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Challenges and Improvement Strategies of Computer Science Programme in Nigerian Polytechnics in Post COVID-19 Era

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Abstract

This paper is based on the study conducted in 2021 to identify and analyze the challenges facing Computer Science Programme in Nigerian Polytechnics and improvement strategies. Survey method was used for the study and data was collected from 180 Computer Science Lecturers, Technologists and students through questionnaire. The respondents were selected from Federal Polytechnic Oko, Federal Polytechnic Nekede, Federal Polytechnic Ado-Ekiti, Federal Polytechnic Bida and Federal Polytechnic Kaduna. The study results showed that 58.33% of the respondents agreed that the traditional learning method used affect learning negatively while 88.88% agreed that lack of learning facilities pose big challenge to Computer science programme. The results also showed that the respondents agreed that over population of students in classroom, lack of qualified academic staffs, lack of incentive for academic staffs, lack of encouragement of students, poor conduction of practical and execution of projects negatively affect Computer Science programme at corresponding percentage of 91.11%, 61.11%, 56.66%, 75%, 69.94% and 63.88%. All the respondents agreed that instability in academic calendar and students' non-seriousness negatively affect Computer Science programme. Improvement strategies based on the findings of the study includes: use of qualified lecturers and technologists (academic staffs), modification of the learning method, regular training of academic staffs, provision of facilities and incentives to academic staffs, encouraging students through scholarships, reduction of number of students in class to 40, integration of time management in the curriculum and adoption of online dispute resolution. It was recommended that the strategies be adopted in order to improve learning in this post COVID-19 era.

Keywords: Computer Science Programme, traditional learning method, challenges, improvement strategies, post COVID-19 era.

Introduction

In recent times, Nigeria graduates suffer from unemployment and the unemployment rate increased to 45% as at (Ezetoha and Ohaneme 2019). Graduates of professional courses such as Computer Science are also unemployed even though they are already equipped to be self employed because of the skills they have acquired during the course of their undergraduate programme. These skills are higher order skills and include program design, coding, deployment and implementation skills and other graduate skills (Ezetoha and Ohaneme 2019)

The unemployment of Computer Science graduates may be as a result of lack of knowledge and skills due to bad

curriculum used (Fairtest, 2012) or their non-seriousness during undergraduates programme.

To determine the cause of non-acquisition of the graduate skills, it is necessary at this point to study how computer Science programme is run in Nigeria Polytechnics and how to improve it.

Further, COVID-19 brought total lockdown in Nigeria from March to October 2020 (Ezetoha & Nwankwo, 2020). Learning in the institutions was disrupted for the period of lockdown. In addition, learning was rushed when polytechnics reopened after the lockdown in view to covering the areas missed during the lockdown. So, the knowledge and skills meant to be acquired by students during the lockdown and immediately afterwards may not have been fully acquired and this may have contributed to the poor acquisition of higher order skills. On this background, this study was carried out to identify and analyze the challenges facing Computer Science Programme in Nigerian Polytechnics and to improvement strategies.

Materials and Methods

Study Design

Quantitative research approach was adopted for investigating the research problem.

Study Sample

The sample population comprises of 180. Computer Science Lecturers (42), Technologists (21) and students (117) from 5 Federal Polytechnics in Nigeria. The Polytechnics include; Federal Polytechnic Oko (FPO), Federal Polytechnic Nekede (FPN), Federal Polytechnic Ado-Ekiti (FPA), Federal Polytechnic Bida (FPB) and Federal Polytechnic Kaduna (FPK).

Data Collection

The data for the research was collected through questionnaire administered to the respondents in February/March 2021.

The questionnaire comprises of two parts, part A and B. Part A consists of questions on demographic information of the respondents. Part B consists of questions on the challenges of computer science programme in Nigerian polytechnics. The questions were well-structured and constructed based on the researchers experience in the field.

Data Analysis

Statistical tool; percentage measure was used for data analysis.

Results

General and Demographic Characteristics s

180 out of 220 respondents comprising of Computer Science Lecturers, Technologists and Post graduates students participated in the study. The target was to reach 100 who were qualified to take part in the investigation. However it was not possible to achieve 100% coverage of the target sample because some of the respondents were ignorant of the topic. The general and demographic characteristics are shown in table 1.

Table 1 General and Demographic Characteristic

	No of Respondents	Percentage of respondents (%)
INSTITUTION		
FPO	52	28.89
FPN	48	26.67
FPA	35	19.44
FPB	23	12.78
FPK	22	12.22
STATUS		
Lecturer	42	23.33
Technologist	21	11.67
Students	117	65.00

Challenges of Computer Science Programme in Nigerian Polytechnics

The study results showed that 58.33% of the respondents agreed that the traditional learning method comprising of class lecture, take-home assignments, essay-type examination, laboratory practical, project, tutorials and SIWES used affect learning negatively while 88.88% agreed that lack of learning facilities pose big challenge to Computer science programme. The results also showed that the respondents agreed that over population of students in classroom, lack of qualified academic staffs, lack of incentive for academic staffs, lack of encouragement of students, poor conduction of practical and execution of projects negatively affect Computer Science programme in corresponding values of 91.11%, 61.11%, 56.66%, 75%, 69.94% and 63.88%. All the respondents agreed that instability in academic calendar and students' non-seriousness negatively affect Computer Science programme. The detailed result is shown in table 2.

