

# ICT AND EDUCATION IN AFRICA: A PARADIGM SHIFT IN TEACHER PROFESSIONAL DEVELOPMENT IN THE GAMBIA

<sup>1</sup>Matthew I. Ivongbe, <sup>2</sup>Sunday A. Ojeifo, <sup>2</sup>Peter A. Akhator, <sup>1</sup>Harry Omorogbe,

<sup>1</sup>Igbinedion University Okada / Nigeria, <sup>2</sup>Ambrose Alli University Ekpoma / Nigeria  
mivongbe@gmail.com, ojeifomatrix755@yahoo.com, matt2leeds@yahoo.com,  
harresearchwork@yahoo.com

## Abstract

The Gambia was a recipient of the World Bank's World Links for Development (WorLD) pilot programme (1997-2001) which is part of the bank's educational projects in developing countries which focused on the promotion of new and better ways of achieving effective learning through the use of technology. This study investigated whether concerns of the WorLD Programme teachers in The Gambia, regarding the non-effective utilisation of ICT in education in achieving professional teacher development, prevailed in other WorLD schools throughout Africa. The framework was to conduct a focus study interview with project teachers, administer questionnaires to determine teachers' concerns regarding the WorLD Programme and other factors contributing to the success or failure of the Programme in their schools. An evaluative research method was used to investigate benchmarks developed as possible indicators to achieve project objectives. The study found out that despite the key role of ICT in improving the quality and delivery of education globally, imperatives to achieving educational outcomes, such as access to computers and Internet networking, training of educators and a supportive working environment were still unavailable to education role players in The Gambia. The study revealed that though educators in WorLD schools have been equipped with new skills and modern insights into education. However, the project failed to achieve a great proportion of its outcomes and impact. It was strongly recommended that the issues that have impeded achieving the objectives of the WorLD project be addressed through a national ICT education policy to achieve future outcomes and impact.

**Keywords** - ICT in Education, World Links for Development, eLearning, Teacher Professional Development, Learning, Teaching, Research, Education Development.

## 1.0 Introduction

The World Links for Development (WorLD) Programme is one of the World Bank's education projects. It focuses on the promotion of new and better ways of achieving effective learning through the use of technology. The Programme started as a four-year (1997-2000) pilot initiative of the World Bank in developing countries. The Programme came into effect in response to widespread requests from developing countries to assist them in preparing their youth to participate effectively in the global information economy. The work of the WorLD Programme in participating countries is carried out with five major Objectives. These were to provide: Internet connectivity for secondary schools in developing countries; training and educational content to promote economic and social development; regional and global partnerships with public, private and non-governmental organisations; telecommunications policy advice for the education sector; monitoring and evaluation support.

The study is conducted using the evaluative approach and consists of four sections: Section one is a general overview of the study which include an introduction and a justification for the study. Section two is the conceptual framework with a review of issues in the literature. Section three entails a detailed description of the methodology used for the study and also presents and analyses the collected data and a discussion of the findings. Section four summarises the findings and makes recommendations and conclusions.

## **1.1 Problem Statement**

After four years of implementing the WorLD Programme in the Gambia (1997-2001), some teachers from participating schools expressed concern about the inability of students to retrieve and use information from computers for collaborative school projects. They argued that students' problems stem from their slow pace of attaining the required computer and information skills. The teachers claimed that they spend more time than they should in assisting students with the new technology. The teachers maintained that they had to attend to frequently non-functioning computer systems and were thus unable to adequately fulfil their roles as subject teachers. They attribute their problems to; learners' lack of literacy skills, a lack of a computer-based pedagogy in their schools and a school environment deprived of information resources. The concerns of these teachers confirmed observations made in this study. The teachers have raised specific issues, which require investigation and verification in WorLD schools throughout The Gambia.

## **1.2 Objectives of the Study**

The objectives of the study are to assess teachers' training received during the WorLD Programme, determine the information resource capacity of WorLD schools; investigate the capacity of WorLD project teachers to implement projects, assess the need to utilise multimedia resources in WorLD schools and determine other factors that contribute to the success or failure of the WorLD Programme in The Gambian schools;

## **1.3 Justification of the study**

This study is undertaken, not to re-echo the impact of ICT on teaching and learning, but to establish whether observations (viewed as challenges to the implementation of the WorLD Programme) prevail throughout WorLD schools in Africa. This study assumes that if issues identified are addressed, the WorLD Programme and future ICT projects in schools will achieve greater success. The use of ICT among teachers and learners will improve and provide teachers with the skills needed in an information economy.

