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DIFFICULTIES ENCOUNTERED BY UNDERGRADUATES' SCIENCE EDUCATION STUDENTS IN INTRODUCTORY PART OF RESEARCH WRITING: A CASE STUDY OF UNIVERSITY OF UYO, NIGERIA

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Abstract: The study tried to identify difficulties encountered by science education undergraduate students in the introductory part of research work.It was a survey research carried out at the University of Uyo, Akwa-Ibom State. Three research questions and a hypothesis formulated to guide the study. The population of the study comprised all the final year students and all the lecturers in the Faculty of Education, University of Uyo, Akwa Ibom State while 19 lecturers and 109 students of Science Education Department of the University formed the sample size. Structured questionnaire developed from literature reviewed by the researchers was the instrument used for data collection. Cronbach Alpha method that gave a reliability coefficient of 0.82 was used to establish the internal consistency of the items.Data collected were analysed using mean and standard deviation. The findings revealed that students encounter all the difficulties listed. The findings also showed that causes of the difficulties range fromsupervisors to students and even institution related factors. It was also found out that gender has no significant effect on the difficulties encountered. It was recommended among other things that too many students should not be assigned to lecturers at a time to enable them do good job.

Keywords: Difficulties Encountered, Undergraduate, Science Education Students, Research Writing

Introduction

The new challenges posed by the emergence of a knowledge-based society in various disciplines have tremendously increased the quest for research in these fields. Research, a scientific exercise for proffering solutions to problems has been recognized as the most reliable means of acquiring knowledge.

Research is defined asa systematic, organised, and controlled process involving observation(s) and the analysis of such observation(s) aimed at discovering the truth (Isangedighi, Joshua and Asim, 2004). Kpolovie(2010)explained that research can satisfactorily be defined as thelogical, systematic and objective collection, analysis, synthesis, evaluation and recording of accurate and controlled observations for the development of generalization, principles, or theories that are ultimately aimed at description, explanation, prediction and control of natural phenomenon to meet specific needs of man (p.3).

Research can be defined in its simplest form as a systematic academic enterprise conducted to address a particular problem. Research project of various types and complexity are integral part of the college experiences that offers one the opportunity to learn a valuable set of skills. Research in the words of Bocar (2013) is done in a precise and systematic manner to look for new knowledge, skills, attitude and values or precisely for the re-interpretation of existing knowledge, skills, attitude or values.

The importance of undergraduate research has been well recognised over the years and the objectives established. Hussey and Hussey in I'Anson and Smith (2004) identified four objectives of the undergraduate research project to include:-

a) analytical problem solving skills;
b) active learning through identification of a problem to be explored and completed;
c) skills development for independent research;
d) application of academic knowledge.

These objectives could be part of the reason for making this course (research method) compulsory for every final year student in higher institutions of learning. It is in this course that students are taken through the skills, principles and traditions of research writing. It is in this course that the students are equipped for the practical aspect of the work. It, therefore, becomes pertinent that students are thoroughly taught

theoretically to enable them carry out the research work practically.

Nevertheless, it is very appalling that a good percentage of undergraduate students in higher institutions in Nigeria today are deficient in the skills for research writing and so cannot achieve the stated objectives. This results in laissez-faire attitude of these students towards quality research project. Achievement of theforegoing objectives requires thorough grooming of undergraduate students through established, organised and systematic steps and principles of research writing skills and this will invariably improve the quality of research work. Onwioduokit (2003) submitted that right from the search for research topic through the way data are analysed and inferences drawn, there are steps, principles and traditions to be followed if the findings of any research are to be of any use to the community. In addition, the quality of research project work bothers onthe following established steps and principles of research work.

Quality has to do with the degree of excellence or the worth of something (Lorimer, 1996). This is needful especially in writing skills for articles that are to be published for public consumption. With respect to science education, some researchers like De Jong, Schmidit and Zoller (2000) outlined quality criteria for research papers to include:-

- clear description of the objective;
- stimulating new ideas or challenging existing theories;
- detailed description of the research methodology;
- check on the validity and reliability of the procedures used (page 30).

