extent to which NOUN places high premium on quality of academic programmes.

Objectives of the Study

The main focus of the study was to gauge the opinion of NOUN academics on quality assurance of academic programmes. Specifically, the study set out to accomplish the following objectives:

1. Ascertain the level of awareness of NOUN academics on the existence of internal quality assurance measures (IQAM) framework.
2. Assess academics' perception on the quality of academic programmes.
3. Determine the extent of academics' compliance with IQAM demands.
4. Assess academics' perception on the quality of course materials produced in NOUN.
5. Identify constraints (if any) to compliance with IQAM.
6. Suggest ways to address identified constraints.

Research Questions

Based on the objectives stated, the following research questions were raised:

1. What is the level of awareness of NOUN academics on the existence of internal quality assurance measures (IQAM)?
2. What is the academics' perception on the quality of academic programmes?
3. To what extent has NOUN academics complied with IQAM demands?
4. What is academics' perception on the quality of course materials produced in NOUN?
5. What are the constraints to compliance with IQAM?

Research Methodology

The study adopted a descriptive survey research design and employed both quantitative and qualitative approaches in data collection and analysis. The population included the entire academic staff at the 5 academic schools and the centre at the NOUN headquarters, comprising 106, and all of these took part in the study.

The quantitative instrument used was a 32-item structured questionnaire tagged "Academics' Perception Scale on Internal Quality Assurance Measures" (APSIQAM). It was developed and validated by the researchers and designed to elicit information on academics' perception on the variables of the study. The questionnaire had 2 sections. Section A with 9 items sought necessary background information on the respondents. Section B contained 23 items divided into 5 sub-sections and designed to gather required information on the variables of the study, thus items 1-6 measured level of respondents' awareness on the existence of quality assurance mechanisms, items 7-10 on the quality of academic programmes, items 11-14 on compliance to quality assurance mechanisms, items 15-20 on quality of course materials, items 21-23 on constraints to compliance, all of which were slated on a 4-point Likert-type scale of strongly agree, agree, disagree and strongly disagree and scored 4, 3, 2, 1, respectively. The psychometric properties of the instrument were established: the face and content validity were assessed by experts in quality assurance and research methodology while test re-test reliability with correlation coefficient of 0.78 obtained confirmed the reliability of the instrument. The data gathered were subjected to basic descriptive statistical analysis using frequency counts and percentages.

In an attempt to obtain qualitative information to crosscheck and complement some of the responses from the questionnaire, particularly items 21-23, and to further enrich the findings of the study, the personal observation of the investigators was included as additional input. Thus, with the use of a guide/checklist, observation was conducted in the 5 academic schools, the centre as well as the library, to evaluate the availability, working condition, and adequacy of the following facilities: academic staff offices, infrastructure/internet connectivity, office equipments, and library resources. Data collected were interpreted qualitatively.

Study Findings

Results obtained are presented in Tables 1–5, showing the frequency and percentage distribution of respondents' responses on the variables of the study using the research questions as guidelines.

1. Level of Awareness of NOUN Academics on the Existence of Internal Quality Assurance

Table 1 shows that a significant percentage of NOUN academics (83%) agreed that academic programmes were approved according to stipulated guidelines, a few (11.3%) were in disagreement while 5.7% did not respond to the item. A high percentage (73.6%) expressed awareness of the existence of various internal quality assurance mechanisms put in place to ensure quality of academic programmes as against 20.8% who expressed unawareness while 5.7% were silent on the item. Percentage of respondents (47.2%) who agreed that quality assurance is emphasized during discussions at school level is slightly greater than those who disagreed (35.9%) while 17% did not respond. Majority (67.9%) expressed the opinion that the importance of quality assurance was emphasized during school board meetings while 26.5% reported a contrary view with blank response of 5.7%. A significant percentage (69.8%) reported that newly appointed academics were not given induction training on various aspects of quality assurance mechanisms as against 30.2% who consented to newly appointed academics given induction training.

Table 1: Frequency and Percentage Distribution of Respondents' Responses on Level of Awareness on the Existence of Internal Quality Assurance Measures (N=106)

Variables/Items	SA		A		D		SD		Blank Entry		
	F	%	F	%	F	%	F	%	F	%	
Awareness of Existence of Internal Quality Assurance Mechanisms (IQAM)											
Academic programmes are approved according to stipulated guidelines	56	52.8	32	30.2	0	0	12	11.3	6	5.7	
I am aware of the various mechanisms put in place to ensure quality of academic programmes and course materials	34	32.1	44	41.5	22	20.8	0	0	6	5.7	
I am not aware of NOUN internal mechanisms for assuring quality of academic programmes	10	9.4	35	33	26	24.5	29	27.4	6	5.7	
The need for IQAM is always emphasized during discussions at school level	6	5.7	44	41.5	23	21.7	15	14.2	18	17	
During school board meetings, the importance of quality assurance of academic programmes is often emphasized	16	15.1	56	52.8	22	20.8	6	5.7	6	5.7	
Newly appointed academics are given induction training on various quality assurance mechanisms in place	5	4.7	27	25.5	51	48.1	23	21.7	0	0	

Key: SA-Strongly Agreed, A-Agreed, D-Disagree, SD-Strongly Disagree

This goes to show the importance that NOUN places on the issue of quality. However, many respondents agreed that newly appointed academics were not given induction training on various quality assurance mechanisms. This means that NOUN has to make quality the concern and responsibility of every staff – both old and new. Enhancement of quality assurance requires continuous reorientation for all academics.

2. Academics' Perception on the Quality of Academic Programmes

Table 2: Frequency and Percentage Distribution of Respondents' Responses on Quality of Academic Programmes (N=106)

Variables/Items	SA	A		D		SD		Blank Entry			
	F	%	F	%	F	%	F	%	F	%	
Quality of Academic Programmes											
NOUN academic programmes/courses are comparable with the best in the world	0	0	83	78.3	17	16	6	5.7	0	0	
NOUN is a quality-conscious institution	23	21.7	61	57.5	0	0	17	16	5	4.7	
Quality of academic programmes can determine quality of products	47	44.3	44	41.5	6	5.7	5	4.7	4	3.8	
I will recommend and encourage my relative to study in NOUN	11	10.4	34	32.1	35	33	11	10.4	15	14.2	

Key: SA-Strongly Agreed, A-Agreed, D-Disagree, SD-Strongly Disagree

Table 2 indicates that many of the respondents (78.3%) perceived NOUN academic programmes and courses as comparable with the best in the world while 21.7% did not hold this view. A significant proportion of the respondents (79.2%) agreed that NOUN is a quality-conscious institution as against 16% who did not agree while 4.7% did not respond to the item. It is however observed that only 42.5% indicated willingness to recommend and encourage their relations to study in NOUN, 43.4% indicated unwillingness to do so while 14.2% were silent on the item. Table 2 is a practical case of attitude-behaviour inconsistency in human nature.

3. Extent of Academics Compliance with Demands of Internal Quality Assurance Measures

Table 3: Frequency and Percentage Distribution of Respondents' Responses on Level of Compliance with Demands of Internal Quality Assurance Measures (IQAM), N=106

Variables/Items	SA		A		D		SD		Blank Entry		
	F	%	F	%	F	%	F	%	F	%	
Extent of Compliance with IQAM											
NOUN staff are known to comply with IQAM	6	5.7	70	66	20	18.9	7	6.6	3	2.8	
I don't see any need to comply with IQAM	7	6.6	6	5.7	33	31.1	47	44.3	13	12.3	
It doesn't make a difference whether or not I comply with IQAM	9	8.5	15	14.2	24	22.6	56	52.8	2	1.9	
Staff members know that accrediting body is interested in compliance with existing policy on quality assurance	27	25.5	41	38.7	23	21.7	6	5.7	9	8.5	

Key: SA-Strongly Agreed, A-Agreed, D-Disagree, SD-Strongly Disagree

As observed in Table 3, the majority of the respondents (71.7%) reported that NOUN staff were known to comply with demands of internal quality assurance measures while 25.5% disagreed with 2.8% no response. 75.4% expressed the importance for compliance with internal quality assurance policy, while a few of the respondents (12.3%) did not see the need for compliance, 12% did not respond on the item. 75.4% of the respondents disagreed that it does not make any difference whether or not one complies with internal quality assurance measures as against 22.7% who indicated agreement, 1.9% did not respond. On whether staff members have the knowledge that accrediting body is interested in the institution's compliance with existing policy on quality assurance, 64.2% reported in the affirmative while 27.4% expressed a contrary opinion, 8.5% did not respond on the item. The results show that NOUN academic staff recognize the importance of compliance of the demands of internal quality assurance mechanisms of the institutions, to ensure high standards of academic programmes.

4. Academics' Perception on the Quality of Course Materials Produced in NOUN

Table 4: Frequency and Percentage Distribution of Respondents' Responses on Quality of Course Materials Produced in NOUN (N=106)

Variables/Items	SA		A		D		SD		Blank Entry		
	F	%	F	%	F	%	F	%	F	%	
Quality of Course Materials											
NOUN course materials are constantly reviewed and updated	16	15.1	28	26.4	50	47.2	10	9.4	2	1.9	
NOUN course materials meet the standards specified for ODL and are designed according to the principle of self-instruction	18	17	73	68.9	4	3.8	6	5.7	5	4.7	
Some NOUN academic staff are not competent enough to write course material	15	14.2	47	44.3	42	39.6	0	0	2	1.9	
NOUN course materials are learner-centred	23	21.7	70	66	0	0	11	10.4	2	1.9	
NOUN course materials are comparable in content to those of conventional systems	23	21.7	73	68.9	8	7.5	0	0	2	1.9	
Quality of course materials is compromised	10	9.4	16	15.1	65	61.3	13	12.3	2	1.9	

Key: SA-Strongly Agreed, A-Agreed, D-Disagree, SD-Strongly Disagree

As Table 4 shows, the percentage of respondents (41.5%) who agreed that NOUN course materials are constantly reviewed, revised and updated is less than those (56.6%) who disagreed, while those who did not respond make up 1.9%. A significant proportion of the respondents (85.9%) opined that NOUN course materials are designed to meet the standard specified for ODL and designed according to the principle of self-instruction, while 9.5% had a contrary view, 4.7% did not respond. A similar result is reflected on the nature of NOUN course materials, with the majority of respondents (87.7%) indicating that NOUN course materials are learner-centred while a small percentage (10.4%) disagreed. Concerning staff competence in writing course materials, a relatively high percentage (58.5%) held the view that some staff members are not competent enough to write course materials as against 39.6%

who held a contrary opinion with no response from 1.9%. Still on course materials, a significant percentage (90.6%) believed the course materials were comparable in content to those offered in conventional systems while a very small percentage (7.5%) disagreed and 1.9% did not respond. A few of the respondents (24.5%) reported that quality of course materials is compromised, the majority (73.6%) did not share this opinion while 1.9% kept silent on the item.

5. Constraints to Compliance with Internal Quality Assurance Measures

This study sought to find out possible constraints that could cause hindrance on ODL programme implementation. Opinions expressed by respondents are summarized in Table 5.

Table 5: Frequency and Percentage Distribution of Respondents' Responses on Constraints to Compliance with Internal Quality Assurance Measures (N=106)

Variables/Items	SA		A		D		SD		Blank Entry	
	F	%	F	%	F	%	F	%	F	%
Constraints to Compliance to IQAM										
Academic staff offices are not conducive for research and course material writing	56	52.8	38	35.8	1	0.9	9	8.9	2	1.9
Academic staff are over-saddled with administrative tasks more than academic tasks	62	58.5	20	18.9	13	12.3	9	8.5	2	1.9
Resources for preparing course materials are readily available	13	12.3	11	10.4	45	42.5	32	30.2	5	4.7

Key: SA-Strongly Agreed, A-Agreed, D-Disagree, SD-Strongly Disagree

As observed in Table 5, a sizable number of respondents (88.6%) were of the opinion that academic staff offices were not conducive for research and course material writing, while 9.8% disagreed on this, with no response from 1.9%. On academic staff workload, a high percentage (77.4%) held the view that academic staff members were over-saddled with administrative task than academic task, with 20.8% of the respondents were in disagreement, 1.9% did not respond. On availability of resources for preparing course materials, a few (22.7%) consented that resources were readily available while the majority (72.7%) were in disagreement and 4.7% silent.

Qualitative data obtained via observation revealed that academic staff offices appeared hot and stuffy. Further observations revealed that the offices were fitted with air conditioners which appeared non-functional. Besides these, most other facilities sighted include computer systems, copier machines, printers and internet facilities. Many of the staff members were seen busy with work activities, although it was not clear whether the nature of work was administrative or academic, as this was beyond the scope of the study. Further observation revealed that the library was adequately equipped with both print and electronic resources.

Summary of Findings

The majority of NOUN academics are not only aware of the existence of internal quality assurance measures put in place but also expressed the importance for compliance, to ensure high standards of academic programmes. There was a narrow margin between respondents who agreed that quality assurance is emphasized during discussions at school level and those who disagreed. Majority expressed the opinion that the importance of quality assurance was emphasized during school board meetings. A significant percentage reported that new members of academic staff are not given induction training on various aspects of ODL quality assurance mechanisms. NOUN was rated to have high concern for quality and its academic programmes/courses highly rated and considered comparable with the best in the world. However, just a few respondents expressed willingness to recommend and encourage their relations to study in NOUN - what an irony! A significant proportion were of the opinion that NOUN course materials usually meet the standard specified for ODL and are designed according to the principles of self-instruction and learner-centredness, however there were more respondents that disagreed than those that agreed with the fact that the course materials were constantly reviewed, revised and updated. Several respondents were of the opinion that among academics there were some that lack sufficient skills to write course materials. On constraints likely to hinder effective internal quality assurances practices in the institution, the majority of the respondents expressed reservation about their offices not being conducive. A sizable number indicated being over-saddled with administrative matters and many reported lack of resources for preparing course materials. The personal direct observations carried out revealed that academic staff offices appeared hot and stuffy. Tools and office equipment needed for day-to-day tasks were sighted and library facilities were adequately equipped.

Discussion

This study was designed to investigate the perception of academics on quality assurance of academic programmes at the National Open University of Nigeria (NOUN). One hundred (106) academic staff from the 5 schools and the centre participated in the study. Based on the assessment, it was found that the level of awareness of NOUN academics on the existence of internal quality assurance measures was quite high as indicated by the majority of respondents. This is buttressed by the majority of the academics who expressed the opinion that the importance of quality assurance is emphasized during school board meetings.

As the results from this study indicate, NOUN academic programmes and courses were highly rated. This is not surprising as quality is the watchword at the NOUN and it underpins every aspect of the experiences prepared for the students. To ensure quality, all the universities in Nigeria, including NOUN, are assessed through the accreditation team of the National Universities Commission (NUC). Hence, NOUN programmes, its tutorial facilitation and degrees awarded are all subjected to the same quality assurance as other Nigerian universities. This fact was buttressed by a significant proportion of the respondents who agreed that NOUN academic programmes were approved according to stipulated guidelines. Besides, NOUN has internal mechanisms for assuring high standards of its academic programmes. It is however observed that only 42.5% indicated willingness to recommend and encourage their relations to study in NOUN. There is a wide margin when compared with the over 70% who held positive views about NOUN academic programmes. This suggests that the academics are skeptical about the effectiveness of ODL. This skepticism may stem from the fact that ODL in Nigeria is at the infancy stage and still developing. In another perspective, this finding provides support to research studies demonstrating an inconsistent relationship between perceptual responses/attitude and behaviour.

Again, from this study, it was found that the majority of respondents indicated the importance of compliance to internal quality assurance policy. As noted by Ogidan (2009), no ODL system can be successful without strict adherence to application of quality assurance mechanisms which have been inbuilt into its processes from policy and planning framework to learners' entry and completion. NOUN is aware of this fact and works to ensure strict compliance with demands of internal quality assurance measures in NOUN.

As the results from this study indicate, NOUN course materials were highly rated and comparable in content to those offered in conventional systems. This finding corroborates those of Russell (2002); Sukati, Magagula, Chandraiah, Simelane and Sithole (2010), who found non-significant differences in the quality of education received through distance learning versus the classroom. On the views of the respondents regarding staff competency in writing course materials, it is a known fact that no educational system could rise above the level of quality of its teachers (National Policy on Education, 2004). The quality of products of any educational delivery can only be as good as the quality of the staff, who in the case of ODL, are responsible for course content development. According to Schlenker (2005), the quality that comes out of a process is affected by the quality of what goes in and what happens at every step along the way. It follows that NOUN as well as ODL institutions must build quality into every step, process and system, to produce quality in the outcome, bearing in mind that course material is the soul of ODL system.

The results of this study point to the heavy workload imposed upon academic staff. More often than not, NOUN academics are overloaded and often stressed in handling multiple tasks, which can lead to tension and consequently inefficiency and ineffectiveness that will manifest in poor quality output as a result of shoddy service (Agbu, 2010). Also, the work environment was reported to be un-conducive for demands of ODL practices. For NOUN to be able to compete favourably with other ODL institutions in the world and meet the challenges in Nigeria, there is need for management to provide a conducive work environment for academic staff as this is one of the basic ingredients for quality assurance. This is why this study is pertinent, hence its findings and recommendations should be taken seriously

Conclusion

The increasing acceptance of ODL as a major channel of widening access to higher education underscores the need for this study. The study has brought to light the opinions of academics on quality assurance of academic programmes at the NOUN. The findings suggest that NOUN academics have a positive perception towards IQAM within the institution, to ensure quality of academic programmes, including course material development process. However, academics expressed reservations regarding work environment, administrative workload as well as capacity of some academics to write course

materials effectively, as constraints to quality assurance implementation. Understanding and taking the academics' perceptions into account and addressing the suggested gaps could help to further enhance and strengthen IQAM, which will further establish the institution's good reputation and image.

Recommendations

Specific recommendations that could address some of the issues and concerns arising from the study are highlighted:

1. There is need for NOUN to conduct orientation programmes for new members of academic staff on quality assurance measures. They should be highly trained to acquire enough skills in ODL and its operations.
2. There is need for provision of functional air conditioners in academic offices.
3. Qualified, competent and dedicated academic staff should be employed.
4. Establishment of quality assurance committees in each academic school is necessary (if not in existence) to coordinate implementation of recommended internal quality assurance policies.
5. Quality should be the responsibility of every staff. Therefore everybody should be involved when decisions about the products and services are made.
6. Workshops in course material writing should be organized periodically for members of the academic staff, to build the necessary knowledge, skills and competence in course material writing. In addition, academic schools should organize mini-training, to equip new staff with course writing skills.

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DISTANCE EDUCATION: A PRODUCT OR A PROCESS?

Guantai Mboroki

Abstract

“Do not conform any longer to the patterns of this world, but be transformed by the renewing of your mind” Romans 12:2

The poster title of this paper tries to look at distance education from the standpoints of product and process. It assumes that both a historical and comparative approach are necessary to unravel the various conceptions of the reality that is distance education. It views challenging moments in society as indicators of the need to change the thinking so that we can “burst the bubble” for the process to move forward while the quiescent moments in history reflect ownership. For instance, the medieval represents education as a product to be protected for the good of society (sacralist) while the 18th and 19th centuries represent a massification (profanity) and hence a challenge to sacralism, which then bursts the bubble for educational access to be extended by the birth of the school. This introduces Hegelian dialectics into the understanding of education as a historical process. The paper then proceeds to look at the various reasons that have led countries to adopt distance education as a challenge to the now traditional mode of classroom delivery. These include; democratization of education, access to education for geographically isolated learners, utilization of limited resources for the provision of quality education and provision of qualified manpower without interrupting production. This is seen as leading to the interpretation of distance education as a commodity in the market-place. The paper then concludes by first clarifying the actual purpose of education and then presents both product and process as reflections of sociological functionalism. Therefore, classroom, distance and e-learning constitute parts of a process called education while the components represent products rightly called study modes in the process of provision of education.