## **1.4 Scope of the study in relation to the WorLD Programme**

The present study is limited to the WorLD Programme conducted in WorLD schools in The Gambia. The study is limited to the investigation of the following objectives of the WorLD Programme only. These objectives are; the provision of computers and Internet connectivity for secondary schools in developing countries and the training of teachers to integrate computers into the school curriculum.

## **2.0 Conceptual Framework**

The objectives of the WorLD Programme are the main focus here. Literature on the following aspects of the project was reviewed, in addition to factors influencing the use of ICT in schools: computer access and Internet connectivity for secondary school education; teacher training for school ICT projects: The literature review concentrates on disadvantageous situation of use of computers in The Gambian schools and the rest of the world – areas covered by the WorLD Programme. The literature review also focused on the problem of this study, seeking answers to the issues presented in Section One.

### **2.1 Relevance of Information & Communication Technology (ICT) in Education**

A number of authors (Hawkrige 1990; Tinsley and Van Weert 1995; Bigum 1997 & World Bank 1999) state why it is necessary to incorporate ICT into education systems. Hawkrige (1990) proposes four rationales for the utilisation of computers in schools. He notes these as social, vocational, pedagogical and catalytical. The social and vocational rationales point to the increased use of ICT in all spheres of human activity. The pedagogical and catalytical rationales relate to the effects of technology on students and schools.

According to Bigum (1997), arguments for using computers in schools stem from technological and socially determined points of view. His standpoint is that the school system, within which the computer is used, is driven by computers. He argues that a change occurs within the education system using the computer and that change is a result of the effect of technology. Bigum (1997) argues that the social context sees computers as neutral technology – technical means of achieving a defined purpose in education (Bigum 1997: 251). The contexts of utilising computers, expressed by Hawkrige

(1990) and Bigum (1997), underpin rationales for the implementation of the WorLD Programme. The primary goal of the Programme was to provide technology-based education for social and economic development in developing countries. Two contexts emerge and are used in this study: the social context and the pedagogical context. The social context runs along the line of Hawkrige's (1990) social and vocational rationales, while the pedagogical context agrees with Hawkrige's pedagogical and catalytical rationales. The pedagogical context also agrees with the views of Bigum (1997)

## 2.2 Rationale of utilising ICT in Education

Computer technology today spans all spheres of social and economic activity, making significant impacts on the lives of people (Hawkrige, Jawuski and McMahon 1990: 3). Information and Communication Technologies are central to global socio-economic advancement. Countries in the vanguard of the world economy today have shifted emphasis to knowledge from production resources. Such countries have adopted computer technologies to enhance their education systems, thus allowing the generation of wealth and power faster than the slower economies of the developing nations (*World Development Report* 1999:16). The WorLD Programme, therefore, has as its ultimate goal, the social and economic development of countries participating in its projects through the use of ICTs in their education systems. Hawkrige (1990:15) concludes that in view of the accelerated rate at which computers are pervading society, it was necessary to de-mystify their use by preparing students to be aware and unafraid of them as social tools, have control over them, know how they work and be able to use them for productive causes.

## 2.3 Pedagogical skills for utilising computers in Education

In view of the profound educational changes brought about by the integration of computer technology into schools, teacher professional education and in-service training have taken a position of prime importance (van Weert 1995:10). This is more so because education systems devoid of resources and appropriate pedagogy are largely characterised by a *chalk and talk* mode of imparting knowledge (Bouwer 1998:225; Hayman 1999:45; Bot 1999:6). While many teachers lack the expertise and means to deal effectively with the unique cognitive needs of black African learners, most of the learners are faced with a critical lack of exposure to learning experiences, which Western curricula require for cognitive development and skills of self-learning (Bouwer 1998: 225).

## 3.0 Research Methodology

The research methodology outlines and explains the relationship between the WorLD Programme, the literature review, the data collection method and instrument and the analysis of the research. Table 3.1 below specifies the research questions asked and the research tools employed:

**Table 3.1 Data collection matrix**

Research questions	Research tools employed				
	Documentation	Focus group discussion	Online data	Questionnaire	Interviews
How successful was the training provided to teachers in WorLD schools?	✓	✓	✓	✓	✓
To what extent are the WorLD teachers able to handle school projects, attend to computer systems and teach their normal school lessons?	✓	✓		✓	✓
What other factors contribute to the success or failure of the WorLD Programme in The Gambia?	✓	✓	✓	✓	✓

### 3.1 The self-administered questionnaire

A self-administered questionnaire was used, this was possible because a pre-conference session was held in Gambia where the WorLD Programme was discussed, provided the study with the opportunity of a focus group discussion of questions with WorLD teachers and thereafter sent and administered the questionnaires. 9 teachers from 11 WorLD project schools in The Gambia were sampled and a focus study interview with project teachers was conducted, questionnaires were administered to determine teachers' concerns regarding the WorLD Programme and other factors contributing to the success or failure of the Programme in their schools.

