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POSTGRADUATE STUDENTS' PERCEPTION OF THEIR COMPETENCIES IN DESIGNING EDUCATIONAL RESEARCH: CASE OF THE UNIVERISTY OF NIGERIA, NSUKKA

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Abstract: *Proficiency in research is a prerequisite for academic achievement for postgraduate students. Even though research writing abilities are crucial, the majority of students find it difficult to complete tasks involving research. As a result, this study looked at how postgraduate students perceived their level of expertise when it came to creating instructional research. The survey design used in the study was descriptive. The study was guided by two null hypotheses and three research questions. A sample of 300 post-graduate students, 157 of whom were male and 143 of whom were female, was employed in the study. There were 198 Masters and 102 Ph.D. students. The researchers created the Students' Perceptions on their Competences in Research Designing Questionnaire (SPCRDQ), which was the tool used to collect data. Using Cronbach's Alpha, the instrument's dependability was assessed; the result was a reliability index of 0.85. The three research questions were addressed using the mean and standard deviation, and the two null hypotheses were tested at the 0.05 level of significance using the t-test statistical method. The results show that students were competent in some areas but there were areas in designing educational research they need improvement. It also showed that there was no discernible difference between the perceptions of male and female students' design competencies. Nonetheless, a notable distinction was found in the design of educational research competencies between Ph.D. and masters students.*

Key words: *assessment; research; educational research; research design; competence.*

Introduction

Higher education institutions, particularly universities, play a critical role in addressing societal challenges through research and innovation. These institutions cultivate intellectual growth, foster advanced research capabilities, and prepare students for careers in public service and academia. As Socrates famously stated, "The unexamined life is not worth living." Research, driven by an inherent human desire for knowledge and understanding, is an investigative process that seeks to find reliable solutions to problems through systematic inquiry. It involves methodical data collection, analysis, and interpretation, leading to new discoveries and advancements in various fields. In the words of Muredzi (2019), research is a crucial endeavor that "aims to find a trustworthy solution to a problem through methodical selection, data collection, analysis, and interpretation." It not only expands our knowledge base but also enhances our understanding of the world around us and develops new skills.

Furthermore, research design is the cornerstone of any successful research endeavor. It provides the framework for the entire research process, guiding data collection, measurement, and analysis. As Akhtar (2016) emphasizes, stakeholders in education recognize the paramount importance of research design proficiency among students. Kirshenblatt-Gimblett (2020) aptly describes research design as "the overarching approach used by researchers to logically and cogently integrate the various study components in order to guarantee that the research challenge is successfully addressed." The choice of research design is crucial, as it must be tailored to the specific nature of the research question.

A well-defined research design is crucial for successful research. It serves as a roadmap, guiding the investigation and ensuring that the collected data directly addresses the research problem. This could involve testing a hypothesis, evaluating a program, or accurately characterizing a phenomenon. Neglecting to carefully consider design challenges upfront can lead to weak and unconvincing conclusions, ultimately hindering the progress of the broader research problem. As Nworgu (2015) explains, a research design is a "strategy or manual" that outlines how to gather and analyze relevant information. Given the diversity of research questions, a one-size-fits-all approach to design is not feasible. Researchers must carefully select a design that aligns with their research objectives, considering factors like time constraints and resource availability. Furthermore, research design acts as a bridge between research topics and their practical implementation, facilitating the execution of the research strategy.

Effective research design is essential for producing trustworthy results, generating new knowledge, and fostering innovation. It empowers researchers to equip students with the knowledge, skills, and values necessary for personal and professional growth (Aripin et al., 2021). Research is undeniably vital for the advancement of education in any nation. One of the most significant challenges faced by university undergraduates is selecting an appropriate research design. Prokhorchuk (2014) emphasizes that competence stems from superior information processing, knowledge acquisition, and skill development. Investing in the development of information retrieval skills, fostering a lifelong learning mindset, and cultivating research abilities is crucial for the growth of both human and natural resources. These skills empower students to reach their full potential, collaborate effectively, and develop a deep understanding of research methodologies (Bandaranaike, 2018). Furthermore, graduate education has a primary responsibility to prepare students for professional roles and equip them with strong research skills (Gilmore & Feldon, 2010). Future research endeavors should prioritize the development of operational and sustainability competencies, along with the creation of robust assessment tools to measure student competence (Cebrain et al., 2019). Yarullin et al. (2015) highlight the critical importance of research competence, emphasizing its role in enhancing professional skills within the scientific domain. This includes the ability to identify and formulate relevant research questions within the context of future professional activities. Davidson and Palermo (2015) further emphasize that developing research competence enhances an individual's confidence in their ability to design research, select samples, collect and analyze data, and effectively communicate research findings. Given the significance of research skills and competence, it is crucial to regularly assess student learning to determine their level of attainment.

