

## Manpower Development In The 21<sup>st</sup> Century: The Role Of Distance Education

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Generally, education is considered one of the biggest instruments for development; a means for realizing social, cultural, economic and political needs and aspirations. However, in many African educational institutions there is an enormous challenge in training a cadre of highly qualified professionals to fuel such development. There are inadequate educational resources, due to loss of the best talented faculty to the developed world. In addition, contemporary educational thought holds that one of the pivotal causes of inadequate school performance is the inability of schools to adequately staff classrooms with qualified teachers, especially in fields such as mathematics and science (Gordon and Thomas, 2007, p.43). To address the issue of teacher shortages in Kenya, some single mode universities converted themselves into dual-mode. Among them is the University of Nairobi. Apparently, the belief among academics is that conventional education is real education. This makes distance education to act as complementary and worse of all supplementary. This paper sets out to compare whether there is a significant difference in TP performance between B.Ed (Science) Distance and on-campus students. A sample of 181 students: face-to-face n=131 vs. distance learning n= 50 students was used. The instrument of data collection was an observation guide. Though students taking courses by on-campus mode outperformed their counterparts in the distance mode of learning, this paper will conclude that distance learning should be treated as the emerging standard of quality in higher education and can effectively perform a complementary function, which should alleviate teacher shortage in Kenya. This study has demonstrated that science can be successfully taught by distance mode even given the current technological investment levels. This is important for policy because it leverages on what is available and the change that can bring especially in the area of manpower development, access and equity. The researchers argue that raising the technological level is not difficult since this can be done through collaboration with specialized bodies such as the African Virtual University (AVU) that is spearheading the infusion of ICTs and e-learning into the educational arena

**Key words:** Distance education, face-to-face learning, teaching practice

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## Introduction

Conventional or on-campus mode of learning is the widely accepted and known mode of learning. Tsolakidis (2000) system of teaching by someone who is removed in space and time from the learner through teaching materials that have been systematically developed using different types of media to provide two way communication (Moore and Kearsley, 1996). By its inherent nature, distance education system has some features of

In Kenya, the Public Universities Inspection Board (2006) and Amutabi (2011, p.3) reports that in Kenya ODL is looked down upon and 'very few universities have embraced the model of open and distance learning and even in those institutions where this is used, it is taken as a second or third class form of instruction'. This could be a pointer that the academics do not view the quality of distance learning as similar to conventional learning. What is more, the academic performance of distance learners is deemed to be of lower quality. The Public Universities Inspection Board reported that:

Experiences from other countries such as Tanzania, Nigeria, South Africa and the United Kingdom have demonstrated the potential of Open and Distance Learning (ODL) in increasing access. Kenya has not pursued this mode of delivery in a consistent and aggressive manner. As a result, Open and Distance Learning

defines conventional education/on-campus as the universally accepted approach for knowledge acquisition. On the other hand, distance learning is a openness. Open learning describes a situation where control of learning is essentially in the hands of the learner. In literature, the terms Open and Distance Education (ODE) and Open and Distance Learning (ODL) are used synonymously and in some instances; this paper will treat the two terms as synonyms.

programs are the individual initiatives of the local universities with limited government funding (Republic of Kenya, 2006, p. 19).

Whereas the above concerns called for a national policy framework that would address the issue, this has not been done. Yet the number of students who desire university education keeps swelling every year. Some of these students are adults who cannot afford to enroll on a full-time basis because of work, family responsibilities, and other commitments. Others are Kenya Certificate of Secondary Education (KCSE) candidates who attain the minimum university entry requirements of grade C+ as shown in Table 1.1 but miss admission into public universities because admission is tied on the bed capacity and resources allocated to each university by the government (University of Nairobi, 2008, p. 9). The present public universities in Kenya absorb a total of 28-30 percent (MoHEST, 2011).

