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OBSTACLES TO PRACTICAL SKILL DEVELOPMENT AMONG STUDENTS IN KADUNA POLYTECHNIC, NIGERIA

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ABSTRACT: There is no doubt that quite a number of obstacles are stumbling blocks to students' practical skill acquisition. Such impediments could either be as a result of factors directly related to students, their lecturers or the institutions where the students are undergoing their training. This study identified the hindrances to practical skill development among the students in Kaduna Polytechnic, Nigeria. Four research questions and a null-hypothesis guided the study. 840 Academic staff and 18000 students of the polytechnic form the population, out of which proportionate stratified random sampling technique was used to draw a sample of 168 lecturers and 900 students for the study. A 52-item questionnaire was used to collect data from the respondents, while mean statistics and z-test were used for data analysis and testing of hypothesis respectively. The study revealed that there is no significant difference in the mean response of lecturers and student on obstacles to practical skill development among the students in Kaduna Polytechnic. The major findings include students' lack of sound technical background, leading to poor quality projects; large class size which result in lecturers' inability to organize proper practical session for the students and obsolesce of many machine/equipment in workshops/laboratories. Finally, the study recommended that the institution should provide adequate tools/materials in workshop/laboratories and that such should be properly maintained.

INTRODUCTION: Polytechnics in Nigeria are no doubt offshoots of trade centres, craft schools and later Technical Institutes established during the pre and post independence period. The northern regional government converted its only technical institute in Kaduna (set up in 1956) to Kaduna Polytechnic in 1962. Yaba College of Technology and the Ibadan Polytechnic came into existence in 1972.

Since then polytechnic education continued to expand such that country now had – 21 federal; 36 belonging to states and 17 private owned (National Board for Technical Education [NBTE], 2013) ¹.

Presently, Kaduna Polytechnic has the highest number of programmes, staff and students' population in the country. It has over 1000 academic staff; 25,000 students spread across over 40 academic programmes. The institution, according to Yakubu (1996) ² had two colleges by 1968. These were the College of Science and Technology (CST) and the College of Administrative and Business Studies (CABS). Then in 1979, the former survey unit of the Northern Region became the College of Environmental Studies (CES) as the third campus.

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However, by 1990, CABS was splitted into College of Administrative studies and Social Sciences (CASSS) and the College of Business and Management Studies (CBMS) while the College of Engineering was carved out from College of Science and Technology.

The institution like any other polytechnic was set up to offer post secondary job-related courses. Polytechnics provide practical experience to students as part of their training programme which conforms with classroom instructions. Agyeman (2006) and Ansah (2012)³ asserted that the primary concern of polytechnics is the development of highly skilled manpower needed in industries and the world of work. Not only are they expected to keep teaching and learning settings favourable for the production of qualified workforce but also offer opportunities to carry out research for nation's progress.

The Federal Republic of Nigeria (FRN) (2013)⁴ highlighted that the objectives of polytechnics among others are to:

- Provide technical knowledge and the required skills for agricultural, industrial, commercial and economic development of the country.
- Contribute to national development through high level manpower training.
- Train and impart the capabilities imperative for the production of technicians/technologists as well as other skilled and enterprising personnel.
- Prepare those who can use scientific and technical skills to clear environmental hazards for man's convenience.
- To reduce skill shortages through the production of skilled manpower relevant to the needs of the labour market.

Therefore polytechnic programmes pay particular attention on students' Practical Skills Development. Practical according Dictionary.com (2015)⁵ is an act of being inclined toward or fitted for actual work or useful activities. Skill, according to Encarta Dictionary (2009) is the ability to carry out an activity very well. It denotes expertise or ability developed in the course of training. This covers not only the trade and craft skills acquired by apprenticeship but also higher grade performances in many fields (Gregory 1987 cited in Kayode, 2009).

While development signifies growth or progress in the acquisition of skill in order to meet the need of workplace or industry (Dictionary.com, 2015)⁵. Skill Development means developing yourself and your skill sets to add value for the organization and for your own career development (University of California Human Resources [UCHR], 2015)⁶. Continuously learning and developing one's skills requires identifying the skills needed for mobility, and then successfully seeking out trainings or on-the-job opportunities for developing those skills (UCHR, 2015). UCHR further suggested that skill development should follow what it termed as the 70-20-10 rule: That is 70% of your development should come from on-the-job activities and action learning; 20% of your development should come from interactions with others; while 10% of your development should come from training, including classes, seminars, webinars, podcasts, conferences, etc.