Sacralism versus Profanity

Communication with distance in mind is as old as writing. Human beings have always had the desire to extend themselves beyond the limitations of their physical confines as a way of either sharing their thoughts or influencing others. Distance education is a function therefore of human desire to extend the self. This extension can either be vertical, thus extending a person beyond

his/her lifetime, or horizontal, thus extending a person beyond his/her geographical location (McLuhan, 1964).

History, on the other hand, created the school. Although we do not exactly know why the Sumerians came up with the classroom system, we can very well tell how the modern school came about. Education in Europe before the Industrial Revolution was either monastic, giving capacity to the clergy whose business was to teach the world how to perceive itself or governess-based, to teach the children of the privileged aristocracy their place within the cultural endowment and how to preserve it (Stones, 1992). These two approaches are called sacralist because of their preoccupation with control within an elite class (Keegan, 1983). The Industrial Revolution brought in the printing press which massified book production and created the possibility of mass readership which could only be created within the framework of the emergent rich but illiterate middle class which is the subject of one of Charles Dickens's novels. In England we witness the growth of the Workhouse as described by Dickens (David Copperfield) while in the New World of America the Farmhouse developed, which was to be the genesis of the school (MacNergney and Herbert, 1998). This model is referred to as the profane as it was deemed to dilute the value of the high culture through massification as opposed to the near "elect" status of the products of sacralism (Keegan, 1990).

The school became a tool once again for high culture as the enlarged privileged class sought to own and control its production capacity. By this control the emergent classes hoped to deny or control access to the working class, thus maintaining the new status quo. In the New Lands and the Empire, the school also became the source of privilege. But just like any other social process, this control was pushed over by the pressure to enter or access privilege. The need to enter this elite domain brought in correspondence education which to the neo-sacralists became a profanity. The development into distance education has not changed the mindset of the neo-sacralists and the current virtual realities are being used to entrench the concept of the traditional classroom (Saint, 2000).

The world has witnessed the coming of larger and faster trains, aeroplanes, vehicles and the attendant obsolescence, although not the abandonment of earlier modes of travel. Developments in laser technology have revolutionized surgery, not only in the Developed World, but also in parts of the Third

World. The change from analogue to digital communication systems has transformed the way people relate.

However, none of these changes have managed to obliterate the role of earlier technologies in serving humanity. Indeed they complement each other in covering the world and due to infrastructural differences arising from the way world resources are shared, traditional technologies will be a useful tool to many for quite some time to come. But to what extent is the car a product of the horse carriage? Is the motorcar a manifestation of a point in a process called speed or is it a product? So then, what is distance education? Is it a product of conventional education or a point in the history of education? Delling (1966) defined distance education as:

A planned and systematic activity which comprises the choice, didactic preparation and presentation of teaching materials as well as the supervision and support of the student learning and which is achieved by the bridging of the physical distance between the teacher and the student by means of at least one appropriate technical medium.

Delling (1966) places distance education among the communication processes characterized by its industrialized mechanisms which carry its artificial dialogic and 2-way communication processes. He reduces to a minimum the role of the teacher and throws the whole weight of his analysis on the learner. His definition gives the elements of choice, didactic preparation, presentation, supervision of learning, learner support and appropriate media. Keegan (1990) summarizes the known definitions of distance education in 6 points, which are:

1. The separation of teacher and learner, which distinguishes it from face-to-face lecturing.
2. The influence of an educational organization, which distinguishes it from private study.
3. The use of technical media, usually print, to unite teacher and learner and carry the educational content.
4. The provision of 2-way communication so that the student may benefit from, or even initiate dialogue.
5. The possibility of occasional meetings for both didactic and socialization purposes.

6. The participation in an industrialized form of education which, if accepted, contains the genus of radical separation of distance education from other forms within the educational spectrum (Keegan, 1990).

Williams (2002) defines distance education as:

Learning occurring in different places from teaching, in which the instructor and the students are separated. It requires special techniques in course design, instructional techniques and different types of technology (such as printed materials, video material and online material, etc) to provide contact between instructor and student, to enhance 2-way communication.

The essential contribution of Williams is the clarification that the preparation of distance education materials requires special techniques, which differentiates it from the preparation of text-books and correspondence manuals. It also incorporates the current technologies which help bridge the physical gap such as video and online technologies, taking the debate back to Schramm's (1977) "big media, little media" days.

Both definitions do not seem to concern themselves with who is responsible for this type of learning. This is a critical omission as we must concern ourselves with this third player; that is the supporting institution. Holmberg (1985) gives the following definition:

The term distance education covers the various forms of study which are not under the continuous immediate supervision of tutors present with their students in lecture rooms or on the same premises, but which nevertheless benefit from the planning, guidance and tuition of a tutorial organization.

The definitions by Delling (1966), Williams (2002) and Holmberg (1985) define a system which, like industry, has to prepare its content using specially developed techniques being fully aware that once the product leaves the industry to the consumer, it will have to be used as if the manufacturer was present to give directions for its proper use. This is important in that it is a point of departure from on-campus systems where the manufacturer is deemed present with the consumers to direct proper use. What comes out

clearly is the fact that the definitions do not cover education, *per se*, but deal with study modes and student learning as a consequence of the failure of the traditional modes to provide educational access to those who need it.

The emergence of communication technology as a mediator instead of the teacher also challenges the role of the school as we know it. The educational system loses the monopoly of education and communication becomes itself a vehicle for education (UNESCO, 1980). This frees the provision of education from the restrictive classroom and introduces flexibility as a challenge to the traditional conception of education. Arising from this development distance education has risen as an answer to the many problems society experienced in an attempt to provide education to its citizenry. Those who have chosen distance education as an answer to their learning needs have, to use a consumption phraseology, picked a product from a supermarket shelf. Each of the players has picked the product in answer to a specific need as shown in the following section.

Democratization of Education by Distance Education

Education is a human right that has no possibility of being realized if its provision is to remain in systems that endeavour to replicate the Ivy League in USA or Oxbridge in England. To this end, distance education can democratize the provision of education by replacing elitist structures with individualized learning systems.

Universities such as Texas A&M in the USA have developed elaborate systems with broadcast facilities that provide real-time interaction between learners in various campuses via television, computer networks and so on. The same systems are used by students asynchronously.

In Britain, the systems existing before the Open University of the United Kingdom (OUUK) in 1969 gave an educational provision that favoured the elite. This created a gap between societal needs and the capacity to satisfy that need created a contradiction: “An adult who wished to take a degree, whether he was qualified or not, would find it exceptionally hard to gain entrance to any university or polytechnic. This was true even if he was prepared to study fulltime” (Koul and Jenkins, 1990).

This dichotomy, where Britain enforced universal education as a human right up to the end of secondary school and yet allowed the existence of structures that restricted higher education through traditional beliefs and practices introduced a contradiction which had to be resolved. Harold Wilson, the Labour Prime Minister of the 1960s wanted to see an education that was a “total weave” of the formal, non-formal, vocational, adult, distance education matrix where a person could move through one to the other and have “a permanent intercourse with learning” (Koul and Jenkins, 1990). This is happening today in the United Kingdom, USA, and Australia.

This same dichotomy has been a bottleneck to the provision of higher education to qualified citizens in Kenya. Public universities peg their admission to bed capacity in the campuses (Bogonko, 1992). This has locked out qualified candidates by existing criteria who in turn take up the capacity of those qualified to take courses in the public middle level colleges.

The external degree programme of the University of Nairobi was meant to ameliorate the situation but this was not to be as the numbers seeking university education continued to grow exponentially (Agalo, 2002). The Ministry of Education states that in 2004, the country had 7 public universities, with a total enrolment of 82,257 persons and 17 private universities with a total enrolment of 9,541 persons (Ministry of Education Strategic Plan, 2006-2011).

This situation has worsened over the years despite the increase of the public universities from one to 7, the private universities to 17 and a plethora of foreign accredited universities. The projection for 2006/2007 is that 14% (10,000) of the 68,000 who qualified to enter public universities will actually get places. Another 10,000 will join the parallel programmes of the same universities while a similar number will either join the local private universities or study abroad. The parallel programmes came, not as a result of a contradiction in access to education, but as a way of raising staff incomes and hence stemming the brain-drain that was threatening to impair the universities. But having gone that far, the universities are now realizing that they need to seriously address the issue of inequity in the provision of higher education. At a vice-chancellor’s workshop held under the auspices of UNESCO and the Commission for Higher Education in Kenya (CHE) in July 2001, they noted, *inter alia*, that the “changing student demographics reflected the number of

nontraditional students seeking degrees” and acknowledged that there were “technological advances that were producing alternative modes of delivering university education”. Acknowledging the declining government financing of universities, they endorsed “the use of modern technology and distance learning as an alternative mode of delivery” (UNESCO, 2001).

The government, faced by the problem of absorbing qualified candidates in the existing system, admits that there are tertiary institutions already offering university level education and the Ministry of Education is working out modalities to allow the national polytechnics to offer university education and degrees (Ministry of Education Strategic Plan, 2006-2011). The entry of the African Virtual University into university education is not seen as a realistic solution as it utilizes “the ever-changing information communication technology which calls for heavy investments” (Ministry of Education Strategic Plan, 2006-2011).

The situation is far from being democratic. Agalo (2002) has gone to the extent of proposing the setting up of an open university for Kenya to ameliorate the situation. Thus, while Britain had to go to the market-place, Kenya is still dilly-dallying. Maybe the pressure of democratic behaviour is not yet a real issue in the country.

Access to Education for Geographically Isolated Learners

Distance education has been with us since the Pauline letters were written in the 1st century A.D, with the purpose of tutoring the early Christians with the consideration of a physical distance which had to be bridged with a technical medium. In the 1850s, both Pitman and the London University started what was to take the existing system further by starting correspondence education. Further afield, the realities of the New Lands of Australia and Canada were to give correspondence education the *raison d’etre* that it required to develop to what it is today, that is, a distance mode of education, equal to and sometimes superior to the conventional education that is believed by many to be the preferred mode of the future.

Distance education could provide access to education to learners who are geographically isolated by employing existing and incoming communication technologies. When distance education (correspondence) started in Australia in 1911, it was borne out of the need to provide primary education to white

children scattered in the harsh outback. Thus, the primary objective was to provide a means that would enable the colonist children what was deemed a white child's human right.

The parents who took responsibility for their children's education needed some training and guidance. The telephone and the post office provided the ideal medium and the later developments in gramophony and tape-recording were to improve on the asynchronous delivery of content and a modicum of interactivity. Even today, the traditional distance education in Australia is predicated on isolated students. It is resource-based with little, if any, regular face-to-face teaching (Harry, 1999).

The last half of the 20th century witnessed expansive growth in distance education provision through the creative use of communication technologies. While countries like Kenya benefited through the in-service training of teachers, the external degree programme and co-operative education using print, radio and audio-cassettes (Kithome, 2004), Britain, Germany, Thailand, India and Canada have developed what has come to be termed as "mega-universities" that have intakes running to hundreds of thousands, using anything from radios and televisions to satellites and computers (Saint, 2000). But what has revolutionized distance education is the computer and communication satellites, creating a boom in e-learning possibilities and access to libraries electronically. This has led to the emergence of 13 virtual universities worldwide and the number is set to increase (Saint, 2000). Digital libraries and other databases are being shared worldwide as globalization takes a firm hold of the world as we know it. Some are seeing this as a solution to the North-South inequity where:

The libraries in the universities of most African countries have suffered woefully from lack of money and could at the present form the basis for any serious electronic library project. Open universities in the industrialized world are investing heavily in making databases and course related material available to their students electronically. It would be relatively easy to for these institutions to extend these facilities to the universities in the developing world and to add additional documentation of special relevance to the country concerned (Daniel, 2001).

In Africa the African Virtual University (AVU) is a nascent reality. The initial phase of the AVU consisted of 22 universities in 16 African countries using a common satellite link (Saint, 2000). The major content providers were the Association of Universities and Colleges of Canada (AUCC) and Laval University in Canada for the Francophone countries and the Royal Melbourne Institute of Technology (RMIT) and Curtin University, both of Australia, for Anglophone universities (Koul and Kanwar, 2006). This delivery mode faced a number of challenges, 2 of which were lack of scalability as witnessed by the small number of graduates over time and the local non-identification with the content since they had not been involved in programme conceptualization, curriculum design, material development and programme implementation. The second phase of the AVU takes cognizance of these challenges and sees itself as:

An educational institution that is a part of a network and works with and supports initiatives in African partner institutions, to make use of open, distance, and electronic learning (ODEL) methodologies in teaching and learning at the tertiary level? (Koul and Kanwar, 2006).

However, it is feared by some that these technologies and open courseware, coming as they do from the developed world to the third world, might be used as instruments of control and increase dependency now at the intellectual level, reinforcing the already stifling economic dependence (Daniel, 2001). Others see them as a very real economic and educational benefit to African students and universities (Agalo, 2002).

But at the value-free level they have the capacity to expand access to education as they overcome the barriers of geography, increase the multiplier effect and greatly reduce cost through the exploitation of economies of scale.

Utilization of Limited Resources for the Provision of Quality Education by Distance Study

Immediately after the First World War, the British Broadcasting Corporation (BBC) was established as a public utility. In the 1920s the British toyed with the idea of creating a “University of the Air” to employ this new medium to the service of education (Koul and Jenkins, 1990). It has been mentioned in this paper that both Canada and Australia used the emergent communication technologies to deliver educational content to far flung low population density

areas. Even developing countries like Kenya have harnessed the potential of these technologies, as Professor Peter Kinyanjui notes:

Radio broadcasts have been used regularly to supplement instruction in each subject in the same way that a classroom teacher would offer extra help to the slower students to encourage them, sustain their interest, answer their questions and help them solve their problems (Mackenzie, 1975).

As flexibility grew with the coming of compact cassettes and video-tapes, distance education expanded on the range of interventions available to improve the spectrum of offer. Current advances have made it possible to access educational fare through tele-audio/video conferences, CDs, DVDs and the internet, hence facilitating increased learning (Saint, 2000).

Today, most developed countries offer their students on-campus/off-campus education without any doubts as to the possibility of any medium providing inferior quality (Koul and Jenkins, 1990); Smith and Kelly (1987)). This is because the inclusion of modern technologies has given distance learning a competitive edge in 2 distinct ways. One, until recently face-to-face teaching had the advantage of interactivity while distance learning has had the disadvantage of real-time interactivity, “however modern communication technology is allowing the lack of interactivity in distance education to be overcome” (Smith and Kelly, 1987).

Secondly, there is a realization that distance learning materials, being in the public domain by their very nature, demand the best preparation by courseware developers. This knowledge, added to the concept of course teams, helps to come up with material that is of high quality and adequately critiqued to present the highest refinement in teaching and learning capacity (Smith and Kelly, 1987; Koul and Kanwar, 2006).

Once the materials are ready, the rest of the logistical aspects require a management team that *need not be large, but it must be capable* (Saint, 2000). The use of part-timers to teach also removes costs such as salaries, pensions, medical and other related expenses. It also satisfies the critics that there is face-to-face contact and hence learning.

Provision of Qualified Manpower by Distance Education

The issue of man-power development is one that developing countries cannot afford to take lightly either at the undergraduate level or continuing education level. Some educational economists have observed that at least 12-15% of a nation's workforce must have tertiary education if it is going to compete in the new global economy. They also add, "Seeking to meet this demand requires a conceptualisation of massification that is not currently under consideration" (Teferra and Altbach, 2003).

Distance study could provide qualified manpower without interrupting productivity at individual, organization/institution or national level. This has been a major problem for developing countries. In 1966, a meeting of broadcasters and educators meeting in Bangkok noted that:

The serious large-scale problems facing Asian countries calls for an educational effort of immense dimensions which can be tackled only by a new technology in education and the employment of all available resources (Bishop, 1986).

In Kenya, a similar observation had been made by the Ominde Commission in 1965 (Republic of Kenya, 1965). The in-service training of teachers programme initiated by the Government of Kenya in 1969 produced 10,000 P3 teachers by 1972, thus breaking up the bottleneck of qualified manpower shortage in that area and the incapacity of conventional teacher training colleges to provide this solution (World Bank, 1977). More significant was the observation from educational authorities, that is headmasters, education officers and school supervisors that:

95% of the teachers had improved their performance in the classroom after the upgrading course there was visible improvement in the classroom performance and the examination results of the pupils who were taught by these teachers (Bishop, 1986).

All the authorities agreed that the in-service training courses offered the best opportunity for most teachers to improve their skills, and that the traditional teacher training colleges were not able to cope with the increasing demands for qualified teachers in Kenya. They also agreed that in-service courses gave the teachers a good opportunity to apply their knowledge and skills in the

classrooms, and test their suitability in actual classroom situations (Bishop, 1986).

It is upon this model that the government is able to introduce and carry out programmes such as Supporting Mathematics and Science in Secondary Education (SMASSE) and Supporting Primary Education (SPRED). However distance learning, though regarded as good for breaking bottlenecks, has not been absorbed into the milieu of the educational process in Kenya.

Additionally, distance education provides individualized study drawing from educational theory. Conventional education sees the class as the entity for learning. Distance education sees the individual who is desirous of learning. Plato acceded to the fact that learning can only take place within the individual. Any external assistance given to the learner must be in consonance with the individual's capacity and intention to learn. The teacher can only facilitate learning (Sims, 1977). Plato equated the role of the teacher to that of the midwife. The pregnant woman must finally manage her own labour and the best that outsiders can do is to assist her in delivery by the ancillary art of midwifery. So the teacher is there to ask questions, to stimulate the learner to order his thoughts so as to produce a sound result. (Bowen and Hobson, 1975).

If then education is about the learner, and current technologies and advances in distance education methods have the capacity to empower the learner to learn, then technologically, it is possible to multiply the number accessing that facility without compromising quality, as Holmberg posits:

....there is vast potential for, on the one hand, effective mass teaching, and on the other hand, highly individualised study inherent in distance education. To make use of these in different cultural settings is problematic, however. The general educational and social traditions and attitudes vary and are very powerful in official systems in shaping study regulations, probably even so than tangible educational needs (Holmberg, 1985).

This writer was invited for a course in "modern distance education and e-learning" in China in 2004 and found that despite elaborate measures to bridge the gap between the learner and the teacher, distance education is still regarded

as second-rate and the learner certificate must indicate the mode of study, reminiscent of the “albatross around the neck of the ancient mariner”. But in Britain the contradiction is no longer tenable, as Koul and Jenkins confirm:

An important manifestation of the Open Universities (OUUK) acceptance in UK higher education is the extensive range of opportunities now available to its students to transfer into conventional universities or to switch to the open university, each being able to transfer credits (Holmberg, 1985).

It should be noted that it has taken a long period of time for the demystification and demythologization of education to take place. But the change has come. Individualization and massification are no longer contradictory as demonstrated by the current educational practices in Australia, Canada, USA, Britain and other countries.

As Sims (1977) concluded in a statement that is consonant with Plato’s theory of education presented elsewhere in this document, and which provides for the vision of education presented by Harold Wilson in the 1960s:

In whatever society, for whatever purposes, by whatever means, under whatever ideology, the essential objective in educating process is learning by the individual learner ... the methodologies employed are only incidental to this end (Holmberg, 1985).