**Table 1.1: Number of KCSE candidates admitted in Private and Public universities**

Year	C+ and Above	Private universities	Public universities	Left out
2006/2007	62,926	17,706	10,000	35,220
2007/2008	82,134	20,432	16,000	45,702
2008/2009	72,500	22,123	20,000	30,377
2009/2010	81,048	35,179	24,221	21,648
2010/2011	97,134	37,848	29,237	30,049

**Source: The Kenya National Examination Council and Joint Admission Board (2011)**

Those who are shut out may join private universities. Private universities absorb less than 25 percent of students who attain mean grade of C+ and above at KCSE level (MoHEST, 2011). Others may join the public universities through the ‘parallel programs’ commonly referred to as Module 2 and Module 3 programs. In Module 2 students learn in the evenings, or get integrated with the fulltime students while Module 3 is the distance learning mode.

While ODE is credited for enhancing participation and access in higher education, there is skepticism on the quality of learning. This is on the assumption that it undermines traditional education, limit student interaction with peers and lecturers and eradicate the platform for which a deliberate academic discourse takes place (Mathews, 1999). Other scholars assert that distance education has shown a capacity to help students acquire knowledge and communication skills but fails in developing the skills of analysis, synthesis, application, judgment and value that are the ‘characteristics of a truly higher education’ (Smith and Kelly, 1987, p. 48).

Fox (1998) argues that what is in dispute is not whether distance education is ideal, but whether it is good enough to merit a university degree, and whether it is better than receiving no education at all. Fox alludes to an argument that students learn far too little when the teachers personal presence is not available because the student has more to learn from the teacher than the texts. Hannay and Newvine (2006, p. 5) add that distance learning examinations are ‘cheap’ since they test lower cognitive levels of knowledge and comprehension. No wonder, distance education has been described as learning at the back door (Ding, 1988); second hand education or the Cinderella of the educational spectrum (Keegan, 1990) and an ignored and neglected step child of education (Peters, 1993).

Despite such concerns, the researchers are of the view that ODL is as good as on-campus learning as long as the students are stimulated to order their thoughts and actively get involved in the academic requirements. This is because there are successful single and dual mode universities in the world that have continually channelled out quality graduates into the labour market. For instance in 2011, the Open University of

the United Kingdom was rated among the United Kingdom's top three higher education institutions. It came third out of 157 universities in the National Student Survey - placed equally with Oxford. The rating was based on student satisfaction, number of graduates and research output (<http://www.open.ac.uk/about/main>). Open University of Tanzania and University of South Africa are among the top ranked universities in Tanzania and South Africa respectively with various programs on offer. (<http://www.open.ac.uk/about/main>)

### **Assessment of Academic Performance of B.Ed (Science) Course**

Assessment may be defined as the process of determining the extent to which learning has taken place. Chris (1999) defines assessment as the systematic collection of information about student learning using the time, knowledge and resources available, in order to inform decisions about how to improve learning. In this study, assessment is defined as the methods used by lecturers to determine the extent to which students have comprehended the course content.

University of Nairobi uses two methods to assess the Bachelor of Education (Science) students: written examinations at the end of each semester and teaching practice at the end of the third year. Examinations consist of 30% course work comprising of written assignments (term papers), semester tests, practicals, projects; and 70% written examination at the end of each semester. Each course unit is examined by a two hour paper and the pass mark for each paper is 40%. The B.Ed (Science) students in the two modes of study sit for different but equivalent

examinations which go through the same university mechanism of content validity through internal and external moderation. Teaching is a complex activity; student teachers need to develop their capacity in making intelligent decisions to handle ambiguous and challenging situations in schools and beyond. Lam and Fung (2001, p. 1) notes that teacher education ‘...is largely a matter of developing a teacher’s capacities for situational understandings as a basis for wise judgment and intelligent decisions in complex, ambiguous and dynamic educational situations’. This means that educational and teaching theories learned in teacher education programs may not be applied straightforwardly to complex and dynamic educational situations. It is only during teaching practice when student teachers are given an opportunity to test theories learnt in the lecture rooms in real life experiences. No wonder teaching practice is compulsory to all students studying for a degree in Education.

