

KENYA REPORT

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Introduction

This report presents research findings of the Pan African Research Agenda on the Pedagogical Integration of ICT in Education in Kenya. This was part of a twelve country research whose aim was to investigate the way in which pedagogical integration of ICT into African education systems can improve the quality of teaching and learning. Ten educational institutions selected on the criteria of presence of computers, ownership, location, educational level and gender were studied. This report, therefore, highlights the methodological challenges and lessons learned from the study, a brief summary of the participating institutions, the major findings and conclusions and recommendations. Findings from the ten institutions indicate that while a lot of attention has been directed toward acquisition of ICT equipment, little has been done to integrate them into teaching and learning. Interviews with teachers showed great awareness of how ICT can be used to enhance the quality of teaching and learning but this is hampered by challenges that revolve around the lack of clear policies and action plans on the use of ICT both at the school level and at a national level.



Methodological Challenges and Lessons Learned

Qualitative and quantitative approaches to research were used and data collection methods triangulated to include questionnaires, focus group discussions with teachers and pupils, interviews with school managers and ICT advisors, videotapes of ICT laboratories, classrooms and grounds, audiotapes of discussions and examination of documents produced by teachers and students.

Although care was taken to collect quality data, several challenges were encountered during the research process. Some questions in the interview guides and questionnaires were ambiguous and led to multiple interpretations by both the respondents and the researchers. Emergence of new factors which conflicted with data collected earlier due to time lag between the first round of data collection and the subsequent ones required synchronization and confirmation of the data and this required more visits to the institutions than earlier planned. Change of respondents in subsequent visits resulted in conflicting descriptions of ICT use in some schools.

Other challenges were related to logistical issues such as difficulties in securing appointments with the head teachers as some were uncooperative while others were too busy and unavailable for interviews. Some were uncomfortable with photographs of their schools being taken by ‘strangers whose mission was suspicious’ while some schools ask for payment for pictures to be taken probably because of their exemplary designs and beautiful grounds.



In some cases, teachers were unwilling to give documents such as lesson plans for unexplained reasons. Other difficulties encountered were related to the technological challenges of using the iPod and camera. Sometimes the power would go off in the middle of a recording.

Several lessons were learned from this study. Firstly, focus groups are an effective method for obtaining detailed information and clarifying data from questionnaires. Secondly, team approach in data collection and especially when carrying out focus group discussions is very effective as there was division of labour. We also learned the value of triangulation and the use of phenomenological approach especially for researchers coming from the positivist school of thought.

Brief Summary of the Participating Institutions

Ten institutions participated in this study: These were four primary schools, five secondary schools and one teachers training college. Aga Khan High School is an urban, co-educational and multicultural day secondary school. It has 350 students, 100 female and 250 male and 23 teachers, 12 female and 11 male. It has 31 computers, 25 of which are connected to the internet. It has computer software called Cyber School which is used in the teaching of science subjects. Enna School is a semi-urban, private girl's secondary school with 100 students and 30 functional computers. It has 6 male and 4 female teachers. It has no internet connectivity. Kenya Technical Teachers College is a public, urban, tertiary level college, which trains Diploma Teachers to teach technical subjects at secondary school. It has 116 lecturers, 45 female and 71 male. It has 870 teacher trainees, 388 female and 482 male. There are 120 computers, 90 of which are connected to the internet. Musa Gitau Primary School is a public, high cost, government assisted day and boarding mixed school located in a semi-urban area. It has 31 female teachers and 9 male. It has 1500 pupils of which 750 are female and 750 are male. It has 50 functional computers and only one is connected to the internet.