The basic purpose of assessment in any educational system is to help teachers determine how well their pupils are meeting and mastering the learning objectives. As to Anandan (2016), the term assessment encompasses the diverse range of techniques employed by educators to appraise, gauge, and gather data regarding students' academic advancement and proficiency. According to Ghaicha (2016), assessment is a procedure that is used in education to evaluate students' proficiency and abilities by gathering, gauging, assessing, combining, and interpreting pertinent data on a certain subject of interest. Empirical data on student learning are used in assessment to improve student performance, program design, and attain intended outcomes. In order to provide specialized academic support, educational programming, or social services, educators can quickly and easily identify each student's strengths and weaknesses through assessment. They can also provide

feedback on the efficacy of instruction and assist students in determining the extent of their progress (Yambi, 2018). Teachers can ascertain whether pupils are acquiring the necessary concepts, abilities, and values through assessment (Tremblay et al., 2012). Additionally, it shows how much a student possesses particular qualities or attributes based on standards or criteria, which is a source of proof for a variety of aspects of the student's knowledge, comprehension, skills, and talents. Hence the study aims at using assessment to measure the postgraduate students' perception of their competency in designing educational research.

Students find it difficult to write, conduct research, and present their findings, even in higher education settings where research is necessary and valued (Shahsavar & Kourepaz, 2023). Because life without inquiry is not worth living for a human being and because research activity generates new information, the low performance of these students has become a serious concern to parents, students, and stakeholders. It is equally vital to remember that developing research skills and preparing students for professional obligations are two of higher education's main goals. The research design employed and the students' proficiency with educational research design determine the effectiveness of research projects and their applicability in any educational institution. If design issues are not well taken care of, the conclusions drawn will have the risk of being weak and consequently, fail to adequately address the overall research problem. One of the glaring problems facing the undergraduate students in universities is the skills and competence to choose appropriate research design for their study. As a result of these problems, it therefore becomes important to carry out this study on postgraduate students' perception of their competency in designing educational research.

Purpose of the Study

The general purpose of the study was to determine postgraduate students' perception of their competency in designing educational research.

Specifically, the study tends to determine:

i. The perception of postgraduate students on their competencies in designing educational research.
ii. Male and female post-graduate students' perception of competency in designing educational research.
iii. Masters and Doctorate students' perception of competency in designing educational research

Research Question

The following research questions guided the study:

i. What are the levels of postgraduate students' perception of their competency in designing educational research?
ii. What is the mean ratings of male and female post-graduate students' perception of their competency in designing educational research?
iii. What is the mean ratings of Masters and Doctorate students' perception of competency in designing educational research?

Hypotheses

The following hypotheses that guided the study were tested at 0.05 level of significance:

H_{01}: There is no significant difference in the mean ratings of male and female post-graduate students' perception of competency in designing educational research.

H_{02}: There is no significant difference in the mean rating of Masters and Doctorate students' perception of competency in designing educational research

Results

This section presents the results of the study in line with the research questions and the hypotheses generated to guide the study

Research Question 1: What are the levels of postgraduate students' perception of competency in designing educational research?

S/N	Statements	Mean	SD	Decision
1	Given a research topic in education, I can determine the target population.	3.49	0.55	Accept
2	Given a research topic in education, I can determine the proportion of the target population that should be selected.	3.52	0.51	Accept
3	If I am given a research topic in education, I can explain how to collect data pertinent to the problem.	3.59	0.61	Accept
4	For any research topic in education, I can state the most appropriate statistical test for the problem.	2.75	0.46	Accept
5	For any research topic in education, I can state the design of the study.	3.52	0.51	Accept
6	Given a research topic in education, I can delineate the scope of the study.	3.08	0.68	Accept
7	Given a research topic in education, I can determine how to enhance generalizability of the results.	2.41	0.50	Reject