Teaching practice is equivalent to two units. Each candidate on teaching practice is assessed a minimum of three times in each of the teaching subjects and each assessment is marked out of 100 marks. Teaching Practice is viewed by many educational authorities as the measure for the success of an Education degree (Stones 1992)... ‘because the student teacher is provided with the opportunity of practically synthesizing and applying in a real situation the theoretical learning that has been provided throughout the teacher preparation program’ (Molomo as cited in Digolo, 2002, p. 96). Teaching practice students are assigned students to teach and what they teach is real learning content

that might decide the future of that learner. At the University of Nairobi, students go for their teaching practice just before the beginning of their final year. By this time they have covered most of their academic work and they have covered both general and subject methods of teaching. Therefore, it is not enough for a person to show examination grades, but should demonstrate that learning through communicative acts (Keegan, 1990, pp. 14-15). Mager (1973, p.2) aptly concludes that 'you cannot find out if someone can ride a unicycle unless you or someone else watches him ride one. You cannot find out if the objective is achieved unless you use items that ask the student to perform what the objective is about' (Mager, 1973, pp. 2-3). This then implies that you cannot find out if a student-teacher can translate theory into practice unless you watch him or her in a real classroom environment.

### **Literature Review**

There are numerous research studies that have been conducted comparing the two modes of learning. These studies have presented conflicting conclusions creating 'a doubt, a barrier, and an indeterminate situation crying out to be made determinate' (Kerlinger and Lee, 2000, p. 67). This will be demonstrated below:

### **Comparative Studies in Kenya**

Mutonga (2011) conducted a comparative study in Kenya of academic performance of students in the Registered Community Health Nurse Upgrading Program under face-to-face and Distance learning mode of instructional delivery. The design of this study was descriptive survey. The target population was 1,363 students; 943 distance study and 420 face-to-face

students who sat for the Nursing Council of Kenya (NCK) licensing examination between 2008 and 2010. The study used secondary data obtained from NCK's electronic database. The study found out that there was a statistically significant difference ( $p=0.000$ ;  $p < 0.05$ ) between the performance of distance education and face-to-face students. Face-to-face students performed significantly higher than distance study students. The study also found that there was a relationship between student's performance and their entry qualification. The higher the O-level grade attained, the higher the licensing examination mean score.

Mboroki (2007) carried out descriptive Survey study that compared performance in teaching practice between 43 Bachelor of Education (Arts) on-campus students and 50 distance study students of the University of Nairobi. The findings of this study showed that there is parity in performance in teaching practice between on-campus and distance study students of the University of Nairobi in the way the students are assessed in lesson preparation, presentation, development and mastery of content, classroom management and personal deportment.

### **Comparative Studies outside Kenya**

Unterberg (2003) carried out a study at the Harvard Medical School Center for Palliative Care in Boston. The purpose of the study was to compare learning outcomes of undergraduate students in a Physical Therapy Education degree course, given different learning environments. The two learning environments were in-classroom environment, where students met in a classroom with the instructor

present, and the computer-mediated distance learning environment, where students worked independently, receiving information and communicating with the instructor via e-mail. Unterberg's study found out that 43.0 percent of the distance group and 49.0 percent of the in-class group scored above-average, 32.0 percent and 34.0 percent scored average while 25.0 percent and 17 percent scored below average respectively.

Urtel (2008) carried out a study at the Mid-Western Urban University, Indianapolis to compare academic performance between face-to-face and distance education course format. The sample was 116 face-to-face and 269 distance study learners. Data were collected by use of document analysis. Examination grades and gender were used as comparative variables. Results analyzed at .05 level of significance indicated that there was a statistically significant difference between the distance education and face-to-face groups regarding overall academic performance as measured by grade earned ( $p=0.011$ ). The students enrolled in the face-to-face mode earned, overall, an average GPA 3.16/4.00 against 2.28/4.00 of the distance study students. When analyzing gender interactions, there was no statistically significant difference in performance of females versus males ( $p=0.2214$ ). Urtel concluded that contrary to some studies, students in distance education course do not automatically perform equally as well, or even better, than in a face-to-face course and that older students' in distance education do not automatically outperform their younger counterparts in face-to-face class.