Musa Gitau Secondary School is a public, government assisted, mixed day school. It is located in a semi-urban area and has 405 students, 140 male and 265 female. It has 21 teachers, 11 female and 10 male. It has 20 functional computers and has no internet connectivity. Ruaraka Academy is a private, mixed primary school located in a semi-urban location. It has 298 female and 304 male pupils. It has 30 teachers, 13 of whom are male and 17 female. It has 15 functional computers, 4 of which are connected to the internet. St Joseph's, Githunguri is a public, boy's secondary school located in a rural area. It has 800 male students with 32 teachers, 25 female and 5 male. It has 14 functional computers and no internet connectivity. The Green Garden School is a privately owned mixed primary school located in a semi-urban area. It has 350 students, 163 male and 187 female. It has 21 teachers, 14 female and 7 male. It has 19 functional computers 9 of which are connected to the internet. Tigoni Primary School is a mixed public primary school located in a rural area. It has 1345 pupils, 684 female and 661 male. It has 25 teachers, 20 female and 5 male. It has an arrangement with a private organization to provide computer services. There are 12 functional computers and no internet connectivity. Uthiru Girls is a girl's public secondary school located in an urban area. It has 500 female students and 35 teachers, 10 male and 25 female. It has 23 computers and internet connectivity and all are networked.

Research Findings and Discussion

This section of the report presents a summary of the research findings and discussion. The presentation is arranged in themes guided by the major indicators of the study.

Description of ICT national policies in education

An examination of the National ICT Policy (2006) and The National ICT Strategy for Education and Training revealed that they recognize the role of ICTs in education and development. ICT as a universal tool in education and training, and its integration to improve access, learning and administration are emphasized. These policies seek to establish policy frameworks; install digital equipment, connectivity

and network infrastructure; and integrate ICTs in education and training. Kenya Education Sector Support Programme (KESSP) (2005-2010), focuses on challenges facing the education sector and gives solutions on how to overcome them. ICTs in Education Options Paper, discusses the ways in which ICTs can support and improve delivery of quality education to Kenyans. Although the ICT syllabus in secondary schools and teachers' colleges provides basic computer knowledge, skills and attitudes on use of computers, the focus is on the computer as the object of study. Due to deficiencies in the implementation strategy use of ICT in teaching and learning are lacking in public schools.

From the policy documents, the government hopes to raise digital infrastructure to 80% in secondary schools and to 10% in primary schools by 2011. It also proposes to increase computer-student ratio to 1:50; connectivity and network infrastructure to 70% for secondary schools and 10% in primary schools. It is observed that ICT policy frameworks on ICT are lacking in public schools. Public institutions lack integration of ICT in delivery of curricula as compared to private institutions. The government should work on ICT in education policy to enhance the pedagogical integration of ICT in institutions.

Status of ICT equipment, connectivity and access

This study also examined the status of ICT equipment, connectivity and access in schools and the extent to which it facilitates teaching and learning. The findings show that 9/10 of the institutions had computers. However, only (6/10) and 38% (128/334) of the computers were connected to the internet. The ratio of educators to computers was 1: 1.05 (352/334) while the ratio of available computers to educators was 1:2.5 (352/139). Similarly, the ratio of learners to computers was 1:24 (6,822/279). Another finding was that 8/10 of the institutions had an ICT advisor/technician. The roles of the ICT advisor/technician varied from one institution to another but generally, their duties were to maintain and repair computer equipment; and to advise management on choice of ICT hardware and software. In some schools, they also taught computer skills to teachers and students. A variety of computer software for teaching, learning

and administration were used. However, there was no curriculum from the Ministry of Education to guide the schools on how to integrate computers in teaching and learning.

Teacher Training

Kenya Technical Teachers College (KTTC) was selected because of its clear presence of ICT in the teacher-training curriculum. Trainers receive ten hours of professional development in ICT per week. The factors that have supported the use of ICT include: the deliberate emphasis by the college management on the use of ICT in teaching; the provision of resources like computers, LCDs and smart boards; a clear training policy by the college management on the integration of ICT in teaching. Challenges experienced included lack of enough computers (only 18 were dedicated to teachers); technophobia and unreliable internet connectivity. Teacher trainees indicated that computers were adequate; teachers were willing to help them even during their free time and they received encouragement from the College Principal to use computers. For the learners, the use of ICT by teachers, especially the smart board improved their concentration and retention of content taught. The greatest impact was on practical subjects like engineering courses where ICT has enabled the demonstration of very expensive machine parts that would have been difficult to dismantle. The main impact for educators is on access to courses on The Internet. Some of them are already enrolled in online higher-level courses in other universities locally and internationally.

