Student Performance in Computer Studies in Secondary Schools in Malawi

Patrick Albert Chikumba

Department of Computing and Information Technology,
The Polytechnic, University of Malawi
Private Bag 303, Chichiri, Blantyre 3, Malawi
patrick_chikumba@yahoo.com

Abstract. Malawi has a national policy for ICT which emphasizes introduction of computer lessons in the education, especially primary and secondary levels. In response to this, in five years ago, Government of Malawi through Ministry of Education introduced Computer Studies as an optional subject at senior secondary level. Since introduction of Computer Studies in secondary schools, there has been no literature on how students perform in this subject with emphasis on 'type' of secondary school, gender and school location. This paper highlights performance of students in Computer Studies with an aim of finding out which schools are doing better than others which will prompt for further study to investigate reasons of success or failure. Private secondary schools are performing better in Computer Studies than government secondary schools and this is not due to location, gender and 'type' of school. Particularly government secondary schools need to invest much more in computers, teaching materials and staff in order to delivery this subject to more students than it is now.

Keywords: Challenges in computer education, computer studies, ICTs in education, Malawi education system.

1 Introduction

Considered as a powerful tool to promote social and economic development, education has become a primary focus of the recently forged ICT for Development (ICTD) community, especially in the least developed countries. Introducing ICT as a tool to support the education sector has initiated substantial discussions since late 1990s [7]. Even in Africa, the point that socio-economic development will need to embrace the use of ICT appears to be widely recognised by governments and this is evidenced by a number of countries that have a national policy for ICT in place or under development [3].

Malawi has a national policy for ICT [4] which is under development and among other areas it points out the utilisation of ICTs in Education. It partly reads *"…The Government shall facilitate the development of the educational sector by introducing ICTs to all levels of the education as a key step toward the realization of the policy objectives. …"* The policy emphasizes, among others, the introduction of computer lessons in the education, especially primary and secondary levels and using ICTs to

modernize the educational system in order to improve and extend access to educational, training and research resources and facilities.

In response to this, in five years ago, the Government of Malawi (GoM) through the Ministry of Education (MoE) in partnerships with British Council, SchoolNet Malawi and other stakeholders, introduced Computer Studies as an optional subject at senior secondary level (Forms 3 and 4). SchoolNet Malawi sources second-hand computers from various agencies which are then refurbished and distributed to Malawian schools. It also conducts training programmes for both teachers and students after each successful distribution phase although in most cases this training is not conducted as it is supposed to.

Education system in Malawi follows 8-4-4 pattern comprising primary, secondary and tertiary. Secondary education begins after eight years primary education cycle and consists of junior and senior cycles. Successful completion of the final two years of secondary education (senior cycles) qualifies eligible students to sit for Malawi School Certificate of Education (MSCE) examinations managed by Malawi National Examinations Board (MANEB) and Computer Studies is one of the subjects. Computer Studies mainly covers areas of basic computer hardware and software, word processing, spreadsheet, databases, PowerPoint presentation and network and Internet. Assessment is in point-scale of 1 to 9 as in any other subjects and the points are translated as follows: (a) DISTINCTION (1 and 2 points), (b) CREDIT (3, 4, 5, and 6 points), (c) PASS (7 and 8 points), and FAIL (9 points).

Since introduction of Computer Studies in secondary schools, there has been no literature on how students perform in this subject with emphasis on 'type' of secondary school, gender and school location. In this paper, 'type' of secondary school is in two dimensions: (a) whether a school is owned by the government or private organization/individual; or (b) whether a school enrolls only boys, only girls or both. This paper highlights performance of students in Computer Studies at MSCE with an aim of finding out which schools are doing better than others which will prompt for further study to investigate reasons of success or failure. Can 'type' of school, gender and location play a great role in performance of students in Computer Studies in secondary schools in Malawi?

