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Influence of Instructional Resources on Academic Performance of Junior Secondary School Students in Computer Science

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Abstract

Instructional resources are major complementary and supplementary resources which aid effective instructional delivery. Therefore, the objective of this study was to investigate the influence of instructional resources on the academic performance of Junior Secondary School students in Computer Science in Egor local government area of Edo State. The population comprised all Junior Secondary School teachers and students in the Local Council. Purposive sampling technique was used to select 200 JSS 1 students and six Computer Science teachers for the study. The instruments were a self-structured checklist and a Computer Science achievement test. The data were analysed using mean, standard deviation, T-test and chi-square. The findings indicated that the sampled schools had no good and functional instructional resources for teaching Computer Science except competent teachers of the subject who were available in the schools. The study found no significant difference in the provision of instructional resources for teaching Computer Science between public and privately owned junior secondary school in the area. It was also established that availability of resources had on influence on the academic performance of students in Computer Science. Based on the findings, it was recommended that government and private school owners should ensure the provision of a well-equipped computer science laboratory and computer related facilities.

Keywords: Instructional Resources, Academic Performance, Junior Secondary School Students, Computer Science

Introduction

Education has been described as the bedrock of any civilized society and a major instrument for human capital development. Chijioke (2013) stated that education was central to economic growth, and any country that wished to thread on the path of growth must be ready and willing to consciously and passionately appropriate a substantial part of her resources to the educational sector development. This implies that qualitative and sound education can only be possible when the right human and material resources are provided to drive the sector.

Instructional resources are often described as those materials which facilitate teaching and learning. There are various ways of classifying instructional resources. For example, Syengo et al (2016) categorised instructional resources as primary (such as relia), secondary (which included models and materials preserved for future use) and

tertiary resources (which were basically a two dimensional representation of real objects). Noun (2009) categorised instructional resources into seven groups which comprised physical/material resources, time resources, human resources, financial resources, information and communication technology resources, community resources and fundamental/supporting resources. However, no matter how learning resources are classified, what is important is that they entail all important educational tools, human or non-human, employed in the teaching-learning process which help to facilitate learning. This is irrespective of the subject, topic and age of learners whose behavioural change is targeted. Scholars have over the years stressed the need for active involvement of learning resources in the teaching of any subject including Computer Science, if the effective teaching-learning outcome is to be attained.

The role of Computer Science in contemporary society cannot be over emphasized. It has come to transform all facets of modern existence with its application in solving problems of today and helping to project into the future through its application in other fields of human endeavour. It has been emphasised that nations which have fully integrated computers into their educational systems have soared higher in terms of economic development (Mwaniki, 2007). Adeogun (2001) established that students' academic performance was enhanced after being taught by trainee teacher who were exposed to instructional media production. Schools with enhanced instructional resources have higher chances of improved academic achievement than those which do not have. For example, Eme et al (2015) noted that instructional resources positively impacted on the learning outcome of students. This stamen was affirmed by the marked differences noted in the performance in Computer Science by Bawa (2016) and in Chemistry by Adalikwu and Iorkpilgh (2013) between groups exposed to instructional resources and those which were not exposed to the same resources. Computer Science, by its nature, is a science subject and the suggested methods of teaching it require both theoretical and practical interactions with other materials and teaching aids such as a computer and its accessories.

In Nigeria, reasonable computer education in secondary schools is far from being realised when considered in terms of the provision of instructional resources in schools with respect to student-computer ratio, government funding and low numbers of skilled Computer Science teachers to drive the process (Jegede & Owolabi, 2003). This is comparable to Kenya's predicament where Macharia (2013) noted that although connections to electricity were adequate, other resources needed to drive the implementation of Computer Science in secondary schools such as UPS, backup generators, scanners, computer laboratories, funding and trained computer science teachers were either not available or were inadequate. Oladimeji et al (2018) conducted a study on secondary schools in North East Zone of Nigeria and reported that Computer Science resources were not adequately provided both in terms of trained manpower and adequacy of content. This situation seems to cut across all the levels of education as noted by Syengo et al (2016). Primary schools face similar challenges due to lack of electrical resources to support learning. In Nigeria, the Junior Secondary School which takes the first three years of secondary education is pivotal to the nation's educational system on two major premise: first, it builds on the basic knowledge acquired in the primary education and second, it serves as a medium for equipping the child with both diverse basic and prevocational skills. Based on these roles, it is therefore, pertinent to

investigate the influence of facilities on students' academic performance especially at the Junior Secondary School level.

