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ASSESSMENT OF AVAILABLE BASIC TECHNOLOGY INSTRUCTIONAL RESOURCES AND THEIR FREQUENCY OF USE BY BASIC SCHOOLS TEACHERS IN ILORIN, NIGERIA

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Abstract

This work focused on assessment of instructional resources for teaching basic technology in upper basic schools in Ilorin, Nigeria. Basic Technology Resources Availability Checklist of the NERDC (2007) was employed for the available instructional resources while all the 91 Basic Technology teachers in the 109 public upper basic schools in Ilorin Nigeria responded to the frequency of use. Three research questions were answered using frequency counts, means and percentages and the hypothesis was tested using t-test. Findings showed that 3,280 (45.02%) instructional resources were available, 4,006 (54.98%) were not available while 1,340 (40.85%) were frequently used, 548 (16.71%) were seldom used, while 1,392 (42.44%) were not used. The hypothesis testing indicated significant difference that qualified teachers utilized the available instructional resources than unqualified teachers. It is recommended that: Curriculum planners and policy makers should make provisions for specific instructional resources needed in schools; Seminars and workshops should be organized for teachers on how to use instructional resources in schools; Government officials and agencies should assess the quality and quantity of instructional resources that are provided in schools.

Keywords: Basic Technology, Instructional Resources, Frequency of Use, Teachers in Ilorin, Nigeria, Qualification of Teachers

INTRODUCTION

The Federal Republic of Nigeria introduced the 6-3-3-4 system of education, to provide the trainees at each educational tier with practical skills, art and craft in pre-vocational and vocational fields Nigeria National Policy on Education, Federal Republic of Nigeria, (FRN, 2009). Technology can help student learn, both in short, simple lessons and as an integral part of larger, more complex, projects. Technology as a part of classroom activities can motivate students and allow them to learn and share their understanding in a variety of ways.

Basic Technology is an essential skills, knowledge or method applied to a subject or an activity. Jimoh, Amao, Olaseyinde and Musa (2003) as cited by Issa (2004) defined Technology as the product of science; it is the application of scientific, laws and principles to satisfy human need. The Basic Technology curriculum provides that the teaching and learning of the subject should be both theoretical and practical in nature (NERDC, 2007). As a skill oriented subject, whose major aim is to expose the learners to the rudiments of technology, it is very necessary that it should be taught with equipment. This will enable the learners to gain awareness; appreciation and orientation into technology; thus enabling them develop further or choose a trade.

The National Commission on Colleges of Education (NCCE) at its meeting in Ibadan in December 2005 directed the Nigerian Educational Research and Development Council (NERDC) to carry out this assignment. The NCCE also approved a new curriculum structure namely:

1. Lower Basic Education Curriculum (Primary 1-3)
2. Middle Basic Education Curriculum (Primary 4-6)
3. Upper Basic Education Curriculum (JSS 1-3) with subject listings.

In general, the curriculum pays particular attention to the achievement of the MDGs and the critical elements of NEEDS. It is generally agreed that development could only be meaningful if and when it is science and technology driven. As such, countries of the world are now categorized as developed, developing or underdeveloped as a result their scientific and technological attainments. Hence, the incorporation of Basic Science and Technology as a core subject in the 9 year Basic Education Programme. The purpose is to contribute to the achievement of the National Education goals by:

1. Inculcation of technological literacy, that is the basic understanding of and capability in technology
2. Exposure of students to the world of work to match their talents and interest for wise vocation choice and
3. Inculcation of positive attitudes towards work as a source of human identity, livelihood and power (NERDC, 2007; p. iv).

The curriculum suggests the use of Information and Communication Technology (ICT) and instructional resources to facilitate teaching and learning. The National Policy on Education (FRN, 2009) recommended Basic Technology as a way of life and the gateway to industrialization and it is accepted as a vehicle of productivity, social and economic development. Basic Technology was established in direct response to the country's need for skilled innovations and technological oriented man-power resources for the development of a technologically based economy. NERDC, (2007) suggests some useful and relevant instructional resources to prevent the teachers from wasting too much of time in explaining abstract.

The place of instructional resources in successful implementation of the curriculum cannot be over emphasised, they provide channels through, which information or messages can be disseminated to the learners. Instructional resources are critical ingredients in learning which provide information, organise the scope and sequence of information presented, and provide opportunities to pupils to use what they have learnt.