2   Challenges in Computer Education

ICTs are used to help unlock the door to education and have opened up new potential. They facilitate administration of education and training, provision of learning content, and communication between learners and between learners and teachers. Computer-enhanced delivery of education and training is becoming increasingly widespread and can make education and training available to many more people around the world.

While there is an agreement that ICT can be a powerful tool for advancing education efforts going forward, the main challenge being faced today is turning the potential of ICT for Education (ICTE) into reality with results. This is a tremendous challenge, compounded by realistic fears that if not used properly, ICT can increase existing social and economic inequalities, particularly if access and use of ICTE is not equally available to everyone. With an active and transformative education policy and a supportive infrastructure, the development of a knowledge-based population can

apply itself to sustained and equitable growth. ICT can play a vital role in increasing access to education as well as providing better quality education.

Since the world is now in information technology age, there is a need to keep abreast of time. One way achieving this is through the introduction of computer education in training institutions including secondary schools. Computer education is the ability to make the generality of the people computer literate which means ability to understand and operate computers [1]. For a country to be internationally competitive it is essential that its labour force is able to utilise and harness the advantages of ICTs. However, if tomorrow's leaders (the youth) are not able to fully utilise the benefits of ICT, as a result its population will be poorer.

Countries everywhere are facing similar challenges in implementing ICT in their education systems. The challenges of computer education are both educational and administrative. Where attempts are made to purchase computers for instructional purposes the costs of installation, maintenance and replacement are unavoidable

Some key challenges in integrating ICTs in education include implications of ICT-enhanced education for educational policy and planning, capacity building, language and content, financing the cost of ICT use, and infrastructure-related challenges [2][5][6]. Attempts to enhance and reform education through ICTs require clear and specific objectives, guidelines and time-based targets, the mobilisation of required resources, and the political commitment at all levels to see the initiative through. Availability of electricity and appropriate rooms or buildings to house the technology should be considered. Various competencies (for example in teachers, education administrators, technical support specialists and content developers) must be developed through the educational system for ICT integration to be successful.

According to Crawford [2] and Salim [6] as compared to other subjects barriers to providing computer education include: (a) study of ICT requires access to more expensive hardware, software and communication technologies; (b) technology changes rapidly and often unpredictably which results that schools must re-equip themselves much frequently; (c) there is insufficient hardware in many schools for students to have access whenever they need it, and they may have to share computers; (d) many teachers of ICT lack qualifications in ICT or computing, particularly at degree level or above, and very few have been specifically trained to teach ICT; (e) teachers of ICT must regularly learn new concepts, and re-learn old skills in new contexts, as the tasks that can be accomplished using ICT are extended; and (f) students may have more extensive ICT skills than their teachers as they often have access to more modern computer equipment at home and teachers generally rely on older equipment at school. Some of the above difficulties are due to schools' lack of staff with expertise in teaching and managing ICT in secondary schools, and more effective training, planning and resource management would be likely to lead to improvements.

3 Methodology

Examination results of Computer Studies of 2007, 2008 and 2009 academic years were used to find out the performance of students in this subject. Sample of schools was drawn from the list of examination centres (schools) whose ten or more students

wrote Computer Studies examinations in each of those three years. Analysis was based on grade (distinction, credit, pass and fail), type of school, gender and academic year. Point 1 & 2 were considered as a distinction, point 3 – 6 as a credit, point 7 – 8 as a pass and point 9 as a failure. Absentees were also included in the analysis. The data was in Ms Access 2003 and results of Computer Studies were extracted into Ms Excel 2003 for the analysis that included summation, percentages and categorization.

4   Findings

4.1   School and Student Population

In Malawi, secondary school education is offered mainly through five types of schools namely (a) conventional secondary schools, (b) community day secondary schools, (c) open (distance) schools, (d) grant aided secondary schools, and (e) private secondary schools. Both conventional and community day secondary schools are fully run by the government. Open secondary schools are also run by the government through Malawi College of Distance Education while grant aided secondary schools get support from the government but are run by independent boards. Private secondary schools are run by individuals or private institutions. Some of these schools enroll boys only or girls only and others enroll both boys and girls.

