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Assessment of Application of Research Skills of Students in Health Training Institutions in Cross River State, Nigeria

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Abstract: *- This study assessed the research skills of students in health institutions in Cross River State, Nigeria. The study adopted a survey research design using a sample of 230 completed National and Higher National Diplomas research projects of College of Health Technology, College of Health Information Management, and School of Nursing and Midwifery in Cross River State from 2013/2014 and 2014/2015 sessions, through stratified random sampling technique. The instrument used for collecting data for the study was a 16-item Assessment Rating Scale on four major research skills (problem articulation, hypothesis formulation, literature review and statistical analysis). The population t-test analysis, independent t-test analysis and analysis of variance (ANOVA) were used to test the three null hypotheses at .05 alpha levels. The results of the study revealed that: (i) Application of research skills of students in terms problem articulation, literature review, formulation of hypotheses and statistical analysis is significantly high (ii) Students' area of specialization significantly influenced application of research skills in terms of hypotheses formulation, literature review and statistical analysis while that of problem articulation was not significant. (iii) There is no significant influence of school location on application of research skills in terms of problem articulation and hypotheses formulation. However, school location had significant influence on research skills of literature review and statistical analysis. The study recommended, among others, that workshops and seminars should be organized on a regular basis for students to improve and consolidate on their effective application of research skills.*

Keywords: *Assessment, Research skills, Health training institutions, Cross River State, Nigeria.*

Introduction

The term research typically refers to a process through which we attempt to achieve systematically with the support of data to answer questions and give solution to research problems. It is an investigation carried out to discover new facts and additional information about a phenomenon. It can also be seen as the systematic process of collecting and analyzing information (data) in order to increase our understanding of the phenomena with which we are concerned or interested in studying. The major essence of research is to provide a methodology for obtaining answers to questions raised by inquiringly studying the evidence within the specified parameters, using scientific method. In health training institutions, students require scientific process in the application of research Skills to outline build up knowledge through experiences and add substantially to existing knowledge through coherent research work.

Okebukola (2002) noted that university students performances in research methods examination is not commensurate with the growing demand for good research that meet the local and national standards for publishing with the sole aim of contributing substantially to the knowledge bank. It is also observed that there is an ample evidence to show that research conducted by higher education (especially students and academic staff) has contributed to the expansion of the world knowledge, and improvement in the economy of a nation (Bako, 2005). In Nigeria and other parts of

the world, some students lack the basic skills to outline existing knowledge and this had led to the collapse of adequate application of research skills in research project (Okebukola, 2002). Lacey (2007) noted that lack of commitment to course of study can adversely affect the students performances in the application of research procedure and the result thereafter.

Denga and Ali (1983) also identified the following basic skills needed for the preparation of research project; these include the skills of research introduction, statement of problem, literature review, research design, analysis of data, and conclusion. Therefore, this study seeks to assess the application of students' research skills in terms of problem articulation, organization of literature review, formulation of testable hypotheses, and statistical analysis in research projects.

There seems to be a lapse in information concerning the assessment of the extent to which students in health training institutions have applied research skills in; problem articulation, formulating tested hypothesis, organization of literature review, and choice of suitable statistical data analysis. Articulation of the research problem is a basis on which all the other items in the whole research procedures and presentation are to be made. Isangedighi, Joshua, Asim and Ekuri (2004) argued that, problems that agitate the mind and urge for solution arises from the contact between the mind and the world of nature outside the person.

Isangedighi ET. al., (2004) maintained that literature review is an activity, which involves identifying, locating, reading and assessment of existing area with a view to sharpening and clearly defining the problem in specific term. Such knowledge to be sought for in literature review includes conceptual frameworks, empirical evidence, theories, hypothesis and conclusions of other scientific works related to the question under investigation.

