TECHNICAL TEACHERS' FACTORS THAT INFLUENCE STUDENTS' ACADEMIC PERFORMANCE IN INDUSTRIAL EDUCATION

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Abstract

The study on technical teachers' factors that influence student's academic performance in industrial education programme in Rivers State, Nigeria was carried out in Rivers State University of Science and Technology, Port Harcourt, Rivers State, Nigeria and Rivers State University of Education, Port Harcourt, Rivers State, Nigeria. The population for the study comprised all students undergoing industrial programme while sample size used for study was 206 students, which comprises 96 students for Rivers State University of Science and Technology and 110 students for University of Education. The only instrument used for the study was the questionnaire. Two research questions and one null hypothesis where posed and tested for the study. The Findings of the study imply that, workshop spaces are inadequate, teacher in both institutions do not use instructional materials always, teachers do not select and use the most appropriate techniques in lesson delivery. Based on the findings, some recommendations were made.
Key words: *academic performance, industrial education, technical education, technical teachers*.

Introduction

The word education as a concept has as many definitions as there are authorities in the field. However, it is generally accepted that education involves a desirable change in behaviour, knowledge, understanding, skills or capabilities. Fafunwa (1974) sees education as that generation gives to its young ones which make them to develop skills, abilities, attitudes and other behaviours which are of positive value to the society in which they find themselves. The National Policy on Education (1981) defines education among others as the appropriate skills, abilities and competencies, both mental and physical which equip the individual to live in and contribute to the development of his society (FRN, 1981). In the same vein, Eskamp, *et. al*. (1992), said that education includes the acquisition of skills, knowledge and the absorption of values.

In an attempt to draw the relationship between education and instruction, Vikoo (2003), said that the basic realm of social progress involves the activities to transform nature, society and man. The transformation of nature results in an increase in production of wealth, the transformation of society results in rationalization of social relationships, while the transformation of man results in his mental and his growth into a powerful social being having higher standards of cultural wealth. He added that of the three major aspects of transformation, the transformation or remolding of man is paramount usually through instruction and that this remolding is what is known as education.

Thus, education is the pivot on which the prosperity and future of any community,

state or nation depends. Okwelle (2003a), is of the view that instruction is same as teaching; the process of transferring knowledge from the teacher to the learner. He stressed that the programme of industrial education is geared towards helping an individual to acquire some relevant knowledge, develop skills as well as appropriate attitudes in specific occupational areas which will enable the individual enter and progress in the world of work. Three essential factors to be considered for any effective industrial education programme are the environment, learner and teacher. Among these factors, the teacher greatly influences his learners in every direction. He is the centre figure in the industrial instructional process. The quality and quantity of knowledge and skill acquired by the learners, their appearance, deportment, the condition of the school, class rooms, workshops and laboratories, all affect the standard set and maintained by each technology teacher. It is evident that the teacher is the pivot or nucleus around which other variables of industrial instruction revolves Okwelle (2003b) therefore opines that an effective teacher therefore should possess mastery of his trade and pedagogy, able to manage his environment (classroom, workshop, etc) and motivate students effectively in order to achieve the objectives of technology education. According to him the effective technology teacher is a manager, supervisor, and teacher. This study looks at the technical teachers' factors that influence students' academic performance in industrial education.

Problem of Research

Success or failure in any occupation is largely determined by the personality of an individual. The personality here as concerns teaching is the teacher's ability to attract and hold the interest and co-operation of the students. While practical skill and technical information are important in technology or industrial instruction, it is the teacher's personal clement, personal traits and characteristics that often tip the scales one way or the other, (Okwelle, 2003a).

Both students and school administration are critical of the teacher. The students are in close and intimate contact with the teacher day after day and they learn to appraise the teacher correctly. On the other hand the school administration expects the teacher to operate efficiently so that the school can render the services required by the society. The teacher is critically and constantly appraised by the school administration through reports on students' morale, progress and attendance, job placement and quality as well as quality of work completed.

Ekpo (2001) is also of the view that ineffectiveness and incompetence of technology teachers in terms of knowledge of theoretical concepts and practical work could impair students' performance in examinations and equally make drop out of industrial education programmes. These factors are the issues which this study seeks to confirm or disconfirm and to find out what other factors may be inhibiting students' academic performance.