Lizzio, Wilson and Simons (2002) conducted a study to determine the influence of Tertiary Entrance (TE) score in the students' years 11 and 12 of their secondary education on academic outcomes at the University of Griffith, Australia. A sample of 64 students was drawn from the Faculty of Business Studies. Findings showed that TE score was positively but weakly ( $\rho = .39$ ) associated with a high Grade Point Average (GPA) score measured on a scale from 1 (low) to 7 (high). The weak relationship could be a pointer that past performance is not a determinant of the present performance probably due to maturity which is associated with cognitive development. In contrast, Adedeji (2001) found a strong positive correlation ( $\rho = .85$ ) between students admission scores and their undergraduate performance at the Faculty of Technology, University of Ibadan. A study by Aderson, Benjamin and Fuss (1994) also found out that student's who received better scores (between 777-999) in high school tended to have a Grade Point Average score of above 3.0/4.0 at the university.

Pascallera and Collins (2003) conducted a randomized instructional experiment between a group of 46 students in a Fire Fighting Tactics and Strategy course learning on campus and learning at a distance at a Community College in Iowa. In one format students received face to face instruction in a traditional classroom on-campus while the rest received the same course instruction by two-way Interactive Television on the Iowa Communication Network (ICN). The findings of the study were that: The specific medium of instruction has little

impact on how students learn. Students can master course facts and concepts as well when they receive instruction at a distance as they can when they receive the same instruction on-campus in a traditional face to face environment; and the parity in outcomes holds irrespective of students pre-course level of content knowledge, their prior exposure to post-secondary education or their related professional training and experience. Pascarella and Collins' study used a different form of distance education; teleconferencing (e-learning) which is more interactive (Keegan, 1986) than the print medium used at the University of Nairobi.

Carmel and Gold (2007) examined the relationship between modality of course delivery and the level of student Grade Points Average (GPA), satisfaction and retention achieved by students attending either traditional on-site or distance study courses at the University of Phoenix. A document analysis incorporated data from 110 courses and 164 students of which 95 students were attending on-site classes while 69 were in distance study. The average GPA for distance mode was 3.74 while on-site was 3.77. Statistical significance of the means was tested at  $\alpha = 0.05$ . Carmel and Gold concluded that there is no statistically significant difference between the means of the groups ( $p=0.293$ ).

Cano and Garton (1994) conducted a study that investigated in-service performance of 82 practicing teachers who had majored in Agricultural Education at The Ohio State University. These researchers were interested in the relationship between instructional format and student's success

in a college level course. The researchers based their study on Richard Clark's theory which states that any medium of instruction is capable of delivering instruction. Cano and Garton (1994). Two instructional formats were compared; face-to-face learning and distance learning with minimal face to face interaction. Results indicated a low positive relationship ( $\rho = .30$ ) between instructional format and academic achievement in the course. The researchers concluded that instructional medium does not significantly influence academic performance.

Neuhauser (2002) conducted a research that focused on the relationship between learning environment and academic outcomes. The researcher analyzed documents of 54 students enrolled in two high school psychology classes. 27 students were in distance mode and the other 27 were in the face-to-face mode of learning. Results showed that the mean performance of the face-to-face group was not significantly higher ( $M = 76.47$ ) as compared to distance mode mean performance of 74.21 with  $p > .05$ . Thus the researcher concluded that equivalent learning activities could be equally effective for distance and traditional classroom learners as long as the students spend 'quality time' studying.

Okoh (2010) examined the influence of age, financial status and gender on academic performance among a sample of 175 undergraduates; 57 males and 118 females enrolled in a Counseling Psychology course offered through face-to-face and distance learning. One of the hypotheses the researcher tested was 'There is no significant difference in the

academic performance of undergraduate students based on gender'. A  $p > 0.05$  was obtained and the researcher concluded that there is no significant difference between male and female respondents in their academic performance. A probable explanation to this observation is that since both male and female undergraduates are exposed to same social and academic environment, they are assessed using the same criteria, then their reaction to grading (academic performance) is similar.