In addition, these researchers continued that the following criteria should be addedto the list:

- containing sufficient crucial information;
- concise way of reporting the research methodology;
- good references, but not too many;
- provision of keywords;
- avoidance of use of 'I' or 'We' too often by the researchers (page 30).

In preparation for quality research project work for undergraduate of science education students, a course known as research method is usually introduced at the students' third year. This course is meant to introduce the skills/principles of research writing theoretically to the students. It is expected that students that have passed through this course should acquire these skills and principlesand if they are meticulously followed by undergraduate students of science education, good quality research projects would be produced.

Despiteo this expectation, the researcher has observed with great dismay that the research skills needed to write a good introductionof a research project work by undergraduates students islacking. The researcher s'interview with somelecturers confirmed this observation. Asim, Kalu and Ekwueme (2004) submitted that the principle and traditions of research writing has left both published and unpublished research. Writing a good researchwork is a tedious exercise and as such requires teaching.

According to Alshehry (2004), teaching that enables students to develop good research skills will benefit the students' immediate studies and also provide a foundation for continued learning. Writing of undergraduate research project is a good ground for inculcating such skills in the students and this has established format and procedures.

Calabrese(2006) submitted that generally, many doctoral dissertations or thesis and and undergraduate thesis follow the five chapter format altogether:

Chapter 1 – an introduction, statement of the problem and research question;
Chapter 2 – a review of the literature;
Chapter 3 – the methodology used in the study;
Chapter 4 a presentation used in the study;
Chapter 5 – discussion of results.

In concurring to the above submission, Nworgu, (2005) stated that reporting the process and outcome of a research investigation or a proceeding is all about communication and in the context of educational research, a logical analysis of the substance to be communicated would reveal five essentials that include:

i) The problem investigated
ii) Theoretical justification of the problem
iii)The process of the investigation
iv)The outcome of the investigation
v) Interpretation of the outcome and conclusion.

Though the procedures may be almost the same in every higher institution of learning for both undergraduates and postgraduates inclusive except for little modifications in some faculties/departments to suite the different courses of study, the format according to Nworgu, (2005) may vary from discipline to discipline or from organisation to organisation.Students need to develop good research skills in all the chapters especially chapter one (the foundation) for them to

be competent enough to produce a quality research project. This study tried to focus on the first section or chapter of any research report captioned'introduction' that according to Nworgu (2005), deals essential with problem conceptualization.

The introduction aims at providing the reader with the proper understanding of the problem that under study and most importantly establishing the rationale for the study by providing necessary background information needed to understand the rest of the work. It is the foundation upon which other chapters are built. The introduction of research work covers background to the study, statement of the problem, purpose of the study, significance of the study, research question/hypothesis, scope or delimitation of the study and definitions of terms. Introduction is one of the difficult part of a research work. Students, therefore, need to be well groomed through the skills of writing a good introduction. It is against this background that this study sought to identify the difficulties encountered by undergraduate science education students inthe first section of the research work captioned 'introduction'as a basis for quality research project. Consequently, the objectives of the study were to:-

I. Identify the typeof difficulties encountered by undergraduate science education students in the introductory part of the research project;

II. Find out the possible causes of the difficulties encountered.

III. Findout whether gender has any significant influence on the difficulties encountered.

Research Questions

1. What type of difficulties do undergraduate science education students encounter in the introductory part of the research project?
2. What are the possible causes of the difficulties encountered by the students in the introductory part of the research work?
3. What is the influence of gender on the difficulties encountered by undergraduate students in introductory part of research work?

Research Hypothesis

Male and female undergraduate science education students do not differ significantly on the difficulties exhibited in writing the introductory part of research work.

Methodology

The study adopted a survey research design. The population of the study consisted of all the 168 lecturers in the Faculty of Educationand all the final year students in the eight departments of the Faculty. Using the purposive sampling technique, all the 109 final year students made up of 40 males, 69 females and 19 lecturersin Science Education Department, University of Uyo in 2013/2014 academic sessionformed the sample size.