Adequate application of research skills in hypotheses formation helps the researcher confirm or reject his proposition. This means that there are adequate hypotheses and there are wrong ones. The idea that hypotheses should not contradict already established theories inform us that they should be formed in such a way that they agree with known theories (Joshua, 2005). Working on health institution students and statistical analysis skills, Hoffman, Antwi-Nsiah, and Stanlsy (2008) revealed that on the overall, 72% of respondents had been taught how to search online article database at some point in their academic career, but this percentage decreased for most other skills, (such as data analysis and validation skills). The culminating step to data description and analysis is to perform statistical analysis. The objective is to make inferences about a population based on information gathered in the sample of a research study.

Hoffman et al (2008) in a study on what information-seeking skills institution type (supervisors) think are most important for their students. It was found that various institutions seemed to feel most strongly that their students should develop a repertoire of strategies for searching the literature while student's perspectives were that institutions place importance on knowledge copyright, intellectual property than guiding them on other research skills. Furthermore, institutions members express a strong desire for students to have hand-on experience with library research skills instruction.

A study was carried out by Howard University (2010) on school location, using 12 professional health institutions students who pursued studies in 50 areas leading to undergraduate and professional certificates. The results of the study revealed that students in urban schools have understanding and ability to successfully demonstrate research skills in articulating research problem, review of literature and analyses of research projects. This study added that students' proficiencies in research skills are related to expected knowledge and professional disposition, including the facilities in the respective schools and colleges.

What the situation is with students in health training institutions in Cross River State, Nigeria, is the

concern of this study. Therefore, the specific purposes of this study are:

1. To find out the extent of the application of research skills in terms of problem articulation, hypothesis formulation, literature review and statistical analysis among students in health training institutions.
2. To examine the influence of students' area of specialization on the application of research skills, in terms of problem articulation, hypothesis formulation, literature review and statistical analysis among students in health training institutions.
3. To examine the influence of school location on the application of research skills, in terms of problem articulation, hypothesis formulation, literature review and statistical analysis among students in health training institutions.

Statement of hypotheses

The following hypotheses were formulated to guide the study:

1. Application of students' skills in terms of problem articulation, hypothesis formulation, literature review and statistical analysis among students in health training institutions is not significantly high.
2. There is no significant influence of students' area of specialization on application of research skills, in terms of problem articulation, hypothesis formulation, literature review and statistical analysis among students in health training institutions.
3. There is no significant influence of school location on the application of research skills, in terms of problem articulation, hypothesis formulation, literature review and statistical analysis among students in health training institutions.

Method

The design for this study is survey research design. The systematic sampling procedure was adopted in selecting elements of the population (completed research projects) for this study. The first stage in the selection of sample involved stratification based on four types of health institutions, (College of Health Technology, School of Nursing, School Health Information Management and School of Midwifery) from each of the health training institutions, 20 percent of the research projects were drawn using systematic random sampling to constitute the sample, in such a manner that for every five(5) projects, one was picked. The sample involved two hundred and thirty (230) research projects from the various health training institutions in Cross River State, Nigeria, as shown in Table 1.

Table 1: Distribution of study samples

S/N	Name of Health Training School	Total No. of project work	No. of research project (20%)
1.	College of Health Technology, Calabar	550	110
2.	School of Nursing, Calabar	98	20
3.	School of Nursing, Itigidi	77	15
4.	School of Nursing, Ogoja	80	16
5.	School of Health Information Management, Calabar	250	50
6.	School of Midwifery, Calabar	50	10
7.	School of Midwifery, Obudu	45	9
	Total	**1150**	**230**

The researchers, with the assistance of three research experts in educational measurement and evaluation developed a 16-item assessment rating scale for data collection. The rating scale was tagged "Assessment Rating Scale for Health Training Institutions Students Application of Research Skills". The rating scale comprised four major areas of research skills, namely; problem articulation, hypothesis formulation, literature review and statistical analysis. Each of the major

skills comprised four parameters, which were used to rate students projects to determine the adequacy or otherwise, of the research skills in questions. In all, 16 parameters constituted the rating scale. The rating scale consisted of 5 points and the rating options are: Excellent, Very good, Good, Average, Very poor. To ascertain the extent to which the items in the check list assess research skills in health training institutions, face validation was used. This was done and found to be appropriate. In order to provide data on the reliability of the rating scale, thirty research projects were rated and inter-rater reliability coefficients ranging from .71 to .82 was obtained using Scott reliability approach.

