Challenges of Teaching Computer Programming in Nigerian Primary Schools

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Abstract

Computer offers many important advantages which include capacity to expand the range of what can be created and how pupils can express themselves with the computer. However, some challenges often discourage teachers from teaching computer in Nigerian primary schools. This study was therefore designed to investigatethe challenges preventing teachers fromteaching computer programming (LOGO) in Nigerianprimary schools.A validated questionnaire focusedon the challenges of teaching computer programming in primary schoolswas administered to 24 computer studies teachers selected from eight primary schools in Ibadan North Local Government Area of Oyo State. The findings revealed teachers had a strong desire to teach computer programming, they encountered some obstacles such as inadequate staff to supervise the pupilsand inadequate time for them to explore LOGO programming software.Content analysis of the results indicated that lack of expertise on the part of the teachers is not a major problem, rather insufficient fund to purchase equipment and to employ supporting staffare the highly related problems. It is recommended that enough time should be allocated for teaching LOGO (computer programming) in primary schools.

Introduction

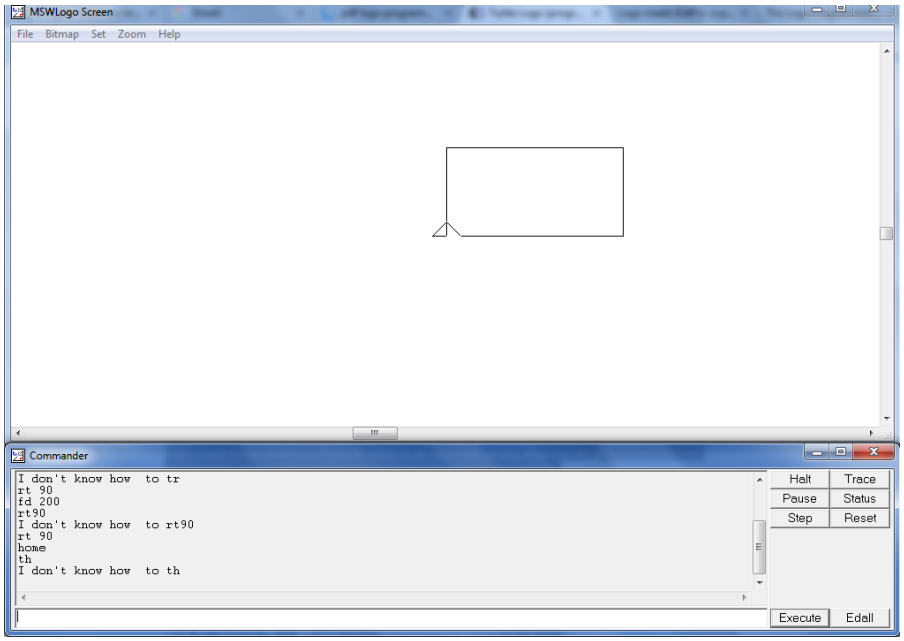
Primary education, which prepares children in fundamental skills and knowledge areas, can be described as the early stages of formal or organized education where it is important to lay solid and strong foundation for children prior to secondary education. It is believed to be the most important level of education where the child acquires the fundamental knowledge, skills, thoughts, feelings and actions which are considered necessary for all citizens regardless of social status, vocation or gender. This level of education does not only serve as the bedrock of subsequent levels of education but it is also regarded as the gateway to all higher levels of education that produce scientists, teachers, doctors, engineers and other highly skilled professionals that every country requires (Bruns, Mingat and Mabila, 2003). In order to ensure a firm ground at this grass root level, National Policy on Education (NPE) (2004) encourages the use of technology for teaching and learning in primary education.

It is universally acknowledgedthat implementation of computer in schoolshas progressedin nearly identical pattern, from formulation of policies, attainment of basic computer skills, computer aided teachingand learning, communications and research, to usage in every subject. In Nigeria, the Federal Ministry of Education, with the intention of improving the quality of education and facilitating national development, set up a committee in 1988 to ensure the implementation of computer literacy at the national level. One of the recommendations of that committee was that computer literacy should be introduced to teachers and students at all levels of the educational (Idowu, Adagunodo and Idowu, 2004).The objectives of the computer component

of the basic education curriculum are to assist the learners to: acquire basic computer skills such as the use of the keyboard, mouse and operating systems; use the computer to facilitate learning electronically and develop a reasonable level of competence in ICT applications that will engender entrepreneurial skills (NERDC, 2007).