Experts have agreed that practical skill development is the art of building upon those skills acquired or possessed to a more advance level for effective performance. This simply implies that skills are first acquired and then subsequently developed upon through practice and utilization. Okorie in Kailani and Cornelius (2012) explained that practical skills are acquired whenever procedural instructions are matched with performance activities. For the practical skills to be developed among students, opportunities are given to them for full participation and practices under real life condition. In order to ensure sound development of abilities and skills in any course of instruction, individual students must operate under real life situation. It is the basis for sound judgment and clear cut modes of actions relative to standard of that operation (Mgbeahurike 2000).

The NBTE minimum standard for instructional delivery in Polytechnics is 50% theory and 50% work practice, in addition to a compulsory Student Industrial Work Experience Scheme (SIWES), however, as a result of many obstacles polytechnic students are usually unable to develop the required practical skills to enable them become self reliant. Evidences abound from literature to show that graduates of the nation's educational system in general and particularly those from the polytechnic fail to perform as expected.

Olaloye (2010) asserted that the system was unable to properly equip its beneficiaries with marketable skills for wealth creation. Wellington in Kailani and Haruna (2014) was also frightened by the several complaints from industries that new recruits from schools especially those from polytechnics do not possess the basic skills for tasks performances. And in view of the above premise, the problem of this study could be asked in the question: What are the obstacles to practical skill development among students in Kaduna Polytechnic?

This study was guided by the following research questions:

1. What are the students – related impediments to practical skills development among students in Kaduna Polytechnic?
2. What are the lecturer-associated hindrances to practical skills development among students in Kaduna Polytechnic?
3. What are the institutionally –linked barriers to practical skill development among students in Kaduna Polytechnic?
4. What are the strategies that could be employed to enhance practical skills development among the students?

Hypothesis: There is no significant difference in the mean responses of lecturers and students on obstacles to practical skills development among the students in Kaduna Polytechnic.

Methodology: The study adopted a descriptive survey design. 840 Lecturers and 18000 students from the College of Science and Technology; College of Engineering and College of Environmental studies form the population of this study, while a proportionate stratified random sampling technique was used to draw a sample of 20% (168 lecturers) from the lecturers' population and a sample of 5% (900 students) from the students' population. This decision is in line with the suggestion of Borg and Gall cited in Uzoagulu (2011)¹⁵ which stated that 20% could be used to draw sample from a population of up to 1,000, 10% from a population up to 5,000 and 5% from a population up to 10,000. The strata used were colleges as stated above. Three experts in the

Department of Education (Tech) Kaduna Polytechnic validated the instrument¹⁶.

Test – retest method was used to obtain the reliability level of 0.84 for the instrument. The questionnaire was divided into two sections A and B. For section A, respondents indicate with a tick (√) if they are lecturers or students. Section B is divided into 4 clusters (I), (II), (III) and (IV). Cluster I with 14 items asked respondents to rate the level of agreement on students-related impediments to practical skills development. Cluster II with 11 items directed them to indicate the extent of agreement on lecturers-associated hindrances.

Cluster III with 12 items required them to signify the magnitude of agreement on institutionally linked barriers. For cluster IV, respondents marked the scope of agreement on strategies that could be employed to enhance practical skill development among the students.

A four (4) point rating scale was employed in the study from Strongly Agree (SA) – 4 points to Strongly Disagree (SD) – 1 point. Mean statistics was used for data analysis. A cut-off point of 2.45 was adopted. All items with a mean score of 2.45 and above are regarded as agree whereas those with mean scores below are considered as disagree.

The null hypothesis was tested using z-test at 0.05 level of significance. Analysis of the results was carried out according to research questions that guided the study.

RESULTS AND DISCUSSION:

Research Question 1: What are the students-related impediments to practical skill development among students in Kaduna Polytechnic?

The result of data analysis in **Table 1** indicate items 2 – 14 as students'-related impediments to practical skills development in Kaduna Polytechnic. This is because the resultant mean score of each of these items is greater than the cut-off point of 2.45. Item 10 have the highest resultant mean score of 2.93. It is on the absence of sound technical background among the students which give rise to poor quality practical projects.