Statement of the Problem

The provision of the appropriate instructional resources like computers in the school has been perceived as a major vehicle for an effective instructional delivery. However, the non-availability/ inadequacy of such resources has affected the smooth teaching and learning process in all schools. Over the years, it has been noticed that the academic performance of each student in any school subject is largely contingent upon the resources such student is exposed to while learning. Teaching of Computer Science in schools, especially at the Junior Secondary School level, is more of theoretical memorisation of concepts than experiential activities. Thus, it is a school subject which requires the use of varieties of instructional facilities/resources such as functional computer, computer laboratory, computer accessories, electricity, among others. It appears that computer resources seem to be lacking in schools, and even when they are provided, they are usually grossly insufficient for teaching /learning hence, the teacher has no choice than to rely on verbal presentation of the lessons. As a result, the active mental engagement of learners in practical activities is absent or non-existent. What seems bothersome is that despite the nation's quest for and verbal projection of becoming one of the leading black nations in terms of technological growth, the stakeholders seem oblivious of the need to 'catch them young' by laying emphasis on practical computer driven education backed up with the right instructional resources. It is against this backdrop that the current study investigated the influence of instructional resources on academic performance among Junior Secondary School students in Computer Science.

Research Questions

The following research questions were generated to drive the study:

1) What instructional resources are available for the teaching of Computer Sciences in Junior Secondary Schools in Egor Local Government Area?
2) Are there differences in the provision of instructional resources for teaching Computer Science between public and privately owned Junior Secondary Schools?
3) Does the availability of instructional resources influence the academic performance of Junior Secondary School students?

Hypotheses

Research question 1 was answered while questions 2 and 3 were hypothesized

1) There is no significant difference in the provision of instructional resources for teaching Computer Science between public and private Junior Secondary Schools in Egor Local Government Area.
2) The availability of instructional resources does not significantly influence the academic performance of Junior Secondary School students in Computer Science.

Methods

The research design used in this study was a survey which adopted the expo facto design. The population of the study comprised all the students and Computer Science teachers in

both public and private Junior Secondary Schools in Egor Local Government Area of Edo State. The sample was 200 JSS one students and six (06) Computer Science teachers, who were selected from six Junior Secondary Schools (three (03) each from private and public secondary schools) in Egor L.G.A through purposive sampling. The instrument for the study was a self-structured "Computer Science Achievement Test" and a checklist which was systematically arranged to collect test scores in Computer Science from the students and availability of instructional facilities in the schools. The face and content validity of the instrument was established by three experts in Education and Computer Education. The instrument was further subjected to a pilot test on fifty (50) respondents (students) and two teachers in two schools outside the Local Government Area of the study. The Kuder-Richardson 20 reliability statistics was used and it gave a value of 0.70. A total of six checklists and two hundred (200) Computer Achievement Test were administered to 200 students and six Computer Science teachers in the six (6) Junior Schools used for the study. The data collected were analysed using mean and standard deviation for the research question. A normative mean value of 1.00 -1.49 was regarded as not available. 1.50-2.49 implied available but not adequate; 2.50-3.49 implied available and adequate; and 3.50-4.00 which implied available, adequate and functional was used to answer research question one. The independent sample t- test was used to test hypotheses one while Chi-square statistics was used to test hypothesis one. All the hypotheses were tested at 0.05 level of significance.