The present trends focus on introducing pupils to a wide range of different applications such as word processing, spreadsheets, graphics software, and communication packages. While these are important skills of teaching their use often place children in the role of consumers of software programmed by others instead of producers. The main problem is that the creative potential of pupils will not be well-developed compared to their counterparts in the developed nations who have the opportunity of being exposed to fully incorporated computer programming language in the curriculum. Kalelioglu (2015) asserted that because children are born into a technological world where new technological skills must be adapted fast, there is a demand for changing education programmes to teach computer programming for young learners. According to Duncan, Bell and Tanimoto (2014) the value of teaching computer programming enable students to understand what computer is all about, and the general value of computational thinking which will be of use regardless of a student's career. It gives pupils the ability to create technologies that impact those around them and create things that could change the world.Due to importance of computer programming in the society and possibly in the future of education, identifying the possible challenges to the teaching in schools would be an important step in improving the quality of teaching and learningto bring up constructively computer-literate young citizens.

There are different types of computer programming for children such as Alice which was developed to encourage girls to write programming, kudo, RoboMind, Scratch, Greenfoot and Language of Graphics Orientation (LOGO).LOGO computer programming was used to elicit information on the challenges teachers faced in teaching computer programming in Nigerian primary schools. It was developed for children experimenting their first programming steps. It guides kids step by step with the basics of computers programming. LOGO is not only a programming language but also a learning tool and a language that encourages young children to explore, to learn, and to think (Papert, 1980). Its main difference from other programming languages is that the tool used in LOGO programming is an image of a turtle on the screen which is child friendly, it is written in simple English Language and is used for generating basic shapes using a turtle, which is an on-screen cursor, which can be given movement and drawing instructions, and is used to programmatically produce line graphics.



Research Question

What challenges will Nigerian primary school teachers face in teaching computer Programming Language in the classroom?

Methodology

The research design adopted for the study was expo-factor design of survey type. The population for the study was all primary school teachers in Ibadan North Local Government Areas of Oyo State. From which three teachers were randomly selected from eight primary schools in the local government to make the total sample of 24 teachers. The criteria used for the purposive sampling were: availability of computer laboratory facilities and computer teachers in each school.Questionnaire which consists of 10 items to elicit information on challenges that primary school teachers faced in teaching computer programmingwere distributed. The data collected were subjected to content analysis and descriptive statistics.

Results

Eight of the ten challenges listed in Table 1 seems to constitute threats to the effective teaching of computer programming in Nigerian Primary Schools (Table 1). The most challenge is inadequate supporting staff to supervise pupils' and frequent electricity interruption (items 7 and 8; 100%; Rank 1) followed by lack of time for teachers to explore different programming software (item 10: 87.5%; Rank 2). Also, insufficient number of computers (item 1; 75%; Rank 3), insufficient funds to purchase equipment (items 3; 75%; Rank 3) and problems of scheduling enough programming Language time in different classes (item 9; 75%; Rank 3). Others include insufficient number of computers for pupils' use (item 2; 62.5%; Rank 6), lack of maintenance and technical staff (item 6; 62.5% Rank 6) and teachers' lack of expertise (item 5; 50%; Rank 8). The challenge which is not of serious magnitude is teachers' unwillingness to learn (item 4; 12.5%; Rank 9). This pattern shows that most of the listed challenges actually militate against effective teaching of computer Programming Language(LOGO) in the schools.

Table 1: Challenges faced by Nigerian teachers in teaching computer programming (LOGO)

S/N	ITEMS	Freq	%	Rank
1	Insufficient number of computers for teachers' use.	18	75	3
2	Insufficient number of computers for pupils' use.	15	62.5	6
3	Insufficient funds for purchase of equipment	18	75	3
4	Teachers' lack of interest/willingness to teach computer programming	3	12.5	9
5	Teacher's lack of expertise.	12	50	8
6	Lack of maintenance and technical staff.	15	62.5	6
7	Frequent electricity interruption	24	100	1
8	No enough supporting staff to supervise pupils'.	24	100	1
9	Problems in scheduling enough time for computer programming in different classes.	18	75	3
10	No time in teachers' schedule to explore different programming software	21	87.5	2