Research Focus

The purpose of the study is to ascertain the technical teachers' factors that influence students' academic/ performance in industrial education programme (s) and work on the assumption that performance at school would mean performance at work. Aminu (1992) said that our mission is to give Nigerians high quality, functional education that will help them to develop and to catch up with the rest of the world and to remain there at the frontier. Education in Nigeria is performance-oriented. Nigeria must have an educational system respected for its intrinsic quality. The nation's human resources are the greatest asset, as such the human resources must be trained in an atmosphere which emphasizes excellence in order to achieve her national goals.

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Methodology of Research

General Background of Research

A study of this nature will help teachers of technology or education programmes to discover those attributes which the students, the school, the government and the society at large look out for in them. It may also enable students to appreciate what they should do to help technical teachers to help them. On the whole, the study could help to bring about improved work quality by teachers and enhanced student performance arising from the highlights of the study. The research work is designed to cover all the tertiary institutions in Rivers State that offer courses in technical or industrial education at degree level (that is, Rivers State University of Science and Technology and Rivers State University of Education. Two research questions were raised for the study. They are:

1. What specific teacher's factors influence students' academic performance in industrial education programmes?
2. What are the implications of factors on students' academic performance in the learning of industrial education programmes?

A null hypothesis was formulated for the study: Ho_1: Technical teachers' factors have no significant influence on students' academic performance in industrial education programmes in Rivers State, Nigeria.

Sample of Research

The population for the study comprised of all current students of the Technical Education departments in Rivers State University of Education, Port Harcourt, Rivers State, Nigeria and Rivers University of Science and Technology, Port Harcourt, Rivers State, Nigeria who have under gone the industrial training programme of the schools involved. Twenty students were randomly selected from each unit of three departments which comprise; mechanical, electrical/ electronics and building. Thus, 120 students were randomly sampled from both institutions.

The content and face validity of the research instrument was ascertain in order to establish the ability of the research instrument to measure relationship among the variables of interest that has been designed for. The researchers designed the questionnaire and gave 30 copies of the questionnaire to experts in technical education, industrial education, measurement and evaluation. The experts' criticism and suggestions were strictly incorporated which led to modifications in some items of the questionnaire. This confirmed that the content of the test items measured favourably well with the variables under study.

Instrument and Procedure

This instrument for data collection was the questionnaire which comprised three sections; Section A contained four items which sought information on the personal data of the respondents. While Section B concerns technical teachers' factors that enhance students' academic performance. Section C measured the characteristics implications on the study of industrial education. The reliability of the instrument was determined by a pre-test interview and test–re-test technique adopted by the researchers. The researchers exposed the instrument to a sample target at two different visits with an interval of seven (7) days. The questionnaires were then subjected to reliability test. The data collected were analysed to determine the reliability co-efficient of the instrument used. The calculated value yielded 0.97 reliability index which was considered adequate for the study.

Data Analysis

The data collected were analyzed through the use of mean ratings and Standard deviation scores. Mean scores of 2.50 and above were considered acceptable. The Chi-square (χ^2) was used to test the hypothesis formulated.

Results of Research

Research Question 1

What specific teachers' factors influence students' academic performance in industrial education programmes?

Table 1. Results of Analysis for Rivers State University of Science and Technology.

S/No.	Teachers' characteristics	SA (5)	A (4)	U (3)	O (2)	SD (1)	T.S	$\bar{x}$	S_x
1.	Possession of knowledge of theory	10	30	-	16	4	206	3.43	1.24
2.	Possession of knowledge of practical	16	26	1	11	5	214	3.63	1.30
3.	Instrument involving more of practice than theory	-	6	3	40	13	122	2.03	0.82
4.	Being accessible to students	-	10	4	38	8	136	2.27	0.09
5.	Use of instructional devices	-	8	4	40	18	122	2.03	0.96
6.	Use of variety of teaching methods	-	5	8	26	21	117	1.95	0.91
7.	Entertaining questions by students	14	30	-	11	7	211	3.52	1.35
8.	Gentleness and friendliness	1	8	3	30	18	124	2.07	1.02
9.	Fairness and firmness	4	12	4	24	18	142	2.37	1.29
10.	Tolerance	14	10	5	26	7	176	3.03	1.43
11.	Giving attention and advice to students	-	9	6	35	14	130	2.17	0.96

Results in Tables 1 show that teachers of Rivers State University of Science and Technology Port Harcourt, Rivers State of Nigeria exhibit such characteristics as possession of knowledge of theory and practice as well as entertained question students ask during the process of instruction with tolerance. The results also indicate that teachers' mean ratings on the above characteristics ranged between 3.03 and 3.63.