The learning resources that enhance pupil learning are textbooks, teacher guides, supplementary readers and other learning aids. Because textbooks deliver the curriculum, they are the single most important instructional resources. Nothing has ever replaced the printed word as a key element in educational process at all level of education. When the textbooks are available, instructional time is not wasted.

Since it is very obvious that technology plays a key role in the development of any nation, it is therefore very important as well to assess the level of preparedness of our country in terms of provision of the required instructional resources for the teaching of Basic Technology.

Quality teachers are often seen simply as good teachers and are considered to be those who exhibit desirable traits and uphold the standards and norms of the profession. They are also considered to be those who bring about student learning. These teachers are called effective (Berliner, 1997, 2005) or successful teachers (Fenstermacher & Richardson, 2005). In order to show how important the teacher's qualification is, the National Policy on Education of the country stipulates the minimum qualification for entry into the teaching profession as the Nigeria certi-

cate in Education (NCE) (FRN, 2009). This was further corroborated by the National Commission for Colleges of Education (NCCE) which was established by an act in 1989.

The mandate of the commission include the laying down of rules and regulations that will be guiding all programmes of teachers' education, accreditation of certificate and academic awards including guidelines for approval. The NCCE (2002) listed the qualification of academic staff thus:-

- (a) Every academic staff shall be a professionally qualified teacher (a minimum of NCE or PGDE)
- (b) A good bachelor's degree (not less than a second class lower division) in the relevant disciplines as the minimum qualification for appointment as lecturer III or its equivalent.
- (c) HND holders with a minimum of a merit are qualified to be appointed as instructors.
- (d) Higher degrees or additional professional qualification in the relevant discipline are added advantages.

It is however very sad that majority of people who are teaching Basic Technology in most of the junior secondary schools in the country today are not professionally qualified to teach it. According to a research conducted by Thomas (2002) and cited by Abolade (2007) carried out a study on professionally qualified teachers in senior secondary schools in Kwara State. Thomas (2002) found out that, the number of unqualified teachers out-numbered that of the qualified ones. It was then concluded that professionally qualified teachers were in short supply as most of them in secondary schools had not been adequately prepared for teaching.

Munzali (1997) cited by Ibrahim (2007) viewed professionally qualified teacher as a person who has successfully gone through a well-designed educational programmes in recognized institution(s), professionally prepared and practices the act of teaching in accordance with the accepted professional principles. It is however a professionally trained teacher that will have the knowledge of acquiring knowledge and how to impart it to others. This cannot be done or will poorly be done by non-professionally qualified person.

Statement of the Problem

Several research works have been carried out in the areas of availability and use of Instructional materials and the influence of instructional resources on the academic performance of students and these includes: Yusuf (2004) investigated the attitude of junior secondary school teachers and the use of community resources in social studies in Ilorin. Abolade (2007) conducted a study on the assessment of standard facilities available for teaching and learning of Chemistry in secondary schools in Kwara central Senatorial district. Ogunyemi (2004) also studied infrastructures for effective teaching of Introductory Technology in Nigeria junior secondary schools in Lagos State. Their findings revealed that facilities and infrastructures were in short supply.

Very close to this study is that of Ibrahim (2010) worked on assessment of instructional resources for teaching basic technology in junior secondary schools in Ilorin Kwara State using a researcher's designed instrument. The study examined whether human and non human resources were available for teaching Basic Technology and whether teachers improvise the instructional resources that are not available in their schools with concern for the variable of school proprietorship. The findings revealed that public schools had more human and non-human resources than private schools. However, the issue of frequency of use and the qualification of teachers were not addressed.

Most of these studies were carried out on Lower basic schools and precisely on the use of electronics and visuals in the teaching of Basic Technology. Results revealed that teaching of Basic Technology becomes meaningful when using instructional media to carry out teaching and learning using different instrument. Therefore, this study focussed on assessment of instructional re-

sources for teaching Basic Technology in upper basic schools in Ilorin metropolis with particular attention to frequency of use and the qualification of teachers.