Instrument for data collection

The instrument for data collection was astructured questionnaire developed by the researchers from the literature reviewed. This was validated by 2 senior lecturers and a professor in the department of science education and 2 measurement and evaluation experts in the Faculty of Education, University of Uyo, Akwa Ibom State. It was a four- point Likert typescale of very strong difficulty, strong difficulty, weak difficulty and not a difficulty. Causes of difficulties were equally rated on a four point scale as follows: major cause of difficulty, a cause of difficulty, a minor cause of difficulty and not a cause of difficulty with 2.50 points as the decision level for the two factors. Any value below 2.50 is not a difficulty and a cause ofdifficulty otherwise a difficulty and a cause of difficulty respectively.

Data collection and analysis

Data collected were analysed using descriptive statistics of mean and standard deviation while the hypothesis was analysed using t - test.

Presentation of result

Table 1: Mean rating of the respondents on the types of difficultiesencountered by students in writing the introduction.

S/N	Difficulties encountered by students	Mean ($\bar{X}$)	Remark
1.	Presentation of ideas in the background of the studylogically and coherently.	2.70	Difficulty
2.	Highlighting factors, viewpoints and data necessary for one to understand the problem.	3.00	Difficulty
3.	Operational definition of importantkey words in the study	2.65	Difficulty
4.	Definition and justification of variables (independent and dependent) in the background	2.60	Difficulty
5.	Statement of the purpose/ objectives of the study	2.55	Difficulty
6.	Stating the research questions and hypotheses properly	2.95	Difficulty
7.	Establishment of the rationale for the study	2.75	Difficulty
8.	Identification ofthe gap(s) the study intends to fill	2.80	Difficulty
9.	Presentation of ideas logically and coherently	3.20	Difficulty
10.	Statingthe significance of the study to the beneficiaries and how it will benefit them.	3.00	Difficulty

From the mean rating on each item on table 1 on the difficulties encountered by the students, it is seen that these students find all the skills for writing the

introduction (chapter 1) of research project difficult. The fact that their mean rating on each item is above 2.50 which is the decision level shows that they encounter all the difficulties listed.

Table 2: The mean rating of the lecturers on the causes of difficulties encountered by students

S/N	Possible causes of difficulties encountered. Supervisor related factors	Mean ($\bar{X}$)	Remark
1	Too many students to supervise	3.25	ACD
2	Lack of time for thorough supervision.	2.70	ACD
3	Lack of research skills among the supervisors	2.93	ACD
4	Lack of research experience	2.30	NCD
5	Inadequate guidance	3.00	ACD
6	Lack of direction	2.70	ACD
7	Clash with other lecture/private interest	2.30	NCD
8	Bulky and illegible writing	1.75	NCD
	Students' related factors		
9	Poor theoretical background	3.10	ACD
10	Poor knowledge and lack of ICT materials	2.60	ACD
11	Lack of library materials	2.95	ACD
12	Lack of fund	2.50	ACD
13	Insufficient time to carry out the work	2.90	ACD
14	Lack of interest and motivation for research work	2.80	ACD
	Institution related factors		
15	Lack of internet/library facilities	2.90	ACD
16	Inadequate facilities to encourage/maintain academic environment	2.65	ACD

ACD means a cause of difficulty while NCD means not a cause of difficulty

From table 2, it was seen that,a lot of factors contributed towards the difficulties encountered. From supervisors' related factors,it is only items 4,5 and 8 which were on lack of research skill, research experience and bulky and illegible writing that are not rated as a possible cause of these difficulties. All the items under students' and institution related factors are causes of the difficulties encountered.

Table 3: Mean rating of male and femalestudents on types of difficulties encounteredin writing the introduction.