Teachers, however, during instructions did not involve more of practice, were inaccessible to students did not use instructional devises and variety of teaching methods. Also, they did not exhibit gentleness and friendliness, fairness and firmness including giving attention and advice to students. Teachers' mean ratings on these were less than the cut-off point of 2.50.

Table 2. Results of Analysis Rivers State University of Education on teachers' characteristics.

S/No.	Teachers' characteristics	SA (5)	A (4)	U (3)	O (2)	SD (1)	T.S	$\bar{x}$	S_x
1.	Possession of knowledge of theory	3	21	-	5	1	110	3.67	1.24
2.	Possession of knowledge of practical	7	19	-	4	-	119	3.90	1.30
3.	Instrument involving more of practice than theory	-	3	2	21	4	64	2.13	0.82
4.	Accessible to students	-	2	1	28	2	68	2.10	0.90
5.	Use of instructional devices	-	4	-	19	7	61	2.07	0.96
6.	Use of variety of teaching methods	-	3	3	16	8	61	2.03	0.91
7.	Entertaining questions by students	3	22	-	3	2	111	2.86	1.35
8.	Gentleness and friendliness	-	3	2	18	9	59	2.56	1.02
9.	Fairness and firmness	-	2	2	13	13	53	1.77	1.29
10.	Tolerance	7	4	2	11	4	83	2.34	1.43
11.	Giving attention and advice to students	-	2	1	30	4	61	2.23	0.96
	TOTAL	20	85	13	168	54	850	27.66	12.18

Reports from Table 2 did not differ so much from Table 1 in that Rivers State University of Education teachers exhibited same characteristics such as possession of knowledge of theory and practice. They also entertained questions by students and exhibited gentleness and friendliness.

Table 2 differed from Table 1 as teachers did not exhibit tolerance. They also showed lack of all other characteristics as indicated in Table 2.

Research Question 2

What are the implications of factors on students' academic performance in the learning of industrial education programmes?

Table 3. Results of Analysis for Rivers State University of Science and Technology on teachers' characteristics.

S/No.	Teachers' characteristics	SA (5)	A (4)	U (3)	O (2)	SD (1)	T.S	$\bar{x}$	S_x
1.	Possession of knowledge of theory	7	9	-	15	3	96	3.2	1.42
2.	Possession of knowledge of practical	9	8	1	7	5	99	3.30	1.53
3.	Instrument involving more of practice than theory	-	3	1	20	9	58	1.93	0.87
4.	Accessible to students	-	8	3	13	6	73	2.43	1.10
5.	Use of instructional devices	-	4	4	11	11	61	2.03	1.03
6.	Use of variety of teaching methods	-	2	5	10	13	56	1.87	0.94
7.	Entertaining questions by students	11	6	-	8	5	100	3.33	1.60
8.	Gentleness and friendliness	1	5	1	18	9	65	2.17	1.15
9.	Fairness and firmness	4	10	2	9	5	89	2..97	1.38
10.	Tolerance	7	6	3	11	3	93	3.1	1.39
11.	Giving attention and advice to students.	-	7	5	10	10	69	2.3	1.18
	TOTAL	39	68	25	122	79	859	28.63	13.33

Reports from Table 3 did not differ from the over all data of Table 2. It, however, showed difference when compared with Table 2 as teachers here exhibited tolerance. The result showed a mean rating of 3.1 and standard deviation of 1.38 for tolerance as against Table 2 with mean rating of 2.34 and standard deviation of 1.43. Teachers' means rating of 2.34 did not measure up to the cut-off point of 2.50. Apart from items 1,2,7,9 and 10, the response did not show any exhibition of the other teachers' characteristics. Item 5 in Table 4 below therefore shows the magnitude effect of the absence of these characteristic thus their performance in examination and at work.

Table 4. Implications of poor teachers' characteristics on students' academic performance for Rivers State University of Science and Technology.