Factors affecting implementation of ICT

Several factors were found to hinder or encourage the use of ICT in the selected Schools. The ICT skills of the school manager are seen as a major success factor. In cases where the Manager had ICT skills or had a keen interest, a trickle down effect was observed. This was evident at Uthuru Girls where the School Principal has a Higher National Diploma in IT and at Green Garden School where the school director has a lot of interest in e-learning and has even attended the past three international conferences organized by e-learning Africa. Providing all learners with computer literacy is seen as another



success. Although the ratio of computers to learners is quite low in most schools, an attempt has been made to fit all the classes in the school timetable. Learners have been allocated between 40 minutes and 100 minutes a week for computer lessons.

Investment in educational programmes such as the Encarta Encyclopedia has revolutionized learning in some of the schools. At Green Garden for example, the learners as well as the teachers use the information to confirm facts in the recommended school textbooks which sometimes have factual errors. Schools like Aga Khan use LCD projectors to teach sciences. The constraint is this has to be done in the computer laboratory which wastes time because of movement. The secondary schools indicated that programmes such as Corel draw have helped them design projects that have won in the national science congress competitions.

The training of teachers in ICT has been consistent in the schools where the principal has ICT skills or very keen interest. At Green Garden, for example, teachers are in-serviced in ICT and at the same time are expected to produce computerized work as a matter of policy. These include, processing of marks, lesson plans, schemes of work and teaching notes. Teachers who have no skills have no choice but to learn.

There are also several factors that hinder the implementation of ICT integration and these include: time to prepare ICT teaching materials was difficult to find because of the loaded curriculum. Converting manual teaching notes to ICT requires both time and skill. Teachers feel that this is also an added load and because there is no special reward and it is not part of the curriculum, there is no motivation. The number of computers was seen as a major barrier in that learners have to share the few that are there when they have classes. At Uthiru Girls the disparities between learners' level of knowledge is a problem because when a group works on one computer, those who know end up doing the assignment for those who don't, hence disadvantaging them. The inability to acquire sufficient computers or update those which are obsolete is due to lack of finances, fast changing technology and high overhead costs. St. Joseph Githunguri, for example, had a large number

of unused computers due to a lack of maintenance and repair plan.

Lack of a unified school curriculum in primary schools is a big concern as schools teach a localized curriculum prepared by the ICT teacher or by suppliers such as CFSK. This means the skills are limited to how much the ICT teacher knows. The lack of textbooks and references specifically for primary schools is also lacking. Resistance by teachers to use ICT in teaching and learning due to technophobia was cited in all the schools. This applies more so to the older generation teachers. This could probably be linked to the teacher training curriculum which does not include ICT integration as part of its curriculum. Frequent power black outs and computer viruses are a universal problem. The problem of viruses is exacerbated by learners who sneak in discs from cyber cafes and a lack of expertise to clean the computers. The cost of anti-virus software contributes to the problem. This disrupts learning as the computers shut down frequently. Public schools complained of the lack of government employed teachers. They are forced to hire thus draining the scarce resources which could have been used for upgrading the ICT facilities. In addition, parents are not willing to pay any extra fees because of free primary education. They feel it is the responsibility of the government.

Impact of pedagogical integration of ICTs in education

The study established that the pedagogical integration of ICTs had a positive impact on teaching and learning. Both students and teachers reported that they used computers to access knowledge. In 60% of the institutions, off line resources such as Microsoft Encarta Encyclopaedia was used, there was also restricted access to information from online resources in schools that had connectivity. One of the schools was offering the CISCO networking programme for its learners. Twenty percent of the institutions were using the cyber-school software to teach science subjects. In cases where the school had no connectivity students reported that they accessed the internet from cyber cafes during school holidays. The study further established that teachers used ICTs for pedagogical purposes. Indeed, more than fifty percent (54.29 %) of the courses in the institutions

under study were taught using ICTs. Programmes such as Microsoft Excel were used for academic data analysis, 20% of the institutions used NetCen School Solution to prepare the school time tables. Some teachers reported the use of computers to present work in class using power point presentations, while 20% of the institutions used smart board technology in teaching. Teachers reported use of Ms Word for their day to day and routine work such as making of lesson plans and schemes of work. Students reported that ICTs made learning more interesting and fun, enhanced learning and made them produce better results especially in practical subjects and science congress competitions. They also used computers to write and present assignments. The students further reported that learning using ICTs enhanced retention.