8	Given a research topic in education, I can highlight the potential problems and challenges in the investigation.	2.59	0.71	Accept
9	I can determine whether my collected data in educational investigation violates the assumption of the required statistical test.	2.34	0.79	Reject
10	I can conduct educational investigation involving experimentation.	2.27	0.77	Reject
11	I have the ability to conduct study in education that is multiple regression analysis.	2.59	0.71	Accept
12	I can successfully supervise undergraduate students' research project in my area of specialization.	2.27	0.68	Reject
13	I can conduct a study requiring an ex-post factor design.	2.39	0.71	Reject
14	I can carry out a study in education that requires descriptive survey design.	2.92	1.01	Accept
15	I can analyze my collected data using appropriate software.	2.54	0.89	Reject
16	I can report my finding in line with A.P.A style.	2.47	0.89	Reject
	Grand Mean	2.85	0.64	Accept

Table 1: Mean and Standard Deviation of Post-Graduate Students' Perception of Competency in Designing Educational Research

Table 1 indicates that the mean responses of postgraduate students on items 1, 2, 3, 4, 6, 8, 11, 14, and 15 were above the mean bench mark of 2.50 implying that the students have competence in designing issues captured by these items. However, mean rating on items 7, 9, 10, 12, 13, and 16 were below the mean bench mark of 2.50 implying that the students do not possess the competences captured in these items

Research Question 2: What is the mean ratings of male and female post-graduate students' perception of competency in designing educational research?

S/N	Gender	Male			Female		
	Statements	Mean	SD	Decision	Mean	SD	Decision
1	Given a research topic in education, I can determine the target population.	3.47	0.56	Accept	3.51	0.54	Accept
2	Given a research topic in education, I can determine the proportion of the target population that should be selected.	3.48	0.50	Accept	3.57	0.51	Accept
3	If I am given a research topic in education, I can explain how to collect data pertinent to the problem.	3.61	0.60	Accept	3.57	0.62	Accept
4	For any research topic in education, I can state the most appropriate statistical test for the problem.	2.75	0.48	Accept	2.75	0.45	Accept
5	For any research topic in education, I can state the design of the study.	3.51	0.50	Accept	3.53	0.51	Accept
6	Given a research topic in education, I can delineate the scope of the study.	3.04	0.68	Accept	3.11	0.69	Accept
7	Given a research topic in education, I can determine how to enhance generalizability of the results.	2.39	0.50	Accept	2.44	0.50	Reject
8	Given a research topic in education, I can highlight the potential problems and challenges in the investigation.	2.58	0.69	Accept	2.60	0.73	Accept
9	I can determine whether my collected data in educational investigation violates the assumption of the required statistical test.	2.33	0.79	Reject	2.36	0.80	Reject
10	I can conduct educational investigation involving experimentation.	2.28	0.77	Reject	2.25	0.78	Reject
11	I have the ability to conduct study in education that is multiple regression analysis.	2.58	0.69	Accept	2.61	0.74	Accept

12	I can successfully supervise undergraduate students' research project in my area of specialization.	2.27	0.68	Reject	2.28	0.69	Reject
13	I can conduct a study requiring an ex-post factor design.	2.38	0.68	Reject	2.41	0.74	Reject
14	I can carry out a study in education that requires descriptive survey design.	3.65	0.49	Accept	3.65	0.52	Accept
15	I can analyze my collected data using appropriate software.	2.54	0.86	Accept	2.54	0.91	Accept
16	I can report my finding in line with A.P.A style.	2.47	0.88	Reject	2.48	0.90	Reject
	Grand Mean	2.83	0.65	Accept	2.85	0.67	Accept

Table 2: Male and Female Responses on the Post-graduate Students' Perception of Competency in Designing Educational Research

In Table 2 shows that the result of responses of male and female students on their competencies in designing educational research. The result revealed that majority of both male and female students have design skill as most of the items had mean ratings above the 2.50 benchmark except for items 7, 9, 10, 12, and 16 were both male and female students had mean ratings below 2.50 benchmark.

Research Question 3: What is the mean ratings of Masters and Doctorate students' perception of competency in designing educational research?