Table 1. Sample Schools and Student Population

Year	Sample Schools	Students from sample schools written Computer Studies examination		
		Total	**Male Students**	**Female Students**
2007	77 out of 901	2461	1470	991
2008	97 out of 922	3186	1847	1339
2009	107 out of 944	3264	1870	1394

Note:
- Sample school has at least ten students wrote the Computer Studies examination in that year

It has been observed that number of schools interested to offer Computer Studies increased from 2007 to 2009 academic years (see Table 1) with also an increment in number of students but male students were dominating female students in all years. The increment was bigger from 2007 to 2008 than from 2008 to 2009 academic years. For example from the sample schools, in 2008 additions of 725 students wrote the Computer Studies examination while in 2009 there were only additions of 78 students. But there was no big difference between increment in male and female students.

In most of schools very few students registered to take this examination. In 2007 academic year out of 77 sample schools only 15 schools had 30% or more of students sitting for Computer Studies examination. The number increased to 20 out of 97 schools in 2008 and in 2009 the number dropped to 14 out of 107 schools.

4.2 Student Performance

Generally student performance was good in 2007 which dropped in 2008 and then improved in 2009 (see Table 2). In 2007 there was good number of students got distinction and credit but in 2008 there was big increase in failures and absentees which made distinction and credit to drop. For instance, distinction dropped from 11.1% in 2007 down to 1.4% in 2008. The student performance improved very much in 2009 especially in failures and absentees. Number of failures decreased from 24.0% in 2008 down to 10.6% in 2009.

Table 2. General Student Performance from the sample schools

Year	Distinction	%	Credit	%	Pass	%	Fail	%	Absentees	%
2007	273	11.1	819	33.3	694	28.2	286	11.6	389	15.8
2008	45	1.4	697	21.9	1128	35.4	764	24.0	552	17.3
2009	162	5.0	1110	34.0	1228	37.6	345	10.6	419	12.8

The male students did better than female counterparts in all three academic years. As shown in Table 3, male students who got distinction were twice as much as female students particularly in 2007 and 2009 academic years. Female students failed badly as compared to their male students. Both groups performed badly in 2008.

Table 3. Male and Female Student Performance in Percentages

Year	Distinction (%)		Credit %		Pass %		Fail (%)		Absentees (%)	
	M	F	M	F	M	F	M	F	M	F
2007	13.6	7.4	33.6	32.8	27.8	28.9	9.4	14.9	15.6	16.0
2008	1.6	1.2	22.9	20.5	35.9	34.7	21.3	27.6	18.3	16.0
2009	6.4	3.1	37.3	29.6	34.9	41.3	8.6	13.3	12.9	12.8