TABLE 1: MEAN RATINGS OF LECTURERS' AND STUDENTS RESPONSES ON STUDENTS'-RELATED IMPEDIMENTS TO PRACTICAL SKILL DEVELOPMENT

S/N	Item	\bar{X}_L	\bar{X}_S	\bar{X}_R	Decision
1	Students prefer theory over practical	2.48	2.00	2.24	Disagree
2	Students carried out practical works outside the school	2.64	3.00	2.82	Agree
3	Students are overloaded with many courses	2.48	3.06	2.77	Agree
4	Grouping students for practical work makes many become redundant	2.64	2.59	2.62	Agree
5	Lack of financial support among students makes its it difficult for them to acquire all the necessary materials for practical	2.48	3.25	2.89	Agree
6	Students don't know had to handle most basic tools/equipment	2.64	2.75	2.70	Agree
7	Students have nonchalant attitude toward practical skill acquisition	2.48	2.56	2.52	Agree
8	Parents do not probe their words for the skills acquire in schools	2.64	2.50	2.57	Agree
9	Low students' knowledge of tools and materials make it difficult for skill acquisition.	2.48	2.87	2.68	Agree
10	Lack of sound technical background among students lead to poor quality practical projects	2.64	3.21	2.93	Agree
11	Students lack requisite background to know what to expect from practical course	2.48	2.87	2.68	Agree
12	Laziness among students contribute to poor practical skill development	2.64	2.84	2.74	Agree
13	Lack of interest among students lead to poor practical skill development	3.02	2.68	2.85	Agree
14	Lack of hardworking spirit among students contribute to insufficient practical skill acquisition	2.97	2.63	2.80	Agree

Note: \bar{X}_L = Lecturers' mean; \bar{X}_S = students' mean; \bar{X}_R = Resultant mean; $N_L = 168, N_S = 900$

Research Question 2: What are the lecturers-associated hindrances to practical skill development among the students?

The results of data analysis in **Table 2** reveals that lecturers and students agree on all items 15 – 25 as lecturer-associated hindrances to practical skill

development among the students in Kaduna Polytechnic. Each of the items has a resultant mean score above the cut-off point. Item 23 have the highest mean score of 3.26. It is about large class size which makes it difficult for the lecturers to organize proper practical session for the students.

TABLE 2: MEAN RATINGS OF RESPONDENTS ON LECTURER-ASSOCIATED HINDRANCES OF PRACTICAL SKILL DEVELOPMENT

S/N	Item	\bar{X}_L	\bar{X}_S	\bar{X}_R	Decision
15	Lecturers apathy toward practical courses	2.48	2.93	2.71	Agree
16	Lecturers are overloaded with so many other administrative tasks	2.55	2.59	2.57	Agree
17	Lecturer are reluctant to conduct practical session for students	2.20	3.09	2.65	Agree
18	Lack of possession of adequate practical skills by the lecturers	2.52	2.71	2.62	Agree
19	Lecturers are preoccupied with other undertakings outside their main duties	2.40	2.65	2.53	Agree
20	Lecturers are not supervised on their performances over students practical projects	2.94	2.90	2.92	Agree
21	Lecturers don't assist and guide the students during practical	2.16	2.81	2.49	Agree
22	Laziness among lecturers hinder students' practical skill acquisition	2.24	2.84	2.54	Agree
23	Large class size make it difficult for lecturers to properly organize practical	3.21	3.31	3.26	Agree
24	Lack of spirit of hard work among lecturers impedes students' practical skill attainment	2.32	2.81	2.57	Agree
25	Lack of design skill in practical project by lecturers obstruct practical skill development	2.55	2.87	2.71	Agree

Note: \bar{X}_L = Lecturers' mean; \bar{X}_S = students' mean; \bar{X}_R = Resultant mean; $N_L = 168, N_S = 900$

Research Question 3: What are the institutionally-linked problems to practical skill development among students in Kaduna Polytechnic? Outcome of data analysis in **Table 3** shows that the resultant

mean score for all items is above the cut-off point. Item 26 have the highest mean score of 3.39. It is on outdated condition of machines/equipment in the workshops/laboratories.