Purpose of the Study

The purpose of this study was to assess instructional resources that are available for teaching Basic Technology at upper basic schools level in Ilorin metropolis and also to know if they are adequately used to facilitate teaching and learning. Specifically, the study sought to:

1. Identify the types of instructional resources available for teaching Basic Technology in upper basic schools in Ilorin metropolis;
2. Examine the extent to which the instructional resources are being used by teachers of Basic Technology in Ilorin metropolis;
3. Find out if there is any difference in the extent to which instructional resources are used by qualified and unqualified teachers of Basic Technology

Research Questions

The following research questions were generated in the study:

1. What types of instructional resources are available for teaching Basic Technology in upper basic schools in Ilorin metropolis?
2. What is the extent to which teachers use the available resources in teaching Basic Technology in upper basic schools in Ilorin metropolis?
3. Is there any difference in the extent to which instructional resources are used by qualified and unqualified teachers of Basic Technology in upper basic schools in Ilorin metropolis?

Research Hypothesis

The study tested only one hypothesis:

H₀₁: There is no significant difference in the extent to which instructional resources were used by qualified and unqualified teachers of Basic Technology in upper basic schools in Ilorin metropolis.

METHODOLOGY

The study was concerned with the assessment of instructional resources for teaching Basic Technology in upper basic schools in Ilorin metropolis. A descriptive method of the survey type was employed for the study. It covered all basic technology teachers in Ilorin, Nigeria, which consists of three Local Government Areas. These are Ilorin-East, Ilorin-West and Ilorin-South. All the schools and their teachers constitute the study sample. Purposive sampling technique was used to sample all the 91 teachers in 109 public upper basic schools. Major focuses were on instructional resources from the perspectives of their availability and extent of use by qualified and unqualified teachers.

The Instrument used for the study was a Basic Technology Resources Availability Checklist adopted from the NERDC (2007) to determine the availability of instructional resources in the schools and subsequently used to find out the frequency of use by the teachers. The instrument consist of three sections: section A requested for basic information about the respondents including the qualifications, section B consist of the resources availability checklist recommended by NERDC (2007) for teaching Basic Technology in upper basic schools. It was used to investigate the degree of utilization of resources in the selected schools.

For the reliability and validity of the Instruments, The NERDC (2007) document is assumed to have been validated but as a means of ensuring that the research instrument measures what it is

intended to measure, the section A and C of the instrument was discussed with colleagues, five Basic Technology teachers and lecturers in the department of Educational Technology, University of Ilorin for comments and views on the face and content validity. In order to achieve the reliability of the research instrument, it was initially administered to 30 Basic Technology teachers in upper basic schools in Ogbomoso, Oyo State, Nigeria and was collected immediately. These teachers were not part of the main sample. After an interval of two weeks, it was re-administered to the same respondents. The two scores were correlated using Pearson Product Moment Correlation Coefficient, the value obtained was 0.97 at 0.05 significant level. The calculated significant level was considered high enough, hence the instrument was accepted as reliable and suitable for this study.

To carry out the real study, the researchers personally visited the schools' Basic Technology workshops with the checklist to assess the available resources and also administered the questionnaire to the teachers having sought for permission of the school authority and other personnel involved. The completed questionnaire was collected immediately from the respondents for analysis. The data collected were analyzed using descriptive statistics of frequency count, mean and percentages while the only hypothesis was tested using t-test.

Clarification of Major Terms and Variables

The following terms were operationally defined for the purpose of this study:

Availability: existence of the instructional resources in the school

Utilization: adequate, proper, appropriate and correct use of instructional resources by teachers.

Instructional resources: are animate or inanimate inputs used to aid or facilitate teaching and learning of Basic Technology. In this study, the NERDC (2007) document was used as yardstick

Qualified teachers: are trained teachers of Basic Technology at the basic schools with a minimum of B. (Ed), B.Sc. (Tech-Edu), N.C.E (Tech-Edu) or PGDE in Technology Education.

Unqualified teachers: are Basic Technology teachers without B. (Ed), B.Sc. (Tech-Edu), N.C.E (Tech-Edu) or PGDE in Technology Education, ND and HND.

RESULTS

The results are as follows based on each research questions

Research Question 1

What types of instructional resources are available for teaching Basic Technology in upper basic schools in Ilorin, Nigeria?