If this is the case, then distance education is the force that is to burst the bubble so that the process of education can move from the product inertia state that was created by the ossification of the school to a synthesization of educational thought to fully incorporate distance education as that missing link that will help globalize access to education. This will consequently reduce the current local and international social disequilibrium brought about by unequal access to global resources. Education is a social process just like communication, health and sanitation, and environmental conservation, and yet, a product of human civilisation. It has components that designate themselves as products of historical moments which are really add-ons to the learning experience — schools, distance study, e-learning and now, the new global term of open-learning.

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RELATIONSHIP BETWEEN SCHOOL ENVIRONMENT AND USE OF ICT IN TEACHING SCIENCE CURRICULUM IN NEPAD AND CYBER E-SCHOOLS IN KENYA

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Abstract

The school environment is a crucial factor in the use of ICT in teaching and learning science subjects in schools. The reality in the classroom falls short of the aspirations of those advocating for the use of Information and Communication Technology (ICT) in teaching and learning, especially in New Partnership for Africa Development (NEPAD) e-schools and cyber e-schools in Kenya. This article presents results of 4 hypotheses which tested the relationship between characteristics of the school environment and their influence on the use of ICT in teaching and learning science in Kenyan secondary schools. The sample was drawn from 12 Cyber Schools Technology Solution (CSTS) and NEPAD e-schools. A descriptive survey was employed using an *ex-post facto* design. Data was collected using questionnaires, interviews, observations, site visits and analysis of documents. A total of 1,247 students and 44 teachers were sampled from the 12 schools. The results showed that the location of the school had a statistically significant positive relationship between where the school is located and use of ICT for teaching and learning science subjects, while access to internet services had a weak statistically significant relationship with utilization of ICT in teaching science subjects. The source of power supply (electricity) has a strong positive significant relationship with use of ICT in teaching science subjects. The relationship between various physical factors inside the ICT laboratory and use of ICT in teaching sciences was also tested and the results indicated a significant relationship with lighting, ventilation and noise level but no significant relationship with the type of furniture was found. From these findings, it was concluded that the location of the schools, access to internet, availability of electricity supply and the physical environment within the school, play a major role in the effective utilization of ICT in teaching and learning science subjects. It is recommended that schools invest in ICT infrastructure. A national ICT training strategy should be developed to guide the improvement of the school environment, to make it more supportive of ICT integration in learning and teaching science subjects

Introduction

The introduction of ICT in educational institutions is considered part of the technological modernization of administration and education, as well as of the information society action for electronic government (e-Government) and electronic learning (e-Learning) in Kenya (Keiyoro, 2010). ICT enters the school environment progressively, with the objective of adopting technological applications in the teaching and learning process, monitoring of students' progress, school administration, the school library and generally in management of the whole school as an organization. ICT in schools can be examined from 4 angles — as an administrative and management tool; as a teaching medium; as a learning object; and as a learning tool. As such, the implementation of ICT in the school environment may be characterized as having 4 primary functions — administrative, library *resource*, learning and a medium for teaching — with new technology as the focal point. This study focused on characteristics of the school environment and its influence on use of ICT for teaching and learning science subjects in NEPAD and cyber e-schools in Kenya.

ICT has a significant role to play in facilitating the creation of new types of learning environments, supporting distance-based models of learning and opening up a wealth of new educational resources. Kenya is currently confronted with many educational challenges, which may imply that the ambitious Millennium Development Goals and Kenya's Vision 2030 goals for education are unlikely to be met without well-trained and committed teachers working within ICT-enhanced school environments.

According to the Ministry of Education (MoE) (2006), such challenges include poor access to ICT infrastructure by both students and teachers. In most cases, this is due to the low level of functioning ICT infrastructure in schools. The condition of the ICT infrastructure in a majority of schools does not meet basic standards. For example, many of the computers that are donated to schools by different organizations have inadequate RAM, processors and software. Moreover, some machines have less storage space than the 64 MB flash drive (Keiyoro, 2010). Keiyoro (2010) also demonstrated that there is increased concentration of information flow to urban areas.

ICT can play a big part in supporting face-to-face teaching and learning in the school environment. The technologies can help teachers to enhance their

pedagogical practice and consequently assist students in their learning process. Use of ICT in learning plays an important role in enabling students to gain ICT skills and motivating them in the process of acquiring knowledge. It is therefore argued that students who are proficient in ICT skills are able to search for information, present data and complete many learning tasks. However, certain factors that are pertinent to characteristics of the school can have significant impact in influencing the use of ICT skills in learning and teaching opportunities in school environments. These include the availability of ICT resources, training in ICT skills and school leadership. Gakuu (2009) found that the success of the integration of ICT in teaching and learning varies from curriculum to curriculum, place to place, class to class and school to school, depending on the ways in which it is applied and the enabling environment. For example, schools in less economically advantaged areas and rural districts tend to fall further behind in access to internet, power supply, poor school leadership and poor equipped ICT laboratories. This study assessed how the above-mentioned school environment related factors influenced the integration of ICT in teaching and learning science in NEPAD demonstration and cyber secondary schools in Kenya. The study focused on how the school-related issues influence the use of ICT in teaching and learning science subjects. It examined the relationship between various school internal and external variables, which includes the location of the school, mode of internet connection, power supply and physical environment inside the ICT laboratories.

Literature Review

The level of ICT infrastructure provision in schools varies enormously across Kenya (Godia, 2006). This consideration should be taken into account when developing programmes that use ICT in teaching and learning in the country. Factors influencing use of ICT in teaching and learning in urban schools in Kenya are often different from those across much of the rest of country (Godia, 2006). The digital divide has expressed itself across the country as a bandwidth divide. Good broadband connectivity, for example, is now taken for granted in many of the richer countries of the world where educational software is increasingly being developed to take advantage of this. This access to the internet is rare and expensive in Kenya. Although 2-way satellite connectivity is now available across most African countries, the costs of using this for educational purposes remains prohibitively high to make it a sustainable choice for learning and teaching (Vanbuel, 2004).

Variability in ICT infrastructure provision means, in practice, that use of ICT in teaching and learning science subjects will need to be thought through carefully in specific school contexts (MoE, 2006). Teachers and learners need to have access to similar training through different media, depending on the infrastructure available to them. This is because schools located in urban areas have better ICT infrastructure and hence have a higher probability of effective utilization of ICT than those in rural areas (Godia, 2006). The present study investigates this assumption.

Although there is no consistent relationship between the average amount of ICT use in schools and its apparent effectiveness in raising standards, the effective use of ICT in schools with good levels of ICT infrastructure can have a positive impact on students' achievement (Harrison *et al.*, 2002). In addition, HanneleNiemi (2003) found that while the number of computers in schools did not increase the use of ICT by teachers, proper ICT infrastructure remains one of the main factors of the successful integration of ICT in education. For instance, it is pointless to provide schools with adequate ICT hardware without proper software. Apparently, there is a need for technical support and maintenance of ICT infrastructure in schools (Granger *et al.*, 2002; Hakkarainen *et al.*, 2001). Technical assistance is a key factor for implementing new innovations (Fullan, 1999). Unreliable ICT infrastructure in schools has been found to be “the best innovation killer” (Hepp *et al.*, 2004). There is often a significant, positive correlation between the technical assistance received by schools and the progress of integrating ICT into teaching and learning (Byrom, 2001).

Learning environments in schools typically involve one or more teachers who interact with a number of learners, usually in well-defined physical settings. Both the teacher and the learner interact and form a variety of relationships, creating what Salomon (1994) calls a system of interrelated factors. These factors jointly affect learning interactions with the relevant individuals. This is what Wubbels *et al.* (1991) also terms as the “relationship dimension” in a classroom and school environment.

Therefore, Wubbels *et al.* (1991), explains that learning environment has a physical as well as a relationship dimension, with the physical dimension being a room full of furniture and equipment. Curriculum materials such as books and videotapes may be present in a room to form the relational component of

a teaching and learning environment in a school. The curriculum also has a place in the relationship dimension of the school environment in that, students and teacher(s) are focused on certain processes and content in the curriculum. They also relate with that curriculum and the methodologies that are associated with conveying the curriculum.

The place of ICT infrastructure in learning is most likely to provide relational aspects in the classroom in the school environment. Most experts in the field of educational computing (Lynch, 1990; Olson, 1988; Rieber, 1994) characterize ICT infrastructure as interactive and place it within the relationship structure of the ICT-enhanced classroom-learning in school environments. The curriculum is concerned with what is learned and taught and how this learning occurs may depend on physical aspects of the school often called learning resources. What is learned or taught includes objectives, content, and learning outcomes (the knowledge acquired, skills and attitudes that students are expected to demonstrate). The curriculum includes content, teaching or learning methodology, teaching strategies and media resources in a school (Lynch, 1990).

Salomon (1994) noted that most teaching or learning methods and strategies involve the use of multimedia equipment. Some teaching methods may only include the use of a blackboard and chalk while others may make use of a television or overhead projectors. These types of equipment and their use within the curriculum are often referred to as educational technology. Educational technology, therefore, is concerned with the technology that is used to facilitate the teaching or learning process in school environments. Keiyoro (2010) observed that educational technology is also considered as the “tool of the teaching trade” as part of the medium used to convey the curriculum. Some of these technologies involve the use of computers or ICT infrastructure (Salomon, 1994).

Keiyoro (2010) emphasized that there is a 2-way relationships between the curriculum and educational technology in schools. Typically, the teacher and other components of the education system determine what is to be taught and learned as well as the methodology and educational technology to be used. The technology to be used is determined by the intended curriculum and certain environmental characteristic of the school. The part of the context of the curriculum concerns the role of the teacher, physical setting in the school

environment and general pedagogical views of the teacher and educational system. These are likely to affect the choice of technology used and the learning environment in which it should be utilized (Keiyoro, 2010; Wubbels *et al.*, 1991).

There are a number of instances when the curriculum has been changed due to changes in technology (Wubbels *et al.*, 1991). In such cases, the invention of new technology has added content to the curriculum. In other cases, new technology has made parts of the content obsolete, for example using calculators instead of logarithm tables for calculation. Availability of technologies such as overhead projectors, videos and computers has led to the development of new methods of learning and teaching which were not feasible previously. Therefore, technology can affect the curriculum, both in terms of content and methodology of delivery applied in the school environment.

Operational Definitions of Relationship between School Environment and Use of ICT in Teaching the Science Curriculum

This study investigated how the school environment relates to the use of ICT in teaching and learning science subjects. The independent variables are the location of the school, mode of internet connection, power supply and physical environment inside the ICT laboratories, while the dependent variable is use of ICT in teaching science subjects. Use of ICT in teaching science subjects refers to the frequency with which teachers use various ICT tools in teaching science subjects as reported by the respondent. It is assumed that teachers use ICT as a teaching tool if other ICT-related factors are available in school.

Table 1: Operational Definitions

Objectives	Research Questions	Variables/ Indicators/ Dimensions	Hypothesis	Types of analysis
To establish how each of the following characteristics influence the use of ICT in teaching and learning science subjects i.e Location, mode of internet connection, Powers supply and physical environment inside ICT room,	How had the specific environmental characteristics of the schools influenced the use of ICT in teaching science curriculum in the selected schools?	Location of schools-rural, urban and semi urban	H _a : The location of schools does not influence the use of ICT in teaching science subjects	Descriptive statistics, regression, Chi-Square
		Mode of internet connection	H _b : The access to internet services in schools does not influence the use of ICT in teaching science subjects	Descriptive statistics, Regression Chi-Square
		Power supply to schools	H _c : The power supply does not influence the use of ICT in teaching and learning science subjects	Descriptive statistics, regression
		Physical environment in the ICT laboratory	H _d : The physical environment inside the ICT laboratories does not influence the use of ICT in teaching and learning science subjects	Descriptive statistics, Regression Chi-Square

Research Questions

- (i) How does the location of the school influence the use of ICT in teaching and learning ?
- (ii) How does the availability of power supply influence use of ICT in teaching science subjects in the schools.?
- (iii) What is the influence of internet connectivity on use of ICT in teaching science curriculum in the schools.?
- (iii) How does the physical condition inside the ICT room influence use of ICT in teaching science subjects in the school?

Operational Definitions of the Independent Variables

Location of school: refers to the geographical location of the schools. This was operationalized as urban schools, semi-urban schools and rural schools. In the study, the hypothesis is tested so as to find out the influence of location of schools on use of ICT in teaching and learning science subjects. The assumption is that schools located in urban areas have higher chances of accessing electricity, internet, modern ICT laboratories and better support

from school managers, hence they are able to integrate ICT in teaching science subjects more effectively. From this argument, the following hypothesis was developed and tested:

There is no relationship between the location of schools and use of ICT in teaching science subjects

Mode of internet connection: refers to the means by which schools connect to the internet. It assumed that since the internet is a source of a lot of e-learning science materials and collaborative learning in a school, its availability will therefore influence its use for teaching and learning. To establish the nature and strength of this relationship, the following hypothesis was tested:

There is no relationship between access to internet services in schools and use of ICT in teaching science subjects

Power supply: refers to a source of regular supply of electrical power to a circuit or device that must be operated within certain power supply limits. The assumption of this was that even if all other ICT infrastructures were in place without electricity, learning using ICT will not take place and science teachers will therefore most likely revert to the conventional mode of teaching (chalk and talk). From this observation, the following hypothesis was tested:

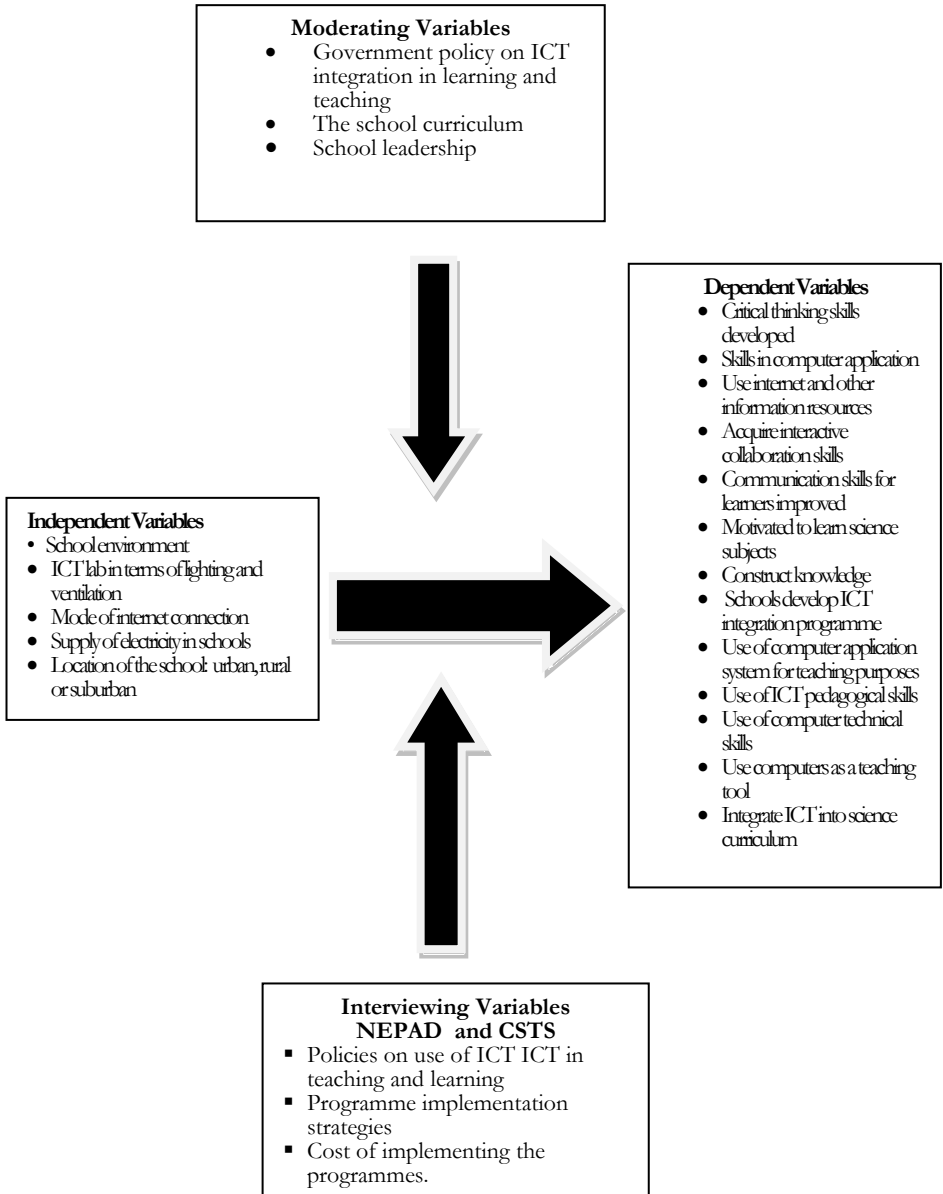
There is no relationship between power supply and use of ICT in teaching and learning science subjects

Physical factors inside ICT laboratory: refers to the physical condition of the computer laboratory in terms of lighting, ventilation, furniture and noise level. The assumption of this study was that computer laboratory which had good lighting, was well-ventilated, had good furniture and reduced noise, would influence use of ICT in teaching and learning. This argument led to the following hypothesis:

There is no relationship between the physical factors inside the ICT laboratory and the use of ICT in teaching and learning science subjects

Conceptual Framework

Figure 2: A Conceptual Framework of the School Environmental Variables Influencing the Use of ICT in Learning and Teaching Science Curriculum



The study used a descriptive survey method to collect basic data on the current practice of ICT in teaching and learning of science subjects in cyber and NEPAD ICT-supported secondary schools. This research method is capable of collecting background information and also the researchers had little opportunity to motivate or influence respondents' responses. Survey technique was suitable for this research because attitudes, ideas, comments and public opinion of the problem or issue such as the one under study were sort (Fraekel and Wallen, 2000). The descriptive survey approach was chosen for the present study because it sought to gain insight into a phenomenon as a means of providing basic information in this area of study (Fraekel and Wallen, 2000).

The target population was science teachers who are currently teaching in public secondary schools located in the 8 provinces of Kenya. Censor method was used to sample all the 6 NEPAD-supported secondary schools while random stratified sampling was used to obtain 6 cyber-supported schools. Fifty copies of questionnaires were randomly distributed to science teachers from the 12 public secondary schools located in different provinces in Kenya; 44 of them filled the questionnaires and returned. This gave a response rate of 85%.

Sampling Technique

The study was conducted in secondary schools that participated in the CSTS project and NEPAD e-schools initiative projects. The selection of the NEPAD e-schools for the study was purposive (Fraenkel and Wallen, 2000). All the 6 secondary schools were implementing ICT programmes and were funded by NEPAD e-Africa initiative commission. They had the necessary ICT infrastructure or had initiated use of ICT in the curriculum used for teaching science.

Through their own initiative or through MoE support, the cyber e-schools have acquired digital science learning materials at a cost from CSTS. The schools had also put up basic ICT infrastructure through their own funding projects or through government financial support. The implementation of ICT in education was a necessary condition for this investigation.

The units of analysis in this study were cyber and NEPAD e-schools. The units of observation were the teachers, learners and school environment in the

selected schools. Science teachers in these schools were treated as key informants.

Sampling procedures were conducted to ensure that conclusions from the study were generalized to the entire population. Teachers in the NEPAD programme were not sampled because e-schools were few and hence all the science teachers in the schools participated in the ICT programme. However, 30% of the teachers in the sampled cyber e-schools that were in the CSTS programme were selected through simple random sampling for this study (Fraenkel and Wallen, 2000).

A stratified random sampling procedure was used to determine the number of learners to be sampled for purposes of the present investigation. To ensure that the sample was representative of a population about which there was a fair amount of information available, the population was divided into sub-groups (Mulder, 1993). The student population of 3,577 was divided into sub-groups according to their class levels which were categorized as Form One, Two, Three and Four.

