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Exploring Intellectual Capital

Getting Schools Ready for Integration of Pedagogical ICT: the Experience of Secondary Schools in Uganda

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Abstract

The purpose of the study was to establish whether secondary schools in Uganda are prepared for effective teaching of ICT education. The study was carried out in six secondary schools in Uganda. Both qualitative and quantitative research methods with a descriptive cross sectional survey design were adapted to collect data from 96 respondents. Questionnaires and interviews were employed as data collection instruments. The study findings showed that, the introduction of ICT education as a subject in the secondary school curriculum is a good government's policy that will bring in every secondary school graduate to the use of internet, world of employment creativity, knowledge and use of internet and other related technologies for national development. The findings further revealed that success of the ICT education policy will depend on governments' effort to recruit well qualified teachers in the subject, supply of enough computers, and construction of adequate computer laboratories and libraries in all secondary schools and availability of a reliable power supply in the country.

1.0 Background to the Study

Uganda is one the developing countries located in East Africa. With a population of 33.4 million, Uganda has 1,114 Government- aided secondary schools and 1,800 private secondary schools throughout the country (New Vision, 2009). The Uganda system of education is based on an initial seven years of primary education. Students who successfully complete primary schooling join a four years secondary Ordinary Level (O.Level). Those who successfully complete O.Level may then choose to enroll in the two- year Advanced Level (A.Level) program and after which, tertiary education. Secondary education was introduced by European missionaries, who were mainly from the Anglican and Catholic Churches. The first secondary schools were unevenly distributed in different regions of the country. English language was introduced as the medium

of instruction. Missionary education was religious bias, and aimed at creating cheap labor force to serve in the lowest ranks of the colonial administration (Ssekamwa, 2005).

In 1924 the colonial government opened the very first secondary school for Africans in Uganda. By 1950 there were fifty-three secondary schools for Africans throughout the country. Out of those 53, government operated only three, while three others were privately funded, and the rest (47) were operated by missionaries (http://www.uganda-visit-and-travel-guide.com). In 1962 Uganda attained independence from the British colonial masters. But even then, up to 1974, almost all subjects in secondary schools were taught according to the British syllabus. For instance, British standard examinations were used to assess students' academic progress. In 1975 the Ministry of Education began to implement a locally designed curriculum. This implied providing local instructional materials to suit designed curriculum.

Information and communication technology (ICT) is defined as a diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information (Blurton, 2002). These technologies include computers, the Internet, broad- casting technologies (radio and television), and telephony. The concept of ICT in education takes account of systems that enable information gathering, management, manipulation, access, and communication in various forms (Chan, 2002). In Uganda, technologies such as the telephone, radio and television are in operation as ICT instructional tools. For instance, radio and television have for years been used for language instruction. The use of computers and the Internet are part of the school system at the moment.

There are several developments in the education system signifying the vitality of ICT in secondary schools of Uganda. Uganda was the first country in Africa that has used Microsoft Partners in learning to develop localized digital content basing on the national curriculum (MAPEA, 2004). This was a remarkable success towards the achievement of relevant ICT education. The birth of ICT policies in Uganda was in 1998 when a number of international organizations from the Developed World that approached the Uganda National Council for Science and Technology (UNCST) were given an opportunity to develop ICT policies based on different sectors (Uganda. MoES 2005: Draft Policy for ICT). According to the draft policy, UNCST was mandated by the government of Uganda to coordinate, formulate and manage explicit national policies concerning science and technology. The council was therefore commissioned to oversee the integration of technology in the socioeconomic process and provide the government with appropriate technical advice.

The national ICT policy development process in Uganda initiated in 1998, came out with the national ICT policy framework that was approved in 2003 (Torach et. el, 2009 and Uganda Ministry of Works, Housing and Communications, 2003). Among others, the policy recognized the strategy to incorporate ICT in educational curricula and provide for equitable access by students at all levels (Uganda Ministry of Works, Housing and Communications, 2003). Heathcote (2000, p.24) observed that in the last 20th Century man passed through major technological changes known as the "Information Technology Age". The processes are categorized as Stone Age, Agricultural Age, Industrial age, and the Information Age.

In Uganda, the Government White Paper on Education (1992, p.76-78) recommended that IT be included as one of the vocational subjects in the secondary school curriculum. These were to include computer science and computer education, and fibre communication. IT encourages students in secondary schools to articulate their different affiliations and define their respective historical culture and tradition, IT also informs students about what is going on worldwide with regard to natural calamities, politics, sporting events and other internet services. Such exposure acts as a central role in students' academic performance (Fourie, 1997, p.39). The focus of this study was preparedness of teaching ICT education in secondary schools in Bushenyi district.