TABLE 3: MEAN RATINGS OF LECTURERS AND STUDENTS ON INSTITUTIONALLY LINKED PROBLEMS TO PRACTICAL SKILL DEVELOPMENT

S/N	Item	\bar{X}_L	\bar{X}_S	\bar{X}_R	Decision
26	Most machines/equipped are obsolete and no longer in use	3.35	3.43	3.39	Agree
27	There are no basic tools for use during students' practical	3.00	3.21	3.11	Agree
28	There is inadequacy of measuring/testing instrument in the laboratories/workshops	3.10	3.12	3.11	Agree
29	Insufficiency of work stations for students to carry out practical individually	3.01	3.12	3.07	Agree

30	Shortage of consumables needed for demonstration to students	3.39	3.09	3.24	Agree
31	Broken down tools/equipment in workshop/laboratories contribute to lack of practical among the students	3.43	3.21	3.32	Agree
32	Dearth of tools/equipment to later for large students' population	3.48	3.21	3.25	Agree
33	Rare accreditation of programmes result is lack of basic facilities	2.67	2.78	2.73	Agree
34	Maintenance culture is not instituted in work environment	3.04	3.15	3.10	Agree
35	Insufficient funds allocated to practical exams	3.41	3.21	3.31	Agree
36	Lack of political will and focus on the part of government and polytechnic management	3.00	2.81	2.91	Agree
37	Inadequate emphasis on practical skill development in the curriculum	2.70	3.18	2.94	Agree

Note: \bar{X}_L = Lecturers' mean; \bar{X}_S = students' mean; \bar{X}_R = Resultant mean; $N_L = 168, N_S = 900$

Research Question 4: What are the strategies that could be adopted to enhance practical skills development among the students in Kaduna Polytechnic? Scrutiny of the data in **Table 4** above reveals that respondents agree with all items as strategies for improving practical skills

development among students in Kaduna Polytechnic. Each of the items has a resultant mean score above the cut-off point. Item 40 have the highest resultant mean score of 3.69. It is about the provision of adequate tools and materials in workshops/laboratories.

TABLE 4: RESULTANT MEAN RATINGS OF LECTURERS AND STUDENTS RESPONSE ON STRATEGIES FOR IMPROVING PRACTICAL SKILL DEVELOPMENT

S/N	Item	\bar{X}_L	\bar{X}_S	\bar{X}_R	Decision
38	The management should motivate lecturers by attaching rewards to practical projects	3.24	3.15	3.20	Agree
39	Incentive be given to best students in practical	3.31	3.46	3.39	Agree
40	Enough tools/materials be always provided in the workshops/laboratories	3.72	3.15	3.69	Agree
41	Alternative source of power supply be made available in workshops and laboratories	3.68	3.62	3.65	Agree
42	Retraining of lecturers to update their skills be carried out regularly	3.64	3.54	3.57	Agree
43	There should be proper maintenance of tools and equipment in the workshops	3.83	3.71	3.67	Agree
44	Water/electricity be sufficiently supplied for students' practical session	3.64	3.50	3.57	Agree
45	Curriculum be frequently reviewed to meet the need of student and societies	3.43	3.40	3.42	Agree
46	Management should consistently supervise practical sessions	3.21	3.37	3.29	Agree
47	Satisfactory funding of practical skill development be offered by the government	3.64	3.46	3.55	Agree
48	Consumables in laboratories/workshops be regularly supplied	3.59	2.96	3.28	Agree
49	Students' excursion be made compulsory in the curriculum	3.37	3.52	3.49	Agree
50	Exhibition of students' practical projects be conducted regularly	3.39	3.53	3.46	Agree
51	Computers and computer services be made available to students and lecturers	3.41	3.48	3.45	Agree
52	Current text materials on practical skills be promptly supplied in polytechnic library	3.36	3.46	3.41	Agree

Note: \bar{X}_L = Lecturers' mean; \bar{X}_S = students' mean; \bar{X}_R = Resultant mean; $N_L = 168, N_S = 900$

Test of Hypothesis: H_0 : There is no significant difference in the mean response of students and lecturers on obstacles to practical skill development among the students in Kaduna Polytechnic. Result in **Table 5** reveals that the z-calculated 0.610 is less than the z-critical value of ± 1.960 at 0.05 level of

significance ($z\text{-cal} < 0.05$). Hence H_0 was accepted. This therefore implies that there is no significant difference in the mean responses of students and lecturers on obstacles to practical skill development among the students in Kaduna Polytechnic.