S/N	Difficulties encountered by students	Gender	No	$\bar{X}$	SD	Remark
1.	Presentation of ideas in the background to the study logically and coherently.	M	40	2.65	0.92	
		F	69	2.73	1.13	Difficulty
2.	Highlighting factors, viewpoints and data necessary for one to understand the problem.	M	40	2.97	1.05	
		F	69	3.00	1.17	Difficulty
3.	Operationaldefinition of important /key words in the study	M	40	2.59	0.72	
		F	69	2.62	0.89	Difficulty
4.	Definition and justification of variables (independent and dependent) in the background	M	40	2.56	1.13	
		F	69	2.61	1.23	Difficulty
5.	Statement of the purpose/ objectives of the study	M	40	2.50	1.09	
		F	69	2.57	1.12	Difficulty
6.	Stating the research questions and hypotheses properly	M	40	2.92	0.32	
		F	69	2.98	0.43	Difficulty
7.	Establishment of the rationale for the study	M	40	2.68	0.65	
		F	69	2.74	0.83	Difficulty
8.	Identification of the gaps the study intends to fill	M	40	2.75	0.93	
		F	69	2.79	1.15	Difficulty
9.	Presentation of ideas logically and coherently	M	40	2.98	0.52	
		F	69	3.10	0.57	Difficulty
10.	Stating the significance of the study to the beneficiaries and how it will benefit them	M	40	2.89	0.79	
		F	69	3.10	0.88	Difficulty

Table 3 has shown that both male and female students encounter all the 10difficulties enumerated in writing the introductory part of research work as indicated from their mean rating of 2.50 and above on each factor.

Table 4: t-test analysis of the influence of gender on the difficulties encountered by the students.

Gender	No	$\bar{X}$	SD	Df	Cal	t- value	Decision
Male	40	2.82	0.42	107	0.79	1.96	NS
Female	69	2.77	0.49				

Table 5 shows that the calculated t-value of 0.79 at 107 degrees of freedom is less than the critical value of 1.96. The null hypothesis is, therefore, accepted.

Discussion of findings

The results of this study indicate that undergraduate science education students of the University of Uyo encounter all the difficulties listedin writing the introduction of research work. This finding is in agreement with that of Ugwu, Ifeanyieze and Agbo (2015) who submitted that postgraduate students of Nigerian Universities need all the research competencies identified in their studies for them to do well in research. It also agrees with Abonyi (2003) who revealed that there are some fundamental flaws in published research work.In other words, even researchers that are looked up to do commit some errors in research writing. It is equally in agreement with Asim, Kalu & Ekwueme (2004), and Agbo (2013) who found out that there is lack of research skills and tradition in both published and unpublished research work, indicating deficiencies in research skills among professional and armature researchers.

The result of the present study together with findings from the literature reviewed is an indication thatmost researchers (graduates from our higher institutions) including some lecturers in the field are not competent enough on research writing skills since some published research works have some fundamental flaws. On the other part, it is an indication that students are not well taught in the skills and tradition of research writingand as such, stand the risk of producing results that are not reliable and useful in the community.This is a threat to growth and development in the country since these students are the future hope of this country and as such, a serious problem that needs urgent attention considering the importance of research in the society as a basis for growth and development.

According to Pineteh (2012), encouraging students

to write their own research assessment or essays is a good training exercise in the discipline of clear and concise writing. It will not only enhance the quality of research work in the department but will help to alleviate alot of problems that such poor work would always create to the wider society.

The findings which showed that the causes of the difficulties encounteredrange from supervisors to students and institution related factors are not in agreement with that of Bocar (2013) but an addition to the factors known. She submitted that getting hold of the cooperation of the students' respondents contributed to a very great extent to the students' difficulty in conducting research. Nevertheless, the findings has revealed that a lot of factors related to (students, lecturers and institutions) collectively contribute to the difficulties encountered by students in research work.There is, therefore, the need for the stakeholders in education and lecturers/project supervisors particularly in our higher institutions of learning to look into the matter and see that most of these factors are dealt with and the causes reduced to the barest minimum. The fact that lecturers, students and their respondents and even institutions contribute towards these difficulties encountered means that the solution to the problems needs the joint efforts of all.

Lastly, the findings also revealed that gender has no significant influence on the difficulties encountered. This is in agreement with Ugwu et al (2015) who suggest that research skills acquisition depends on the dexterity of purpose and competencies possessed by the researchers and not on the level of education attained. This present study is an addendum that it does not depend on gender too.