		Masters			**PhD**		
S/N	Statements	Mean	SD	Decision	Mean	SD	Decision
1	Given a research topic in education, I can determine the target population	3.39	0.54	Accept	3.68	0.53	Accept
2	Given a research topic in education, I can determine the proportion of the target population that should be selected.	3.45	0.51	Accept	3.66	0.48	Accept

3	If I am given a research topic in education, I can explain how to collect data pertinent to the problem.	3.50	0.67	Accept	3.77	0.42	Accept
4	For any research topic in education, I can state the most appropriate statistical test for the problem.	2.68	0.49	Accept	2.88	0.38	Accept
5	For any research topic in education, I can state the design of the study.	3.54	0.51	Accept	3.49	0.50	Accept
6	Given a research topic in education, I can delineate the scope of the study.	3.09	0.73	Accept	3.06	0.58	Accept
7	Given a research topic in education, I can determine how to enhance generalizability of the results.	2.35	0.49	Reject	2.52	0.50	Accept
8	Given a research topic in education, I can highlight the potential problems and challenges in the investigation.	2.54	0.80	Accept	2.70	0.46	Accept
9	I can determine whether my collected data in educational investigation violates the assumption of the required statistical test.	2.19	0.85	Reject	2.65	0.56	Accept
10	I can conduct educational investigation involving experimentation.	2.07	0.80	Reject	2.66	0.55	Accept
11	I have the ability to conduct study in education that is multiple regression analysis.	2.35	0.49	Reject	3.07	0.84	Accept
12	I can successfully supervise undergraduate students' research project in my area of specialization.	2.13	0.68	Reject	2.56	0.59	Accept
13	I can conduct a study requiring an ex-post factor design.	2.19	0.60	Reject	2.78	0.74	Accept
14	I can carry out a study in education that requires descriptive survey design.	3.55	0.54	Accept	3.85	0.36	Accept
15	I can analyze my collected data using appropriate software.	2.37	0.89	Reject	2.87	0.78	Accept

16	I can report my finding in line with A.P.A style.	2.30	0.90	Reject	2.81	0.77	Accept
	Grand Mean	2.73	0.66	Accept	3.06	0.56	Accept

Table 3: Mean Ratings of Masters and Doctorate Students' Perception of Competency in Designing Educational Research

The result in table 3 showed that all the Ph.D students had mean above 2.50 indicating that they agreed in all the items. On other hand, Masters students agreed in some of the items as they had mean score above 2.50 except in items 7, 9, 10, 11, 12, 13, 15 and 16 where they had mean score less than 2.50 indicating that they have problems in those items.

Hypothesis 1: There is no significant difference in the mean ratings of male and female post-graduate students' perception of competency in designing educational research.

Grouping Variables	**N**	**Mean**	**SD**	**t**	**df**	**Sig**	**Remark**
Male	158	45.35	7.47	-0.35	298	0.73	Not Sig
Female	142	45.65	7.88				

Table 4: t-test Analysis of Male and female Post-graduate Students' Perception of Competency in Designing Educational Research

Table 4 shows that the male students' mean perception of competency in designing educational research (male, Mean=45.35, SD=7.47) is not significantly (t=-0.35, df=298, P=0.73>0.05) difference from the female students (female, Mean=45.65, SD=7.88). This implies that both male and female postgraduate students had similar perception of their competencies in designing educational research.

Hypothesis 2: There is no significant difference in the mean rating of Masters and Doctorate students' perception of competency in designing educational research.

Grouping Variables	**N**	**Mean**	**SD**	**T**	**df**	**Sig**	**Remark**
Masters	198	43.68	7.71	-6.04	298	0.001	Not Sig
Ph.D	102	49.01	6.21				

Table 5: t-test Analysis of Masters and Ph.D Postgraduate Students' Perception of Competency in Designing Educational Research

Table 5 shows that the Masters students' mean perception of competency in designing educational research (masters, Mean=43.68, SD=7.71) was significant (t=-6.04, df=298, P=0.001<0.05) difference from the Ph.D students (Ph.D, Mean=49.01, SD=6.21). This implies that both masters and Ph.D students differed in their perception of their competencies in designing educational research with Ph.D students having more competencies as compared to their masters' counterparts.

Discussion

The findings of the study showed that most postgraduate students can determine the proportion of the target population, explain how to collect data pertinent to their problem, state appropriate statistical test, design and scope of their study. The students equally agreed on some items showing that they can highlight the potential problems and challenges in their research work and analyse collected data correctly. On the other hand, some postgraduate students showed difficulties in items like the assumption guiding statistical test, use of some research design, generalizability of result, reporting of research work and educational investigation involving experimentation. The current findings are consistent with those of Eze et al. (2021), who evaluated the gender distribution and research application skills of students in Cross River State health training institutions and discovered that these students, in general, have high application skills for research and effectively apply those skills to their projects. According to their findings, students' research skills in relation to issue articulation and hypothesis formulation were significantly high, as evidenced by the positive t-values linked with those two talents.