Table 2: Challenges of Computer Science programme in Nigerian Polytechnics

Challenges	No of participant	% no. of participant
Unsuitable learning method	105	58.33%
Lack of facilities	160	88.88%
Students' overpopulation	164	91.11%
Instability in calendar	180	100%
Lack of qualified staffs	110	61.11%
Student's non-seriousness	180	100%
Lack of incentives	102	56.66%
Lack of encouragement	135	75.00%
Inadequate practical	125	69.94%
Poor Project execution	115	63.88%

Discussion

The questions asked in the questionnaire were based on experiences and observations of the researchers on learning method for Computer Science programme in Nigerian Polytechnics. Lecturers from the five federal Polytechnics in Nigeria were selected because they are seen as the good Polytechnics in Nigeria where one can study. The Polytechnics were selected from both Southern and Northern parts of Nigeria in order to represent national character. Lecturers, technologists and students were used because they are knowledgeable enough about Computer Science Programme.

The study by using the survey approach tried to evaluate the problems associated with Computer Science Programme in Nigeria. The result showed that majority of the participants 105(58.33%) agreed that traditional teaching method negatively affect Computer Science programme in Nigerian Polytechnics. Traditional Face-to-face method of teaching/learning does not allow students-centered learning known as constructivist approach (Bitter and Pierson, 2002). The essay type and multiple choice test used for examinations and quizzes are unsuitable for assessing higher order learning (Ezetoha and Onyemaobim, 2016; McNeil, Gosper and Xu, 2012) as they support the reproduction of information from lectures or textbooks.

The results indicated that 160 (88.88%) of the respondents agreed that lack of necessary learning facilities negatively affects Computer Science Programme. Generally, lack of equipment/laboratory materials, poor standard classroom and lack of text books affect learning (Oluremi and Olubukola, 2013).

The results also showed that 164 (91.11%) of the respondents agreed that over population of students in classes negatively affects Computer Science Programme. Over population of students as observed in Nigerian *institutions* and lecture halls (Clark, and Ausukuya, 2013) also contribute to insufficiency in learning facilities. Again, large number of students in class negatively affects learning (Oweye, 2000)

The result of the respondents 180 (100%) showed that disruptions in learning due to instability in academic calendar, strike actions and cult activities negatively affects Computer Science programme. The insufficient lectures received by students as a result of disruptions, negatively affects higher order learning (Tsindou, Vassilis and Panos, 2010).

The result indicated that 110 (61.11%) of respondents agreed that the use of unqualified Lecturers and Technologists negatively affects Computer Science Programme. Some of lecturers and technologists in Computer Science departments are not qualified and thus finds it difficult to teach some of the courses in the curriculum. Again the

unqualified technologists find it difficult to handle practicals. Ineffective knowledge and skills are impacted on the students as a result of poor quality lectures and practicals received (Tsinidou, Vassillis and Panos, 2010).

The results also showed that 180(100%) of the respondents agreed that non-seriousness of the students negatively affect Computer Science Programme. The non-seriousness of the students may involve missing of lectures, lack of interest on study/learning and copying of assignments. Non-seriousness on learning leads to poor performance (Bagongon and Ryan, 2007).

The result also showed that majority of the respondents agreed that lack of incentive for academic staff, lack of encouragement of students, poor conduction of practical and execution of projects negatively affect Computer Science programme in corresponding values of 56.66%, 75%, 69.94% and 63.88%.

Improvement Strategy

Improvement strategy based on the findings of the study includes:

- Use of qualified lecturers and technologists (academic staffs)
- Modification of the learning method with online learning
- Regular training of academic staffs
- Provision of facilities and incentives for academic staffs
- Encouraging students through scholarships
- Reduction of number of students in class to 40
- Integration of time management in the curriculum
- Adoption of online dispute resolution

Combination of traditional face-to-face and online learning methods (web-based blended learning) will improve Computer Science Programme. Web-based blended learning provides students the means to learn in different ways (Twigg, 2003) and environment that generally involves a mixture of instructional modalities, delivery media, instructional methods, and web-based technologies (Graham, 2006). In addition provision of incentives to academic staff, learning facilities, use of qualified academic staffs, regular training of staff and encouragement of students

through scholarships will improve Computer Science Programme in Nigerian Polytechnics (Ezetoha & Okechukwu 2016). Integration of time management in the curriculum will make students to manage their time effectively while adoption of online dispute resolution will bring about timely resolution of crisis between workers and government.

Conclusion

The study on the challenges of Computer Science Programme in Nigerian Polytechnics and improvement strategy has been successfully carried out. The results of the study has indicated that the use of unqualified lecturers and technologists, assessment method currently being used, student non-seriousness and poor learning facilities are the major challenges of Computer Science Programme in Nigerian Polytechnics. Finally the improvement strategy based on the results such as use of qualified lecturers and technologists (academic staff), modification of the learning method, regular training of academic staff, provision of facilities and incentives to academic staff, encouraging students through scholarships, reduction of number of students in class to 40, integration of time management in the curriculum and adoption of online dispute resolution were provided.

Recommendations

3. It is recommended that the improvement strategy provided in this work be adopted for improving the Computer Science Programme in Nigerian Polytechnics since it has the potential of overcoming the problems associated with the learning method.

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