An assessment of the problems associated with the teaching/learning of computer science education in a Nigerian institution

*Sam Egbe Ehondor¹ and Prince F.E.O. Omoruyi²

¹Edo State Institute of Management and Technology, Usen, Edo State, Nigeria.
²Faculty of Education, University of Benin, Benin City, Edo State, Nigeria.

Corresponding author’s email: omoruyi4christ4love@yahoo.com

Abstract

This study investigated the problems associated with the teaching and learning of computer science education. Data was collected from 50 respondents comprising of 10 instructors and 40 students randomly selected from the Edo State institute of management and technology. The analysis of data collected revealed that inadequate professionally trained teachers, inadequate computers, inadequate instructional resources, inadequate instructional resources, lack of motivation and incentive for teachers, lack of encouragement and motivation for the students, student apathy and indifference are problems associated with the teaching and learning of computer science education. It was recommended inter alia, that computer science teachers should be given appropriate pedagogical training to provide them with the requisite knowledge needed for efficient and better performance and the relevant instructional resources and support infrastructural facilities provided to ensure effective teaching and learning of computer science education at the institution.

Keywords: Computer science, education, teaching, learning, Nigeria

INTRODUCTION

Computer education technically in schools has become one of the most fast growing and far reaching developments in Nigeria (Okebukola and Ajewole, 1990). The transmission of information and instruction are now bending towards Computer technology. According to Okebukola (1990), the idea of using and studying computer in schools and its gradual acceptance started in the late 1960 even though computers have been around much earlier.

Computer is conceived as a device or machine designed specially to perform calculations, process data and store information which can be easily retrieved when required (Aghadino, 1990; Adamu and Bello, 2002). To Ahore (1990), computer refers to a device for executing precisely stated rules with accuracy, rapidity and with great reliability. On his part Adamu (1994), described computer as a machine used by human beings to solve problems. This probably explains the role of computer in processing information for dealing with certain problems confronting human kind. From the foregoing, it is obvious that computer is a device or machine designed to help process information or data and for storing such information for future use in dealing with problems of daily living. Computer education, on the other hand, Okebukola (1990) described as the learning that can lead to computer literacy. This implies that the aim of learning and teaching computer education is to make individual develop the knowledge and skills of computer application or use. Computer education is a learning process in which the individual is taken through the rudiments of using the computer to store and process data/information accurately and efficiently. The process seeks to equip the individual with skills and knowledge that can make him/her use the computer effectively (Adamu and Bello, 2002). Anyone who is literate in computer or has received computer education and instruction is expected to tell the computer what he wants it to do and, this according to Gboboniyi (1989), Aghedino (1990), and
Adamu and Bello (2002), include the ability to understand what the computer says. They add that to be literate in computer science amounts to being able to read, write and speak the language of the computer.

In modern world, the computer is being gradually applied in all aspects of human endeavour. It has been stressed that the application of computer will enhance effectiveness and efficiency in this rapidly growing and technologically changing world. Computer education is being advocated because it is almost certain that computer literacy will have as much impact on career opportunities in the fast growing information age (Adamu and Bello, 2002). The relevance of computer education is therefore, hinged on its utility value.

The National Policy in Education (NPE, 1981, revised in 1988, 1991, 1998 and 2004) introduced the teaching of computer science in Nigerian schools. The inclusion of the study of computer science in the school curriculum was aimed at providing opportunity for every student to become computer literate. The study of computer science has in effect, gained tremendous influence on the student and society. However, the use and study of computers in Nigeria is recent when compared to other parts of the world where computers have been in use in all facet of human endeavour including offices, schools, industries, research centre’s, communication, hospitals to mention but a few.

The complex nature of present day school situation has made transmission of information and instruction to students and the nature of learning and teaching in general more complex. This has made the role of the teacher in promoting learning more challenging. The new role does not just, involve mere transmission of information to students but also include looking at the problems associated with learning and instruction so that students can gain maximally from teaching and learning process. Computers are now used wherever there is a lot of data to be manipulated, where complex tasks must be managed or where there is need for real time access to centralized information from arbitrary locations such as in education, telemedicine, telecommunicating and in several other area (Adewopo, 1995). The study of computer in school is therefore, aimed at helping the students cope with modern technological development, equip them knowledge and competencies or skills of programme and administrative management as well as improve the learning process.

Students are expected to master the skills of computer appreciation or application and not just what it is and can do. Students are therefore, expected to be taught in such a way as not only to conceptualize and understand the computer, but also to be able to effectively manage their own learning, reinforce it and apply such knowledge or training in practical situation. This new approach has made the teaching of computer science a little bit more complex and challenging.

It has been observed that the teaching and learning of computer science in schools has not been quite easy. Often time, people talk about inadequate equipments, facilities, and computers instructional resources for learning and teaching exercise (Aghadino, 1990; Okebukola, 1990). It is believed that teaching of science in general and computer science in particular is beset with a number of problems (Adamu, 2000). The slow pace of learning and application of computer had been attributed to this. This presupposes that there are problems associated with the teaching and learning of computer science education. In the circumstance therefore, one is prompted to ask: what exactly is the situation? What are the problems associated with the teaching of computer science education? It is against this backdrop this study was designed to assess the problems associated with computer science education using a Nigerian institution as a case study.