S/ No.	Poor teachers' characteristics could lead to the following	SA	A	U	D	SD	Affirmative (%)	Non Affirmative (%)
1.	Impaired students performance in examinations.	14	8	3	3	2	22 (73.3)	5(16.7)
2.	Diminished student motivation and achievement.	17	11	1	1	-	28 (93.3)	1 (3.3)
3.	Students engaging in examination malpractices in order to succeed.	11	15	3	5	4	26 (86.7)	2 (30)
4.	Students changing from technical education programmes to other programmes.	13	5	3	5	4	18 (60)	9(30)
5.	Drop out of student from the programme.	15	7	2	4	2	22 (73.3)	6(20)
6.	Students leaving school without acquiring relevant sellable skills.	11	14	-	3	2	25 (83.3)	5 (16.7)
7.	Skill learning not closely related to industrial practices.	10	12	-	7	1	22 (73.3)	8 (26.7)
8.	Difficulty in transferring learnt skills to industrial application.	18	9	-	3	2	25 (83.3)	8 (26.7)
9.	Inability of graduate to gain employment.	12	14	1	3	-	26 (86.7)	3 (10)

Reports from Table 4 show that Rivers State University of Science and Technology respondents affirmed that all the stated items numbering 1-9 were implications of poor teachers' characteristics or factors on students' performance. Respondents were 60 percent and above affirmative as indicated by the table.

Table 5. Implications of poor teachers' characteristics on students' academic performance for Rivers State University of Education students.

S/ No.	Poor Teachers' characteristics could lead to the following	SA	A	U	D	SD	Affirmative (%)	Non Affirmative (%)
1.	Impaired students motivation	6	19	-	5	-	25 (83.3)	5(16.7)
2.	Diminished student motivation and achievement.	15	9	2	4	-	24 (80)	4 (13.3)
3.	Students engaging in examination malpractices in order to succeed.	21	6	2	1	-	27 (90)	1 (3.3)
4.	Students changing from technical education programmes to other programmes.	17	8	2	2	1	25 (83.3)	3(10)
5.	Drop out of student from the programme.	13	13	1	2	1	26 (86.7)	3(10)
6.	Students leaving school without acquiring relevant sellable skills.	19	9	1	1	-	28 (93.3)	1(3.3)
7.	Skill learning not closely related to industrial practices.	17	11	-	2	-	28 (93.3)	2 (6.7)
8.	Difficulty in transferring learnt skills to industrial application.	22	6	1	1	-	28 (93.3)	1 (3.3)
9.	Inability of graduate to gain employment.	12	5	3	8	2	17 (56.7)	10(3.3)

Reports from Table 5 also indicate that between 57 percent and 93 percent of Rivers State University of Education respondents were affirmative that items 1-9 were possible implications of poor teachers' characteristics on students' academic performance. It is often said that for every action or event there is cause and effect. In this study, teachers' characteristics is a cause (although it might be looked at, at some other point at effect) while the implications are the effect. Both Rivers State University of Science and Technology and the Rivers State University of Education respondents painted a seemingly conforming picture with regard to teachers' factors.

Hypothesis Testing

RSUST	96	99	58	73	61	56	100	65	89	93	69	859
UOE	110	119	64	68	61	61	111	59	53	83	61	850
TOTAL	206	218	122	141	122	117	211	124	142	176	130	1709

Key: RSUST represents Rivers State University of Science and Technology
UOE represents Rivers State University of Education

fo	fe	fo-fe	$(fo-fe)^2$	$(fo-fe)^2/fe$
96	103	-7	49	0.48
99	110	-11	121	1.10
58	61	-3	9	0.15
73	71	2	4	0.06
61	61	0	0	0.00
56	59	-3	9	0.15
100	106	-6	36	0.34
65	62	3	9	0.15
89	91	-2	4	0.06
93	89	4	16	0.18
69	65	4	16	0.25
110	103	7	49	0.48
119	108	11	121	1.12
64	61	3	9	0.15
68	70	-2	4	0.06
61	61	0	0	0.00
61	58	3	9	0.16
111	105	6	6	0.34
59	62	-3	9	0.15
53	71	-18	324	4.56
83	87	-4	16	0.18
61	65	-4	16	0.25
Total				10.12

Result: $\chi^2_{cal} < \chi^2_{crit;}$ Ho is therefore rejected.

The null hypothesis (Ho) predicted that there is significant difference between the responses of Rivers State University of Science and Technology students and those of Rivers State University of Education students and thus their mean ratings with respect to specific teacher factors that influence students' academic performance.