Teachers carried out the sampling of learners in a systematic manner. A rigorous procedure was applied to avoid bias and maintain a representation of the diverse groups of learners in each school. A simple random sampling procedure (Fraenkel and Wallen, 2000) was adopted to select learners to answer the questionnaire as recommended by Fraenkel and Wallen (2000) who state that, with a simple random sample, each element in the population stands an equal chance of being selected in the next draw.

The sample size in each school was 20% of the student population that were using ICT for learning science subjects. This number was determined by the researcher with the help of teachers and rounded off to the nearest whole number. The sample size was determined by the number of learners presented by each school.

The study used both qualitative and quantitative research methods. According to Fraenkel and Wallen (2000), the styles of both methods differ in that the quantitative uses numbers and statistical methods and is based on the numerical measurements of specific aspects of a phenomenon. It abstracts from particular instances to test causal hypotheses or seek general description.

It involves measurements and analysis that are easily replicable by other researchers. Qualitative research does not rely on numerical measurement. It focuses on a small number of cases, uses in-depth interviews and observation techniques. According to Fraenkel and Wallen (2000), it entails general discussions and individual questions that are developed spontaneously in the course of the interview and is concerned with a comprehensive account of an event.

In this study, an interview schedule was constructed and used to conduct in-depth interviews with key informants in the respective schools chosen for the study. The observation technique was also used to collect accurate information on the endeavours of the various schools and teachers in using ICT in learning and teaching science subjects. The information gathered was used to add value to the findings and act as a complement to the information collected using the questionnaires to highlight the factors that influence use of ICT in teaching sciences in the selected schools.

Primary data was obtained from students in the respective schools using face-to-face structured interviews based on standardized questionnaires that had open and close-ended questions. This involved a set of predetermined questions and highly standardized techniques of recording. Other methods used for the study included sources such as documentation in schools, online data, interviews, focus group discussions and observations. Secondary data was collected from books, journals, unpublished research work, the internet and magazines.

The questionnaires were pre-tested in 2 secondary schools, each representing the 2 categories of schools — NEPAD and cyber e-schools used in this study. The purpose was to test the instruments for validity and reliability (Nevell, 1993) and to determine how realistic the questions were for the learners and teachers. Nevell (1993) stressed the importance of scrutinizing data gathering instruments to identify ambiguity, misleading questions or instructions and suggesting improvements. Minor changes were made after the pre-tests, in collaboration with the researchers conducting the study.

The sampling method allowed the researchers to use cases that have the required information and facilities (Fraenkel and Wallen, 2000) with respect to the problem and objectives of the study. The schools selected were public and

teach the main science subjects in the science curriculum in Kenya — mathematics, physics, biology and chemistry.

The target population was science teachers and students in the selected schools. The science teachers in the 36 selected secondary schools comprised the total population. Thirty percent (Fraenkel and Wallen, 2000) of the teachers in cyber secondary schools were sampled through simple random procedure (Fraenkel and Wallen, 2000) and all science teachers in the 6 NEPAD e-schools programme were purposively included in the study.

An official permission was attained from the MoE and the questionnaires were dropped and collected after being filled at the sampled secondary schools. The questionnaires were administered to 42 science teachers.

Data Collection Instruments

The survey instrument was developed by the researchers after an extensive review of literature and scales used in different educational backgrounds guided by the theoretical base of the study. This instrument was sent to experts working in the field of ICT in education, to determine its face and content validity. The instrument was improved in the light of the feedback. The questionnaires were pre-tested to ascertain the instruments validity and reliability (Nevell, 1993) and to determine how realistic the questions were to the ability of learners and teachers.

The split half technique was used to calculate the reliability coefficient using the following formula.

$$Re = \frac{2r}{1+r}$$

Where:

Re = correlation coefficient of the entire test

R = correlation coefficient of the even numbered statement with the scores of the odd numbers statements.

The value “r” indicated the degree to which the two halves/subsets were internally consistent. Reliability coefficient ranges from values of 0.000 and +1.00 indicating perfect reliability. In this study, the reliability coefficient was

found to be 0.72 which meant that the instrument could be relied on to make valid conclusions.

Data Presentation, Analysis and Interpretation

The data were analyzed via SPSS 12.0 for Windows. Descriptive statistics were used to describe and summarize the properties of the mass of data collected from the respondents. The findings are presented in form of tables, figures and descriptions of the data. Simple regression analysis was performed to analyze the relationships between the school environment variables and use of ICT in teaching and learning science subjects. A level of 0.05 was established a priori for determining statistical significance.

The relationships among the various school environment variables were analyzed in order to establish how the school environment influences the use of ICT in the teaching and learning of science subjects. The independent variables were location of school, mode of internet connection, power supply and physical environment inside the computer laboratories, while the dependent variable is use of ICT in teaching science subjects. Four hypotheses were developed and tested.

1. Location of Schools and Use of ICT in Teaching Science Subjects

The descriptive analyses showed that 54.8% of the schools were located in semi-urban areas, 36.8% in urban areas and 8.4% were in rural areas. There is a likelihood of a relationship between access to ICT prerequisites for example electricity, telecommunication, and internet connectivity. This can influence either success or failure of a school to utilize ICT in teaching and learning science subjects. Over half of the sampled secondary schools (54.8%) were located in semi-urban areas, 36.8% were in urban areas while 8.4% were in rural areas. Table 1 shows areas where different categories of schools were located.

Table 1: Area/Environment where the Schools were Located

	Urban		Semi-urban		Rural	
	Freq.	%	Freq.	%	Freq.	%
Cyber School	265	25.6	208	20.1	51	4.9
NEPAD	115	11.1	359	34.7	36	3.5
TOTAL	380	36.8	567	54.8	87	8.4

Using a simple linear regression analysis, a statistically significant positive relationship between where the school is located and use of ICT for teaching and learning science subjects ($r^2 = 0.431$, P-value 0.023) which is less than <0.05 , was established.. The assumption was that secondary schools located in urban areas have higher chances of accessing electricity, internet, modern computer labs and enjoy better support from school principles, hence they are able to integrate ICT in teaching science subjects more effectively. The null hypothesis (H_0) that there is no association between location of the school and use of ICT in teaching science subjects was rejected. These results may be explained by the fact that different location of schools (urban, semi urban and rural areas) had different challenges affecting them such as power supply and internet connection.

Table 2: Location of Schools and Use of Computers for Teaching Science Subjects

Relationship test	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
Relationship between the location of the school and use of ICT in teaching science subjects	.656(a)	.431	.265	.66121		2605	9	1.139	.023

2. Internet Services in Schools and Use of ICT in Teaching Science Subjects

For most schools that had access to internet, it was by fixed line infrastructure (wires). None of the institutions had the broadband wireless connection. It was found that 29.4% used dial-up connection using fixed telephone lines, 23.5% had integrated services digital network ISDN, while 47.1% used ADSL lease line to connect to the internet. It can therefore be argued that the classroom teaching and learning environments are still very much traditional without much internet influence in teaching and learning science subjects.

Table 3: Mode of Internet Connection

	dial up modem(14.4 to 56k)		Integrated Services Digital Network (ISDN)		lease line(ADSL)	
	Freq.	%	Freq.	%	Freq.	%
NEPAD e-schools	1	5.9	4	23.5	4	23.5
Cyber e-schools	4	23.5	0	0.0	4	23.5
TOTAL	5	29.4	4	23.5	8	47.1

This relationship was further tested using a simple linear regression analysis. The result showed that access to internet services has a weak statistically significant relationship with utilization of ICT in teaching science subjects ($r^2 = 0.590$ P-value 0.000) less than <0.05 . The null hypothesis (H_0) that there is no association between access to internet and use of ICT in teaching science subjects was rejected. The assumption was that since the internet is a source of a lot of e-learning science materials and collaborative learning, its availability will therefore influence its use for teaching and learning.

Table 4: Access to Internet Services in Schools and Use of ICT for Teaching Science Subjects

Relationship test	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df 1	df 2	Sig. F Change
Relationship between access to internet services in schools and use of ICT in teaching science subjects	.768(a)	.590	.471	.32621	.590	4.960	9	31	.000

3. Power Supply and Use of ICT in Teaching and Learning Science Subjects

The descriptive analysis showed that 10.7% of the sampled secondary schools had no electricity but relied on diesel driven generators for power supply, while in 89.3% of the secondary schools which had power supply, it was restricted to areas such as the principals’ offices, office reception and staff rooms but not in any of the classrooms. It can therefore be argued that, the environment in which the schools are located affects availability of permanent power supply, which in turn will affect utilization of ICT.

Table 5: Availability of Permanent Power Supply

Students in:	Yes		No	
	Freq.	%	Freq.	%
Cyber School	465	45.9	45	4.4
NEPAD	440	43.4	64	6.3
TOTAL	905	89.3	109	10.7

Source: Field Data

The study also found that 39.8% of the schools had unreliable electricity, in the sense that they frequently experienced power failures for 2 or more days in a row. The majority of teachers claimed that they were unable to rely on the current state of the electricity supply to plan their science lessons or science activities. Most schools could not afford generators, let alone the fuel required to drive the generators. Only one school had a back-up functioning generator. However, 48.6% of the schools had a reliable source of power supply while 11.7% had very reliable electricity supply.

The source of power supply (electricity) has a strong positive significant relationship with use of ICT in teaching science subjects R square = .492 (p -value = 0.050). The null hypothesis (H_0) that there is no association between availability of reliable power supply to schools and use of ICT in teaching science subjects was rejected. These findings mean that even if all other ICT infrastructure were in place without electricity, learning using ICT will not take place. The science teachers will therefore most likely revert to the conventional mode of teaching (chalk and talk). The unreliability of electricity was cited by 39.8% teachers as being an impediment to their effective use of ICT in teaching and learning science subjects.

Table 6: Power Supply and Use of ICT in Teaching and Learning Science Subjects

Relationship test	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
Relationship between power supply and use of ICT for teaching and learning	.701(a)	.492	.334	.40989	.492	3.120	9	29	.050

4. Physical Environment inside the ICT Laboratories and Use of ICT in Teaching and Learning

The location of computers in schools can determine the ease of their access by teachers and students. In particular, teachers’ and students’ utilization of ICT can be restricted when access is confined to computer laboratories. The access to computers in the majority of schools was in fact restricted to computer laboratories. Teachers expressed the need for more access to ICT especially outside computer laboratories. In one teacher’s words, “I believe that we need computers, data projectors, and scanners in classrooms instead of ICT laboratories.” Other teachers proposed that ICT laboratories should be made available for all subjects, all the time. A number of teachers during group discussions indicated the need to have computers in classrooms to be able to teach some of the new digitized curricula with efficiency and ease. Respondents were asked to rate their computer laboratory in terms of internal lighting, ventilation, furniture and space.

The lighting in the laboratories was rated well by 26.2% of the respondents. 59.5% indicated that it was good while 11.9% indicated that it was fair. However, 2.4% respondents indicated that their computer laboratories had very poor internal lighting. In terms of ventilation, majority 45.2% of the respondents indicated that their computer laboratories had very good ventilation, 28.6% cited that the ventilation was good while 19.0% rated it fair. However, 4.8% rated it poor while 2.4% indicated that it was very poor.

Lack of space and overcrowding in laboratories was evident. In total, 33.3% of the respondents indicated that the laboratories had fair space, 21.4% indicated the space is poor while 9.5% indicated that space is very poor. Only a few of the secondary schools had spacious computer laboratories as was indicated by 26.2% of the respondents while 9.5% indicated that the space in their computer laboratories was good. Though, 26.2% of the respondents rated the furniture in their computer laboratories as very good and 45.2% rated them good, it is evident that in this research uncomfortable furniture was another major problem experienced by both students and teachers in some secondary schools. This is affirmed by 16.7% who rated them fair, 9.5% rated them poor while 2.4% rated them very poor. There is need for institutions to invest in purchasing of good chairs and computer desk that are comfortable.

Noise, unnecessary movements and commotion was relatively fair in majority of the selected schools 40.5% while 7.1% indicated that it was a major problem in their schools. However, 21.4% indicated that noise level in their computer laboratories was reasonable while 31.0% indicated that it was good. The respondents also indicated that the slow response of computers to commands, and slow internet accessibility was a major setback in the use of computers for teaching and learning science curriculum. This may be due to the fact that, the bandwidth of the (ISP) is small; the computers are not well maintained. Some users also did not know how to use the computers effectively. Table 7 shows the physical aspects of classroom environment.

Table 7: Physical Aspects of Classroom Environment

		Very good	Good	Fair	Poor	Very poor
Lighting	Cyber e-Schools	11.9%	38.1%	4.8%		0.0%
	NEPAD e-Schools	14.3%	21.4%	7.1%		2.4%
	All schools	26.2%	59.5%	11.9%		2.4%
Ventilation	Cyber e-Schools	19.0%	19.0%	14.3%	2.4%	0.0%
	NEPAD e-Schools	26.2%	9.5%	4.8%	2.4%	2.4%
	All schools	45.2%	28.6%	19.0%	4.8%	2.4%
Furniture	Cyber e-Schools	7.1%	31.0%	7.1%	9.5%	0.0%
	NEPAD e-Schools	19.0%	14.3%	9.5%	0.0%	2.4%
	All schools	26.2%	45.2%	16.7%	9.5%	2.4%
Noise level	Cyber e-Schools	11.9%	23.8%	19.0%	0.0%	
	NEPAD e-Schools	9.5%	7.1%	21.4%	7.1%	
	All schools	21.4%	31.0%	40.5%	7.1%	

Space	Cyber e-Schools	7.1%	9.5%	19.0%	16.7%	2.4%
	NEPAD e-Schools	19.0%	0.0%	14.3%	4.8%	7.1%
	All schools	26.2%	9.5%	33.3%	21.4%	9.5%

Source: Field Data

The regression analysis results showed that various physical environment factors inside computer laboratory have a significant relationship with use of ICT in teaching science subjects. Lighting in the laboratory had ($r^2 = 0.515$, P-value 0.003), ventilation had ($r^2=0.636$ p-value 0.000), noise level had a relationship at p-Value 0.000. However, the furniture in the laboratory had no relationship ($r^2=0.370$ p-value 0.071 which is >0.05). The assumption of this study was that computer laboratory which had good lighting, well ventilated, good furniture and reduced noise will influence teaching and learning. Table 8 shows the relationship between physical environment inside computer laboratory and use of ICT for teaching and learning.

Table 8: Physical Environment inside Computer Laboratories and Use of ICT

Model		R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
						R Square Change	F Change	df1	df2	P-Value
Lighting	1	.718(a)	.515	.375	.62245	.515	3.662	9	31	.003
Ventilation	1	.797(a)	.636	.530	.70876	.636	6.018	9	31	.000
Furniture	1	.608(a)	.370	.187	.92194	.370	2.020	9	31	.071
noise level	1	.801(a)	.642	.538	.61962	.642	6.170	9	31	.000

The null hypothesis (H0) that there is no association between physical environment inside a computer laboratory and use of ICT in teaching science subjects was rejected. These factors should be taken into account while setting up a computer laboratory since they seem to affect ICT aided learning or teaching at significant level.

As demonstrated above, the hypothesis that school environment is significantly related to use of ICT in ICT in teaching science subject in NEPAD and cyber e-schools was accepted. The suggestion here is that the location of the schools, access to internet, availability of electricity supply and

the physical environment within computer labs play a major role for effective utilization of ICT in teaching and learning science subjects.

Discussion

The aim of this study was to investigate how the school environment influenced the use of ICT in teaching and learning science subjects. The results showed that the location of the schools had an influence on the availability of ICT prerequisites, for example, electricity, telecommunication, and internet connectivity. Over half of the sampled secondary schools 54.8% were located in semi-urban areas 36.8% were in urban areas while 8.4% were in rural areas. The test results revealed an association of $R^2=0.431$, P-value .023 which is significant with regard to the study's set level of significance ($p=0.05$). Consequently, the conclusion was that the location of school influenced use of ICT in teaching science subjects.

The location of computers in schools also determined the ease of access by teachers and students. In particular, teachers and students' use of ICT for teaching and learning was restricted if the access was confined to laboratories. Also, test results showed that the various physical environment factors inside computer laboratory influenced use of ICT in teaching and learning ($R^2=0.375$, p -value 0.003). These factors include good lighting, well ventilation, and suitable furniture and reduced noise levels.

Secondary schools are not given adequate funds to provide furniture, laboratories and adequate classrooms, let alone being given adequate funds for ICT infrastructure. Due to lack of adequate power supply, especially in rural areas, secondary schools located in these areas had no access to the internet and hence, could be perpetually excluded from the world's information superhighway (Paltridge, 1996).

Access to the internet varied greatly amongst the selected schools. The majority of sampled secondary schools (46.2%) had only one computer connected to the internet. About 7.7% had 2 computers connected to the internet; 15.4% had 3 connected to the internet; while 30.8% indicated that they had an average of 20 computers connected, which translated to all computers in the laboratories connected to internet. Nevertheless, teachers

complained about the quality of internet speed. Consequently, this hampered the use of computers for internet searches, for science information or performing assignments given to students by their science teachers. The association between access to internet services in schools and use of ICT in teaching science subjects was found to be significant at $p=0.000$ and was below the study's level of significance (0.05). The conclusion drawn from this is that access to internet services influences use of ICT in teaching science subjects. This was due to the fact that internet was a source of a lot of e-learning science materials and collaborative learning.

The association between power supply and the use of ICT in teaching and learning was found to be significant at $p=0.050$, which fell below the study's level of significance (0.05). The conclusion drawn from this is that access to power supply strongly influences the use of ICT in teaching and learning science subjects. These findings mean that even if all other ICT infrastructures were in place without electricity, learning using ICT would still not take place. The science teachers would therefore be likely to revert back to the conventional mode of teaching ('chalk and talk' method). The unreliability of electricity was cited by 39.8% teachers as being an impediment to their effective use of ICT in teaching and learning science subjects.

The association between various physical environments inside computer laboratories and use of ICT in teaching and learning was as follows. Lighting in laboratory had ($r^2=0.515$, p -value 0.003), ventilation had ($r^2=0.636$ p -value 0.000), while noise level had a relationship at p -value 0.000 and was below the study's level of significance (0.05). The conclusion drawn from this is that computer laboratories which had good lighting, were well ventilated, had good furniture and reduced noise, would influence teaching and learning. Consequently, there was a strong relationship between physical environment inside computer laboratories and use of ICT in teaching and learning.

Conclusion

As has been highlighted, the school environment is significantly related to the use of ICT in teaching science subjects in NEPAD and cyber e-schools. Consequently, the location of schools, access to internet, availability of electricity supply and the physical environment within computer laboratories, plays a major role in the effective utilization of ICT in teaching and learning science subjects.

Schools which have a significant number of functioning computers may enhance their utilization in teaching and learning science subjects, since the computer sharing ratio will be enhanced. Furthermore, network connection and availability of file servers positively influences the use of ICT in teaching and learning. Consequently, for purposes of efficiency and effectiveness in using ICT in teaching science curriculum in schools, computers need to be made available for both teachers and students at the most preferable ratio of 1:1. This is assumed to increase learner's concentration and capacity to absorb all learning materials.

When the available ICT resources are effectively used, the impact will be felt more in schools that are ICT-resourced compared to resource-deprived schools (Hallinger and Heck, 1998). This calls for institutions to increase the number of ICT resources in their schools, rather than wait for ICT facilities from external sources, in the form of donations. The providers should consider giving more technical support to institutions because this will enhance usage of ICT in teaching and learning.