Magagula and Ngwenya (2004) carried out a comparative analysis of the academic performance of off-campus (distance) and on-campus learners at the University of Swaziland in 2004. The purpose of the study was to; a) examine the background characteristics of 70 off-campus and 70 on-campus enrolled in Bachelor of Arts and b) the extent to which the academic performance of off-campus and on-campus were similar and/or different. Academic performance was operationalized as the overall average mark or grade obtained by a learner in each of the following subjects in year one of the final examination at the University of Swaziland; Academic Communication Skills (ACS), History, Theology, African Languages, Geography, and English. The researchers compared the academic performance based on Rumbles (1997) assertion that if the entrance requirements (entry qualification) and content of both off-campus and on-campus programs are the same, lecturers are the same and both off-campus and on-campus learners write the same final examination then it should be possible to compare the academic performance of both modes.

## Research Methods

The design of this paper was a survey where a sample of 50 ODE and 131 on-campus students was drawn from a population of 58 ODE and 195 on-campus students respectively. These were the third year B.Ed (Science) students who were out for TP in 2012. Simple random sampling was used. To achieve a simple random number, each student in the sampling frame was assigned a number from 1 to 195 for on-campus students and 1-57 for distance study students. Computer Random Number Generator was then used to generate a list of random numbers that were used to the sample.

An observation guide was used to measure teaching practice performance. The university uses a standardized measuring instrument referred as Teaching Practice Observation Sheet for awarding marks. Various behaviors (or elements) are assessed. These behaviors are Preparation (20 marks), Presentation (15 marks), Lesson development (35 marks), Classroom management (10 marks), Summary/conclusion (10 marks) and Personal factors (10 marks).

## Results and Discussion

The total student sample size for this study was 181 B.Ed (Science) students. 131 representing 72.4% were on-campus students while 50 representing 27.6% were distance study students. Majority of the on-campus students were males representing 71.0% while majority of the ODE students were females representing 56.0% as shown in Table 1.2. This high percentage of the males could be a pointer that there is a gender gap in science performance at KCSE. As per this finding, males had performed higher in Sciences at

KCSE than females. The ODE mode of learning attracted more females than males a finding that concurs with Aragon et al (2002) study who found that females

enrolled in distance education classes at a higher rate than males because of the flexibility of the mode of learning.

**Table 1.2: Gender Distribution of the B.Ed (Science) students**

Distance Study students			On-campus students	
Gender	Frequency	Percentage	Frequency	Percentage
Male	22	44.0	93	71.0
Female	28	56.0	38	29.0
<b>TOTAL</b>	<b>50</b>	<b>100.0</b>	<b>131</b>	<b>100.0</b>

Teaching Practice (TP) is a compulsory exercise for every student enrolled in a B.Ed (Science) course. A common adapted T.P Lesson Observation Guide was used to assess the students as they taught in their TP schools. Just like in examinations, the TP marks are converted into grade letter where Grade A ranges from 70-100%, Grade B from 60-69%, Grade C from 50-59%, Grade D from 40-49% while E (fail) is from 0-39%.

The researchers sought to find out teaching practice mean performance between ODE and on-campus students. First, the researcher determined the teaching practice mean score performance translated into letter grades. As shown in Table 1.3, majority of the students in both modes scored above 60.0% while none scored below 49.0%. For instance, 27 (54.0%) ODE and 92 (70.2%) on-campus students scored Grade A in TP.

