

An Assessment of Research Designs Used By Undergraduate Students in Department Of Science Education, Kogi State University Anyigba

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Abstract

The study examined the research designs used by undergraduate students in department of science Education in Kogi State University, Anyigba. Two research questions and one hypothesis guided the study. The study employed the survey research design. The population consisted of 807 bound undergraduate projects from Faculty of Education, Kogi State University, Anyigba. A sample of 246 projects was drawn using simple random sampling technique. The instrument used for data collection was observational checklist titled Assessment of Research Design Checklist (ARDC $r = 0.78$) developed by the researchers. Research questions were answered using frequency count and proportion while the hypothesis was tested using t-test of proportion statistics at 0.05 level of significance. The results showed that the survey research design was the most commonly used research design, followed by quasi-experimental design and ex-post facto design respectively. It was further revealed that the proportion of undergraduate research projects that have appropriate design is 0.77 which was significantly greater than that of National University Commission of 0.75. It was recommended among others that Department of Science Education should on regular basis organize in-house training programme for Lecturers on the use of appropriate research design and also that supervisors should organize orientation programme for their supervisees.

Keywords: *Assessment, Proportion, Research Design, Supervisors, Undergraduate Students.*

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I. Introduction

Research is a systematic and objective search for new knowledge to the solution of a novel problem (Akuezuilo, 1993). Ali (2014) defined research as a process of acquiring dependable and useful information and to discover answers to meaningful questions using laid down procedures. In our own opinion, research is simply a systematic approach of finding solutions to problems of life. Research points to a number of directions namely pure science research, educational research, social science research, arts research etc. The focus of this study is educational research.

Ogunleye (2000) defined educational research as a systematic process of collecting information or data on matters concerning education in order to confirm, improve, modify or predict a particular learning environment. Nworgu (2015) defined educational research as a systematic approach which involves the application of scientific method in finding solutions to educational problems. The researchers see educational research as the application of research process in finding solutions to educational problems mostly prompted by educational practices in schools. Contributing to the purpose of educational research, Ogunleye (2000) pointed out that educational research enables us to: solve societal problems prevalent in schools, choose better technique that enable us improve teaching and learning, give satisfactory explanation of various causes of failure in education, improve and update our existing body of knowledge and predict future trends in various aspects of education. Every educational research has a conceptual framework within which an investigation can be conducted. And this framework can be regarded as research design.

Ali (2006) defined research design as the proposed or adopted systematic and scientific plan, blueprint, roadmap of an investigation detailing the structure and strategy that will guide the activities of the investigation conceived and executed in such a way as to obtain relevant and appropriate data for answering pertinent

research questions and testing hypotheses. According to Amaechi, Onuoha, Jiwueze and Ovute (2017), research design is the systematic steps or methods, procedure and plans which a researcher follows so as to arrive at a solution to his/her identified educational problem. Nworgu (2015) further stated that the functions of research design include: providing the researcher with the necessary framework or blueprint for tackling a particular educational problem, helping researcher in the delineation of research purpose and boundaries and acquainting the researcher with potential problems in the execution of the study.

There are different ways of classifying educational research. Akuezuilo (1993) classified research design into three, namely historical, descriptive and experimental. He further classified descriptive research into: survey, correlational studies, case study, ex post facto studies and development studies. Ogunleye (2000) classified research design into five basic research design which includes: historical research design, descriptive research design, correlational research design, causal-comparative research design and experimental research design. Amaechi, Onuoha, Jiwueze and Ovute (2017) presented the commonly used educational research design to include: historical, descriptive, survey, public opinion, case study, ex-post facto or causal-comparative, correlational, quasi-experimental, evaluation, development and instrumentation research designs.

The call for concern arose from observation that undergraduate students carrying out project work in their final year usually adopt any research design based on the simplicity of the design. Lawal and Shuaibu (2015) and Amaechi, Onuoha, Jiwueze and Ovute (2017) have argued that a glance through undergraduate bound projects suggest that most of the research designs used in such researches may not be appropriate for the topics. There is therefore the need to address these problems. Hence the study is poised to assess the research design employed by undergraduate students in Kogi State University Anyigba.

