

Types of ICT Materials available for Teaching of Geography in Secondary Schools in Rongo District

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Abstract

This article explored the use of ICT in teaching of Geography to students in Rongo secondary schools in Kenya. Objective of this article was; to establish the types of ICT materials available for teaching Geography in secondary schools in Rongo District, Kenya. The Research question was: Which ICT materials are available for teaching Geography in secondary schools in Rongo District? This study was guided by sensory-education theory (Maria Montessori 1870-1952) who emphasized on teaching methods involving actions on things rather than listening to the teachers. The study adopted the descriptive survey design and targeted a population of consisting of form two Geography teachers and students from 40 registered secondary schools in Rongo district. Simple random sampling was used to select 12 schools in Rongo district` of which 30% of total number of enrolment that is 1,200 students, 360 of them were used as respondents. Data was collected using closed and open ended questionnaires. The questionnaires were pre-tested by being administered to respondents from two schools in Gucha district as Pilot Schools for this study. The scores obtained from the first and second tests were : 0.69, 0.60 and 0.73 respectively which was good enough for the instrument which is above 0.50 value recommended as minimum reliability coefficient value required to judge the instrument. The descriptive statistics including percentages mean and frequency tables were used to analyze the data. Data was analyzed using the Statistical Package for Social Sciences (SPSS) version 15 computer programme. The results of the study indicated that ICT resources are inadequately supplied in most schools in Rongo District.

Keywords: ICT Materials, Geography, Teaching, Secondary School, Education.

Introduction

Since Geography is a bridging subject KIE (2006:13), that equips the learner with knowledge and skills that are of great educational value even for other subjects, it requires ICT use to strengthen it. Emergence of Information Technology on the national agenda and the announcement of ICT policies by various State Governments have recognized the "Convergence of Core Technologies and E. Governance" as the tool for sustainable development and globalization of economy through education (Kessy *et al.*, 2006). Successful utilization of ICT depends on the nature of the teaching force in Geography. As one of the key points in the hub of the education systems, teachers constitute an important aspect in students` learning. Towards this end, Krower (2006) argued that advancement

in the ICT in teaching of subjects like Geography is a crucial step in enhancing performance. The teachers may help their students to be familiar with the faster developing ICT use and satisfy one of the most common goals of teaching Geography. It gives a coherent, comprehensive image of our world on a scientific basis, and appreciation of information (Ford, 2007). For this reason, this study explores the use of ICT in teaching Geography in secondary schools in Rongo District.

Statement of the Problem

Many African countries envision being industrialized by the year 2030 and Kenya is no exception. However looking at the way Geography is being taught in secondary schools in Rongo District Kenya, the vision is in doubt because of the theoretical way of teaching bearing in mind that Geography is a practical and bridging subject, KIE (2006). The 2030 vision states that teachers are expected to possess high technical skills so that they can impact on learners if the nation is to be industrialized. Being a visual type of subject, this study puts emphasis on the integration of ICT for good teaching. The improvement in Geography performance in Rongo secondary schools is very minimal. Therefore it is the purpose of this study to challenge Geography teachers to use a variety of instructional techniques and resources in order to achieve the desired goals.

Types of ICT Materials Available for the Teaching of Geography

Education is in the process of a major change, where through innovations in technology and teaching methodology, academic institutions are being given an opportunity to work for the benefit of the student (Bunyi, 1999). The researcher considered the following ICT materials as generally useful for the teaching of Geography:

- Scientific calculators
- Computers
- Cell phones
- Televisions
- Radios
- Internet
- Weather focus devices
- Audio visual devices
- Magnetic compasses.

Total Quality (TQ) is the most important thought provoking revolution in the world of modern management. Souls (2005:1) assert that the secondary school teacher's major task in improving school performance is to provide sound teaching methods to the students. Fry & O'Neill (2002:1) note: "We know that if we can have a dramatic impact on raising the quality of school teaching, we will have a dramatic improvement in student achievement across the board."

International Bureau of Education (2004) suggest that for schools to compete among the best schools, quality teaching within the school environment is of paramount importance to strategic pursuits, competitive advantage and academic survival.

The increasing complexity of teaching methodologies and the need for creative, divergent and expected solutions to school situations requires a more profound approach to the field of education (Kenya Institute of Education, 2009).

During this information age, the growth in information and knowledge and the evolution of technologies that make information and knowledge growth possible has become increasingly

faster. In order to deal with this complexity, the issue of educational management in the information age cannot be ignored. The changing nature of educational access, the realities of the information age, new global partnerships and awareness of technological changes drove this study.