Ornstein (1995, p. 248) and Kakinda (2005, p.5) pointed out that computers have taken a center stage in the information age. They were first developed for use by the military in search for communication systems which could not be displayed by the enemies and they became of use in education in 1950's. The first generations of computers were bulky and slow. Today there are computers of all sizes with high speed. Waburoko (2000, p.1) states that there are miniaturized computers, embedded computers, personal computers, laptop computers, main frame computers, specialized and multipurpose computers.

Today, most modern services are linked to the use of ICT. For instance, the legal informatics, electronic banking, electronic mails, messages, electronic commerce, internet, electronic filling, data centres, digital cameras, online learning and electronic fuel systems. Loundon & Loundon (2004, p.22) state that in today's job environment, it is difficult to work without computers. In this regard, ICT education have become eminent in secondary schools and thus, play vital roles including teaching students various subjects of their interest such as reading, mathematics, computations, language, computerized gardening, communication skills and training students in the operation of games and sports (Stair, 1986, p.17 & Poole, 1997, p.12).

Government of Uganda is indeed progressing in computer technology. The government of Uganda declared 2005 a year of computerization to avoid lagging behind the world as the world embraces the latest technologies (Balimwikungu, 2000, p.23). The Ministry of Education and Sports (MoE&S) is encouraging secondary school teachers to start training in information technology with the purpose of promoting computerized teaching. Students' access to information is quick when using on-line data base and as such, computers can restructure education in the classroom (Poole, 1997, p.26).

1.1 Statement of the Problem

The introduction of ICT education as a teaching subject in the Ordinary Level secondary school curriculum is a big advancement in Uganda's education system. ICT education has become indispensable to a literate modern secondary school graduate as a condition which will introduce him to the world of employment, creativity, innovations and research with the use of internet and other related technologies (UCE syllabus 2005, p.270). However, there is need to ascertain whether secondary schools in Uganda have been made ready to teach ICT education.

It was upon this background that the researchers carried out a study on the preparedness to teach ICT education in secondary schools in Uganda.

1.2 Purpose of the Study

The purpose of the study was to establish how secondary schools are prepared for the effective teaching of ICT education in the country.

1.3 Research Questions

The study was guided by the following research questions:
   i. What type of teachers does Uganda have for teaching ICT education in secondary schools?
   ii. Do schools have sufficient gadgets for ICT lessons?
   iii. Do schools have reliable power source to run ICT gadgets?

2.0 Methodology

2.1 Sampling Techniques

The researchers used purposive sampling technique for selecting schools for the study. Since in purposive sampling technique, participants are chosen for a particular purpose (Leedy and Ormrod, 2000, p.219; Mugenda & Muganda 1999, p.50), six schools were selected to provide samples of end-users suitable for the study. Preference was given to schools already teaching ICT education. The students, teachers and head teachers selected were those believed to be knowledgeable about ICT education and participated in other academic activities in the secondary schools under study. Purposive sampling was further used to select secondary school head teachers and teachers since they participated in the academic affairs management and were knowledgeable about issues that could arise from the use of ICT education in secondary schools.

Random sampling technique was also used to select students for the study. Random techniques were by means of picking and blind foldely technique. This technique was used to assist the researchers to avoid biasness in selecting the samples. Random technique was further Preferred because of its convenience for selecting students to participate in the study because they were many and this would give each one of them a chance to participate in the research (Louis, Lawrence & Keith, 2000, p.1000). The researchers used 96 respondents who included 6 head teachers, 18 teachers, 72 students to collect data for the study.

2.2 Procedure for Data Collection

A pilot study was carried out at one high school to ensure validity and reliability of data instruments. The school was out of the targeted sample. The researchers sought permission from selected secondary schools to conduct the study. The researchers then proceeded to the

field to administer the questionnaires and interviews to the targeted population while jotting down points following the major themes that guided the study.

2.3 Data Collection Instruments

The following instruments were used to collect the data:

2.3.1   questionnaires

Questionnaires were used as the main source of data collection for the study to allow easy and quick generation of responses and taping of attitudes, feelings, interests and opinions of respondents (Amin, 2005, p.269) from a large number of participations within a short time. The questionnaires contained sixteen structured questions in Likert Scale to score the items according to the frequency counts with fixed responses. The same questionnaire was administered to head teachers, teachers and students.