Recommendations

It is apparent that lessons have been learnt and useful insights gained, to guide present and future roll-out plan in use of ICT in teaching and learning projects and processes in schools, in Kenya. However, it is vital that:

1. Secondary schools focus on upgrading their ICT infrastructure (e.g. installing computer laboratories and internet connectivity) and developing relevant ICT skills in their schools. This study has demonstrated that for successful ICT utilization in teaching and learning science to take place in schools, a strong correlation should exist between ICT facilities and other information resources. Information resources should not be viewed in isolation, but holistically.
2. School librarians should be involved in ICT projects and trained in internet information retrieval skills. This will enable them to guide learners with information retrieval skills and use library resources to augment their skills and knowledge in science subjects.
3. ICT teachers are prerequisite to the utilization of ICT in science education but, most importantly, ICT must be integrated into the teaching and learning processes.

4. To avoid “dumping” of obsolete computers, a national policy on refurbished computers is required. There must also be standards regarding the type of computers donated to schools.
5. As ICT projects cannot take place in schools without internet connectivity, it is recommended that the cost of internet access, which is predominantly the cost of a telephone line, be fully explored and discussed with stakeholders during the planning phase of the roll-out process. This would avoid accumulation of phone bills and the cessation of internet access. It is also ideal for schools ICT-usage projects to utilize internet-based compact discs (CDs) during the training. Such an approach would not incur internet costs but assist in providing the required skills. The current internet access rate of 20% for schools in Kenya does not bond well with e-school ICT integration projects. Therefore, it must be examined and the same extended to all other African countries.

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FACTORS INFLUENCING ACCESS TO PROFESSIONAL DEVELOPMENT OF SECONDARY SCHOOL MANAGERS IN KENYA: PROSPECTS FOR DISTANCE EDUCATION

Raphael O. Nyonje and Ndunge D. Kyalo

Abstract

This paper investigates factors influencing access to professional development of secondary school managers in Kenya. Reference is made to the Kenya Education Staff Institute (KESI) in-service programme for secondary school principals. KESI was legally mandated to in-service all principals of secondary schools in Kenya, in 1981. The institute is therefore regarded as a capacity building arm of the Ministry of Education. The purpose of this paper is to analyze factors influencing access to professional development programmes offered by KESI, with the aim of providing findings that will help in improving the design used in the delivery of the program. Nature of schools managed by secondary school principals, gender of the principals, perceived value of the programmes and delivery techniques utilized in the programmes were key factors that were analyzed. The study employed ex-post-facto design. The target population was all principals of secondary schools in Kenya. Multi-stage sampling design was employed to select 120 provincial secondary schools, 15 district education officers (DEOs) and 30 quality assurance officers (QAOs). The first stage of sampling was at provincial level, followed by district level and then school level. Both qualitative and quantitative data was sought. Questionnaires, interview schedules, document analysis, and observation were the main instruments used for data collection. Frequencies and percentages were mainly used as descriptive data analysis techniques. Qualitative statements were used to support quantitative data. Document review was used to analyse current issues concerning the professional development programmes. The study established that although a good number of the principals had accessed professional development programmes (52.6%), a significant number (47.4%) were yet to access the programmes. Most of those yet to access the programmes were female principals, who cited family responsibilities as a cause. An open and distance learning mode was recommended to assist KESI reach out to all principals of secondary schools

in Kenya. This delivery mode was considered suitable due to its timelines, flexibility, cost-effectiveness, and learner friendly aspect, in terms of self-paced learning.

Key words: access to training programmes, approaches to training programmes, adult learning, distance education

Introduction

The Kenya Education Staff Institute (KESI) was established in 1981, through the assistance of World Bank. This was due to a felt need expressed by a committee mandated to review the Kenya Institute of Administration (KIA) at the time. A need to have an institution (KESI) that was going to deal with educational managers in Kenya was realized, courtesy of the committee's work (Iravo, 2002; Olembo, Wanga and Kiragu, 1999).

In Kenya, the Education Act Cap 211 charges the Boards of Governors (BOG) with the responsibility of management of secondary schools. The BOG is assisted by the school principal (Republic of Kenya, 1980; Njageh, 2003). Principals of secondary schools are therefore key in ensuring that the country's national goals of education are achieved through prudent management. It is against this background that the report of the commission of inquiry into the education system in Kenya recommended that principals should have appropriate academic and professional qualifications, experiences and ability, competencies, integrity and initiative, as well as skills suitable for effective and efficient management of schools (Republic of Kenya, 1999). The report adds that in-service training programmes should be provided regularly to managers and administrators, teachers and curriculum implementers.

There are various challenges that Kenyan secondary schools experience that necessitates a transformative in-service training programme. This includes regular student disturbance, which at times results in enormous destruction of schools or private properties; posting of continually poor results over a long period due to poor supervision of curriculum implementation in some schools with inadequate resources; poor financial management and supervision, where heads are occasionally not properly advised by their account clerks; lack of well thought-out and documented school development plans; occasional conflict between the BOG, Parent and Teachers Associations (PTAs) and headteachers due to inadequate skills in conflict resolution through dialogue;

poor handling of student discipline cases, which often results in parents resorting to legal redress; inadequate handling of workers' affairs, which often results in schools losing a lot of funds through court awards to workers; and poor handling of staff motivational issues, which often results in a disillusioned and uninspired teaching staff (Mbamba, 1992; Nyonje, 2008).

Although the reports of most educational commissions recognize the work that KESI has done since its inception, most of the above challenges are still being witnessed in secondary schools. Financial management has been singled out as one of the areas that secondary school managers still experience difficulties in (Republic of Kenya, 1999). Apart from the above reasons, there has been a continuous change witnessed in secondary school curricular, technological development, and a shift in societal needs and interests. This paper seeks to investigate factors influencing principals' access to KESI professional development programmes.

Context of the Paper

The Kenya educational policy, Session Paper Number 1 of 2005 on *Policy Framework for Education, Training and Research*, underscores the importance of regular training of educational managers. It is against this backdrop that the policy paper proposed that KESI be moved from Kenyatta University where it was housed since 1988, to its current location, the former Highridge Teacher Training College (HTTC) in Highridge, along 6th Parklands Avenue, Nairobi. This move was intended to increase the institute's capacity, in terms of space and facilities (Republic of Kenya, 2005). One of the institute's mandates, as guided by legal notice Number 565 of 1988, is to organize and conduct training for personnel involved in education management. This gave the institute a wider client base.

In trying to make its secondary school training programmes accessible, the institute has so far employed various strategies. The most common strategies used include holding training sessions during school holidays, specifically during the months of April, August and December. This was an attempt to allow principals who are in charge of regular programmes in their schools, to access the programmes without interference (Olembo, Wanga and Kiragu, 1992). The institute has been outsourcing training venues within regions targeted by the training programmes. This strategy was aimed at reducing traveling costs for the principals wishing to attend the training programmes

(Nyonje, 2008). Over the years, the institute has been subsidizing training costs for principals. Although training cost per capita for 2 weeks could amount to as much as KES 50,000 /=, on many occasions, the institute charges as little as KES 10,000/= for a 2-week period of training for each principal attending (KESI, 2007). The cost-sharing strategy was employed deliberately, in order to increase access to training.

The professional development programme for principals offered by KESI enjoyed a high demand by both old and newly recruited secondary school principals. This is partially because most of the principals in secondary schools in Kenya are appointed from the already serving classroom teachers, most of whom have no prior training in institutional management (Kalai, 2007; Nyonje 2008). This kind of scenario has been reported in other countries such as Pakistan where headteachers are recruited and promoted on the basis of their teaching qualifications rather than leadership and management experience (Memon and Bana, 2005). Secondly, KESI being a human resource arm of the Ministry of Education, the certificate offered after the professional development course was widely recognized as a prerequisite for the promotion of educational managers.

Most school management training programmes reviewed showed that participants benefited a lot from principals' training and in-service programmes. Keys (1989) in a study to determine the participants' perception after attendance of an Administrative Leadership Development Programme (ALDP) in Saskatchewan, found that the participants' needs were met through the training programme. The participants also indicated that (ALDP) conformed to the guidelines for effective in-service programmes. Kim and Kim (2005) conducted an analysis of the profile of school administrators in South Korea in a comparative study. The study established that the in-service programme in South Korea ranged from 3 months to 3 years. The majority of principals (43%) attended in-service training that lasted 6 months.

Professional development delivery modes manifest themselves in different ways. The first one, and perhaps the oldest, is that whereby training is delivered in an institution, with classrooms, learning materials and teachers, to assist students go through the planned curriculum. In this mode of delivery, learners are required to attend learning sessions in identified institutions. In most cases, traditional delivery systems rely on live lectures and seminars between the teachers and learners. This is supplemented by print materials

which are physically distributed to learners. This mode of delivery is similar to the one used by KESI professional development programmes for secondary school principals. The delivery mode has been criticized as being too academic and scholarly. Thus, it is regarded as being more theoretical than practical (Onguko, Abdalla and Weber, 2008).

The second mode of professional development is what Morabito (1999) refers to as non-traditional or alternative education. In this mode, learners get education or a degree without seating in a classroom on a daily basis. Learners are non-resident in the institution delivering the learning. This mode has various modifications. For instance, we have correspondence instruction, which is a mode of interactive communication between the student and the institution, over a distance. Methods of correspondence may utilize surface mail and e-mail. The components of correspondence include prepared materials which are normally written in self-explanatory fashion and arranged in a series of lessons, supplementary printed material, a series of exercises to be worked out by the student, the evaluation of those exercises by a competent instructor, and a final examination for the course (Morabito, 1999). The correspondence mode is what is now referred to as distance education, which according to Morabito, “Takes place when a teacher and student(s) are separated by physical distance, and technology (i.e voice, video, data and print) is used to bridge the instructional gap” (p.18). This fact seems to be supported by Russel (2004) in the *International Journal of Instructional Technology and Distance Learning (IJITDL)*. He argues that distance education is a delivery system of teaching and learning, employed when the teacher and learners are separated by physical distance and time, and alternative media resources are used to connect them. The term used to refer to this mode of delivery is “Open and Distance Learning”.

The open and distance learning mode that employs online distance learning or web-based distance learning, has become widely popular, with the development of ICT globally. Online distance learning involves delivery of instruction through computers with internet access or other telecommunication means, where learners and teachers are located in different geographical areas. This type of learning system allows learners and teachers from all over the world to interact freely during the learning experience.

Web-based distance learning is being used all over the world. According to IsaBelle, Fournier, and St.Amant (2007), more teachers and school principals in

French-speaking countries, including Canada, enroll in web-based distance learning education programmes. Namibia has been able to address its educational and training needs cost-effectively through this mode of delivery. In 2008, for instance, 1,535 and 1,853 students enrolled in the University of Namibia and Polytechnic of Namibia, respectively, were pursuing various study programmes through open and distance learning. This constituted 18% and 21% of the total student body at the university and polytechnic (Mowes, 2008).

The programme relies a lot on information and communication technologies. The need to offer distance learning to meet the needs of a knowledge-based society cannot be overemphasized. Use of information and communication technologies has so far revolutionized the distance mode. A variety of open source tools and software, such as forums and chats, blogs and wiki are available, to encourage collaborative learning among principals (IsaBelle, 2007)

Wenger, McDermott and Snyder (2002), note that open and distance learning that is web-based enables members of a community to benefit from sharing of knowledge and expertise and to seek assistance in the challenges they face in their practice. Furthermore, the model provides a reduction in time and accumulated costs, and fosters a sense of belonging.

The benefits of open and distance education as a method of professional development are threefold. On the side of the learners, particularly adult learners, open and distance learning increases access and flexibility as well as the opportunity of combining work and education. It also provides a learner centred-approach, enrichment, higher quality and new ways of interrelations. For employers, it offers high quality and usually cost-effective professional development in the workplace. It allows learners to upgrade their skills, increase productivity and develop a new culture. On the side of the implementing organization, open and distance learning increases the capacity and cost-effectiveness of education and training systems to:

- Reach target groups with limited access to conventional education and training.
- Support and enhance the quality and relevance of existing educational structures.

- Ensure the connection of educational institutions and curricula to the emerging networks and information resources.
- Promote innovation and opportunities for lifelong learning (UNESCO, 2002).

There are some criticisms that have been leveled against the distance mode of delivery. Russel in IJITDL (2004), comparing face-to-face model of delivery and web-based distance learning, argues that the latter tends to filter out social and relational cues. Citing Parks (1996), and Sheehy and Gallagher (1996), the author maintains that those cues emanating from the physical setting are missing in online contexts, as are nonverbal cues regarding vocal qualities, bodily movement, facial expressions, and physical appearance. The reduction in contextual, visual, and aural cues causes communication in on-line settings to be more impersonal and nonconforming than their face-to-face counterparts. These leads to lack of instant feedback, a concept referred to as “distance effects of distance learning” which may be isolating and unsupportive to the learners since emotions such as happiness, apathy and reassurance cannot be adequately expressed via email as would be the case through face-to-face delivery. Web-based distance learning therefore needs to be accompanied with supportive mechanisms such as face-to-face interactions.

In order to reduce the distance effects of distance learning modes, Russel proposes among other strategies, the need to increase face-to-face interaction amongst the learners; the need to use desktop video conferencing and streaming video, to supplement online courses; the need to design and implement procedures that can reduce isolation and enhance interaction. The learner’s ability to work independently, or readiness to interact with technology, should be taken into account (IJITDL, 2004).

IsaBelle, Fournier, and St.Amant (2007) argue that although a number of studies point out the advantages of open and distance learning, such as increased feeling of belonging to a group, a lot must be done in planning and implementation of this learning mode. The main challenges that Third World countries face, lie in the skills, knowledge and resources that principals require, in order to be successfully involved in web-based collaborative learning.

Distance learning requires careful blending of technologies in order to meet the needs of the learners. If this is not accomplished then the benefits of the

mode may not be fully realized. A case scenario is Gouda, and Banks (2006), in a study that aimed at investigating the impact of using Egypt's National Network for Distance Training (NNDT) in developing teachers' knowledge and building communities of practice. The study explored the role of professional development experts and teachers' participation within the network. Additionally, it identifies the role of technology in facilitating communication and collaboration between participants. It was established that the current centralized structure of the network in Egypt does not allow training experts to easily integrate constructive approaches such as discussion, problem-solving and small group activities. As a result, the trainee teachers are not actively engaged in the training process and the exchange of professional knowledge is limited. Therefore, the current training is seen as barely facilitating the building of learning communities because it lacks the main features that underpin a learning community as highlighted by Chang (2003). These include spontaneous learning and active knowledge construction by individual learners; idea sharing and information provision for all members of the learning community; and distributed knowledge and expertise among all members through interaction, discussion communication, instruction, sharing or utilisation of tools. Although some teachers felt that the video conferencing technique was a sufficient tool for communication during the training, the majority of them found it to be insufficient. It is a fact that video conferencing brings together large numbers of teachers from different places at the same time. However, the centralized structure for using the network and the large numbers of teachers who participate in each programme inhibits the building of a collaborative learning environment for teachers. In addition, the video conferencing technology has limits as it only allows communication between participants during the actual training-sessions but does not provide further communication channels before or after the training. However, communication tools should provide opportunities for collaboration between teachers, which allows them to share their expertise and knowledge and solve professional problems (Wenger and Synder, 2000).

Conceptual Framework

The following questions are key in understanding the factors influencing access to professional development programmes offered by KESI:

1. To what extent does the nature of secondary schools and gender of students influence access to professional development programmes offered by KESI?
2. How does a principal's perception about the value of professional development programmes managed by KESI influence their access to the programme?
3. To what extent do the delivery methods and techniques influence principals' access to professional development programmes managed by KESI?

The paper conceptualizes that independent variables such as the nature of the schools managed by the principals will pressurize principals to seek further skills and knowledge in school management, and thus influence access to the professional development programmes managed by KESI. It is assumed that the type of school (boys, girls or mixed schools) will influence the principals' decision to seek professional development. Category of the school – provincial, district or national, and size of the school as indicated by the number of streams, are other independent variables that the paper assumes will have a major influence on access to professional development programmes managed by KESI. Other independent variables include the principals' perceived value of the professional development programmes, in terms of job promotion, and gaining of skills and knowledge. The programme delivery methods were also regarded as key in influencing the principals' access to professional development programmes. There are various learning theories that are suitable when delivering learning programmes to adult learners who are already practicing. The paper therefore assumes that principals' access to professional development programmes offered by KESI may be influenced by the delivery methods utilized in the programme.

Methodology

Access to professional development programmes was regarded as the number of secondary school principals exposed to the professional development programmes. In order to explore the research question, the study employed ex-post facto research design that aimed at comparing 2 groups of principals — those exposed to the professional development programmes offered by KESI and those not exposed to the programmes. The study targeted about 4,000 public secondary schools principals across Kenya (MOE, (d) 2007). Senior educational officers who were viewed as secondary school principal

supervisors — District Education Officers (DEOs) and Quality Assurance and Standard Officers (QASOs) — were also targeted. A total of 175 respondents were sampled. The sample included 120 principals of secondary schools, 30 QASOs, 15 DEOs and 10 KESI training programme implementers. Multi-stage random sampling was employed in selecting 4 provinces and 3 districts in each province. Due to the vastness of some districts, 3 more districts were selected, making a total of 15 districts. In each district a total of 8 principals were selected randomly to make a total of 120 principals. A total of 97 principals (80.1%), 26 QASOs (86.7%) and 15 DEOs (80%) were finally reached by the study. This formed a return rate that was considered as adequate for analysis. Four data collection instruments were used, including self-evaluative questionnaires with 30 items, which were both open and close-ended. The DEO and QASOs were also given questionnaires. Both open-ended and close-ended items were used to collect qualitative and quantitative data. Interview schedules were also used to derive information from programme coordinators while document analysis was used to review relevant reports, policies and procedures governing principals' training. Various experts were involved in validating the instrument. The method was also used to review the latest literature on distance learning. Two professors and experts in research and evaluation went through the instruments against the study objectives and gave their opinions and suggestions on areas that required adjustment. An experienced training expert and a senior consultant with East African Development Consultants (EADC) were also approached to give views on the validity of the instrument. Finally, the instruments were taken for pilot testing to 6 principals drawn from Nairobi province. Descriptive statistics such as frequencies and percentages were used for quantitative data. Qualitative data was analyzed by coding and placing the respondent's statements and opinions into themes. Qualitative data was mainly used to supplement quantitative data.

Findings and Discussion

The paper presents and discusses the findings in the following subtopics: nature of secondary schools and selected principal's characteristics and how it influenced access to professional development programmes; principal's perception about the value of professional development programmes managed by KESI and how it influenced access to the programmes; the level at which programme delivery methods and techniques influenced principals access to the professional development programmes.

Nature of Secondary Schools and Selected Principal's Characteristics on Access

This section presents an analysis of the nature of schools in terms of types, categories and sizes. It further analyses selected characteristics of the principals. The selected characteristics were gender and the experience of the principals in managing schools. Both variables were analysed in relation to access to professional development for the principals

The study established that 51 principals (52.6%) of secondary schools had access to professional development programmes offered by KESI. However, a significant number 46 (47.4%) had not yet accessed the programmes. The study further sought to investigate the gender of principals, in relation to access of principals' to professional development programmes. Table 1 shows that out of 51 principals (52.5%) who had accessed programmes offered by KESI, only 18 (18.4%) were females while 33 (34.2%) were males. Female principals also formed a significant number of those who had not accessed the professional development programmes. These statistics are shown in Table 1.