In Kenya for instance, the regulations of the Teachers Service Commission (TSC, 2007), outlines the functions of a secondary school teacher in enhancing the necessary skills and training among the students. The functions of a school teacher as provider of education to the students are enormous, challenging and require technology in order to operate effectively and efficiently. Since this work is enormous, it is important for Information and Communication Technology (ICT) to be integrated in school teaching to improve efficiency.

The Kenya government has seen the need to include technology in teaching as supported by the Kenya National ICT Strategy for Education and Training (MoE, 2008).

In this strategy, it is noted that although the impact of ICT on education goals is still inconclusive, reported observations include rapid expansion of knowledge, improved examination outcomes, enhanced communication and technical efficiency.

Persaud (2006:180) concludes from his study that administrative tasks would be automated and streamlined, giving more time for teachers to focus on instruction, if ICT were integrated in teaching.

Davies (2002:8) observes that the success of ICT rests on proactive school teachers who would give timely support to the integration of ICT in school operations.

In this study, it was assumed that school teachers have a responsibility to make students to want technological change, improve ICT skills and be led into ICT integration. ICT integration has become a global issue and as observed by Persaud (2006:23-24), the process of integrating ICT into learning involves a paradigm shift, where new insights and information facilitates new forms of understanding. This kind of paradigm shift requires Geography teachers who would be able to cope with technological change in classrooms. There is therefore the need to take action towards ICT literacy by imbedding ICT in school structures and the organization of learning. Selwood, et al. (2003:65) support this study that teachers who become more comfortable and competent in using ICT are likely to develop school-wide instructional and administrative responses to technology.

Wilding and Blackford (2006:1-3) in their research report argue that educators need to experience a major technological change in order to start addressing the new situation.

In the education context, this new situation would be dealt with to improve on the quality of leadership which would consequently influence school performance.

In addition (Bradley, 2003: 1) explains that the quality of management should improve in totality and they call this as Total Quality Management (TQM). They add that TQM enhances the traditional way of doing things and the management of a school must participate in the quality program. They further emphasize that by changing the actions of management, the culture and actions of an entire school is transformed. This does not leave out Geography as a subject to be taught through ICT approach.

Basing on this, the researcher assumes that by being ICT literate, secondary school teachers would influence the school operations by encouraging the integration of ICT.

Buchmann (1999) argues that for purposes of ICT integration in secondary school leadership, ICT literacy is necessary for proper performance that can enhance school performance. He adds that today's teachers are expected to be familiar with ICT to be able to cope with emerging technological changes. Studies done by Yambo (2012) posits that learning resource are significant such that every school should endeavor to put them in place for both teachers

and students use for better and improved performance. ICT literacy skills comprise a 21st century form of literacy, in which researching and communicating information via digital environments are as important as reading and writing were in earlier centuries (Bunyi, 2006). However, there is outright lack of information in Kenya as to the role of ICT in teaching Geography and how it aids performance in the subject. The current study would therefore bridge this gap in knowledge.

Methodology

This study was conducted through descriptive survey design. This design was chosen because it is concerned with accuracy in assessments of the situation as it is on the ground. According to (Kothari 2005), this design is efficient method of collecting descriptive data regarding the characteristics of populations, current practices and conditions or needs and make intelligent plans for improving them. The phenomena investigated in the present study were the availability and integration of ICT in the teaching of Geography in secondary schools in Rongo District. Descriptive statistics was chosen for data analysis because of the nature of raw data collected and research tools used. These research tools were mainly questionnaires and interviews which were suitable for this research design Kothari (2005). In this regard it enabled the researcher to obtain opinions from the respondents with respect to the availability and integration of ICT to the teaching of Geography in secondary schools. Rongo district is one of the thirty-six districts of former Nyanza Province. It is in the newly created County of Migori. It borders Gucha to the east, Kisii south District to the North East, Uriri District to the south-east, Ndhiwa to the West and Homa –Bay to the North west. The district lies between 35° 05'E and 30° 00'E of Greenwich Prime Meridian, and 0° 22's and 0° 47's of equator.

This area was chosen because Geography is poorly performed by students in Kenya Certificate of secondary education (K.C.S.E) examination as an indicator to necessitate a good teaching that brings an end result of good abstract experience. This study used questionnaires and interviews. The questionnaires were of two types namely; The Head of Department Questionnaire Interview HODQI, the secondary schools Geography Teachers Questionnaire (SSGTQ) and Geography Students Questionnaire (SSGSQ). Data was analyzed using the Statistical Package for Social Sciences (SPSS) version 15 computer programme.