2.3.2 Interview guides

Interview guides were administered to head teachers to get in depth information on those issues which could have been missed out on the questionnaires

3.0 The Study Findings

3.1 Question one: What Type of Teachers does Uganda have for teaching ICT education in Secondary Schools?

TABLE 1:   Responses on the Type of Teachers for Teaching ICT education in Secondary Schools

ITEM RATED	A Great Deal		Much		Somewhat		Little		Never	
	f	%	f	%	f	%	f	%	f	%
1. Have teachers in your school undergone a professional ICT training course?	16	16.7	16	16.7	16	16.7	48	50.0	00	00
2. Do teachers in your school exhibit necessary ICT skills	16	16.7	80	83.3	00	00	00	00	00	00
3. Does school administration support teachers to train in ICT education.	48	50.0	48	50.0	00	00	00	00	00	00
4. Has the MoE&S posted enough teachers to teach ICT education in your school?	00	00	32	33.3	00	00	32	33.3	32	33.3
5. Does teacher time table allocate sufficient load for ICT education.	00	00	48	50.0	16	16.7	16	16.7	16	16.7

Source: Field data

From table 1, 50.0% of the respondents reported that, teachers had little professional training course in ICT education. 16.7%reported a great deal, much and somewhat respectively, as levels of ICT teachers' training. 50.0% of the respondents confirmed that there was administration support in IT courses to teachers in their schools. Contents from Table 1 also indicate that 83.3% of respondents and 16.7% reporting that in their schools teachers had the necessary skills to teach ICT education. This is as evidenced in responses to item 3, was attributed to teachers attending computer courses in order to improve on their computer literacy skills. The results shown in table 1 also indicate that 50% and 50% reported that schools support teacher training programs in ICT education.

Results further showed that while 33.3% of the respondents report that there is much deployment of ICT teachers by MoE&S, 33.3% and 33.3% respectively reported little and never. This indicates that MoE&S is still hesitant on ICT education teachers' recruitment in some schools. 50% of the respondents reported much allocation of ICT lessons on the time tables.

16.6% reported that somewhat, little and never to sufficiency of ICT teaching loads on the school time tables.

3.2 Question two: Do schools have sufficient gadgets for ICT lessons?

TABLE 2:   Responses on the availability gadgets for ICT lessons

Comment on the following ICT tools in your school	Very sufficient		Sufficient		Insufficient		Very insufficient	
	f	%	f	%	f	%	f	%
Computers for instructors	69	72	27	28	00	00	00	00
Learner computers	02	2.1	07	7.3	47	49	40	42
Computer laboratory	27	28	69	72	00	00	00	00
Printers	02	2.1	07	7.3	47	49	40	42
Scanners	02	2.1	07	7.3	47	49	40	42
Photocopy	02	2.1	07	7.3	47	49	40	42

Source: Field data

Results in table 2 showed that 72.2% of the respondents reported having very sufficient computers used for teaching ICT education lessons. Secondary schools have sufficient computers for teachers to conduct ICT lessons. It was also evident from table 2 that 100.0% of the respondents reported their schools having very sufficient and sufficient computer labs.

However, regarding enough ICT gadgets such as computers for students, printers, scanners and photocopy, 91 % of the respondents reported their schools having insufficient resources. This implies that although there were computer labs in all schools studied, other ICT gadgets in use are still insufficient for effective teaching of ICT education. Many schools still lack adequate facilities for ICT education making utilization of the labs a big challenge in the teaching and learning of ICT education.

3.4 Question three: Do schools have reliable power source to run ICT gadgets?

Table 3:   Responses to reliable power source to run ICT gadgets in Secondary Schools

ITEM RATED	Yes		No	
	f	%	f	%
My school has a steady power supply to run the ICT devises.	30	31	66	69
My school is able to meet power costs used to run computers	68	71	28	29
All classrooms in my school have power connection	30	31	66	69
I have power connection at home	50	52	46	48
The parents' body is willing to contribute to power costs used to run computers at school	60	63	36	37

Source: Field data

Table 3 results show that only 31% of the respondents reported their schools having a steady power supply with all classrooms connected. 71% indicated that their schools are able to meet power costs required to run computers.

On whether respondents had power connection in their homes, 52% of the respondents reported being connected, while 48% were not. On whether parents are willing to contribute to power costs used to run computers at school, 63% of respondents reported willingness of parents. 37% reported that parents are not willing to pay for power used at school.