**Table 1.3: Letter Grade Performance of the B.Ed (Science) students in teaching Practice**

Grade performance	Distance study students		On-campus students	
	Frequency	Percentage	Frequency	Percentage
<b>A (70-100%)</b>	27	54.0	92	70.2
<b>B (60-69%)</b>	21	42.0	38	29.0
<b>C (50-59%)</b>	2	4.0	1	0.8
<b>D (40-49%)</b>	0	0.0	0	0.0
<b>TOTAL</b>	<b>50</b>	<b>100.0</b>	<b>131</b>	<b>100.0</b>

As per the university evaluation, this performance may be termed as good. This may be attributed to the preparation and

support the students received from the university and also from the regular teachers in their TP schools. Using the

scores assigned to the student, the overall TP mean score performance for the on-campus students was higher than for the ODE students. As shown in Table 1.4 the mean score performance for the on-campus students was 71.73 against a mean of 69.88 for the ODE students with a

standard deviation of 4.59 and 4.77 and SE of .40 and .67 respectively. Based on the normal curve, approximately 68% of the on-campus students scored between 67.14 and 76.32 while ODE students scored between 65.11 and 74.65.

**Table 1.4: Mean score performance in TP**

TP Performance	Distance study students			On-campus students		
	Mean	N	Standard deviation	Mean	N	Standard deviation
Overall performance in TP	69.88	50	4.77	71.73	131	4.59

The relationship between the mode of learning and the overall TP performance shows a weak positive linear relationship, Pearson correlation coefficient of  $r = .176$  as presented in Table 1.5. The Table also shows that this relationship is significant  $p < .05$ . This finding implies that there is a

significant relationship between the mode of learning and TP performance. On-campus students perform significantly higher in TP than the ODE students despite the latter having prior Training in Education.

**Table 1.5: Correlation between TP performance and mode of learning**

		Overall Teaching Practice Performance	Mode of Learning
Overall Teaching Practice Performance	Pearson correlation Sig. (2-tailed) N	1 . 181	.176* .018 181
Mode of Learning	Pearson correlation Sig. (2-tailed) N	.176* .018 181	1 . 181

\*Correlation is significant at the 0.05 level (2 tailed)

Finally, the researchers sought to determine whether the difference in mean performance between ODE and on-campus is significant. Independent t-test was used and the output is presented in Table 1.6. As shown in the table, there is a significant difference between the mean performance of ODE students and their counterparts in the on-campus mode of learning. The students in the on-campus mode of learning performed significantly higher ( $M=71.33$ ,  $SE =0.401$ ) than students in the ODE mode of learning ( $M=69.88$ ,  $SE=0.65$ ). This difference was found to be significant  $t(179) = -2.392$ ,  $p < .05$ .

The behaviors assessed during teaching practice were categorized into six attributes. These are lesson preparation, lesson presentation, lesson development, classroom management, summary/conclusion and personal factors. There is no significant difference in the performance of students in both modes of learning in Preparation of the lesson ( $p=.618$ ), Presentation of the lesson ( $p=.508$ ), Classroom management ( $p=.141$ ) and summary and conclusions ( $p=.606$ ). However, on-campus performed significantly higher in lesson development ( $p=.000$ ) while ODE performed significantly higher in personal factors ( $p=.036$ ).

**Table 1.6: Output for the Mean performance in each attribute**

Teaching practice attributes	Mode of learning	N	Mean	Std. deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Overall TP mean performance	Distance learning	50	69.88	4.77	.675	-2.392	179	.018
	On-campus learning	131	71.73	4.60	.401			
Preparation	Distance learning	50	11.54	1.88	.265	.499	179	.618
	On-campus learning	131	11.37	2.17	.189			
Presentation	Distance learning	50	10.74	1.12	.159	.664	179	.508
	On-campus learning	131	10.60	1.37	.120			
Lesson Development	Distance learning	50	26.16	3.06	.433	-5.128	179	.000
	On-campus learning	131	28.34	2.35	.205			
Classroom management	Distance learning	50	6.72	.97	.137	-1.480	179	.141
	On-campus learning	131	6.96	.99	.086			
Summary and conclusion	Distance learning	50	6.60	.78	.111	-.519	179	.606
	On-campus learning	131	6.69	1.20	.105			
Personal factors	Distance learning	50	8.10	.93	.132	2.115	179	.036
	On-campus learning	131	7.82	.75	.066			