Results

Table 1: Instructional Resources are Available for Teaching Computer Science in Junior Secondary School in Egor Local Government Area

Instructional resources/aids	**Mean**	**Standard deviation**	**Level of adequacy**
Availability of a spacious computer room/ laboratory	1.45	0.67	NA
Power supply to the computer room			
Availability of a generator	1.25	0.89	NA
Qualified Computer Science teachers	1.38	0.79	NA
Availability of good computers	3.50	0.47	AF
	1.30	0.86	NA

Key: AF = available and functional; NA = Not available

Table 1 showed that the respondents indicated that the school had no spacious computer room/ laboratory, power supply to the computer room, generator to power computers and good computers. However, it stated that there were qualified Computer Science teachers in the schools sampled**.**

Table 2: Independent sample t –test of the Difference in the Provision of Instructional resources for Teaching Computer Science in Public and Privately Owned Junior Secondary Schools in Egor Local Government Area

Instructional resources	N	Mean	Standard deviation	t	p-value	Remark
Public school	3	13.67	4.65	-1.621	0.890	Not significant
Private school	3	14.46	3.35			

Table 2 showed a t value of -1.621 and a p value of 0.890. Testing at alpha level of 0.05, the p value was higher than the alpha level. Therefore, the null hypothesis which stated, that "there is no significant difference in the provision of instructional resources for teaching Computer Science between public and privately owned Junior Secondary Schools in Egor Local Government Area" was retained.

Table 3: Chi-Square of the Influence of the Availability of Instructional Resources on the Performance of Junior Secondary Schools in Computer Science in Egor Local Government Area

		Score			Total
		Low	Moderate	High	
Instructional Resources	Available and Functional	21(10.0)	37(41.5)	10(16.5)	68
	Not available	0(19.2)	84(80.4)	48(32.4)	132
Total		21	121	58	200

Chi-square = 9.793; p = 0.007; Eta value = 0.489

Table 3 showed a Chi-square value of 9.793 and a p value of 0.007. Testing at alpha level of 0.05, the p value was less than the alpha level. Therefore, the null hypothesis, which stated that "The availability of instructional resources did not significantly influence the academic performance of Junior Secondary School students in Computer Science in Egor L.G.A" was rejected. Consequently, the availability of instructional resources did significantly influence the academic performance of Junior Secondary School students in Computer Science in Egor L.G.A. The Eta value of 0.489 indicated that instructional facilities accounted for about 48.9% of Junior Secondary School students' performance in Computer Science in Egor Local Government Area.

Discussions of Findings

The study revealed that there was no provision for instructional resources such as spacious computer room, power supply, generator and good computers for practical computer teaching in the schools. The finding was in agreement with Jegede and Owolabi, (2003) which revealed that reasonable computer education in secondary schools was far from being realised when considered in terms of the provision of instructional resources in schools with respect to the numbers of students to the computer ratio and government funding. It also corroborated Macharia (2013) study, which showed that resources needed to drive the implementation of Computer Science in secondary schools such as UPS,

backup generators, scanners, computer laboratories, funding and trained Computer Science teachers were inadequate in Kenya. However, the difference between this current study and earlier studies (Jegede & Owolabi, 2003; and Macharia, 2013) was that schools in this study had qualified computer science teacher to teach the subject.

Furthermore, the study revealed that there was no significant difference in the provision of instructional resources for teaching Computer Science between public and privately owned Junior Secondary School in Egor L.G.A. This current study was at variance with Babayomi (1999) findings who revealed that private schools performed better than public schools due to the availability and adequacy of teaching and learning resources. In addition, the current study revealed that the availability of instructional facilities significantly influenced the academic performance of Junior Secondary School students in Computer Science in Egor L.G.A. The study therefore, indicated that instructional resources accounted for about 48.9% of Junior Secondary School Student's performance in Computer Science in Egor L.G.A. This study lent credence to Bawa (2016) study which noted a significant difference between students taught with instructional materials and those taught with conventional materials. It also corroborated Adalikwu and Iorkpilgh (2013) who found that Chemistry students taught with instructional materials, performed significantly better than those taught without instructional materials and also that the use of instructional materials generally resulted in improved comprehension of concepts and led to high academic achievements.

Conclusion

In conclusion, the findings of this study suggest that though government and some private school owners employ computer science teachers, such positive steps are not supported with adequate provision of instructional aids and facilities that make them perform their job effectively. Therefore, students' performance in the subject can only be enhanced if computer science teachers are made to utilize appropriate and relevant instructional materials while teaching the subject in Junior Secondary schools.

Recommendations

Based on the finding, the following recommendations were made:

1. Government and private schools' owners should ensure adequate provision of well-equipped computer laboratories and computer related facilities in their respective schools.
2. All levels of government and other stake holders in the educational sector should ensure implementation of national guidelines on ICT in our secondary schools.

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