Results

Hypothesis one: Application of research skills of students in terms of problem articulation, literature review, formulation of hypotheses, and statistical analysis is not significantly high.

This hypothesis was tested with a test of one sample mean (population t-test). The result shows that the absolute calculated t-values for the four major skills are greater than the critical t-value as shown on Table 2. This means that the t-values (9.54, -37.65, 5.26, and -33.59) are statistically significant. The t-values (9.54 and 5.26) associated with problem articulation and hypotheses formulation skills are positive, indicating that student's research skills with respect to those two skills are significantly high. On the other hand, the t-values (-37.65 and -33.59) associated with literature review and statistical analysis skills are negative, indicating that students' research skills in those areas are significantly low. On the basis of this result, hypothesis one is rejected with respect to problem articulation and hypotheses formulation skills, while the hypothesis is upheld with respect to statistical analysis and literature review organization skills.

Table 2: Population t-test analysis of application of research skills of students in terms of problem articulation, literature review, formulation of hypotheses and statistical analysis (n=230).

Research skills	**Mean**	**Mean error**	**t-value**
Articulation of problem	13.05	.110	9.54*
Literature review	17.46	.120	-37.65*
Formulation of hypotheses	12.61	.120	5.26*
Statistical analysis	17.26	2.04	-33.59*

* $p < 0.05$, df = 229 critical t = 1.97, N = 230. Population mean score = 12

Hypothesis two: There is no significant influence of students' area of specialization on the application of research skills in terms of problem articulation, hypothesis, formulation, literature review and statistical analysis. Table 3A shows that the calculated F-value of .763 was obtained. This was compared with the critical F-value of 3.84 at 3 and 226 degrees of freedom and found to be less. This led to the acceptance of the null hypothesis. The implication of this finding is that area of students' specialization in Cross River State health training schools does not significantly influence the application of the skills of problem articulation.

As shown in Table 3B, the calculated F-value is 9.815 compared to the critical F-value of 3.84. Since the critical F-value 3.84 is lesser than the calculated F-value 9.815at 3 and 226 degrees of freedom, the null hypothesis is rejected and the alternative hypothesis retained. This implies that there is a significant influence of students' area of specialization on the application of the skills of hypothesis formulation. Table 3C reveals that the calculated F-value is 4.66 compared to the critical F-value of 3.84. Since the calculated F-value of 4.66 is greater than the critical F-value of 3.84 at, and 266, degrees of freedom. The null hypothesis is rejected while the alternative hypothesis is upheld that there is a significant influence of student's area of specialization on the application of the skills of literature review.

Table 3 A-D: One-way analysis of variance (ANOVA) of the influence of students' area of specialization on:

Table 3A: The application of the skills of problem articulation among health training schools in Cross River State (n=230)

Group	Area of specialization	n	X	SD	
1.	Health Technology	110	12.91	1.53	
2.	Nursing	51	13.03	1.68	
3.	Health Information Management	50	13.20	1.85	
4.	Midwifery	19	13.47	1.98	
Source of variation		SS	Df	MS	F
Between Groups		6.45	23	2.15	
					.763
Within Groups		636.92	226	2.81	
Total		**643.37**	**229**		

p > .05, df 3,226, critical F = 3.84

Table 3B: The application of the skills of hypotheses formulation (n=230)

Group	Area of specialization	n	X	SD	
1.	Health Technology	110	12.91	1.53	
2.	Nursing	51	13.03	1.68	
3.	Health Information Management	50	13.20	1.85	
4.	Midwifery	19	13.47	1.98	
Source of variation		SS	Df	MS	F
Between Groups		81.902	3	27.30	
					9.815*
Within Groups		628.658	226	2.78	
Total		**710.561**	**229**		

* p < 0.05, df = 3 and 226, critical F = 3.84

Table 3C: The application of the skills of literature review (n=230)