Discussion

The major findings of the study are discussed in this section which summarizes Tables 4 and 5. Results from Table 4 show that Rivers State University of Education and Rivers State University of Science and Technology teachers have knowledge of the subject matter. That is, are sound in theory and also practical as their mean ratings were 3.67 and 3.90 and 3.2 and 3.3 respectively. These are more than the cut-off point of 2.50 and so were accepted. The only set back was that instructions did not involve more of practical as they have a mean of 2.13 and 1.9 respectively. Okwelle (2003a) maintains that practical skill and technical information (which we refer to as theory) are both important. Technical education has been defined as that aspect of education that leads to the acquisition of practical and applied skills, as well as basic scientific knowledge. (FRN, 1981). This definition presupposes that practice should be emphasized more than theory. The reverse is however the situation and one wonders how both institutions considering the above, could turn out good products absorbable by companies and technical institutions.

The researchers however observed that the workshop space provided for technical or industrial education in both institutions is grossly inadequate including the facilities and equipment. The teachers too, were few in number with the result that they are already too over loaded with so many courses. Thus, making predominance of theory over practice inevitable. However the findings are in conformity with the views of Ayodele (1985) and Ezeji (1986) that emphasized the need for teachers to know their subject.

Reports from Tables 4 and 5 also show the presence of such characteristics as entertaining questions by student during instruction for both Rivers State University of Science and Technology and Rivers State University of Education with mean ratings of 2.86 and 3.33 respectively. Whereas teachers of Rivers State University of Education exhibited gentleness and friendliness with an acceptable mean rating of 2.56, Rivers State University of Science and Technology teachers had a mean of 2.17 which was short of the cut-off point.

However, reports from Table 4 revealed that, Rivers State University of Science and Technology teachers exhibited fairness, firmness and tolerance with mean ratings of 2.97 and 3.1 respectively. Rivers State University of Education teachers had unacceptable mean ratings 1.77 and 2.34 respectively as they were below the cut-off point of 2.50.

The tables also revealed that teachers of both institutions lacked such characteristics as accessibility to students, use of instructional devices and of variety of teaching methods, as well as giving attention and advice to students. It is often said that like begets likes and that it is character that makes an individual. If teachers expect to have well behaved and respectful students today and responsible men and women tomorrow, they too have a role to play. According to Akpan (2002), character training has always been considered a major aspect of education in general and vocational education in particular. She quoted businessmen as saying that it is not so important to teach technical skills as it is to develop good character in students. It therefore behoves that teachers of both institutions under study to ensure that they begin to exhibit those characteristics they have been found to fall short of and strengthen those they have exhibited. They should consider the exercise as sowing which is sure to yield rewards. What can be more satisfying and noble as sowing into the life of someone else?

Teachers should therefore endeavour to be fair to all yet firm, tolerant and give attention and advice to students. The importance of instructional materials in the teaching/learning processes, especially in technical education has already been stressed. They aid students to understand, retain and apply experiences gained during instruction to realize overall educational goals. When not used as found in this study, stifles the realization of classroom/workshop instruction, making the whole exercise futile (Okwelle, 2003b).

The study found that teachers did not make use of variety of teaching methods. These

refer to the ways, means and approaches which a teacher adopts in transmitting knowledge, skills and attitudes to the learners so as to realize set objectives. The major aim of industrial education at the tertiary level is to prepare individuals to enter into full occupation. Students in their training are expected to acquire skills relevant to the world of work. Thus, the teaching methods applied should have respect for the tools, equipment and procedures normally used in the occupation the student is being prepared for. Okwelle (2003b) averred that the teaching of all technology education courses at any level, stresses practical activity involving demonstration, project, experiment, field trip, etc. The effect of the dearth of the mentioned characteristics in teachers of both institutions under study is much and counter productive for a nation striving to catch up with the more developed countries.

Item 6 in Table 4 reveals that poor teacher characteristics would lead to impaired student performance in examinations, diminished student motivation, and examination malpractices. It could also lead to change of programmes from technical education, leaving school without the relevant skills, and drop out. It is a clear fact no one offers what he/she does not have. This makes it impossible for such half baked half trained and therefore half developed products to gain employment lets alone apply the skills. However, the main thrust of this study was to compare exhibition of some teachers' characteristics between teachers of Rivers State University of Science and Technology and Rivers State University of Education using responses from students.