Table 1 Access to Principals Professional Development by Sex

		Principals' Sex		
		Male	Female	Total
Principals access status	Accessed	33	18	51
		34.2%	18.4%	52.5%
	Not accessed	26	20	46
TOTAL		59	38	97
		61.0%	39.0%	100%

The study further sought to establish why there were less female principals accessing programmes offered by KESI. The qualitative data analyzed indicated that female principals were more challenged in terms of accessing the programmes. One respondent who had accessed the programme said:

I had to make arrangements. I had postponed attending the programme for so long. There so many family issues that have been cropping up every time I plan to attend.

The same feeling was expressed by the female principals who had not accessed the programmes. The following statement was recorded from one of them:

The KESI programme normally takes place during school holidays. Given that we are very busy during school sessions, school holidays are the only time we have to be with our children. This therefore requires one to be careful in terms of planning.

In the literature reviewed, it was indicated that one of the strategies used by KESI to increase access to programmes for principals, was by scheduling training to take place during school holidays. From the foregoing statement by one of the female principals, it is clear that the strategy was not helpful for some female principals who opted to use school holidays to spend time with their families rather than attend professional development programmes offered by KESI.

The principals’ experience in management was considered as the duration that the principals had been in management of secondary schools. The duration was cross-tabulated against the principals’ access to professional development programmes as shown in Table 2.

Table 2 Principal’s Access to Professional Development Programmes versus their Years in Management

		Years in Management			
		1-5	6-10	11-15	16-20
Principals access status	Accessed	21	19	9	2
		21.6%	19.6%	9.3%	2.1%
	Not accessed	24	15	5	2
		24.7%	15.4%	5.3%	2.1%

TOTAL	45	34	14	4
	46.3%	35.0%	14.6%	4.1%

The study found that out of 97 principals interviewed, 24 of those who had not accessed KESI training were already in management of schools for 1 to 5 years (24.7%). This was followed by 15 principals (15.4%) who said that they had managed their schools for 6 to 10 years. About 7 of the principals (7.3%) said they had managed their schools for over 11 years. The majority of those who had accessed professional development programmes offered by KESI, said that they had managed their schools for 1 to 5 years (21 or 21.6%), followed by 19 who said they had managed their schools for 6 to 10 years (19.6%). It is clear from the statistics that a good number of principals who had not accessed KESI programmes (about 22.8%) were in management of secondary schools for a period of over 6 years. This is a long duration, considering that most of the principals in secondary schools in Kenya are appointed from the group of already serving classroom teachers, most of whom have no prior training in institutional management (Republic of Kenya 1988; Kalai, 2007; Nyonje 2008). There is a high possibility that some of the frequent school unrests witnessed in Kenya could be as a result of the presence of a big number of secondary school principals who are not in-serviced. When the principals were asked for reasons as to why they took long before seeking professional development programmes offered by KESI, one of those who had accessed the programme said:

I had earlier attended a course that targeted deputy principals, so I assumed that it was enough to help me in my managerial duties. I tried to access the programme 5 years after my promotion as a principal, with no success. Were it not for the first training programme that I attended as a deputy, I would not have persisted. I wish there was a smooth transition between training programmes for deputy principals and those for principals.

This statement shows that secondary school principals experience some difficulty in accessing the programmes offered by KESI. This could be due to of lack of information among newly promoted principals. However, it is clear

that there is need for a proper transition between training programmes for deputy principals and those that target principals.

Secondary school management demands may vary, depending on the size and nature of schools being managed. This may be a factor influencing principals' access to KESI training. To explore this, the study sought to determine the principals' access to KESI training as per the category and type of schools they managed. This was reflected in Table 3 below.

Table 3: Access to Principal's Professional Development by Category and Type of Schools

		Provincial	District	Total
Principal's access status	Accessed	22	29	51
		22.7%	29.9%	52.6%
	Not accessed	5	41	46
		5.1%	42.3%	47.4%
TOTAL		27	70	97
		27.8%	72.2%	100%

Table 3 shows that 41 of the principals (42.3%), who were yet to access professional development programmes offered by KESI were in the district secondary school category while only 5.1% were from schools at the provincial level. A total of 29 principals (29.9%) who had accessed the programmes were in district secondary schools while a good number (22.7%) were from provincial schools. Further analysis indicated that 31 of the principals who were yet to access the training (32%) were from mixed schools. It was clearly revealed that all the mixed schools accessed by the study were in the district category. The statistics indicated that principals managing schools categorized as district, were disadvantaged in terms of accessing professional development programmes offered by KESI. The qualitative data indicated that principals in district schools were not readily supported financially to attend the programmes while their counterparts managing provincial schools enjoyed

more support. One of the district school principals who had accessed the programme said:

I did not receive any support from the BOG. I had to finance my traveling and accommodation, which was a bit expensive. But one has to sacrifice..... Some of my colleagues (principals from district secondary schools) find it difficult to attend.

This notwithstanding, the statistics in Table 3 clearly indicate a major disparity among the secondary school principals, in terms of accessing the professional development programmes offered by KESI. This calls for a programme design that is less expensive and one that caters for the needs of all the principals, both newly promoted school principals and those already in practice.

Perceived Value of Principals Professional Development and Access to the Programme

The study sought to establish the principals' perception of the value of professional development programmes against their access to the programmes. To establish this, qualitative data from the principals and DEOs was analyzed. It was clear that most of the principals who had accessed the programmes were propelled by the challenges they had experienced after being in management of their schools for a while. This can be seen in the following statement by one principal who had accessed the programme:

I tried to access the programme 5 years after my promotion as a principal, with no success. Were it not for the first training programme that I attended as a deputy I would not have persisted. I wish there was a smooth transition between deputy principals development programme and principals' development programme.

This statement implies that the principals had to struggle to access the professional programme because of the benefits accrued from the deputy-principal's professional development. The principals also regarded the training as vital since they were able to share the common problems that they experienced in schools. However some felt that the sharing ended immediately the training ended. This was reflected in the following statement by one of the principals:

We experience a lot of challenges in our day-to-day management of schools. At times we need a forum through which we can share our challenges, and at least, find out how other principals handle the challenges. It is just unfortunate that our sharing is restricted to the duration we attend the programme. However, I think those who have not attended this programme are missing a lot.

The same opinion was expressed in the KESI training reports of 2004, 2006 and 2007. It was also found that those principals who had not accessed the programme were looking for an opportunity to access it due to the same perceived benefits. One of them observed:

I look forward to accessing the programme. There are some challenges I encounter that I would want to learn how to tackle and also find out how other principals tackle them.

The majority of DEOs indicated that the professional development programmes was beneficial to the principals (87.4⁰%). They explained that the programmes impacted positively on the school principals and that there was a distinction between principals exposed to the programmes and those not exposed to the programmes. However, they said that there was a problem in ensuring that every principal in their area accessed the programmes. The following sentiment was noted from one DEO:

It is so easy to work with principals who have accessed the KESI professional development programmes. I wish there was a way that I could ensure that all the principals in my area access the programmes.

This statement shows that the programmes are extremely valuable to teachers and that there is need to find ways in which all principals can access the training.

Course Content, Timing and Delivery

The study established that massive content was covered by the principals participating in the professional development programmes. Training reports of 2004, 2006 and 2007 revealed that a total of 40, 36 and 26 topics, respectively, were covered in the programmes. Given that the content is required to be

covered in 2 weeks (10 days excluding weekends) and 2 hours are allocated per topic as per training regulations, it means that about 3 topics could be handled each day. This had an implication on the delivery methods and techniques that facilitators for the topics used. In order to understand these consequences, the principals were asked to rate the frequency with which the facilitators utilized selected methods and techniques of delivery when presenting their topics. The results are shown in Table 4.

Table 4: Delivery Methods Used in Principals Professional Development Programme

Delivery Methods	Rate of Use by Principals			
	Very Frequent	Frequent	Rarely	Never
Lecture	20 39.2%	31 60.8%	-	-
Group Discussion	10 19.7%	26 50.9%	14 27.5%	1 1.9%
Role Play	2 3.9%	19 37.3%	25 49.0%	5 9.8%
Case Study	3 5.9%	8 15.7%	30 58.7%	10 19.7%
Field Study	1 1.9%	19 37.3%	26 50.9%	5 9.8%
Projects/Assignments	2 3.9%	14 27.5%	30 58.7%	5 9.8%

Table 4 shows the principals' rating of selected delivery methods as per their perceptions on how they were utilized by programme facilitators. The lecture method was perceived to have been used very frequently by 20 principals (39.2%) and frequently used by 31 principals (60.8%). This was followed by the group discussion method that was perceived to be very frequently utilized by 10 principals (19.7%) and 26 who said that the method was only frequently used by facilitators (50.9%). Among the methods of delivery that were rarely used included case study and projects/assignment methods cited by 30 principals (58.7%). This was followed by field study and role play methods. The statistics imply that the training was dominated by lecture methods at the expense of other delivery methods. Some principals argued that the delivery was too academic and did not give them a practical approach to problems they faced during day-to-day management of their schools. Indeed, Onguko, Abdalla and Weber, (2008) observed that the training offered by KESI was too academic, scholarly and theoretical, without much of a practical approach. This delivery method was frustrating for some principals who accessed the

programmes with the aim of receiving practical-oriented solutions to the problems they were experiencing in their schools. One of them pointed out the following:

I expected more discussions on practical problems that we experience in schools. We were just rushed through some content without proper discussions.

Another principal said:

Although I felt some difference, I could not resist thinking that there was no difference between us (principals who accessed the training) and those who did not attend the training. The only difference is the notes we were given. If I didn't attend and I had access to notes from the training, I would be no different from those who attended.

This means that the method used in the delivery of the principals' professional development programme was too academic, with minimal discussion. Participants felt that the failure to utilize other delivery methods made the programme lack transformative ability. They felt that there was no difference between them and those who did not attend the programme. The same was observed by Gouda, and Banks, (2006). They noted that the professional development techniques used in Egypt did not allow training experts to easily integrate constructive approaches such as discussion, problem-solving and small group activities. As a result, the trainees were not actively engaged in the training process and the exchange of professional knowledge was limited.

Conclusions and Recommendations

This paper concludes that although the majority of principals had tried to access the professional development programmes offered by KESI, a significant number had failed to do so. Among those who had not accessed the training were principals of the female gender. Family responsibilities were cited as one of the reasons why they had failed to access the programmes. The paper also concludes that there was inequality in accessing the programmes, related to the size and category of schools that principals managed. This was attributed to the cost of the training. It was also clear that those who accessed the programmes benefited, to some extent. One of the benefits cited was a forum for discussion, which a participant said was limited to the duration of the training, and thus was not adequate.

The study concluded that the most frequently used delivery method for the professional development programmes offered by KESI was the lecture method. Limited duration for the programmes (2 weeks), programme content load and timing of each topic, were cited as contributing to over-utilization of the lecture method.

Given the above facts, it was therefore concluded that the face-to-face mode of delivery employed by KESI in the programmes was not effective. The study, therefore, recommends that the institution embrace an open and distance learning mode of delivery that will ensure principals access the programmes at a reasonable cost. Such a delivery mode has the ability to grant the principals learning flexibility — enable access to the programmes at their own convenience. It will also enable principals to have a sustainable discussion forum. Finally, all different learning needs of adult learners are easily catered for by the open and distance learning mode.

The study strongly recommends a blended mode of open and distance learning, in which a web-based distance learning mode is fused with face-to-face interactions. This mode will enable the institution to develop web-based content that will be hosted on the internet. Some of this content should also be made available in print media that can be used by principals who may not have easy access to the web-based content. The same print media can be put on CDs and tapes that can be distributed as learning materials. The institute will need to develop its own online tutors and content developer to backup the mode. Face-to-face interaction can be used to acquaint the web-based student on details of accessing web-based materials and discussion forums, hosting their own materials on the web, chatting and carrying out assignments.

The recommended mode of delivery for professional development programmes for secondary school principals is feasible considering the following factors:

1. The Kenya Educational Sector Support programme (KESSP) developed in 2005 features ICT as one of the priority areas, with the aim of mainstreaming ICT into the teaching and learning process. The concern of the initiative is to ensure that schools have ICT infrastructure. This has been demonstrated by the development of

the National ICT Strategy for Education and Training of 2006 (Farrell, 2007). Through this policy, the effort of the government and that of development partners has been harnessed toward improving the ICT infrastructure in schools. Most principals of secondary schools have received training and even benefited from the supply of ICT equipment through the above efforts. For instance, there are a number of schools in Kenya that have so far benefited from the NEPAD initiative. It is a fact that at least each secondary school principal can access a computer in his/her own school or at least within his/her district. This makes the web-based distance education learning mode a reality.

2. The initiative by the government through economic stimulus, to identify and develop schools in each constituency that can act as centers of excellence, is also an opportunity that KESI can explore, for the success of open and distance delivery mode for delivering professional development programmes for principals. These schools can also act as e-learning centers, through which all the principals within the constituency can access web-based instruction.
3. The spirit of Sessional Paper Number 1 of 2005 was to give KESI more capacity to execute its mandate. At the moment KESI has relocated from Kenyatta University to the former HTTC, thus acquiring more space for its activities. Moreover, KESI enjoys a lot of support from the government through the Ministry of Education as well as from development partners and other ministries. If this support is well utilized, the web-based distance learning mode can be developed and sustained.
4. The opportunities provided by various information and communication companies have made the cost of internet connectivity affordable to the average Kenyan. This makes web-based distance learning a reality.

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

Charles M. Rambo and Paul A. Odundo

Abstract

Distance Learning (DL) provides people in employment with an 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 made to finance distance learners. In view of this, over 70% of distance learners experience fee payment difficulties while another 34% drop out annually. In response to this 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 2 broad categories of financing practices, namely, personal means and institutional funding. While financing from personal means was generally inadequate and unsustainable, institutional funding was largely inaccessible, unaffordable and inadequate. This crystallized the need for a dependable financing program for distance learners. The study recommends the need to amend HELB Act to allow for financing of distance learners; increase HELB's budget, strengthen Constituency Development Fund (CDF) and micro-finance programmes; and encourage employers to support vulnerable learners.

Introduction

The demand for university education has increased since the 1950s in response to 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 DL programmes. The programmes enable people in full-time or part-time employment to acquire university degrees in the most flexible and cost-effective manner. By so doing, DL programmes address the weaknesses of mainstream educational systems to cater for an increasing 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 programmes in subject areas such as health, agriculture, family planning, rural development 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. Since then, additional cohorts have been enrolled at intervals of 8 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 from the 1980s necessitated the introduction of a cost-sharing policy in December 1989. Cost-sharing in the educational sector was first mooted in the 1984/88 *National Development Plan*.

In 1987, the World Bank conducted a study, which culminated in a publication entitled *Education in Sub-Saharan Africa: Policies for Adjustment, Revitalization and Expansion*. The publication influenced Sub-Saharan African countries, including Kenya, to initiate user fees in the social sector. The recommendations of the study were reflected in 2 successive policy documents — the *Kamunge Report* and the *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, whose purpose was to spread education costs between the GoK and beneficiaries. According to Otieno (2002), the introduction of a 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 for 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 constrained by economic under-performance, poor economic governance and the effects of Structural Adjustment Programmes (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 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. This accounts for between 58 to 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 services, pharmacy practice centres, real estate, bookshops and printing presses. Moreover, the university has ventured into parallel degree programmes, which form 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 disbanded 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 as well as 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 students, 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 help a growing number of students meet the costs of a university education (Odundo and Njeru, 2005).

In 2000, HELB expanded its funding coverage in favour of postgraduate applicants for loans, to enable them advance 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 programmes on a full-time basis. For masters programmes, 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 the following categories of learners: 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 programmes (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. Additionally, 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 in the low income group, the program has been recording a growing incidence of drop outs and deferments. This is attributed to non-existence of an official financing program, as enjoyed by learners in

regular programmes (UoN, 2005). Since 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, who included officials of commercial banks, Savings and Credit Co-operative (SACCO) societies, and CDF programmes. A total of 16 key informants were sampled purposively on the basis their respective organization's involvement in financing higher learning and by virtue of being an 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, 2 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 whom 56% were men and 44% were women. Part of the data was sourced from 16 key informants drawn from commercial banks, SACCO societies and CDF programmes. 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 this 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 another 11.1% indicated that bursaries from CDF programmes 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
Disposable personal assets	245	21.7	129	23.6
Dividends	9	0.8	3	0.5
Fundraisers	42	3.7	5	0.9
TOTAL	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 programme

costs. 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 workplaces. In this regard, Table 2 shows that 58.2% of the learners had secured loans from SACCO societies, 20.3% had received loans from micro-finance institutions, 12.6% received loans from their respective places of work, while another 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
Microfinance	47	20.3	15	23.4
Place of work	29	12.6	11	17.2
TOTAL	231	100.0	64	100.0

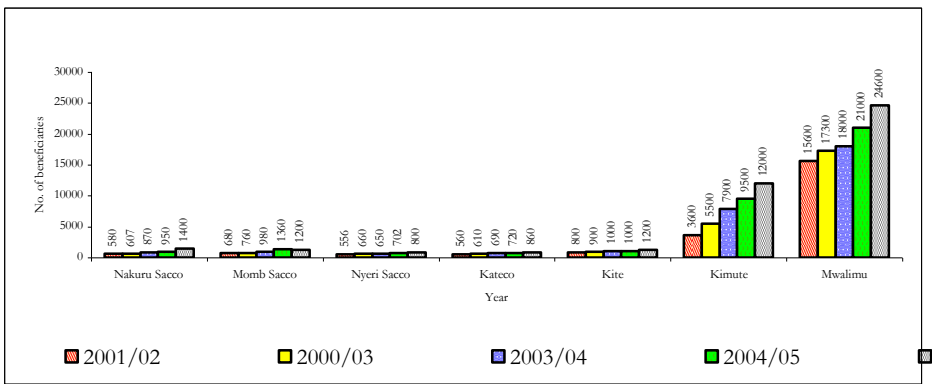
Of the 64 inactive learners who had acquired loans to finance their studies, 56.3% obtained loans from teachers' SACCO societies, while 23.4% had been loaned funds by micro-finance institutions. Further, 17.2% learners obtained loans from their places of work, while only 3.1% had borrowed from commercial banks. The study found that loans from SACCO societies and micro-finance programmes 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 programmes in financing DL.

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 programmes 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 implies 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 Mwalimu SACCO Society had made the highest contribution to financing university education, given its national catchment. The amounts provided varied by need and level of saving. Although members of Kisumu Teachers’ (KITE), Kakamega Teachers’ (KATECO), Mwalimu, Nyeri, Nakuru and Mombasa SACCO societies could borrow up to three times their savings, eligibility was also based on the ability to service loans effectively. Besides membership in the SACCO society, a minimum of 6 months of regular savings was required. Potential loanees were expected 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 institutional financial regulations.

Further, interest rates varied with respective institutions, ranging between 10 and 11% per annum for all the 7 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 durations 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	Number of Applicants	Number Awarded	Percent Awarded
Nakuru	4,351	1,400	32.2
Mombasa	2,959	1,200	40.6
Nyeri	3,591	800	22.3
KATECO	2,645	860	32.5
Kite	4,523	1,200	26.5
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 DL. 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 a time when funds would be available. In this regard, qualified applicants were often put on stand-by. This prompted learners to also defer their studies till a time when 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 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	
	Freq.	Percent	Freq.	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 as 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 be aged above 18 years, demonstrate the ability to repay the loan as per schedule, be a customer of the bank whose salary is processed through the same institution, as well as be on permanent terms of employment or on contract as 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 3 latest pay slips, copies of identification documents, a copy of the personal identification number, and be an account holder with the bank. The duration of payment varied from 12 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 Programmes in Financing Distance Learning

The study found that CDF programmes were increasingly becoming a crucial source of funding for distance learners. All the CDF programmes 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 programmes could not be segregated to determine the exact proportion of distance learners forming the list of beneficiaries.