Table 1 indicated the types of instructional resources available for teaching basic technology in upper basic schools in Ilorin metropolis. Based on the checklist adapted from NERDC (2007) document, findings showed that 3,280 instructional resources were available while 4,006 instructional resources were not available in the selected upper basic schools in Ilorin metropolis.

Table 1: Types of instructional resources are available for teaching Basic Technology in upper basic schools in Ilorin metropolis

S/N	INSTRUCTIONAL RESOURCES	AVAILABLE	NOT AVAILABLE
1.	Workshop/laboratory	4	105
2.	Hand tools: hammers	197	91
3.	Saw	129	86
4.	Hand file	106	68
5.	Pliers	178	87
6.	T-square	195	62
7.	Machines: circular saw	5	106
8.	Surface pliers	35	84
9.	Wood lathe	2	107
10.	Centre lathe	2	107
11.	Power hacksaw	1	108
12.	Pedestal grinder	1	108
13.	Milling machine	1	108
14.	Instructional audio tape	20	89
15.	Television/monitor set	1	108
16.	Audio C.D's on technology	15	94
17.	Video players & recorders	10	99
18.	Computer (monitor, CPU & printer)	215	87
19.	Projectors	1	108
20.	Video CD's	1	108
21.	Chalkboard	334	0
22.	Wall posters on technology	220	65
23.	Photographs on technology	30	70
24.	Models on technology	76	26
25.	Printed media (textbooks & workbooks)	636	0
26.	Pedestal drilling machine	1	108
27.	Portable drilling machine	1	108
28.	Grinding machine	1	108
29.	Workshop bench	10	105
30.	Scrap engine	0	109
31.	Workshop overall	24	105
32.	First Aid Box	106	3
33.	Charts	182	83
34.	Drawing Instruments	207	87
35.	Films, video cassettes and slides of technological processes	10	99
36.	Soldering and brazing tools	15	98
37.	Pictures of chain and belt driven machine	8	101
38.	Roof models	1	108
39.	Models of hydraulic and pneumatic devices	1	108
40.	Blocks, cement sand, zinc, grass and stones	56	92
41.	Pictures of crankshaft, connecting rod and pistons, cams and eccentrics	35	88
42.	Ceramics and glass products	43	84
43.	Specimens of wood and metals	40	98
44.	Plastics and rubber materials	47	65
45.	Kerosene stove	41	78
46.	Conductors e.g metals	36	90
TOTAL		3,280	4,006

Research Question 2

What is the extent to which teachers use the available resources in teaching Basic Technology in upper basic schools in Ilorin metropolis?

Table 2: Extent of utilization of instructional resources by teachers of basic technology upper basic schools in Ilorin metropolis

S/N	INSTRUCTIONAL RESOURCES	FREQUENT- LY USED	SELDOM USED	NOT USED	TOTAL
1	Workshop/laboratory	0	1	3	4
2	Hand tools: hammers	17	70	110	197
3	Saw	12	37	80	129
4	Hand file	6	25	75	106
5	Pliers	5	48	125	178
6	T-square	21	50	124	195
7	Machines: circular saw	0	0	5	5
8	Surface pliers	1	0	34	35
9	Wood lathe	0	0	2	2
10	Centre lathe	0	0	1	2
11	Power hacksaw	0	0	1	1
12	Pedestal grinder	0	0	1	1
13	Milling machine	0	0	1	1
14	Instructional audio tape	0	3	17	20
15	Television/monitor set	0	0	1	1
16	Audio C.D's on technology	0	0	15	15
17	Video players & recorders	0	0	10	10
18	Computer (monitor, CPU & printer)	67	50	98	215
19	Projectors	0	0	0	0
20	Video CD's	0	0	1	1
21	Chalkboard	334	0	0	334
22	Wall posters on technology	28	52	140	220
23	Photographs on technology	0	0	30	30
24	Models on technology	20	14	42	76
25	Printed media (textbooks & workbooks)	636	0	0	636
26	Pedestal drilling machine	0	0	1	1
27	Portable drilling machine	0	0	1	1
28	Grinding machine	0	0	10	10
29	Workshop bench	0	0	0	0
30	Scrap engine	0	0	24	24
31	Workshop overall	0	0	0	106
32	First Aid Box	106	46	108	182
33	Charts	28	104	81	207
34	Drawing Instruments	22	0	10	10
35	Films, video cassettes and slides of technological processes	0	0	15	15
36	Soldering and brazing tools	0	0	8	8
37	Pictures of chain and belt driven machine	0	0	1	1
38	Roof models	0	0	1	1
39	Models of hydraulic and pneumatic devices	0	10	46	56
40	Blocks, cement sand, zinc, grass and stones	0			