Results and Discussions

The data that was analyzed answered the following questions:

Which ICT materials and equipment are available for teaching Geography in secondary schools in Rongo Districts?

In the years 2000-2004 K.C.S.E examination results analysis done by the Quality Assurance and Standards, a section of the Ministry of Education, for example, Geography Performance National Wide had a mean score of:

Table 1

Performance Analysis in Geography in the year 2005

KCSE YEAR	SCORE OF BOYS IN %	SCORES OF GIRLS IN %
2004	44	38
2003	40	35
2002	38	31
2001	37	32
2000	39	34

While Rongo district K.C.S.E performance analysis in Geography in the year 2005, for example only 14 (fourteen) schools out of 36 had a mean score of 6 and above, the rest had 5 and below and as low as 2 (two) with a mean grade of D- (K.N.E.C 2009 KCSE results analysis Rongo district). While the result analysis of 2010 show that the top school of 2009 which was Kanga retained the position but with a lower mean score. It dropped from a mean of 10.7116 to a mean of 9.942955 further, there were 14 schools that scored a mean of 6 and above in 2009 while in 2010 there were 10 (ten) schools that scored a mean of 6 and above. On the lower side the lowest mean score recorded was 1.334615. These findings strengthened this study. This shows that the improvement is very minimal. That is why the findings of this study were vital.

Table 2

*Analysis of teachers' Responses through interview on Availability of ICT Resource Materials in Rongo District Secondary Schools***The figures in brackets show various percentages**

ICT Material	Available		Not Available	Total
	Adequate	Inadequate		
Cellular phones	12 (100)	0	0	12
Scientific calculators	12(100)	0	0	12
Television Sets	10(83.33)	1(8.33)	1(8.33)	12
Tape recorders/CD recorders	4(33.33)	0	8(76)	12
Computers	9(75)	3(25)	0	12
Radios	12(100)	0		12
Internet systems	1(8.33)	0	11(92)	12

The data presented in table 2 on teachers' responses reveals that cellular phones, scientific calculators, computers, and radios were the most widely available ICT media, followed by televisions as internet was rare. This is not surprising because people, including geography teachers want connectivity by use of cellular phones. They can connect or bench mark with their Geography counterparts in other schools on phone. It was also reported that calculators were widely available due to the fact that it is an admission requirement for students in all schools selected for this study.

The study also revealed that tape recorders, digital cameras and internet system were inadequately available as per the data in table 3 below:

Table 3

Analysis of Availability of ICT Resource Materials in the selected secondary schools in Rongo District. (Researcher's observation)

ICT Material	No. of Schools	Percentages
Cellular phones	12	100
Radios	12	100
Scientific Calculators	12	100
Overhead Projectors	10	83.33
Tape recorders	4	33.33
Computers	12	100
Audio visual recorders	2	17
Digital cameras	4	33.33
Video players	12	100
Internet	1	8.33

This table is discussed below.

Availability of ICT Resource Materials in Rongo District Secondary Schools

This section sought to establish the availability of ICT resource materials for teaching Geography. The teachers' responses were confirmed by the researcher's observation presented in tables 2 and 3 respectively.

It was observed that only two schools had audiovisual recorders, four schools only had digital cameras. The researcher also noted that the twelve sampled had cell phones, radios, scientific calculators and video players. The study also revealed that most schools were equipped with ICT materials. The tendency was attributed to the cost sharing policy that was introduced in schools in the late eighties.

The most challenging part of the available ICT materials was their effective use by the teacher. It is of no use to be endowed with ICT equipment and never take a competitive advantage to provide good teaching.

The radios that were available as per the researcher's observation were in 12(100) schools. The teachers' response on this shows that they were adequate in 12(100) schools.

A good percentage of radios being available could be attributed to having procured them in the years of eighties when the Ministry of Education was supplying the schools with facilities under School Equipment Scheme.

The inadequacy or totally unavailability of these ICT media resources may be attributed to the reluctance of the administration to provide them. For instance, it could have been procured or made available through CDF constituent Development fund.

The wider range availability of Audio-visual players in schools could be easily attributed to the available televisions sets and computers used as players particularly for entertainment.

Recommendations

It was observed that local resource materials are very useful in making some ICT resources like Globe, instruments used for measuring weather, which of course are functional, Bulletin boards, pinhole camera and many others suitable for the lesson. Teachers who are creative in the production of and integration of ICT resources in the teaching of Geography should be noticed and motivated or rewarded accordingly. This would challenge other teachers to strive and improve their performance in teaching.

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