Questionnaires were used because it was not possible to interview all 11 teachers in schools covered in the research population. A further reason for using self-administered questionnaires was that, since the schools are scattered across The Gambia, financial, logistics and time constraints would not allow for interviews to be used as the main data collection technique for this study.

The questionnaires were supplemented by telephone interviews and online chat sessions using Yahoo and MSN Messengers with some teachers and officials in the Gambia who were part of the WorLD Project Team. This procedure gave clarity on issues, reducing the ambiguity that goes with questionnaires. In addition, my observation of the actual status of ICT in selected schools in the metropolitan City helped with the design of the questionnaire. Katundu (1998: 59) was supported, that the use of more than one data gathering instrument – the triangulation method – is considered vital in an under-researched problem such as that in the present study.

### 3.2 Research population

Leedy (1993: 197-198) observed that nothing comes out at the end of a long and involved study that is any better than the care, precision, consideration and the thought that goes into the basic planning of the research and the careful selection of the population. The research population of this study is defined as teachers/school project co-ordinators in schools that participated in the WorLD Programme in The Gambia. The names of 11 schools that participated in the Programme are provided in Appendix. Table 3.1 lists the number of WorLD schools according to Division.

**Table 3.1 Population of WorLD schools according to Division**

Division	Number of schools	Percentage of total
North Bank Division	5	45.5
Western Division	6	54.5
Total	11	100

**Source:** Field work collected data

**Table 3.2 Name of school, number of learners and sample range**

	Name of school	Number of learners	Sample range
1	Muslim Senior Sec. School (Host)	40	01-09
2	Gambia Senior Sec. School	35	10-15
3	St. Augustine Senior Sec. School	30	16-21
4	St. Joseph Senior Sec. School	20	22-29
5	Essau Senior Sec. School	20	30-36
6	Kotu Senior Sec. School (Host)	25	37-40
7	Nusrat Senior Sec. School	30	41-48
8	St. Peter Senior Sec. School	15	49-51
9	Bottrop Senior Sec. School	25	52-59
10	Bakoteh Senior Sec. School	20	60-67
11	Sukuta Lower Basic School	10	68-74

**Source:** Field work collected data

### 3.3 Sampling

Teachers in this study were the only one considered. 9 out of the 11 teachers, representing the schools in the WorLD Programme Project participated in the study by providing feed-back using the questionnaire.

## 4.0 Data Presentation and Analysis

This section presents the survey data and analysis based on the objectives set for the study and the research objectives and problems which were outlined in Section 1. Findings from the questionnaires sent to the project coordinators/teachers are outlined. Tables, figures and descriptions of data are used to present the findings as shown below:

**Table 4.1 Data analysis of background on WorLD school co-ordinators and students**

Question	Source and location of Data
How many schools participated in the project?	1. Interview with Country WorLD Project Co-ordinator 2. Sampled number of schools
What was the response to administered questionnaires?	Responses of questionnaire received. Figure 4.1
What was the citizenship of co-ordinators?	Teachers' question 2
What was the motivation of co-ordinators?	Teachers' question 3
What was co-ordinators' background use of computers?	Teachers' question 4

**Table 4.2 Training provided during the WorLD project**

Question	Data
<b>1. How successful was the training provided to teachers during the WorLD Programme in The Gambia?</b>	<b>Section. 4</b>
Which application software have teachers been trained in?	Table 4.1; Figure. 4.2
Which technical skills were provided to WorLD teachers?	Table 4.2; Figure 4.3
Which pedagogical methods are teachers familiar with, trained in and use?	Figure 4.3
How long have teachers been trained?	Figure. 4.4
What information related training have you and other teachers had?	Figure 4.4
What other teachers on staff had access to technical ICT training?	Table 4.5
How have you been trained for the WorLD Programme?	Figure 4.6
Which operating system were you as a learner trained in?	Table 4.6
To what extent have you had a computer to practise after training?	Table 4.7

**Table 4.3 Applications in which WorLD teachers were trained N=8**

Application software	Type/product	Absolute number trained	Percentage trained
Word processing	Microsoft Word	9	100
Spreadsheets	Microsoft Excel	9	100
Presentation graphics	Power Point	9	100
The Internet	Internet Explorer	9	100
The Internet	Netscape	0	0
Electronic mail	GroupWise	9	100
Electronic mail	Pegasus	0	0
Database	Microsoft Access	0	0
Web design		9	100
Information skills		9	100