4.3 Good Performing Schools

Thirty-three schools were identified whose students sitting for Computer Studies examination in at least one academic year was 30% or more. Among these schools only 5 schools were good performing ones in all three years and they are boy's secondary schools except one school (Bambino private secondary school) and all run by private institutions. As indicated in Figure 1, performance of students was good. Majority were getting distinction and credit. Particularly Marist secondary school which had no student got a pass or failed the examination. Over 85% of students from Bedir and Marist secondary schools registered for Computer Studies examination in each academic year.
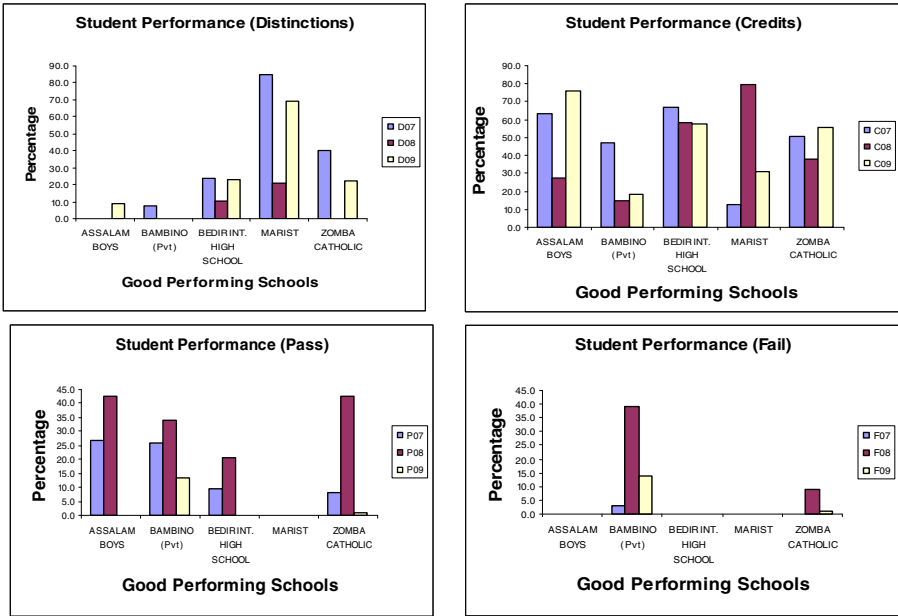
Fig. 1. Number of students (represented in percentage) and their performance

Apart from these good performing schools, some schools have started registering more students in Computer Studies mainly in 2009 academic year. There were eight secondary schools that registered between 30% and 49% of their students to sit for the examination in 2009 but student performance was worse than that of the good performing schools explained above. These schools are also run by private organizations. A majority of students got a pass except one school (Marymount secondary school) whose 10 students got distinction, 44 students got credit and only 5 students got pass. Two schools produced many failures and absentees. Out of these 8 schools two are girl's secondary schools and the rest enroll both boys and girls.

5   Why Such Performance in Computer Studies

There are several factors that can affect the performance of students in any subject at secondary schools in Malawi. For a student to perform well in examinations, he/she requires teaching and learning materials, well-trained teachers, good policies and planning and even dedication or commitment of students. In case of Computer Studies at secondary schools, every school needs, among others, a modern computer laboratory with adequate computers and Internet connectivity, qualified teachers, computer textbooks, financial support on computer operations and maintenance, and technical expertise.

The results have shown that schools run by private institutions or organizations are doing better in Computer Studies than those run by the government. Why is it so? Is it

due to availability of adequate resources? Is it because they enroll only boys or only girls? Is it because they are located in cities or towns?

It can be said that private schools have better resources than government schools although there is no such evidence to support this in Malawi. Government employs teachers who are qualified and have gone through teachers training particularly University of Malawi (UNIMA). Unfortunately, when Computer Studies was being introduced UNIMA had no any degree program to train computer teachers. Even today, there are very few university graduates who have been trained as computer teachers. Most of the teachers of computer studies in government secondary schools went for short-time trainings in basic computing just to prepare them for starting off of the subject. The government is doing its best to support ICT in education by allowing universities in Malawi to introduce new degree programmes in computing for secondary school teachers. For example, UNIMA has introduced a degree in education majoring Mathematics or Statistics and Computing and it is also planning to introduce another degree in Business and Computer Studies education.

The government secondary schools depend much on donations for their computer laboratories and other equipment. Even maintenance and replacement of computers and peripherals are done by donating communities. In Malawi, SchoolNet Malawi plays a recommendable role in supporting government secondary schools by donating computers, providing training and also maintaining computers but the main problem is the capacity building because most of workers at SchoolNet are volunteers. SchoolNet Malawi cannot afford to support adequately all government secondary schools due to some constraints such as lack finances, difficult accessibility of schools, lack of personnel or computer experts and other logistics issues.