3.5 Interview Responses

A set of interview items were administered to head teachers in support of the questionnaires items:-
  i.   Comment on the government support in the deployment of ICT teachers in secondary schools.
  ii.   How have you managed the provision of Educational ICT facilities in your school?
  iii. How have you found parents' willingness to contribute for power costs to run ICT?
  iv.   Comment on the time table time allocation for ICT lessons in your school.
  v.   What is the state of power connection in the community households?

While commenting on the government support in the deployment of ICT teachers in secondary schools, head teachers during interview sessions indicated that they were in full support of the program of teaching ICT education in secondary schools in. Head teachers have been compelled to employ non professional teachers so long as they have some skills in ICT. All the head teachers expressed that government has not yet fully supported ICT teaching. This was reported in limited provision of ICT education materials like computers, printers, scanners and

other key accessories for use in secondary schools. Head teachers also reported that and that government has not posted enough teachers to teach ICT education in some schools.

About how managing the provision of Educational ICT facilities in school, head teachers said that on addition to government and parents' meager contributions, they have sought financial mobilization strategies like fundraising, donations and grants from well-wishers and other stake holders in education.

On parents' willingness to contribute for power costs to run ICT, the head teachers expressed in their opinion that some parents are so poor that they can't afford extra pay on top of school fees. One Head teacher said;

> *If a parent fails to pay school fees for his child, do you expect him to pay for power supply?*

On the allocation of ICT lessons on the time table, head teachers said that the syllabus allocates only three periods per week for ICT. But some students who are longing for frequent use of the new technology are pestering for more time.

> *The national syllabus clearly spells out the time allocation for ICT on the time table. But due to users who are too ambitious, they pester for more time for the subject. This is a government aided school and we shall abide by the time allocation as provide by government.*

About the state of power connection in the community households head teachers commented that some house had no electricity. One head teacher from a rural community secondary school had this to say:-

> *The state of power connection in some of the community households where our students dwell is appalling. Some have never had power in their homes throughout their life.*

In conclusion, views put across by the interviewed head teachers showed that the introduction of ICT education should be fully supported by all stakeholders namely; government, head teachers, teachers, students and the parents 'body.

3.6 Discussion of Results: **What are the types of teachers for teaching ICT education in secondary schools?**

Results collected from respondents indicated that some of the teachers for ICT education had no training course in the subject as professional teachers. This contradicts the observation made by (Ornstein, 1995, p.248) who stated that teachers for ICT education must have completed a professional training course in the subject. The researchers wonder what type of teaching methodologies such untrained teachers employ during the teaching and learning

process of the subject. This suggests that the quality of teaching and learning ICT education in such schools is bound to be low as observed by (Kyriacou, 1997, p.81).

On the positive side, the research revealed that most computer teachers exhibited ICT skills. 83.3% of the teachers acknowledged that teachers exhibited much ICT skills. This is in agreement with (Ornstein, 1995, p.249) who observed that teachers' exposition of computer competency is indispensable towards teaching and learning. The researchers agreed with the above findings since there is a general progress in ICT skills among students in secondary schools of Uganda.

Lastly, majority of the respondents (66.6%) revealed ministry of education had not deployed enough ICT teachers in their schools to support the ICT education in secondary schools. This is worrying since the role of teachers in curriculum implementation is ignored (Kyriacou, 1997).

Regarding time allocation for ICT education on the school time table, respondents expressed longing for more time for ICT lessons. This good reception exhibited by end-users towards ICT education; and is bound to lead to academic excellence in the country in general. It is important to note that if end-users long for more lessons on the time table, it symbolizes positive attitude.

3.7 Discussion of question two: Do schools have sufficient gadgets for ICT lessons?

Majority of the respondents (72.2%) agreed that schools offer teachers with computers for ICT education as one of the teaching subjects. This is in liaison with (Loundon and Loundon, 2004, p.22) whose observation suggests that ICT education have become eminent in secondary schools. Also the above findings are in line with the Uganda Government White Paper on Education (1992, pp. 76-78) which recommended the inclusion of IT to the vocational subjects in the secondary school curriculum and these were to include computer science and computer education.

On the provision of appropriate tools and materials for teaching ICT education, 87% of the respondents reported insufficiency of key materials. This reveals that though the schools are dedicated to the introduction of ICT education, without key resources the progress will be low. This in support with (Musaazi, 2005, p.28) who noted that the provision of appropriate tools and materials to teachers enhance learning and teaching of ICT education.