The null hypothesis formulated which stated: "there is no significant difference in the mean ratings of Rivers State University of Science and Technology and Rivers State University of Education students in terms of responses on the specific teachers' characteristics' was therefore rejected. Thus, the finding was as that there was significant difference between the mean rating of Rivers State University of Science and Technology and Rivers State University of Education students in terms of their responses on the specific teachers' factors or characteristics.

The Chi-Square (χ^2) was used to test the null hypothesis. The result was that the calculated Chi Square (χ^2_{cal}) was less than the table Chi-Square (χ^2_{tab}). The result therefore shows that Rivers State University of Science and Technology teachers exhibited more of the teacher characteristics than Rivers State University of Education teachers to influence students' academic performance.

Conclusion

The study established that there was significant difference between responses of Rivers State University of Science and Technology students and those of Rivers State University of Education with respect to specific teachers' factors that influence students' academic performance. This study has it that Rivers State University of Science and Technology teachers exhibited more of such characteristics than teachers of Rivers State University of Education.

However, there were some of the factors or characteristics both institutions were found to have exhibited below expectations. Performance of students of the institutions would be greatly enhanced if the teachers would do well to exhibit all the factors or characteristics.

Much emphasis is laid on the teaching of science and technology is Nigeria today. The emphasis on science and technology is a major issue not only for our educational system but for all. That is why an arbitrary science/arts ratio of enrolment is imposed upon the higher institutions of learning and why so much is now being done to introduce science and technology education at the lower levels, from primary school (Aminu 1992). It is very important therefore to relate our higher educational institutions, in particular, to the needs of the various sectors of our social and economic life.

Recommendations

Based on the general findings of the research, the researchers proffer the following recommendations:

1. Teachers should concentrate more on practice rather than theory to make for adaptation to new conditions and thereby bringing about a self reliant culture.
2. Teachers should teach with instructional materials to help bring students face to face with the world which education and infact technical education intends to introduce to them.
3. Teachers should select and use the most appropriate approaches or techniques to teach their subject matter, so as to take cognizance of the principles of individual differences. Thus, facilitating meaningful learning.
4. Teachers should entertain questions from students during instruction for complete understanding by them.
5. Teachers should re-evaluate and improve upon such other characteristics as gentleness and friendliness, fairness and firmness.

References

Aminu, J. (1992). How Fares the Cradle of the Greatest Asset? In: Yahaya, A. D., and Akinyele, C. I. (eds.) Human *Resources Development and Utilization: Policies and Issues*. p. 20-33. Badagry: Administrative Staff College of Nigeria (ASCON).

Akpan, V. C. J. (2002). The Role of Business Education in Character Development: Implication for Businessmen/ Personal Secretaries. *Journal of Education and Society*, Vol.5, Issue 2, p. 31-40.

Ayodele, S. O. (1985). Strategies for Teaching and Learning for Vocational and Creative Subjects. In: Ehiametaloit, E. and Ogunsaju, S. (eds.) *Trends in Vocational Education in Nigeria*. Lagos: NERA.

Ekpo, A B. (2001). Teachers, Characteristics and their implications for Electrical / Electronic Skills Acquisition. *Journal of Education & Society,* Vol. 4, Issue 2, p. 95-103.

Epskamp, K., and Boeren, A. (1992). Education and Communication: a conceptual framework. In Epskamp, Kees and Boeren, Ad (eds.) *The Empowerment of Culture: Development Communication and Popular Media*. The Hague: Centre for the Study of Education in Developing Countries.

Ezeji, S. C. O. A. (1986). Teacher Behaviour that Affects Students' Learning. *Journal of Technical Teacher Education*. Vol. 1, Issue 1, p.106-111.

Fafunwa, B. A. (1974). *History of Education in Nigeria*. London: George Allen and Unwin Limited.

Federal Republic of Nigeria (1981). *National Policy on Education*. Lagos: Federal Ministry, of Education.

Okwelle, P. C. (2003a). *Instructional Materials in Industrial Education*. (Handout). (Unpublished) Department of Science and Technical Education, Faculty of Technical and Science Education, Rivers State University of Science and Technology, Port Harcourt, Rivers State, Nigeria.

Okwelle, P. C. (2003b). *Instructional Strategies for Technology Teacher Preparation*. (Handout). (Unpublished) Department of Science and Technical Education, Faculty of Technical and Science Education, Rivers State University of Science and Technology, Port Harcourt, Rivers State, Nigeria.

Vikoo, B. (2003). *Learning Theories and Instructional Processes*. Owerri: Springfield Publications Limited.

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