Sometimes failure is very high in government secondary schools because a good number of candidates sitting for Computer Studies and other subjects are 'external' who study on their own or through distance education. They do not receive adequate support from secondary school teachers. Sometimes they just register for Computer Studies examination and then decide not to write. This increases the number of absentees. For instance in 2008 academic year there were a lot of failures and absentees. It can be believed that more students registered for Computer Studies examination because they thought that this subject is simple after finding out that in previous year, 2007, the majority of candidates performed well. This can be evidenced in 2009 when there was very little increment in student registration.

As compared to government secondary schools, private secondary schools are doing well because they have resources such as teachers and computers. Private secondary schools employ teachers in the same way as the government does but for Computer Studies they employ computer experts to be teachers since teachers training institutions are not ready to provide adequate computer teachers. Some private schools provide training to those teachers on how to teach. Graduates in computing from universities can be employed as teachers of Computer Studies. It can be said that this contributes positive results in the subject.

At most of private schools all students sitting for Computer Students are 'internal' particularly the good performing schools mentioned above. These schools do not allow students learning somewhere to come and write examinations. This is just a policy of these schools with the aim of maintaining quality in order to survive in the school business. This helps the school management to assess the performance of their

students and at the same time to make sure that available resources are utilized by their own students and nobody else.

Private secondary schools invest a lot on computers and other equipment so that students can get necessary theoretical and practical computing skills. They manage the equipment themselves. Since they invest a lot they need to take care of the computers in order to utilize them for maximizing profits.

Private school education is becoming very profitable business in Malawi and even Ministry of Education is monitoring and evaluating private schools very closely to make sure that education quality is maintained. The only way to be in school business is to produce good results at the end of year. Therefore there is a possibility that this prompts majority of private schools to use examination-oriented teaching style in which teachers teach 'examination', i.e. their target is on examination and not much on knowledge and skills. This also contributes to good results in Computer.

Type of school, location and gender do not contribute much to performance of students in Computer Studies. Although in early years boys secondary schools were doing better than other schools, it has been observed that girls secondary schools, such as Marymount and Providence have started to perform well and even schools which enroll both boys and girls are also performing well. Private schools that are doing well are boarding schools and their students come from different parts of the country with various academic and technological backgrounds. Some of these schools are in cities and towns while others are in remote areas like Marist secondary school but it is the best school in Computer Studies so far.

6   Conclusion

Private secondary schools are performing better in Computer Studies than government secondary schools and this is not due to location, gender and type of school. There is a possibility that it is because private schools have more adequate resources than their counterparts. It has been observed that more and more secondary schools and students are interested in Computer Studies and this shows that Malawi is in right direction in campaigning for ICT in Education. Secondary schools, particularly government secondary schools, need to invest much in computers and teaching staff in order to delivery this subject to more students than it is now. For Malawi to do well in ICTs it is necessary to make sure that each and every student attending secondary school education is taking this subject so that he or she can survive in the technological era.

References

1. Bada, T., Adewole, A., Olalekan, O.: Uses of computer and its relevance to teaching and learning in Nigerian educational system. Educational Research and Review 4(10), 443–447 (2009)
2. Crawford, R.: Teaching and learning IT in secondary schools: towards a new pedagogy? Education and Information Technologies 4, 49–63 (1999)
3. Farrell, G., Isaacs, S.: Survey of ICT and Education in Africa: A Summary Report, Based on 53 Country Surveys. infoDev / World Bank, Washington, DC (2007)

4. Malawi Government.: Malawi Information and Communication Technology (ICT) Policy, Government of Malawi (2003)
5. Mfum-Mensah, O.: Computers in Ghanaian Secondary Schools: Where does equality come in? Current Issues in Comparative Education, Teachers College, Columbia University (2003)
6. Salim, R.: Computer education at secondary school level, The Amader Gram Information Technology for Development (ICT4D) project (2007)
7. Stienen, J.: ICTs for Education: Impact and lessons learned from IICD-supported activities. IICD, The Netherlands (2007)