41	Pictures of crankshaft connecting rod and pistons cams and eccentrics	0	5	30	35
42	Ceramics and glass products	0	0	43	43
43	Specimens of wood and metals	10	8	22	40
44	Plastics and rubber materials	12	11	23	47
45	Kerosene stove	5	11	26	41
46	Conductors e.g. metals	10	3	25	36
Total		1340	548	1392	3280
		(40.85%)	(16.71)	(42.44)	(100%)

Table 2 showed that 1340 (40.85%) of the available instructional resources were frequently used, 548 (16.71%) were seldom used while 1392 (42.44%) were not used. The result shows that chalkboards and printed media were the only instructional resources well utilized in the selected upper basic schools in Ilorin metropolis and resources such as circular saw, wood lathe, centre lathe, projectors, drilling machines scrape machines and so on were not in use at all.

Research Question 3:

Is there any difference in the extent to which instructional resources are used by qualified and unqualified teachers of Basic Technology in upper basic schools in Ilorin metropolis?

This research question has a corresponding hypothesis, hence the result was treated as follow:

Table 3: Distribution of Respondents based on Qualification

Qualification	Frequency	Percentage (%)
Qualified	73	80.2
Unqualified	18	19.8
Total	91	100.0

Table 1 indicated that 91 respondents participated in the study out of which 73 (80.2%) were qualified while 18 (19.8%) of the respondents were unqualified.

Hypotheses Testing

Hypothesis One: There is no significant difference in the extent to which instructional resources are used by qualified and unqualified teachers of Basic Technology in upper basic schools in Ilorin metropolis.

Table 4: Mean, Standard Deviation and t-value on the extent to which instructional resources are used by qualified and unqualified teachers of Basic Technology

Teachers' Qualification	N	Mean	SD	Df	Cal. t-value	Crit. t-value
Qualified	78	23.59	3.85	89	3.16*	1.98
Unqualified	18	27.06	5.29			

*Significant, $p < 0.05$

Table 4 shows a calculated t-value of 3.16 and the Critical t-value of 1.98. Since the Calculated t-value is greater than the Critical t-value, the hypothesis is rejected. Hence, there is a significant difference in the extent to which instructional resources are used by qualified and unqualified teachers of Basic Technology in upper basic schools in Ilorin metropolis. The unqualified teach-

ers' gave rise to the difference noticed in the hypothesis as they have a mean score of 27.06 which is higher than the mean score of 23.59 for the qualified teachers. Hence, when a teacher has inadequate knowledge on the use of instructional resources, it negatively affects the use of instructional resources and vice-versa.

Summary of Findings

Based on the results of the analysis presented in this chapter, the following were derived:

1. There are 3,280 (45.02%) instructional resources available compared to 4,006 (54.98%) instructional resources not available.
2. 1,340 (40.85%) of the instructional resources were frequently used, 548 (16.71%) were seldom used, while 1,392 (42.44%) were not used.
3. There is a significant difference in the extent to which instructional resources are used by qualified and unqualified teachers of Basic Technology in upper basic schools in Ilorin metropolis. This shows that instructional resources were well utilized by qualified basic technology teachers than unqualified basic technology teachers.

DISCUSSIONS

The types of instructional resources available include computer sets, chalkboards, printed Medias, charts e.t.c. The findings revealed that there are inadequate instructional resources for teaching basic technology in upper basic public schools in Ilorin metropolis. This is corroborated with the findings of Ibrahim (2010) that most schools are not adequately stocked with instructional resources.

According to research findings on the extent to which teachers use the available resources in teaching Basic Technology in upper basic schools in Ilorin metropolis, it was found out that most of the available instructional resources were not adequately used by basic technology teachers in teaching basic technology in upper basic schools in Ilorin metropolis, this is in accordance with the submission of Abolade and Olumori (2004). Findings on the influence of teachers' qualification on the use of instructional resources indicated that there is a significant difference in the extent to which instructional resources are used by qualified teachers and unqualified teachers.

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