Research Questions

In view of the focus of the study, the following research questions were raised and examined in the course of the investigation.

- What are the problems associated with the teaching of computer science education?
- What are the method(s) used in the teaching of computer science?
- How do the students rate the delivery mode in computer science education?

Method of Study

The study utilized the survey research design. Ten computer science teachers and forty students studying computer science and related course at the Edo state Institute of management and technology were randomly selected and used for the study. Computer Science is the specialization of the students used for the study. A questionnaire titled “Computer Science Education Teaching Assessment Questionnaire (CSETAQ) which sought responses on problems associated with the teaching of computer science in the institution, was the instrument used for gathering data for the investigation (see appendix). The data collected from the sampled population was analyzed using descriptive statistics comprising of frequency count, rank order, simple percentage and mean score. All items with a mean rating of 2.50 and above were regarded as problem associated with the teaching of computer science education in the institution. The highest mean score is 4.00. The accepted range is 2.50 – 4.00. an item mean score falls within the range is considered an accepted problem associated with
Table 1. Data on Problems Associated with the Teaching of Computer Science Education (N=50)

<table>
<thead>
<tr>
<th>S/N</th>
<th>Problems</th>
<th>Weighted mean</th>
<th>Mean Score</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inadequate Professionally trained computer teachers</td>
<td>157</td>
<td>3.14</td>
<td>Accepted as problem</td>
</tr>
<tr>
<td>2.</td>
<td>Inadequate computers</td>
<td>197</td>
<td>3.94</td>
<td>Accepted as problem</td>
</tr>
<tr>
<td>3.</td>
<td>Lack of support infrastructural facilities</td>
<td>152</td>
<td>3.04</td>
<td>Accepted as problem</td>
</tr>
<tr>
<td>4.</td>
<td>Inadequate instructional materials or teaching aids</td>
<td>194</td>
<td>3.88</td>
<td>Accepted as problem</td>
</tr>
<tr>
<td>5.</td>
<td>Poor instructional delivery</td>
<td>104</td>
<td>2.08</td>
<td>Not accepted as problem</td>
</tr>
<tr>
<td>6.</td>
<td>Poor teachers attitude toward the subject</td>
<td>107</td>
<td>2.14</td>
<td>Not accepted as problem</td>
</tr>
<tr>
<td>7.</td>
<td>General students apathy and indifference in computer science</td>
<td>128</td>
<td>2.56</td>
<td>Accepted as problem</td>
</tr>
<tr>
<td>8.</td>
<td>Lack of motivation and encouragement for students</td>
<td>153</td>
<td>3.06</td>
<td>Accepted as problem</td>
</tr>
<tr>
<td>9.</td>
<td>Lack of incentive and motivation for teachers.</td>
<td>181</td>
<td>3.62</td>
<td>Accepted as problem</td>
</tr>
</tbody>
</table>

Table 2. Rank Order of Mean Rating of Problems Associated with the Teaching/learning of Computer Science Education

<table>
<thead>
<tr>
<th>S/N</th>
<th>Problems</th>
<th>Mean Score</th>
<th>Rank Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Inadequate Computers</td>
<td>3.94</td>
<td>1</td>
</tr>
<tr>
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<td>3.62</td>
<td>3</td>
</tr>
<tr>
<td>4.</td>
<td>Inadequate professionally trained teachers</td>
<td>3.14</td>
<td>4</td>
</tr>
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<td>5.</td>
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</tr>
<tr>
<td>7.</td>
<td>General students apathy and indifference in computer science</td>
<td>2.56</td>
<td>7</td>
</tr>
</tbody>
</table>

The teaching/learning of Computer. To get the mean score for each item, the frequency of each level on the scale was first determined and multiplied by the point allocated to the level to get the weighted score. This was then divided by the number of respondents to get the mean score.

RESULTS

Table 1 shows that all the items except items Nos. 5 and 6 were considered or accepted as problems associated with the teaching and learning of computer science education in the institution. These items include inadequate professionally trained computer science teachers, inadequate computers, lack of support infrastructural facilities, inadequate instructional materials, general students apathy and indifference in computer science, lack of motivation and encouragement for students and lack of incentive and motivation for teachers.

The mean ratings of the items were ranked to determine their relative standing in terms of their level of seriousness. The mean rating of the items presented in Table 2 reveal that inadequate computers for teaching and learning rank first with a mean score of 3.94. This therefore means that it is considered the most serious or the greatest problem. This is closely followed by inadequate instructional materials or teaching aids which has a mean score of 3.88. The problem of lack of incentive and motivation followed with a mean score of 3.62. The problem of inadequate professionally trained teachers was 4th with a mean score of 3.14. This was followed by lack of motivation and encouragement for students which was 5th with a mean of 3.06. The 6th
problem was that of lack of support infrastructural facilities with a mean score of 3.04. The last problem accepted by the respondents was that of general student apathy and indifference with a mean score of 2.56. This is therefore, considered the least problem

The results on the issue of methods used in teaching computer science education are presented in Table 3.