TABLE 5: Z-TEST ABOUT STUDENTS AND LECTURERS MEAN RESPONSES ON OBSTACLES TO PRACTICAL SKILL DEVELOPMENT AMONG THE STUDENTS IN KADUNA POLYTECHNIC

Group	Mean	SD	N	Standard error	z-cal	z-critical	Significance	Decision
Lecturers	2.75	0.261	168	0.160	0.610	1.960	NS	Accept H_0
Students	2.91	0.337	900					

$P < 0.05$ NS = Not significant

Discussions of Findings: Major findings of the study on student related impediments to practical

skills development among the students in Kaduna Polytechnic are lack of sound technical background

by the students, inadequate financial supports to students and students' poor interest in practical project. There is no doubt that lack of sound technical background by the students lead to poor quality of practical projects, similarly inadequate financial support makes it very difficult for them to acquire all the necessary tools/materials for practical. Students' poor interest in practical projects also results in poor practical skills development.

These findings are no doubt supported by the assertion of quite a number of authors. For example, Udo and Bako (2014)⁷ lamented that it is quite unfortunate that many Technical and Vocational Education students on training do not possess the sound technical background expected of them. Yet they refuse to work hard to acquire adequate practical skills. On insufficient funding, the authors asserted that government, parents and others are unwilling to purchase modern facilities, consumables and equipment required for students' practical assignments in classes and workshops. Nutman (1987)⁸ asserted that engineering students generally and particularly those in polytechnic have little or no profound technical knowledge. They are similarly unaware of the possibility of coming into direct contact with the industries and other scholarly persons as a strategy of getting the most recent literatures.

On lecturer-associated hindrances to practical skill development, the main findings of the study are: large class size making it difficult for the lecturers to organize proper practical session; absence of adequate supervision of the lecturers on their performances over practical projects and the lecturers' lack of design skill for practical projects. These are also in conformity with the finding of Dasmani (2011)⁹ which reveals that large class size have negative effects on successful teaching of practical lessons. Most large class size especially in Technical and Vocational Education institutions like polytechnics don't usually match with the supply of available resources. Hence instructors/lecturers would not be able to attract and retain attention of their students. On inadequate supervision of lecturers about their performances over students' practical projects as a hindrance, this agrees with Bappah (2011)¹⁰ who stressed that supervision can only be effective if the supervisor

possess the technical knowhow in the area of specialization he/she is supervising. Enemali (2010)¹¹ added that the purpose of monitoring or supervision is to continuously check the progress of implementation. Image of students practical projects is form through careful supervision and it is from there that judgment is "made about resourcefulness initiative and creative thinking" (Allison and Benson 1983)¹². No doubt, lecturers' lack of design skill as one of the finding of this study impede practical skill development among the students.

The foremost findings of this study on institutionally linked problems to practical skill development among the students in Kaduna Polytechnic are obsolescence of many machines/equipment in workshops/laboratories; inadequacy of tools/equipment to cater for large students' population and the insufficiency of workstations for the students to carry out practical individually. These are in conformity with Uwaifo and Udo (2009)¹³ who stated that universities, polytechnic and technical colleges in the country which suppose to train proficient engineers, technologists and technicians are now filled with obsolete and in most cases non functional equipment. This negatively affects the quality of products from the institutions. Yaduma (2010)¹⁴ concluded that the types of tools, equipment and machineries in use in technical and vocational training institutions are old, obsolete and not compatible with current industrial practices.

Recommendation:

In view of the findings of this study, the following recommendations are suggested for Kaduna polytechnic to adopt:

1. There should be adequate provision of tools/materials in all the institution's workshops and laboratories;
2. The tools, equipment and machineries in the laboratories should be properly maintained for effective utilization.
3. Alternative sources of power supply should be made available in the workshops and laboratories.
4. Lecturers should be regularly retrained to update their skills especially on practical projects and

5. Current text materials on practical skills should be constantly supplied in all the polytechnic libraries.

CONCLUSION: Practical projects are certainly very viable to attaining the aims and objectives of not only Kaduna Polytechnic but other polytechnics in the country. It is in view of this that the study concurs with Allison and Benson (1983)¹² who made a declaration that practical projects enable students to be accountable for the “tempo, direction and activity of their learning”. Practical projects inspire the development of several skills among the students as well as feelings in confronting real life problems. However, the study revealed that quite a number of obstacles militate against practical skill development among the students of Kaduna Polytechnic. These obstacles are either students-related, lecturer associated or institutionally linked. The study further showed that there is no any significant difference in the mean score of students and lecturers of the institutions on these obstacles. And so a number of carefully devise plan of actions were proposed for the polytechnic to adopt.

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