3.8 Discussion of question three: Do schools have reliable power source to run ICT gadgets?

Results collected from respondents revealed power shortage both in homes and at schools. This is a great challenge especially for rural schools. Power supply is essential for the operation of ICT devises. In agreement with this, Osakwe (2010) urges that for ICT to be effective there must be a steady power supply.

On the issue of parents support, respondents reported limited parents' assistance. This could be either a result of poverty or lack of proper sensitization. This state of affairs reveals need to sensitize some parents about the significance of ICT for their children especially the rural community. Parents' involvement is crucial for success of school academic programs (Dwyer & Hecht 2001).

4.0 Conclusions And Recommendations

In view of the study findings, the following conclusions and recommendations were made.

4.1 Conclusions

1. Some secondary schools lack trained teachers in ICT education and because of this; the schools have employed teachers who have acquired computer knowledge and other qualifications which are not related to pedagogy.
2. The government of Uganda, through MoE&S, has not supplied secondary schools with enough ICT equipment, computers and accessories. This has compelled the schools to revise their budgets so as to acquire the materials and equipment from their meager income. This has been done through financial mobilization strategies like fundraising, donations and grants from well-wishers and other stake holders in education.
3. Head teachers, teachers and students reported that power connection is still a nightmare in some schools, especially the rural. Worse still, some parents are not in position to pay for power cost for running ICI gadgets at school

4.2 Recommendations

Basing on the study finding, the following recommendations were made;

1. There is need for more human and material resources such as qualified computer teachers, computer laboratory technicians and internet to be provided to secondary schools in the country.

2. The government of Uganda through the MoE&S should design a comprehensive IT policy that will enable schools to budget and allocate funds for the smooth running of ICT education program. This can successfully be done by recommending supplementary sources of funding like fundraising, donations, grants, and PTA contributions. This would enhance government meager financial contributions and therefore promote ICT education programs in schools in the country.

3. MoE&S should encourage in-service refresher courses for all teachers of ICT education to update them on IT and ICT education skills in particular. Such programs can be designed either in school holidays or weekends, at national, regional, district and school level. Teachers' refresher courses would increase teachers' computer literacy and

competence. This would improve students' ICT academic performance due to improved ICT skills as a result of quality methodologies of the teachers.

4. Universities and teacher training colleges in Uganda need to review their curriculum to include IT, computer science and computer education as it was recommended by the Government White on Education (1992, pp.76 & 78). If it is made mandatory for all teachers and students to attend IT courses which is not the case in Uganda's institutions of higher learning currently, it would go a long way in making Information Technology an effective tool for better schools and national development.

Acknowledgement

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Appendix A: Questionnaire

Dear participant,
We are carrying out research on "**Getting Schools Ready for Integration of Pedagogical ICT: the Experience of Secondary Schools in Uganda"** For the attached Questionnaire you are kindly requested to complete it as per the instructions. Your cooperation and assistance in completing the attached Questionnaire will be highly appreciated. All the information obtained as a result of your response will be used only for the purpose of this study and will be kept confidential.

Instructions:
- Kindly put a tick (**√)** in the gap on the right.
- Please respond honestly to all items.
- There is no right or wrong response, so give your honest answer.
- All information will be treated confidentially.

Responses on the Type of Teachers for Teaching ICT education in Secondary Schools

ITEM RATED	A Great Deal	Much	Somewhat	Little	Never
1. Have teachers in your school undergone a pedagogical ICT training course?					
2.Do teachers in your school exhibit necessary ICT skills					
3. Does school administration support teachers to train in pedagogical ICT.					
4. Has the MoE&S posted enough teachers to teach ICT education in your school?					
5. Does teacher time table allocate sufficient load for ICT education.					

Question two: Do schools have sufficient gadgets for ICT lessons?

Comment on the following ICT tools in your school	Very sufficient	Sufficient	Insufficient	Very insufficient
6.Computers for instructors				
7.Learner computers				
8.Computer laboratory				
9. Printers				
10.Scanners				
11.Photocopy				

Responses to reliable power source to run ICT gadgets in Secondary Schools

ITEM RATED	Yes	No
12. My school has a steady power supply to run the ICT devises.		
13.My school is able to meet power costs used to run computers		
14. All classrooms in my school have power connection		
15. I have power connection at home		
16. The parents' body is willing to contribute to power costs used to run computers at school		

Thank you.