Purpose of the Study

The purpose of the study was to assess the characteristics of research design employed by undergraduate students in department of Science Education, Kogi State University Anyigba.

Specifically, the study examined:

1. The types of design popularly employed
2. The proportion of undergraduate research projects that have appropriate design

Research Questions

The following research questions guided the study.

1. What are the designs of the study popularly used by undergraduate students in Kogi State University Anyigba?
2. What is the proportion of undergraduate research projects that have appropriate research design in Kogi State University Anyigba?

Hypothesis

The proportion of undergraduate research projects that have appropriate research design used by Kogi State University Anyigba undergraduates is not significantly greater than 0.75.

II. Methods

The design for the study is survey. The population of the study is the entire undergraduate projects for 2014- 2018 in Department of Science Education Kogi State University Anyigba. There are four options in the department of science education that run undergraduate programmes, namely: Biology Education, Chemistry Education, Mathematics Education and Physics Education. Simple random sampling technique was used to select 246 undergraduate projects across the options. The instrument used for this study was observational checklist titled "Assessment of Research Design Checklist" (ARDC) developed by the researchers. The instrument sought information on the type of design used for analysis. Three experts (two from Science Education and one from Educational Foundations) in Kogi State University Anyigba, validated the instrument. The split-half method was used in determining the reliability of the instrument after administering the instrument in a university outside Kogi state. Using Pearson product moment correlation technique, the reliability coefficient obtained was 0.78. Thus, the instrument was considered good and reliable for this study. The researchers sought permission from the Dean and Head of Department in the Faculty of Education, Kogi State University Anyigba before collecting data for this study. Data collected were analyzed using frequency count, proportion and t-test.

III. Results

Research Question 1

What are the designs of the study popularly used by undergraduate students in Kogi State University Anyigba?

Table 1: Design of Study popularly used by Undergraduate Students in their Projects

Design	Frequency	Percentage (%)	Rank Order
Historical	0	0.0	5
Survey	165	62.5	1
Case Study	3	1.2	4
Ex-post Facto	30	12.2	3
Quasi-Experimental	48	19.5	2
Instrumentation	0	0.0	5

Table 1 shows the number of cases (frequency), percentage and rank order of each of the design used by undergraduate students. The table shows the design types and percentage each scored as follows: historical 0 (0.0%), survey 165 (62.5%), case study 3 (1.2%), ex-post facto 30 (12.2%), quasi-experimental 48 (19.5%) and instrumentation 0 (0.0%). From the percentage and rank order, the design that is popularly used is the survey design with rank order score of 1. This is followed by quasi-experimental design and ex-post facto design with rank order scores of 2 and 3 respectively. The results show that historical and instrumental designs were not used at all.

Research Question 2

What is the proportion of undergraduate research projects that have appropriate research design using National University Commission benchmark of 75% (0.75) in Kogi State University Anyigba?

Table 2: Proportion of Undergraduate Research Projects that Have Appropriate Research Design

No of Projects	With Appropriate Research Design	Without Appropriate Research Design	Proportion With Appropriate Research Design	Proportion Without Appropriate Research Design
264	189	57	0.77	0.23

Table 2 shows that from the total of 264 projects 189 have appropriate research designs indicating a proportion of 0.77 while 57 out of a total project of 264 were without appropriate research design indicating a proportion of 0.23. This implies that 77% of undergraduate students of Kogi State University Anyigba use appropriate research design which is just slightly above the national university commission (NUC) accreditation guideline of 75%. In order words 23% of undergraduate students of Kogi State University Anyigba do not use appropriate design for data collection.

Hypothesis

The proportion of undergraduate research project that have appropriate research design used by Kogi State University Anyigba undergraduates is not significantly greater than 0.75 of National University Commission benchmark.

Table 3: T-test Proportion of the Significance Difference between the Proportions of Undergraduate Research Projects that Have Appropriate Research Design and the Expected 0.75 of the Population.