Conversely, students' research skills in the areas of literature review and statistical analysis are notably low, as indicated by the negative t-values associated with those talents. As can be seen from the conclusion, the students were proficient in writing certain sections of the research paper but less so in others. The researchers encountered challenges when it came to referencing relevant literature and studies, crafting research questions, analysing data, and coming up with a research title. It also aligns with the findings of Meerah et al. (2012) in Measuring Graduate Students Research Skills Social and Behavioral Sciences, which showed that graduates should be able to conduct independent research because they were well-versed in research techniques. But there is still room for growth, especially in the areas of technique and quantitative analysis abilities.

The finding further showed that most of the male and female students have design skills in in that they believed they can determine the target population, determine the proportion of the target population that should be selected, can explain how to collect data pertinent to the problem, can

state the most appropriate statistical test for the problem, can state the design of the study, can delineate the scope of the study, can highlight the potential problems, and can carry out a study in education that requires descriptive survey design. However both male and female students were not competence in determining whether collected data in educational investigation violates the assumption of the required statistical test, in conducting educational investigation involving experimentation, conducting study in education that uses multiple regression analysis, supervising undergraduate students' research project in my area of specialization, conducting a study requiring an ex-post factor design and analysing collected data using appropriate software. A further analysis of the findings revealed no significant difference in the competencies possessed by both male and female postgraduate students. These findings agreed with the finding of Camera et al. (2021) in their work Gendered-Analysis on Research Competency of 21st Century Learners where they found out that both gender identities consider themselves as highly competent in research work.

The findings of the study revealed that masters students were not competence in determining whether collected data in educational investigation violates the assumption of the required statistical test, in conducting educational investigation involving experimentation, conducting study in education that uses multiple regression analysis, supervising undergraduate students' research project in my area of specialization, conducting a study requiring an ex-post factor design and analysing collected data using appropriate software. This is consistent with the findings of Ismaila and Meerah (2011), who evaluated the research competencies of doctorate students and discovered that these students had performed fairly well in terms of their ability to conduct research. The findings, however, were based solely on the opinions of the students themselves regarding their research projects and their results. The research competency items that postgraduate and masters' students found challenging when writing their theses did not significantly differ in mean ratings, according to Ugwu et al. (2015) in Competency Needs of Postgraduate Students of STEM Education in Research Writing in Nigerian Universities.

Conclusion

Poor research work could emanate from inadequate knowledge in designing empirical studies. Hence, this study was carried out to ascertain the competencies of postgraduate students in the Faculty of Education, University of Nigeria in designing educational research. This is very important in order to enhance the quality f research output among educators. It was hypothesized that the competencies of male postgraduate students will not be significantly different from that of their

female counterparts. Similarly, it was also hypothesized that masters' students and Ph.D students would not differ significantly in their competencies in designing educational research. Based on the findings of the study, it is concluded that while postgraduate students showed competency in some areas in designing educational research, there are other areas in designing educational research that the students need improvement. More so, it is also concluded that gender had no significant role in postgraduate students designing of educational research. However, the programme level to which the postgraduate students were admitted significantly influenced the competencies possessed by the students in designing educational research. From the findings and conclusions made from the study, recommendations were outlined as follows:

i. In order to enhance high research skills in undergraduate students, the development of research skills should be done with an integrated curriculum that is able to facilitate students to develop thinking skills and research processes.
ii. Educators in this generation should be equipped with very high research competence and skills through seminars and training in research to be equipped enough to provide research skills needed by the young researchers.
iii. Governments should cooperate to invest and enact support policies for inter-regional and national learning, provide research grant and research opportunities for students especially for master's students that had low mean scores in some items indicating that they have problems in those items.
iv. Higher education system needs innovate and constructive flexible teaching strategies and learning activities that will ensure interconnectedness of roles of instruction, research, engagement and production.
v. The students' research competency should be linked to a more innovative teaching beyond traditional classroom lectures which allows students to share their experiences and participate in classroom discussion.

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