Conclusion and Recommendations

The finding of this study has shown that students encounter difficulties in all theresearch skills needed to write a good introduction.This is an indication that the students do not have a good theoretical background in addition to the reasons given on table 2 of this work and as such they have no solid foundation and so are not well equipped for the task.The study equally revealed that a lot of factors ranging from students to institution related factors contribute significantly to the difficulties encountered and that gender is not a significant factor to the difficulties encountered.

Based on these findings,the researchers, therefore, recommended that:there is need for organisation of workshop and seminars for lecturers from time to time on the skills of research writing to enable themteach the students well. Secondly, Supervisors should not be given more than the stipulated number of students by the National University Commission (NUC) to supervise at a time. Young lecturers should be attached to old and experienced lecturers for proper grooming before giving them some students to supervise. Each supervisor should try and make the sacrifice of re-teaching some relevant aspects of research method to the students assigned to him/her before the commencement of the exercise.

This will help to bring the background to a sharp focus. Generally, the University management should liaise with the lecturers who implement the curriculum and to see that the difficulties related to them are abated and equally help the students reduce the difficulties related to them. When this is done, the difficulties encountered will be reduced drastically and the quality of research work will improve.

References

Abonyi, O. S. (2003). Fundamental flaws in experimental research. Journal of Science Teachers Association of Nigeria, (38) 1 & 2, 107 – 111.

Agbo, A. (2013). The dearth of quality research (1). The Nations Newspaper, Nov.26, 2013, pp 30.

Asim, A. E., Kalu I. and Ekwueme, C. O. (2004). An evaluation of research skills displayed in unpublished graduate theses of published researches in science education. 45th Annual conference Procedings of STAN, pp 26 – 29.

Alshehry, A. T. (2009). Perception of science education for girls in Saudi Arabia higher education: a case study of female biology teacher. Ph. D. Thesis. University of Nottingham, United Kingdom.

Bocar, A. (2003). Difficulties encountered by student researchers and the effects on their research output. Proceedings of the Global Summit on Education (e-ISBN 978-967-11768-1-0).

Calabrese, R. L. (2006). The elements of an effective dissertation and thesis: a step-by step guide to getting it right the first time.Rowman & Littlefield Education, Langham, Maryland, Toronto. Oxford.

De Jong, O., Schmidtt, H. J. and Zoller, U. (2000). Quality criteria for research paper on science education: How can they be used to improve manuscript submitted for publication.Chemistry Education Research and \practice in Europe, 1(1), 27 – 30.

I'Anson, R. A. and Smith, K. A. (2004). Undergraduate research projects and dissertations: issues of topic selection, access and data

collections among tourism management students. Journal of Hospitality, Leisure, Sports and Tourism Education, 2(1), 19 – 32.

Isangedighi, A. J., Joshua, M. T. And Asim, A. E. (2004).Fundamentals of research and statistics in education and social sciences. Nku-Ubia Ventures LTD. Calabar.

Lorimer, L. T.(1996).The new lexicon webster's dictionary of English language. Danbury: Lexicon Publication Inc

Kpolovie, J. (2010). Advanced research methods. Springfield Publishers Ltd. New Owerri, Imo State.

Nworgu, B. G. (2005). Gateway to research proposal and report, In D. N.Ezeh (Eds) What to Write and How to Write, A Step to Step Guide to Educational Research Proposal and Report. A publication of Institute of Education, University of Nigeria, Nsukka.

Onwioduokit, F. A. (2003). National standards for science educational research.In T. P. Baiyelo & T. Busari (Eds).Standards for science and mathematics educational research. Lagos: NASER Academic Press.

Pineteh, E. A. (2000). Using virtual interactions to enhance the teaching of communication skill to information technology students.British Journal of Educational Technology, 43(1): 85 – 96.

Ugwu, A. N., Ifeanyieze, F. O. & Agbo, P. N. (2015). Competency needs of postgraduate students of STEM education in research writing in Nigerian Universities. Creative Journal of Education, 6, 701-706.