N	n	P	P	Q	α	t_{cal}	t_{tab}	Decision
264	264	0.77	0.75	0.25	0.05	2.01	1.65	

The t-test proportion of significance difference between the proportion of undergraduate research projects that have appropriate design and the expected 0.75 of the population was used to the hypothesis. The results in Table 3 show that statistical significance $t_{cal} = 2.01$, $p < 0.05$. This result is significant because the t-calculated of 2.01 was greater than the t-table of 1.65 at 0.05 level of significance. Hence the hypothesis is rejected, implying that the proportion of undergraduate projects that have appropriate research design is significantly greater than 0.75.

IV. Discussion of Findings

The findings of this study show that out of six research designs used in this report, only four, namely case study, survey, ex-post facto and quasi-experimental designs were used by undergraduate students of Kogi State University Anyigba. The results further revealed that survey design was the most popularly used research design, followed by quasi experimental design and ex-post facto respectively with a wide margin between survey design and the other two designs (quasi experimental design and ex-post facto design). The finding of

this study is in congruence with the finding of Lawal and Shaibu (2015) who reported that survey is the most common of all the research designs used over the years by undergraduate students. Furthermore, the findings of this study is in supportive of the finding of Onah and Ukwuoma (2016), which revealed that survey research design was the most commonly used research design with 74.5% of postgraduate students using the design. The outcome of the result of this study is very crucial to instrumentation in educational research. The likely reason, undergraduate students rush to use survey design may be because the design requires the use of questionnaires considered by many as easy to construct and to administer to respondents. Yet Onah and Ukwuoma (2016) clearly stated that the use of survey design as dominant design by students is not in the best interest of education sector because, it's final details are limited, it is lost to broad-based generalizations; it is based on aggregate response which is not traceable and it rely mostly on large scale data. If the undergraduate level which is the foundation stage for researchers run away from using valid and reliable design on the excuse that they want easy ways of completing their projects, then the purpose of carrying out research at the level will be defeated. Thus, this finding has educational implication that is: undergraduate students should be encouraged to show more interest in the use of quasi-experimental design, ex-post facto design, case study design and instrumentation design so as to advance the frontier of knowledge.

The finding of this study indicated that the proportion of undergraduate projects in Kogi State University, Anyigba with appropriate research design is 0.77 which is slightly higher than the criterion proportion of 0.75. Furthermore, the result of the study revealed that the proportion of undergraduate projects in Kogi State University, Anyigba with appropriate research design is significantly more than 0.75. The result agrees with the work of Amaechi, Onuoha, Jiwueze and Ovute (2017) who revealed that the proportion of undergraduate B.Sc./B.A. Ed. research projects that have appropriate research design is greater than that of National University Commission (NUC) stated standard of 0.75. However, the finding of the study contradicts the finding of Isiozor and Akujuobi (2017), which showed that most of the research designs used in Master of Education (M.Ed.) and Doctor of Philosophy (Ph.D) are not significantly greater than 0.75. The reason for this difference may be attributed to the difference in the level of the researches. While the present study deals with undergraduate, the Isiozor and Akujuobi (2017) dealt with postgraduate students. The second reason maybe that at undergraduate level most students employ survey design which they can easily align with their topics.

V. Conclusion

Based on the findings of this study, it is concluded that the most popular research design used by undergraduate students of Kogi State University, Anyigba is survey followed by quasi-experimental and ex-post respectively. It is further concluded that the proportion of undergraduate research projects that have appropriate research design is 0.77, which is higher than the NUC stated standard of 0.75.

VI. Recommendations

1. Supervisors should encourage the students to regularly carryout researches using such designs like quasi-experimental design, case study design and instrumentation design instead of limiting themselves to survey design only to enhance the use of their research findings for the growth of the university and the society at large.
2. Supervisors should give adequate orientation to their supervisees on the appropriate research designs for data collection of their research works.
3. Students should endeavour to persevere in using appropriate designs instead of looking for easy design that will make them quickly complete their projects.
4. Department of Science Education should, on regular basis, organize in-house training programmes for lecturers on the use of appropriate research design.
5. Department of Science Education should encourage undergraduate defense, which will give room for experienced lectures to sharpen the focus of the students on research design issues among others.
6. Supervisors should encourage supervisees to attend workshops and conferences.

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