**Table 4.4 Computer systems in which WorLD teachers were trained N=8**

Computer system	Type/skill	Absolute number trained	Percentage trained
Hardware	Physical identification of computer components and their function in a computer system	9	100
Operating system software	MS DOS	2	22.2
	Windows 95/98/XP	2	22.2
	Windows 2000/NT	2	22.2
	Unix	9	100
Networking	Networking systems and procedures	9	100

**Table 4.5 Attributes acquired to manage school computer system N=8**

Attribute	Number of teachers that acquired attribute	Percentage of teachers that acquired attribute
Ability – Skill to deliver first level support and maintenance	2	22.2
Time – Enough of it outside teaching duties to engage in collaborative projects	4	44.5
Confidence – To operate computers without fear of causing damage to the tool	9	100

Teachers, generally, had acquired the ability to deliver first level support and have less skills in the maintenance of their school computer system. Table 4.5 testifies to the fact that 2 of the respondents (22.2%) had acquired the necessary skill to support and maintain computer systems. The Table shows, however, that there was no time to implement the skills in their schools.

**Table 4.5.1 WorLD teachers' rating of their ability, time and confidence N=15**

Attribute	Rating	Response	Percentage
Ability	Fair – 0% to 50%	2	22.2
	Good – 51% to 74%	3	33.3
	Excellent – 75% to 100%	4	45.5
Time	Fair – 0% to 50%	8	88.8
	Good – 51% to 74%	1	12.2
	Excellent – 75% to 100%	0	0
Confidence	Fair – 0% to 50%	0	0
	Good – 51% to 74%	0	0
	Excellent – 75% to 100%	9	100
<b>Total</b>		<b>9</b>	<b>100</b>

Table 4.5.1 also shows how the teachers rated themselves regarding the attributes listed. It reveals that respondents were adequately trained and rated themselves reasonably well in terms of ability and confidence, but very low in terms of the time at their disposal to utilise their new found skills.

**Table 4.5.2 Effect of project on normal classroom teaching N=8**

Effect	Absolute response	Percentage response
Unable to manage computer system and engage in collaborative projects because of teaching load/duties	8	88.8
To a large extent	0	0
Minimal extent	0	0
Not at all	1	12.2
<b>Total</b>	<b>9</b>	<b>100</b>

Table 4.5.2 Depicts attributes acquired by teachers to manage school computer labs. Table 4.5.1 rates their ability, time and confidence and Table 4.5.2 provides the effect of project on teachers' normal classroom duties. As to the effect of the project on normal teaching duties, the majority of the teachers agreed that the WorLD Programme has had some effect on their teaching duties.

**Table 4.6 Benefit of WorLD programme to the school N=8**

Benefit to the school	Response	Percentage
School has been put on the information superhighway	2	25
Modern educational equipment has become part of the school's teaching and learning environment	3	37
Learners are able to engage in collaborative learning	9	100
Learners acquire skills which they will be able to utilise in work and further education environments	9	100
Infrastructure and logistics of school has improved	4	44.4

Table 4.6 shows the benefits WorLD schools have derived from the project Co-ordinators perspective.

**Table 4.7 Challenges of WorLD programme for teacher/co-ordinator N=8**

Challenge	Response	Percentage
More work and added responsibility without additional pay	9	100
Inability to fulfil normal teaching role	1	11.1
Conflicts with other members of staff	4	44.4
Un-refunded financial expenditure	0	0
Conflict with school principal	6	66.6

**Table 4.7.1 Hindrances posed by the WorLD programme N=8**

Hindrance	Teacher/co-ordinator
Students spend more time in computer lab, at the expense of examination subjects	0
It is an expensive venture	9
No hindrance	0

**Table 4.7.2 Future problems N=8**

Future problems	Teacher/co-ordinator
Cost of maintaining the system may be out of reach of schools/parents	9
Teachers who will not update their knowledge will frustrate the system	4
None	0

Tables 4.7 shows the challenges posed by the WorLD project from the teacher/coordinator's perspective Table 4.7.1 depicts the hindrances posed by the WorLD Programme and Table 4.7.2 depicts the future problems.

**Table 4.8 Suggestions to improve upon the use of computers in schools N=8**

Suggestion	Response	Percentage
Attract more teachers to the idea	9	100
Provide more and better computer equipment	9	100
Computer courses as subjects in schools	9	100
Schools must be linked to the Internet	9	100
More and better technical training	4	44.4

Table 4.8 shows the suggestions put across to improve the use of computers in schools.