Table 5: Beneficiaries of CDF Programmes, 2004-2008

CDF Programme	Number of Beneficiaries	Percent
Nakuru	497	12.6
Kisauni	450	11.5
Nyeri	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 programmes reflected the priority accorded to university education. Although CDF programmes 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. Besides, most CDF programmes 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 an opportunity 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 and 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 DL. Out of 460 active learners, 6.3% had received financial support in form of loans from their employers. 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 DL 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% 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 to transfer to better-paying jobs.

Financing Distance Learning through Income-Generating Activities (IGAs)

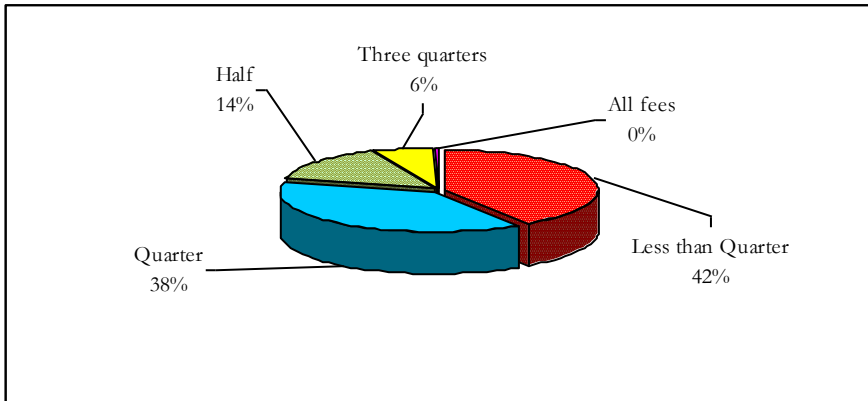
The study found that of the 460 active learners, 72.6% engaged in various economic activities to supplement their incomes. The IGAs cited included barbershops 6.9%, grocery shops 24.3%, computing services 4.4%, *jua kali* welding 11.1%, tailoring 4.0% and video shows 7.8%. In addition, housing investments was cited by 6.5% of the learners and farming activities 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	
	Freq.	Percent	Freq.	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	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 4 crucial sources of institutional funding for distance learners, which included loans from SACCO societies, loans from commercial banks, bursaries from CDF programmes and loans from micro-finance sub-sector. In regular academic programmes, 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 programmes. 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% felt 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

Learner's Opinion	SACCO Societies		Commercial Banks		CDF Programmes		Micro-finance	
	Freq	Percent	Freq	Percent	Freq	Percent	Freq	Percent
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 loans, and commercial bank loans. In view of this, micro-finance 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 the majority of 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. Regarding commercial bank loans, no learner felt that 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% 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

Learner's Opinion	SACCO Societies		Commercial Banks		CDF Programmes		Micro-finance	
	Freq	Percent	Freq	Percent	Freq	Percent	Freq	Percent
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 programmes 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 charged 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 socioeconomic 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 in meeting 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 programmes, 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 (75.3%) of the respondents hinted that CDF bursaries were very inadequate.

Table 9: Rating Adequacy of Institutional Financial Services

Learner's Opinion	SACCO Societies		Commercial Banks		CDF Programmes		Micro-finance	
	Freq.	Percent	Freq.	Percent	Freq.	Percent	Freq.	Percent
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

Further, 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 only qualified for small amounts, which barely met their educational costs. However, in the case of micro-finance loans, about 80% of learners believed the loans were adequate.

Conclusion

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 income, 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 Practice

Based on the findings, the study has identified the following implications for policy and practice of higher education financing in the country. Even though HELB was established to further educational interests for 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 programmes, 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. In this regard, employers should be encouraged through advocacy to establish revolving funds and support their staff member in improving 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 as 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 programmes could not clearly indicate the proportion of distance learners in the 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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ANALYSIS OF THE INSTRUCTIONAL EFFECTIVENESS OF ASYNCHRONOUS E-LEARNING ENVIRONMENTS IN KENYA: A CASE STUDY OF THE WEDUSOFT PLATFORM, UNIVERSITY OF NAIROBI

Joyce K. Mbimesa

Abstract

This study examines and analyzes instructional effectiveness of asynchronous e-learning environments in Kenya, with special reference to Wedusoft, an e-learning platform of the University of Nairobi. Data was sought from a sample of faculty and students. Experimental research design was the main method adopted in the study although this was also complemented by survey research. Results of the study indicated that Wedusoft is an effective learning management system, with most of the teachers interviewed rating it very highly. There were no significant differences in learning outcomes between students taking online classes and those engaged in conventional face-to-face tutoring. The study recommends that there is need to encourage institutions to adopt e-learning as an instructional tool, through building a community of e-learning adopters within the university; strengthening the technology infrastructure; adopting a clear institutional policy on e-learning; and encouraging appropriate staff development, collectively as well as individually, to facilitate the success of e-learning.

Background and Problem Statement

Distance education, particularly in higher education, has grown and evolved tremendously over the last few decades. Developments in technology have had a major impact on distance education, more so, pedagogical instruction. With the advent of the new communication revolution, the world is witnessing an expansion in distance education. The new information revolution has enabled academic institutions to become more flexible in the type of learning environments they adopt for students. It is important to note that today, distance education offers many opportunities for the expansion and access to tertiary education in Africa, and Kenya, in particular.

The potential of Information Communication Technology (ICT) in facilitating distance education and access of higher education is enormous. Today, through distance learning strategies and ICT mediated instruction, we can expand the content and extent by which we reach and increase the effectiveness of existing academic programmes. Through emerging communication technology, effective computer-delivered coursework could be

developed while at the same time improving access to scientific and technical information. ICT-mediated instruction today offers several advantages over the traditional conventional systems of education, including flexible access to education; virtual access to faculty in higher education; introduction of new interactive pedagogical techniques such as more hands-on learning opportunities; interactive, active and collaborative learning; independent research; less reliance on the traditional teacher; and the creation of virtual institutions and linkages, where resources could be shared by people and organizations. ICT technologies actually do provide the capacities for greater interaction.

However, as powerful new technologies such as e-learning continue to create new possibilities for innovative instructional delivery systems, issues regarding the quality, efficiency and effectiveness of these systems as delivery modes for educational programmes continue to be of concern to educational practitioners. For instance, how effective are the existing various e-learning environments for instructional purposes? To what extent does the asynchronous online instruction influence learning outcomes? Is there any significant difference in learning outcomes between students following an online course and those following conventional face-to-face tutoring? These were some of the concerns of the present study. Specifically, the subject of this investigation regards an examination of the University of Nairobi e-learning project, with special reference to the Wedusoft e-learning environment.

Purpose of the Study

The general purpose of this study was to examine and analyze the instructional effectiveness of asynchronous e-learning environments in Kenya, with special reference to the Wedusoft learning management system of the University of Nairobi.

Objectives of the Study

The following were the specific objectives of the analysis:

1. To examine and compare the extent of teacher-student interactivity between online-based instruction and conventional instruction.

2. To determine the level of learner-centeredness and individualization, between online-based instruction and conventional instruction.
3. To find out and compare the learning outcomes between students using technology-based instruction and those using conventional instruction.
4. To identify constraints experienced in instituting technology-based instruction in the universities.

Research Questions

The specific research questions that guided the study were:

1. What is the extent of teacher-learner interactivity in both online based instruction and conventional instruction?
2. Is there any significant difference in learning outcomes between learners using online -based instruction and those using conventional instruction?
3. What constraints are experienced in instituting asynchronous online-based instruction at the University of Nairobi?

Research Hypotheses

The following hypotheses were tested:

1. There is no significant difference in teacher-learner interactivity in online-based instruction and conventional instruction.
2. There is no significant difference in learning outcomes between learners using online-based instruction and those using conventional instruction.

Literature Review

The development of e-learning products and the provision of e-learning opportunities is one of the most rapidly expanding areas of education and training. Whether this is through intranet, 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 sociocultural environment make a difference? Considering the costs

of implementing ICT-based training, is there a positive return on investment? What are the perceptions of professionals? What problems has it created for them?

E-learning is also one of the areas that attracts a great deal of research and development funding. If this investment is to be maximized, it is imperative that we generate robust models for the systematic evaluation of e-learning and produce tools which are flexible in use and consistent in results.

Although recent attention has increased e-learning evaluation, the current research base for evaluating e-learning is inadequate. The lack of systematic evaluation has been a major weakness in e-learning projects (Hughes and Graham, 2002). However, while some have been desperately seeking answers to the question “What works and what doesn’t work?” and looking for ways of improving the quality of e-learning, the response by a large sector of the community of e-learning practitioners, and by technocrats in particular, has been a growing preoccupation with interoperability and regulation of platforms and models.

Hughes (2002) argues that with the evaluation process, standards are more likely to be improved by diversity, flexibility and experimentation, rather than through standardization. Although the existing literature is limited, available evidence thus far suggests that traditional classroom instruction yields a more favorable learner response than e-learning solutions. (Kirkpatrick, 1959). This issue represents a perplexing problem for proponents of e-learning. (e.g. Hughes, 1996, Scrivens, 1999). It also raises the question of whether evaluation of e-learning compared with traditional learning should be the real issue or is it evaluation of e-learning within itself? (and similarly, between different e-learning platforms). Further research is needed to explore these two fundamentally different perspectives and generate reference materials which will look at the strengths and limitations of norm-referenced, criteria-referenced and ipsitive-referenced models of e-learning evaluation.

Various comparative studies on American university students have shown e-learning to be as effective as traditional face-to-face learning (U. Ohio Centre for Evaluation Studies, 1998-2000). While students engaged in face-to-face learning (Level 1 evaluation) have expressed more satisfaction with traditional

learning solutions, the learning outcomes (Level 2 evaluation) are not different for participants of e-learning programmes (Kirkpatrick 1959).

Many researchers have claimed that the same evaluation strategies and processes utilized in other types of evaluations can be applied to e-learning programmes. This may or may not be the case. However, a re-examination of widely used models and benchmarks is warranted (e.g. the “1 to 5 levels of evaluation” proposed by Kirkpatrick). Any inconsistencies and limitations in an e-learning evaluation environment should be identified, particularly for their applicability and potential for adaption or refinement of existing platforms.

There is evidence of a growing practice of building evaluation into an e-learning process through the use of on-line tools that assess students’ perception and performance based on the belief that this can save time as well as money. This notion should be examined from the perspective of the pedagogical assumptions underpinning it and the robustness and usefulness of the data generated in this way.

Most of the credible, holistic evaluation of e-learning has been based predominantly on an evaluative approach based on systems theory or using a positivist-rationalist approach. However, the limitations of “systems theory evaluation” (feedback and error detection) may be more significant in e-learning than in traditional learning. Elliott Stern (2002) notes that the relevance of this approach, particularly at policy level, should be challenged and alternative theoretical bases explored using some of the models generated by Van der Knaap (1998–2001) at the Tavistock Institute on policy evaluation.

While all of these studies have identified the evaluation of e-learning as a major issue, there is still lack of a theoretical basis and a coherent research framework. There is little systematic research into broad-based issues and concepts, or the generation of transferable models and processes of evaluating e-learning or research into the design of tools for analyzing, rather than collecting, data. Furthermore, there are few papers written which collate the results of the existing research and classify it in an accessible way. Nor is there substantial evidence of work that extrapolates and tests generalizable principles arising from the case studies and surveys or which comments on the implications or application of these principles in online teaching practices.

Graham and Cagiltay (2001) attempted to evaluate four online courses in a professional school at a large Midwestern university in the USA. Their study was based on the 7 principles for good practice in undergraduate courses proposed by Chickering & Gamson (1987), which for some time now have been a popular framework for evaluating teaching in traditional, face-to-face courses. The courses were taught by faculty members who also taught face-to-face courses. Their evaluation was based on analysis of online course materials, student and instructor discussion-forum postings and faculty interviews. Their results indicated that instructors wanted to be accessible to online students but were apprehensive about being overwhelmed with e-mail messages or bulletin board postings. They feared that if they failed to respond quickly, students would feel ignored. Another important finding of their study was that instructors often required only “participation” in the weekly class discussion forum. As a result, discussion often had no clear focus. For example, one course required each of 4 students in a group to summarize a reading chapter individually and discuss which summary should be submitted. The communication within the group was shallow because the postings were summaries of the same reading and there were no substantive differences to debate, with the result that discussions often focused on who wrote the most eloquent summary.

Graham (2003) particularly notes that instructors gave prompt information feedback at the beginning of the semester but as the semester progressed and instructors became busier, the frequency of responses decreased, and the response time increased. In some cases, students got feedback on postings after the discussion had already moved on to other topics. Although this study’s contribution on practice in online learning is significant, the study did not attempt to compare traditional face-to-face tutoring which is an important part of the present analysis.

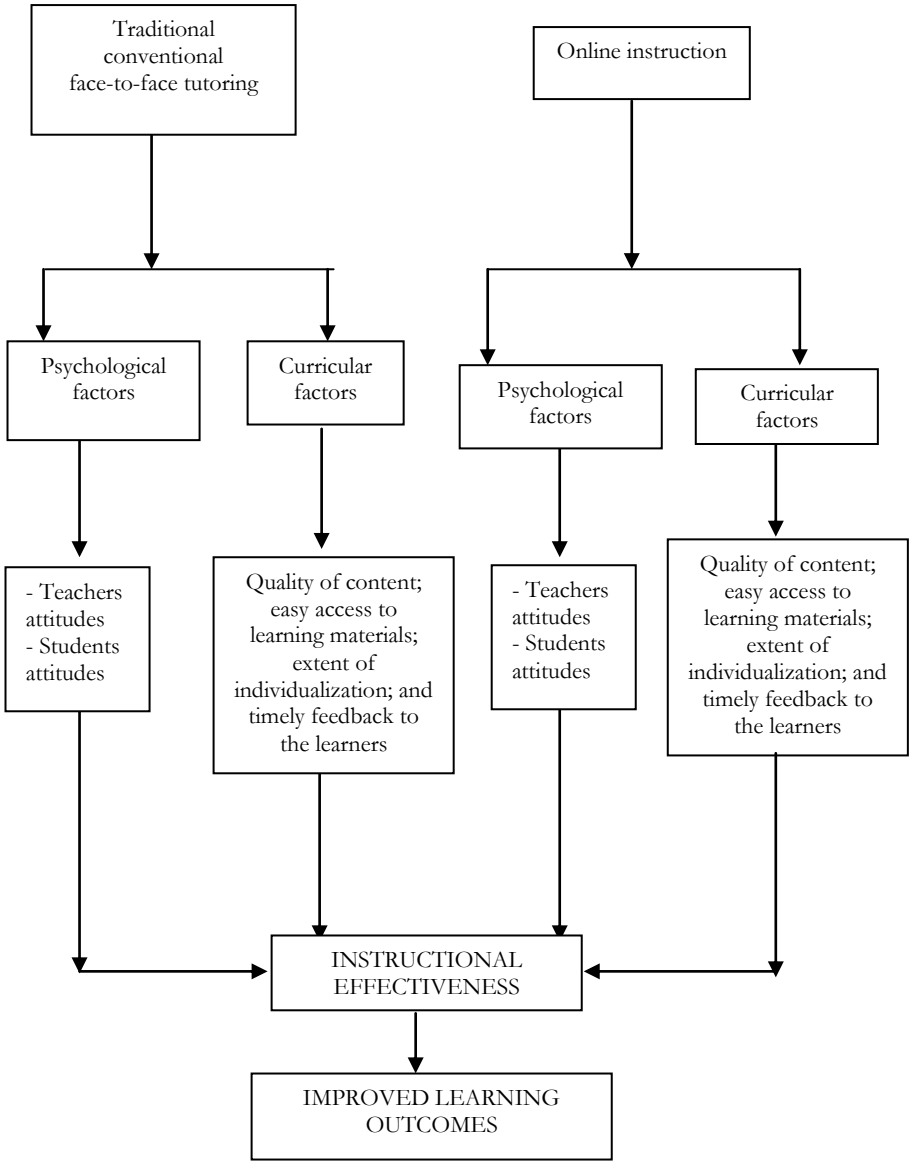
Yet, despite these new developments in the educational sector, the adoption of e-learning in African universities still remains embryonic. While the role of e-learning in higher education is appreciated (Achuna, 2000; Twigg, 2003), Africa is focusing almost exclusively on increasing space at its physical universities. Secondly, while many studies 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 intends to investigate the extent of the adoption of asynchronous learning in Kenyan universities. 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 the Wedusoft platform of the University of Nairobi.

Conceptual Framework

The primary objective of this study was to examine and analyze instructional effectiveness of the e-learning environment in Kenya, with special reference to the Wedusoft platform of the University of Nairobi. The underlying assumption of the study was that online instructional effectiveness is highly influenced by the extent of interactivity of the learners and course material; other fellow learners; course instructors; students' and teachers' attitudes towards online instruction; quality of content; easy access to learning materials; extent of individualization; and timely feedback to the learners. It was assumed in this framework that all these factors should result in improved learning outcomes for the students. Figure 1 is a conceptual framework depicting the assumed interrelationships of the variables in this investigation.

Figure 1: Conceptual Framework



Research Design

Experimental research design was the main methodology adopted in this research. This involves the assignment of subjects to different groups on the variables which have distinct values. The main experimental design adopted in the study was a true experimental design, which involved the use of 2 groups of learners. One group of learners received online instruction through the e-learning software tool, Wedusoft. The other group received instruction through the conventional or traditional face-to-face tutoring. The objective here was to compare the instructional effectiveness of the two pedagogical delivery approaches.

In order to determine the learning outcomes, using online-based instruction and those using conventional instruction, 2 groups of learners were set up — experimental and the control group. The experimental group received instruction using the Wedusoft e-learning tool and the control group received instruction using face-to-face tutoring. Being a true experimental design, both the experimental and control groups were given a pretest, which was a simple test based on their course content to determine the students baseline scores before the experimental group was introduced to the content through the Wedusoft learning system

After the pretest, the experimental group of students received instruction through the Wedusoft e-learning software for a 2-month period. The control group receiving instruction through the conventional face-to-face tutoring was also taught by the same instructor on a face-to-face basis. Thereafter, the 2 groups were given a posttest. The posttest scores of both the experimental and the control groups were then compared to find out if there were any significant differences in the learning outcomes of the 2 groups. Being a true experimental design, equivalent groups were constituted through random assignment to either the experimental or the control groups. The experimental group was given an induction on the use of the Wedusoft software before instruction began. This experimental set-up was repeated using 4 subject areas, to see whether there would be consistency in results among the various subjects. Secondly,

different groups of students were used with the 3 subject areas to see the reliability of the results.

Sampling Design

Two groups of subjects were sampled in this study — the group of students enrolled in the programmes to be analyzed and the teachers involved in the instruction of those subject areas. The groups were not large, therefore, all those taking the courses to be analyzed were involved in the investigation. The student population in these courses was 86. Of these 86 students, 40 were randomly assigned to the experimental group and the other 46 to the control group.

Research Instruments

Both pretest and posttests achievement tests based on instructional content were constructed and administered to the groups of students who were to take part in the experimental and control groups. These was carefully developed and checked for reliability and validity before their adoption.

Structured questionnaires were to be administered to students and faculty members. The main goal of using the questionnaires was to collect basic demographic data about the students as well as the teachers. The questionnaire was also used to seek information about the constraints experienced by the students in using the delivery methods and their general opinions and perceptions about technology-based instruction.

Data Analysis and Interpretation

This section discusses results of the study. Information was sought from students enrolled in the following diploma courses, which have electronic courses already in place: consumer behaviour, personnel management and introduction to research methods. The total student population was 86.