The researchers expected the ODE students to perform exceptionally higher than the on-campus owing to the fact that majority of the ODE students (92.0%) as shown in Table 4.8 have prior training in Education. On the contrary, the on-campus students performed significantly higher than the ODE. This might seem as a challenge to the finding by Mboroki (2007) that there is parity in teaching practice performance between on-campus and distance study students. His findings were on a bachelor of Education (Arts) program and may differ from a science program. An arguable point is that the University of Nairobi may be assuming that the ODE students, majority of whom are practicing teachers do not need to go through micro teaching while at the university. This therefore means that the student goes to the field without being exposed to a mock secondary school classroom. This finding is in accord with Kumar (1997) assertion that conventional education leads to the development of oral presentation skills and interpersonal skills as a result of high teacher/learner and learner/learner interaction. They may therefore not have the skills to teach in a secondary school. As Odumbe and Kamau (1986) explain, ODE students lack confidence in themselves because the society favors conventional modes of teaching.

### **Conclusions**

It is the assertion of the researchers that lack of interactivity which is presumed to be a major contributor to the difference in performance between the two programs will be overcome when the University of

Nairobi fully integrates the e-learning component that is being provided by the partnership with the African Virtual University.

### **Implication on Policy and Practice**

It is not clear why Kenya has so far not developed a policy framework that would mainstream open distance education into the formal delivery of education. Kenya has a long history of distance education experience spanning from 1967 when the Correspondence Course Unit was established at the University of Nairobi's Kikuyu Campus and shortly followed by the very successful In-service Teacher Training Programme of the Ministry of Education in 1969 at the same venue. Indeed so successful have been the Kenyan experiences that countries like Uganda, Tanzania, Zimbabwe, Botswana, Swaziland, Namibia, Ghana, Nigeria and even India have borrowed the Kenyan model and introduced open universities and colleges.

The University of Nairobi has been running a Bachelor of Education (Arts) programme since 1986 and the science equivalent since 2003. The results of this study have demonstrated that a science programme can be taught successfully at a distance. 99.2% of the distance study students scored over 60% in an examination where a 40% mark would have been adequate for a pass. The fact that the research compared both on-campus and distance education students using the same examination dispenses with the notion espoused by Hannay & Newvine (2006) that distance education examinations are 'cheap' since they test

lower cognitive levels of knowledge and comprehension. It confirms the assertion by Fox(1998) that learning by distance education mode is good enough to merit a university degree.

The study further confirms that distance education brings more female learners to the learning arena at the tertiary level. This is an encouraging finding because it demonstrates a direction that can foster gender equity through education.

What the findings of this study mean for policy is that distance education can be used to break the bottleneck of qualified manpower in Kenya. Research has shown that the Gross Enrollment Ratio for Kenya has been 3% against Africa's 6%(Kenet 2009). 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 that 'Seeking to meet this demand requires a conceptualization of massification that is not currently under consideration' (Taferra and Altbach, 2003:74). In recent years the Government has come out strongly in rhetoric in support of distance education as the option that will bring about the massification that will break the manpower bottleneck. There are plans to establish an open university by the end of this year(2014). Among the policy documents that have called for the establishment of the Open University include the Sessional Paper No. 1 of 2005 on Education, Training and Research (2005), Report of the Public Universities Inspection Board (2007), National Strategy for University Education (2008) and the Road Map for Open University (Rumble Report 2008).

Others include the Task Force on the Realignment of the Education Sector to the

2010 Constitution of Kenya (2012), the Task Force on Alignment of Higher Education, Science and Technology sector to the 2010 Constitution of Kenya (2012), the Sessional Paper No. 14 of 2012, on reforming education and training sector in Kenya and the Universities Act, 2012,

This study goes some way in reaffirming the capacity of distance education to produce graduates who are as competent as those produced by the on-campus system.

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