The results in Table 3 reveal that item 1 and 2 were regarded as the dominant methods used in teaching computer science education. The traditional method of teaching has the highest mean score of 4.00. This is followed by discussion with practical display with a mean rating of 2.56. The use of demonstration method/explanation was not accepted as one of the methods used in teaching computer science. This has a mean rating of 2.14.

The results in Table 4 above show the percentage responses on the rating of delivery mode. It can be seen that 15 of the respondents representing 30 per cent indicated that the delivery mode is adequate and good. 30 of them or 60 per cent of the respondents stated that the delivery mode is fairly adequate. Only 4 of them or 8 per cent say the delivery mode is not adequate, while the remaining 1 representing 2 per cent indicated that the delivery mode is bad. This shows that the delivery mode for computer science education in the institution is fairly adequate.

Discussion of Results

Findings of the study have pointed out that inadequate computers for use and inadequate instructional materials or teaching aids are the most serious or critical problems associated with the teaching and learning of computer science education. This finding agrees with the views expressed by Adam and Bello (2002) who observed that one of the problems of computer science education in Nigerian schools is the lack of microelectronic support facilities like electricity which fluctuates. They stated that there is frequent power outage or blackout, adding that such situation does not urge well for effective computer education. Furthermore, they argued that most schools lack good or properly maintained ad managed computer room or laboratory. These are support facilities which make for effective and efficient computer education. A situation like this make students exhibit poor abilities in the application and practical use of the computer since it is capable of hindering effective teaching and learning. The graduates are, therefore, likely to be inadequately prepared. This probably explains why most graduates are good in theory work with very poor practical base. Many have had to go to roadside computer centre's to learn the practical aspect of the work because the practical aspect is most often not properly taught.

Lack of incentive and motivation in term of proper remuneration, retraining and provision of facilities for teachers who also found to be associated problem with the teaching and learning of computer science education. The lack of motivation and incentive is one thing that has been identified to be responsible for low morale and lack of interest and poor attitude of teachers towards teaching. Such situation undoubtedly, affects the input and subsequently, the outcome of the process. This problem explains why not many people take interest in teaching. It is therefore, not surprising to find that there are very few professional trained teachers in the area. Even the few that have acquired the requisite professional training prefer to take up appointment I the industries and companies rather than teach in the classroom.

In addition, the traditional method of teaching where the teacher explains the fact by talking and writing on the
board is still very much practiced. Computer science is practice based. The traditional method is therefore, not adequate in content delivery in such practical oriented subject. The fact that the teachers have clung fast to this old fashioned method of teaching in this case shows that they lack the requisite or pedagogical training in the teaching of computer science. Scholars all over the world have criticized this traditional content delivery mode. It is generally believed that it does not promote resourcefulness, ingenuity and creativity. To crown it all, all the lack of motivation and encouragement through the provision of adequate instructional materials and infrastructural support services for the students and general students’ apathy and indifference may be occasioned and worsened by the lack of professionally trained teacher’s facilities for the study of computer science education. The lack of motivation and incentives for the teachers and the unchallenging learning instructional materials may also have contributed to students’ apathy and indifference in the study of computer science education and, consequently, the poor learning of the subject.

CONCLUSION AND RECOMMENDATIONS

This study has examined the problems associated with the teaching and learning of computer science. The results have demonstrated that the respondents agree that inadequate professionally trained teachers, inadequate computers, inadequate instructional resources, lack of encouragement and motivation for the students, students apathy and indifference are problems hindering effective teaching and learning of computer science. In order to enhance the teaching and learning of computer science education therefore, the following recommendations are hereby proposed.

Computer teachers should be given appropriate pedagogical training to provide them with the requisite knowledge needed for efficiency and better performance. Relevant instructional resources and support infrastructural facilities should be provided that will help ensure effective teaching and learning as well as adequate mastery of both the theory and the practical aspects of the course.

The teachers of computer science should be provided retraining that will expose them to modern and more diagnostic and pragmatic delivery mode that will foster mastery and development of the required competence in computer application in the students.

The students should be encouraged and motivated through the provision and exposures to computers to enable them carry out their practical work when necessary.

Computer science teachers should also be motivated through proper remuneration and incentives. They should be provided a conducive atmosphere to operate and rewarded for excellence as a means of raising their morale and motivating them for better performance.

Good laboratory or computer centre, properly organized, managed and maintained should be established. A good maintenance culture must be put in place to ensure that computers provided are guided properly and prevented from being stolen or damaged.

References


Adegbiya MV (2011). The learning process and collaborative teaching for rebranding the Nigerian educational system. In K.

Adeyemi, B Awe (eds), Rebranding Nigerian Educational System (pp 3-17). Lagos National Open University Commission.