All of the respondents felt there was a need for an additional staff member to help with the Programme. Concerning the nature of training of such a teacher, more than half of the respondents stated that the additional staff member should be a teacher who will manage the library and provide first level technical support. The others felt that such a person would be a purely technical person who should provide technical support.

#### 4.1 Summary

The study concludes that the World Links for Development Programme in The Gambia achieved limited outcomes and impact on ICT education in schools during the project pilot phase between 1997 and 2000. This was because teachers who were Project Co-ordinators in the schools did not have time outside their normal working schedules, they did not have the required technical skills to repair frequently non-functional computers, the Internet was not regularly available in the majority of the schools and support from both school administration and the project initiator was minimal.

#### 4.2 Conclusion

This study concludes that, for an ICT education project to be effective in The Gambia and the rest of Africa, and to meet its outcomes and make the required impact, the following are crucial: A national technical ICT strategy for educators must be developed, similar to the SchoolNet South Africa Educators' Development Network (EDN). It is argued that the limited technical training provided during the WorLD project does not provide teachers with the knowledge to be able to engage the helpdesk with the right information and confidence to solve hardware and network problems.

### 4.3 Recommendations

It is recommended that a thorough base scan should precede school ICT projects. This should be discussed with schools and followed by a thorough needs analysis of the educators. In many instances this was not the case in selected WorLD schools. It is also recommended here that the start-up process of any school ICT project in Africa, should make provision for a highly motivated and dedicated ICT teacher, who should be adequately trained in pedagogical, as well as technical skills, to train teachers as well as be able to sustain project outcomes in a particular school..

### References

- Bigum, C. (1997). Teachers and computers: In control or being controlled? *Australian Journal of Education*, 41 (3): 247-261.
- Bot, M. (1999). The development of quality indicators at school level. *Edusource Data News*, 26:1-16.
- Bouwer, A. (1998). An integrated book-based computer assisted model to develop meta-cognitive reading strategies of all South African learners. *South African Journal of Education*, 18 (4): 225-231
- Busha C. and Harter S. (1980). *Research methods in librarianship: techniques and interpretation*. New York: Academic Press.
- Clyde, A. (1995). Computers in school libraries: The Internet and Australian schools. *ACCESS*, 9 (2): 26-28.
- De Vaus, D. (1991) *Surveys in Social Research*. 3<sup>rd</sup> ed. London, Unwin.
- De Villiers, M. (1998). Instructional theories of experts: a practical implementation. *South African Journal of Higher Education*, 12 (3): 04-213.
- Gordon, D. (1997). Wired learning: Education caution. *Intelligence*, September 38-40.
- Govender, D. (1999). How South African school teachers understand "educational technology". *South African Journal of Education*, 19 (2):79-83.
- Hawkins R. (2000) Interview with the outgoing WorLD Africa Programme co-ordinator in Washington DC.
- Hawkridge D, Jaworski J. and McMahon, H. (1990). *Computers in Third World Schools. Examples, Experience and Issues*. Hound mills, Macmillan.
- Johnson, D. and Eisenberg, M. (1996). Computer literacy and information literacy: A natural combination. *Emergency Librarian*, 23:12-16.
- Karaliotas, Y. (1997). Project Report. Learning on and over the Internet: dynamics and limitations: will the new technology become the main vehicle for a learning society? [Http://www.usersotenet.gr/~kar1125/education.htm](http://www.usersotenet.gr/~kar1125/education.htm) (Accessed 13/08/04)
- Kozma, R. et al., (1999). *World Links for Development: Accomplishments and challenges. Monitoring and Evaluation Annual Report*. California, Centre for Technology International.
- Leedy, P. (1993). *Practical Research Planning and Design*. 5<sup>th</sup> Ed. New York: Macmillan.
- Lundall, P. and Howell C. (2000). *Computers in Schools: A national survey of Information and Communication Technology in South African Schools*. University of the Western Cape. Education Policy Unit, University of the Western Cape.
- Thomson, J. (2000). Interview with the WorLD and SchoolNet South Africa consultant in South Africa.

Van Rooyen, K. 1996. A performance evaluation of the Pietermaritzburg cluster of Theological Libraries (PCTL) in order to determine whether it meets the demands of its users. MIS thesis, Pietermaritzburg: University of Natal.

*World Development Indicators.* (2001). Washington DC. The World Bank.

*World Development Report: Knowledge for Development.*(1999). New York: Oxford University Press.