Demographic Analysis

The female population was slightly higher than that of males with 58% of the respondents being female while 40% were male. Majority of the students were youth, with many (46%) in the age bracket of 19–25, and only a few (18%) being over 26 years old. Many of the students (27%) had no work experience

at all but a few (22%) indicated that they had work experience of between 1 and 4 years.

Comparison of Learning Outcomes between Students Using Online Learning and Conventional Instruction

The key objective of this study was to compare learning outcomes between students taking online courses and those learning through conventional instruction. In order to determine the learning outcomes of students using online-based instruction and those using conventional instruction, 2 groups of learners were set up: one was experimental and the other was a control group. The experimental group received instruction using the Wedusoft learning tool while the control group received instruction using the regular tutoring method. Table 1 summarizes the results of the pretest scores i.e. the mean scores in each of the subject areas before the use of the learning management system.

Table 1: Distribution of Students Scores in the Research Methods Course

Scores	Number of Students in the Online Course		Number of Students in the Face-to-Face Class	
	F	%	F	%
39 marks and below	1	3.3	-	-
40-54	3	10	11	36.7
55-60	13	43.3	14	46.7
61-64	11	36.7	3	10
65-74	2	6.7	3	6.7
Over 75	-	-	-	-
TOTAL	30	100.0	30	100.0

These results indicate that the majority of students taking the online course scored between 55 and 60 (43.3%), while the majority of students taking face-to-face courses also scored the same (46.7%).

Table 2: Distribution of Student Scores in the Quantitative Methods Course

Scores	Number of Students in the Online Course		Number of Students in the Face-to-Face Class	
	F	%	F	%
39 marks and below	2	6.7	3	10
40–54	10	33.3	15	50
55–64	7	23.3	7	23.3
65–74	7	23.3	4	13.3
Over 75	4	13.3	1	3.3
TOTAL	30	100.0	30	100.0

These results indicate that 50% of the students taking face-to-face tutoring scored between 40 and 54, while only 33.3% of the students in the online course attained similar scores.

Table 3: Distribution of Student Scores in the Consumer Behaviour Course

Scores	Number of Students in the Online Course		Number of Students in the Face-to-Face Class	
	F	%	F	%
39 marks and below	3	10	-	-
40–54	15	50	4	13.3
55–64	7	23.3	11	36.7
65–74	4	13.3	12	40.0
Over 75	1	3.3	3	10.0
TOTAL	30	100.0	30	100.0

The majority of students in the face-to-face class scored between 65–74 (40%), while the majority in the online class scored between 40 and 54 (50%).

Table 4: Distribution of Student Scores in the Personnel Management Course

Scores	Number of Students in the Online Course		Number of Students in the Face-to-Face Class	
	F	%	F	%
39 marks and below	-	-	-	-
40–54	11	36.7	7	23.3
55–64	10	33.3	10	33.3
65–74	6	20	10	33.3
Over 75	3	10	3	10
TOTAL	30	100.0	30	100.0

This analysis indicates that the majority of students in the online class scored between 40 and 54 (36.7%), while the majority in face-to-face tutoring scored between 55 and 64 and between 65 and 74 (33.3%).

Table 5: Mean Score across the 4 Subject Areas

Subject area	Mean Score for the Online Class	Std Deviation for the Online Class	Mean Score for the Face-to-Face Class	Standard Deviation for the Face-to-Face Class
Introduction to Research Methods	3.33	.884	2.866	.8604
Introduction to Quantitative Methods	3.03	1.412	2.500	.9738
Consumer Behavior	2.50	.9738	3.466	.8604
Personnel Management	3.03	.9994	3.300	.9523

The mean score was measured relative to a set mean score of 3.00, meaning that the average mean score expected in these results was a score between 55 and 60. Table 5 summarizes the mean scores of each of the subject areas. From this analysis, it can be noted that the mean score for the “introduction to research methods” for the online class was 3.33, with a standard deviation of 0.884, while that of the face-to-face class was 2.866. The mean score for the quantitative course was also higher for the online class (3.03) than for the face-to-face class, which had a mean score of 2.500. On the other hand, the mean score for the “personnel management” face-to-face class was higher (3.300) than that of the online class which had a mean score of 3.03. The analysis also indicates that the mean score for “consumer behaviour”, for the face-to-face class was higher (3.46) than that of the online class (2.50).

It was important to test whether there was any significant difference in the mean scores of the different subject areas between the online classes. To do this, the following null hypotheses were tested.

H0: There is no significant difference in mean scores between students taking online classes and those receiving face-to-face tutoring

H₄: There is a significant difference in mean scores between students taking online classes and those receiving face-to-face tutoring.

Table 6: Summary of T-Tests for the Various Subject Areas

Subject area	Std Error of Mean Differences	Calculated t-value	Table t value	Df
Introduction to Research Methods	.1496	3.120	2.056	29
Quantitative Methods	.1244	4.289	2.056	29
Personnel Management	.2194	-1.216	2.056	29
Consumer Behavior	.1825	-5.298	2.056	29

From this analysis, it is clear that the calculated t-value for the research methods course (3.120) does exceed the table value 2.056. On the basis of this, the null hypothesis was rejected and instead the alternative hypothesis was accepted. Similarly, the calculated t-value for the “quantitative methods” class was higher than the critical value. Based on this fact, the null hypothesis was rejected and instead the alternative hypothesis was accepted. The null hypothesis that there is no significant difference in the mean scores obtained by the online class and the face-to-face class for the “personnel management” class was also tested. The calculated t-value for this course (-1.216) did not exceed the critical t-value (2.026). On the basis of this, the null hypothesis was accepted and the alternative hypothesis rejected. Lastly, the null hypothesis that there is no significant difference between the mean scores obtained for the consumer online class and the face-to-face class was also accepted because the calculated t-value (-5.298) was less than the table t-value.

These results indicate that there was a significant difference in performance between the online classes and the face-to-face classes for the 2 courses i.e. “introduction to research methods” and “quantitative methods”. The students in the online class performed significantly better than those in the conventional class. This could be attributed to factors such as the students having more opportunity to go through the same lessons again and again,

as compared to the one-time lecture that is offered by the conventional teacher. However, there is need to introduce more subjects to this analysis to see whether there would be consistency in the results. There were no significant differences in performance between the online and the face-to-face students in the “personnel management” and “consumer behaviour” classes.

Extent of Teacher Interactivity between Online-Based Instruction and Conventional Face-to-Face Instruction

One of the objectives of this study was to compare the extent of interaction between online instruction and conventional face-to-face tutoring. This was defined as the students’ interaction with the course material, learner-learner interaction, teacher-student interaction, student-teacher interaction and teacher-teacher interaction. To achieve this, teachers were presented with a 4-point measurement scale and requested to rate the level of interaction for both the online classes and the traditional classes, in various areas. Results of this analysis are summarized in Table 7.

From Table 7, the students’ interaction with the course materials in the traditional classes was rated as low by a majority of the staff. For example, 77.3% of the teachers rated this as low while 13.6% of the teachers rated this as very low. Only 2.1% of the teachers rated this as high.

On the other hand, learner-learner interaction in the traditional class was rated as high by 77.3% of the teachers, while 22.7% of them rated it as very high. This could be attributed to the fact that face-to-face tutoring compels learners to assemble in a class, therefore providing good opportunity for the learners to interact more often than is the case for online students who mostly learn independently.

Student-teacher interaction for the traditional class was rated highly, with 77.3% of the teachers rating it as high. However, a few teachers gave it a low rating (22.7%).

Teacher–teacher interaction in the traditional class was also rated as low by the majority of the teachers (68.2%) although a few rated it as high (51.8%). Again this could be explained by the fact that lecturers usually have less opportunity for interaction, even in traditional class teaching. However this is a surprising

Table 7: Faculty Responses about the Levels of Interaction in Traditional Classes

Statement	Very Low (1)		Low (2)		High (3)		Very High (4)		Total	
	F	%	F	%	F	%	F	%	F	%
The students' interaction with the course materials in the traditional class was	3	13.6	17	77.3	2	9.1	-	-	22	100
The learner-learner interaction in the traditional class was	-	-	-	-	17	77.3	5	22.7	22	100
Student-teacher interaction in the traditional class was	-	-	5	22.7	17	77.3	-	-	22	100
Teacher-teacher interaction in the traditional class was	-	-	15	68.2	7	31.8	-	-	22	100
Teacher-student interaction in the traditional class was	-	-	8	36.4	9	40.9	5	22.7	22	100

outcome because it is expected that lecturers meet often when they attend their usual classes. It must also be noted that there is a culture in many learning institutions where teachers only come to campus to teach their scheduled classes, after which they leave. This way, there are less and less opportunities for teaching members of staff to interact. In fact, more often than not, teacher-teacher interaction happens occasionally, when there are departmental meetings or when there are shared tasks. The effect of such limited interaction between the teaching fraternity on student learning could be expected although this was beyond the scope of this study.

Surprisingly, teacher-student interaction in the traditional class was rated as high by a large number of the faculty interviewed (40.9%) with only 22.7% rating this as very high. However, 36.4% of the staff rated this interaction as low. Again, this could be attributed to the fact that teachers and students are always interacting in class through formal and informal discussions, even after lectures, a strength that is associated with face-to-face tutoring.

Table 8: Levels of Interaction in Online Classes

Statement	Very Low (1)		Low (2)		High (3)		Very High (4)		Total	
	F	%	F	%	F	%	F	%	F	%
The students' interaction with the course materials in the online class	-	-	-	-	9	40.9	13	59.1	22	100
Learner-learner interaction in the online class	-	-	14	63.6	8	36.6	-	-	22	100
Teacher-teacher interaction in the online class	5	22.7	14	63.6	3	13.6	-	-	22	100
Student-teacher interaction	7	31.8	15	68.2	-	-	-	-	22	100
Teacher-student interaction in the online class	5	22.7	17	77.3	-	-	-	-	22	100

Table 8 summarizes teachers' responses regarding interaction in the online classes. From this analysis, the attribute of students' interaction with course materials in online classes was rated quite highly by a majority of the lecturers, with 59.1% rating this as very high, while 40.9% rated it as high. In fact, none of the lecturers rated this as low. This could be explained by the fact that e-learning does allow for flexibility and students have almost all of the content of a given course with them. This makes it easier for the students to interact with the material more than in the traditional class, where content is given only during the lecture, after which most of the time the students will keep away the books until the next lecture. Learner-learner interaction in online classes was rated as low by the majority of the lecturers (63.6%) although 36.6% of them gave it a high rating. Again, this could be attributed to the fact that learners interact with the learning materials individually, either in the computer labs, offices, at home, or even in cyber cafes. This is likely to limit the extent of interaction between the learners because of excessive individualization of the learning process. However, this is an area that could be addressed by teachers giving students common tasks to tackle in groups. It must be noted here that virtual interaction between the learners through, for instance, the bulletin board, is more prominent in online classes. However, an interview with the teachers indicated that most of the students did not make use of the bulletin board in the Wedusoft platform despite provisions having been made for it. Equally, because of this, there was also less interaction between the

students and the teachers, a situation that could be improved with more training of teachers. For instance, teachers may need to be trained to encourage the use of virtual interaction amongst the students themselves as well as between the students and teachers.

Teacher-teacher interaction in the online classes was also rated low with 22.7% of the teachers rating this as very low while 63.6% rated it as low. However, a small proportion of the teachers rated it as high (36.6%). This could be attributed to the individualization that is seen in e-learning. Similarly, student-teacher interaction was rated low, with 31.8% of the teachers rating it as very low while 68.2% of them rated it as low. This could be attributed to the students' minimal use of the bulletin board. In fact, this same reason could explain the low rating for the teacher-student interaction that was essentially rated as low by a majority of the teachers (77.3%) and very low by 22.7% of the teachers.

Faculty Response on the Levels of Interaction between the Online Classes and Traditional Classrooms

During this investigation, teachers were asked to compare the extent of interaction between the online classes and the traditional classes. Results of their responses on this item are summarized in Table 9. For instance, when asked to compare the extent of students' interaction between the online classes and the face-to-face tutoring, 59.1% of the teachers indicated that this was much higher in the online classes than in the traditional classes. In fact, 40.9% of the teachers indicated that this was much higher in the online classes than in the traditional classes. Learner-learner interaction was considered by the majority of teachers (50%) as being much lower in the online classes than in the face-to-face classes. Learner-learner interaction within groups of students was considered as much lower in the online classes than in the traditional classes by the majority of the lecturers (72.7%). Student-teacher interaction, on the other hand, was considered as being lower in the online classes than in the traditional classes by the majority of the lecturers (72.7%). Teacher-teacher interaction was also considered much lower in the online classes than in the traditional classes by the majority of the lecturers (86.4%).

Table 9: Faculty Response on the Levels of Interaction between the Online Classes and Traditional Classroom

Statement	Much Lower (1)		The Same (2)		Higher (3)		Much Higher (4)		Total	
	F	%	F	%	F	%	F	%	F	%
Students' interaction with the course materials in the online classes	-	-	-	-	13	59.1	9	40.9	22	100
Learner–learner interaction between groups in the online classes	11	50	3	13.6	8	36.4	-	-	22	100
Learner–learner interaction within groups (public relations class) in the online classes	16	72.7	6	27.3	-	-	-	-	22	100
Student–teacher interaction in the online classes	16	72.7	6	27.3	-	-	-	-	22	100
Teacher–teacher interaction in the online classes	19	86.4	3	13.6	-	-	-	-	22	100

Table 10: Faculty Response on the Levels of Individualization and Flexibility of the Online Classes Relative to the Traditional Classroom

Statement	Much Lower (1)		The Same (2)		Higher (3)		Much Higher (4)		Total	
	F	%	F	%	F	%	F	%	F	%
Extent of individualization in the online classes	-	-	-	-	5	22.7	17	77.3	22	100
Extent of flexibility in the classes	-	-	-	-	3	13.6	19	86.4	22	100
Frequency of students' assessment in the online classes	-	-	-	-	5	22.7	17	77.3	22	100

On the same note, teachers were asked to compare other aspects of online teaching and face-to-face tutoring, such as extent of individualization of online classes and flexibility and frequency of students' assessment. These attributes of online learning were rated highly compared to face-to-face tutoring. For example, the extent of individualization in online classes was considered by the majority of the teachers (77.3%) as being much higher in online classes than in traditional classes. Extent of flexibility of learning in online classes was also considered as much higher in online classes than in traditional classes by

almost all of the teachers (86.5%). Similarly, frequency of students' assessment in the online classes was perceived as being much higher in the traditional classes than in face-to-face classes by 77.3% of the teachers. Many teachers (81.8%) also indicated that feedback was much quicker in the online classes than in the traditional classes. This could be explained by the fact that students are able to attempt tests within the learning management system and get instant feedback just by a touch of a button, a great strength of online learning, compared to traditional face-to-face tutoring. This may imply the need for looking for ways and means of improving the extent of interaction in online learning, if it is to be adopted as an effective teaching approach.

Constraints Faced by Faculty in their E-learning Initiatives

It was important in this study to find out the constraints faced by faculty in their e-learning initiatives. A frequently noted problem by the faculty was lack of computers. This was indeed mentioned by all the members of staff interviewed and constituted 28.2% of the responses elicited from this item. Other frequently quoted challenges were slow internet (23%), inconsistent training (19%), poor coordination of e-learning activities (14.1%), lack of time to develop e-content (10.26%), and poor funding (5.1%). A further discussion with the faculty members indicated that the training of faculty was done in a rather *ad hoc* manner, with no clear follow-up. This implies that there is urgent need to address these issues if e-learning programmes are to be widely adopted in the universities.

Recommendations

This study sought to analyze the instructional effectiveness of asynchronous e-learning environments in Kenya, with special reference to the Wedusoft learning platform of the University of Nairobi. The results of the study indicate that the system in itself is an effective inhouse developed system, despite the challenges that may need to be addressed to facilitate its adoption at the university. Some of the challenges noted by the staff as well as students are lack of computers. This was indeed mentioned by all the members of staff interviewed and constituted 28.2 % of the responses elicited from this item. Other frequently quoted challenges were slow internet speed (23%), inconsistent training (19%), Poor coordination of e-learning activities (14.1%), lack of time to develop e-content (10.26%) and poor funding (5.1%). The recommendations made in this study are therefore made in view of these challenges.

First, it must be noted here that online courses are an effective application of asynchronous distance education; they provide access to a broad range of learning resources and learner assistance, since on-line help and tutorial support are built into the programmes. Furthermore, asynchronous courses enable learners to reflect on and interact with new information before having to respond to it. An additional benefit is that such systems allow the instructor to give each student a high degree of individualized attention. However, it must be noted here that asynchronous systems influence their relative effectiveness and therefore need to be actively planned for and managed. Asynchronous systems, for example, depend on students' self-discipline in participating and maintaining an appropriate learning pace. Additionally, the 24/7 availability of communication in asynchronous systems can tempt instructors to present excessive amounts of information and tasks to the students. Similarly, students can easily be swamped by masses of e-mail from instructors that seem to demand an immediate response. All these challenges indicate that there is need for appropriate training of the staff, to learn not only how to develop instructional content and manage the technical aspects of the learning management system, but also how to manage an online class. One of the fears expressed in this study by many of the teachers is that online learning may end up taking too much of their time, a challenge that could be remedied by appropriate training of staff.

Because large groups of students are likely to exhibit wide variability in their learning characteristics, the use of a combination of media for instruction would increase the chances of positive learning outcomes, by increasing the range of learning styles that can be accommodated in e-learning. The use of animations and other forms of multimedia to enrich the online learning environments would go a long way in enriching online learning. This was one area of the learning management system that was rated poorly by a majority of the staff.

Student characteristics, program design, content, instruction, and program administration all have a major impact on learning effectiveness. Developing a clear conception of the goals and objectives of a program prior to the selection of a particular learning environment and supporting technologies, is the first step in maximizing effectiveness. These goals can then be used in establishing

the appropriate balance of elements that, for any given learning situation, will result in positive learning outcomes and overall effectiveness.

There is need for the university to encourage appropriate staff development, collectively as well as individually, in order to facilitate progress in e-learning. The *ad hoc* one-time training targeting a small group of faculty would not help much in further development and adoption of e-learning. Observatory data from this analysis indicates a widespread need for urgent technology upgrades. The majority of staff noted that the technological infrastructure in university was very poor. For online learning to be effective, the necessary infrastructure must be established.

The study results also imply the infancy in the usage of online learning at the University of Nairobi. It must be noted here that the use of Wedusoft as a learning management tool is still limited in the university, with only 3 faculties so far using the software. There is need, therefore, for an institution-wide adoption of e-learning as an instructional tool. This highlights the need for a clear institutional policy on e-learning, which to date, is not very clear. Building a community of e-learning adopters within the university is clearly crucial, for further e-learning developments.

The government must play a key role in the strategic direction and funding of higher education in general, and e-learning, in particular. It must play an important role in influencing the behaviour of institutions by means of strategic funding/policy. The government and other supporting agencies need to create an enabling environment for e-learning development, not only in the University of Nairobi, but in other universities as well. Government investment in university infrastructure would go along way in making e-learning more of a reality in the universities.

Areas for Further Research

One of the strongest arguments for promoting e-learning lies in its potential to improve, and even revolutionize, teaching and learning. More research needs to be directed in this area. For instance, more research could be conducted to find out the effectiveness of other learning management systems used in other universities.

The present research was a case study that used only a small sample of subjects. More research work could be done using more subject areas, particularly to find out whether the results still hold in there being no significant differences in performance between students taking on-line courses and those taking traditional face-to-face classes.

More research work could also be done to find out the integration of e-learning in other universities in Kenya, a scope that could not be covered in the present analysis.

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