Discussion

The challenges militating against the teaching ofcomputer Programming Language (LOGO) in primary schools include lack of adequate staff to supervise pupils and insufficient time for teachers to explore programming software. Marshall, Elgort and Mitchell (2003) and Silica (2005) in their study reported that the most common challenges reported by all the teachers in their study was the lack of time they had to plan technology lessons, explore the different Internet sites, or look at various aspects of educational software. While this has been interpreted to mean that staff have not had the time to acquire the necessary skills in the use of technology in teaching, it now seems more likely that it reflects a sense of priority conveyed by the institution and a desire by academics to see a return on the investment of their time in developing their teaching delivery with technology. Also frequent electricity failure was found to be a great challenge. Adomi and Kpangban (2010) reported that electricity failure has been a persistent problem militating against ICT application and use in Nigeria. This makes the few schools with ICT facilities unable to use them regularly.

In this study, insufficient number of computers was also found to be a great challenge. Agbetuyi (2012) concluded that the vision to make Nigeria an ICT-compliant country in Africa is yet to be achieved because of insufficient number of computers and high cost of ICT facilities among others. Toprakci (2006) also discovered that low number of computers and scarcity of educational software in schools were barriers to successful implementation of ICT. This is in line with Reynolds, Treharne and Tripp (2003) who claimed that there was insufficient government investment in the development of computer studies in schools and not enough structure and support for how the subject was taught. According to Gulbahar (2005), using up-to-date hardware and software resources is a key feature to diffusion of technology. Inadequate funds to purchase equipment was also a major challenge as teachers claimed that government does not provide funds to purchase the equipment. This led to the problems of scheduling adequate computer time in different classes.

Mumtaz (2001) also states that many scholars proposed that lack of funds to obtain the necessary hardware and software is one of the reasons teachers do not use technology in their classes. A number of researchers have identified time limitations and the difficulty in scheduling enough computer time for classes as a barrier to teachers' use of ICT in their teaching (Beggs, 2000; Al-Alwani, 2005; Schoepp, 2005; Silica, 2005).

Another challenge observed in this study was lack of technical staff that can deal with maintenance issues and resolve technical problems which hinder learning. Pelgrum (2001) found that in the view of primary and secondary school teachers, one of the top barriers to ICT use in education was lack of technical assistance. Silica (2005) also found that technical barriers impeded the smooth delivery of the lesson or the natural flow of the classroom activity. According to Tella, Toyobo, Adika and Adeyinka, (2007), lack of ICT technical support may be attributed to limited number of people who are professional in the use of ICT equipment, coupled with the fact that integration of ICT in the school curriculum in Nigeria and Africa generally has just begin. People are just beginning to develop interest in the area and take it as a chosen field of study. It is assumed that, with time, more experts and ICT technicians will begin to emerge. When planning introduction of a new technology or when it is being used, technical support or support services generally are very important. The finding is consistent with that of National Centerfor Education Statistics (2000) which identified common challenges faced by teachers in their efforts to integrate technology into their curriculum as: 1) adequate time to identify and learn compatible and relevant software; 2) scheduling of access to computers; 3) adequate equipment and use; and 4) adequate and timely professional development.

In addressing some of these challenges, the teachers in the present study demonstrated a lot of initiatives. For example, in schools where they did not have sufficient computers, the teachers introduced sharing of learning space and drew the software interface on the chalkboard to explain the parts of the software and their uses, to show the pupils the home position of the turtle and to demonstrate the movement of the turtle to the pupils before they were engaged in the computer activities. This initiative influenced pupils' ability to ask questions, figure things out, plan ahead, develop self-reliance and approach the computer activities in a flexible manner, all for learning to take place. Other initiative to make learning possible in a school where there is generator teachers sometimes use their money to buy fuel (Premium Motor Sprit, PMS).

Conclusion

In conclusion, computer programming offers pupils to create and express themselves with the computer. Therefore, the challenges should not stand as obstacles to teaching programming at the primary school level of education because they can be addressed continuously in the process of teaching and learning.

Recommendation

1. Computer Programming should be included in the computer studies curriculum for primary education at six year of age, as pupils are able to read and write on their own and more opportunities for independent use become available with increasing language and literacy skills.
2. The Federal Government of Nigeria should resuscitate the power sector to ensure stable electricity supply.

3. As pupils are admitted to the primary level, it is important that they have access to a computer centre with a library of developmentally appropriate software because pupils need opportunity to make choices about some of their computer experiences.
4. Governments at the three tiers should enact policies to train teachers in the area of computer literacy.

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