Role of institutional management in ICT integration

The findings of this study indicated that the school managers and heads of departments had limited skills in ICT. Just 35 % (75 / 217) had some training in ICT. Out of the 142 female managers 45 had received up to 50 hours of training accounting for 32 %. Out of the 75 male managers 30 of them that is 40%, had some ICT training. This shows that relatively more men were trained in ICT than female managers. 132 had e-mail addresses. However, the emails were being used for personal communication and not for institutional work except in the case of the ICT advisor at the teacher training college. Of the 10 institutions studied, only 5 had a strategy in place to maintain and renew their ICT equipment. These findings have implications on the training of school managers.

Policy and Equity issues in ICT usage

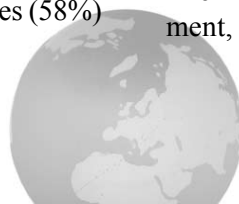
Findings from the ten educational institutions selected for this study targeted a total of 6822 learners of whom 3550 were male and 3272 were female. There were also a total of 352 educators, of whom 148 were male and 204 were female. From the responses, 100% of both the learners and educators had access to the available computers in the school. However, female learners who have access to computers are 48% while male learners who have access are 52%. Among the educators it appears that females (58%)

have more access than male (42%) educators. These findings can be attributed to the large number of female teachers in urban and semi-urban schools in Kenya. This may also imply that since urban schools are better equipped with ICT, more female educators have access to ICT than their male counterparts who are more likely to work in disadvantaged schools in remote areas such as the Arid and Semi Arid Areas (ASALs). In the case of female learners, their numbers nationally are less than males. As such more male learners are more likely to have greater access to ICT than females.

CONCLUSIONS

From the analysis above, the following conclusions can be drawn. While National Policy documents on ICT exist, they have not been fully implemented due to lack of action plans at the school level. It was also noted that a specific policy on ICT integration in education has not been developed. In terms of connectivity and access, it was noted that the use of ICT for learning and teaching is still at its infancy in most learning institutions in Kenya due to lack of a formal curriculum to follow especially in primary schools and limited ICT infrastructure. The ICT policy documents also state the need to have gender and regional parity in access to ICT. Although, access to ICT use between male and female learners had slight differences, this may not be the case if a larger population is studied. In the case of the wide disparity between male and female teachers, this can be attributed to the large number of female teachers in urban and semi-urban schools in Kenya. This may also imply that since urban schools are better equipped with ICT, more female educators have access to ICT than their male counterparts who are more likely to work in disadvantaged schools in remote areas such as the Arid and Semi Arid Areas (ASALs). In the case of female learners, their numbers nationally are less than males. As such more male learners are more likely to have greater access to ICT than females.

The findings generally appear to indicate that ICT use in Kenyan schools is largely internally driven. The initiative emanates from the school management, Board of Governors and Parents Teachers



Association and the learners themselves. This is possibly due to the realization that ICT is the way of the future and the young generation must be exposed to this knowledge if they have to be competitive in the labour market. The government seems to be lagging behind because, whereas computer studies has been introduced in secondary schools as part of the national curriculum, it has not kept up with the provision of the necessary infrastructure both physical and human resources. It is obvious, therefore, that the Ministry of Education should urgently develop an ICT in education national policy to streamline this important area of learning. The Ministry needs to provide ICT teachers to schools and reward those who have the skills and are already offering services so as to motivate them. It is also important to include integration of ICT in teaching as part of the teacher's annual performance appraisal to encourage them to acquire the skills. Increased investment in the professional training of teachers, inclusion of ICT integration in teacher training curriculum, regular equipment maintenance, effective leadership in schools and renovation of classrooms to accommodate ICT use are further recommendations.

Future research needs to focus on the teacher training curriculum at all levels and the methodologies used and the impact it would have on teaching and learning. The dismal state of integration is largely due to a teacher curriculum that lacks ICT. There is need for research into the curriculum development process and the capacity of the curriculum developers in all teacher training institutions. Future research in ICT should be more qualitative or mixed mode as previous ones are mostly surveys. It is recommended that capacity building for researchers in the use of the mixed mode approach and in analyzing qualitative data and dissemination through publications be provided before the start of the research.