Group	Area of specialization	N	$\overline{X}$	SD	
1.	Health Technology	110	17.09	1.85	
2.	Nursing	51	17.52	2.04	
3.	Health Information Management	50	17.68	2.07	
4.	Midwifery	19	18.84	2.03	
Source of variation		SS	Df	MS	F
Between Groups		53.94	3	17.98	
					4.66*
Within Groups		871	226	3.85	
Total		**925.14**	**229**		

* p < 0.05, F3, 226, critical - F = 3.84

Table 3D: The application of the skills of statistical analysis (n=230)

Group	Area of specialization	N	X	SD	
1.	Health Technology	110	17.09	1.85	
2.	Nursing	51	17.52	2.04	
3.	Health Information	50	17.68	2.07	
4.	Midwifery	19	18.84	2.03	
Source of variation		SS	Df	MS	F
Between Groups		92.44	3	17.98	
					8.015*
Within Groups		868.84	226	3.84	
Total		**710.561**	**229**		

* $p < 0.05$, critical F3, 226, critical - F = 3.84

As shown in table 3D, the calculated F-value if 8.015 compared to the critical F-value of 3.84. Since the calculated F-value of 8.015 is greater than the critical-value of 3.84 at 3, and 226 degrees of freedom. The null hypothesis is rejected while the alternative hypothesis is accepted that there is a significant influence of students' area of specialization on the application of the skills of statistical analysis.

Given the significant F-values in Tables 3B, 3C and 3D, a detailed multiple comparison analysis using Fisher's Least Square Difference (LSD) was done to determine exactly which in the group (health training school) differed significantly from each other in terms of problem articulation, hypothesis formulation, literature review, and statistical analysis. The results of these analyses are presented in Table 4A – C.

Table 4 A – C: Results of Fisher's LSD multiple comparison analysis of the influence of students' area of specialization on:

Table 4A: The application of hypothesis formulation skills

Group	Area of specialization	1 (n=110)	2 (n=51)	3 (n=50)	4 (n=19)
1.	Health Technology	12.00[a]	1.03[b]		3.744*
2.	Nursing	3.917*	13.03	.161	
3.	Health Information		.457	13.20	.274
4.	Midwifery	1.20		.463	13.47
MSW = 2.782					

Table 4B: The application of literature review skills

Group	Area of specialization	1 (n=110)	2 (n=51)	3 (n=50)	4 (n=19)
1.	Health Technology	17.09a	.438[b]		3.738*
2.	Nursing	1.349[c]	17.52	.150	
3.	Health Information Management		.368	17.68	1.31
4.	Midwifery	.589		2.089*	18.84
MSW = 3.855					

Table 4C: The application of the skills of statistical analysis

Group	Area of specialization	1 (n=110)	2 (n=51)	3 (n=50)	4 (n=19)
1.	Health Technology	16.71[a]	.781[b]		4.565*
2.	Nursing	2.402[c*]	17.49	.189	
3.	Health Information		.538	17.68	1.162
4.	Midwifery	.971		2.089*	18.84
MSW = 3.844					

a = group means are placed on the diagonal

b = Difference between group means are placed above the diagonal

c = Fisher's LSD t-values are below the diagonals

* Significant at the .05 alpha level, critical t = 1.97.

Tables 4A indicates that significant Fisher's t-value of (3.917) is noted between group 1 (Health Technology) and group 2 (Nursing) and significant t-value of 3.744 between group 3 (Health Information Management) and group 4 (Midwifery). The result revealed that Midwifery students had the highest mean score of 13.47 followed by Health information management (13.20).

In Table 4B, significant Fisher's t-value of (2.089) was noted between Health Information Management (group3) and Midwifery (Group 4), and significant Fisher's t-value of (3.738) between nursing (group 2) and Midwifery (group 4).

In Table 4C, significant Fisher's t-value of (2.402) was noted between Health Technology (group 1) and Nursing (group 2), and significant Fisher's t-value of (4.565) between Health Information Management (group 3) and Midwifery (group 4). Generally, the results indicate that Midwifery students had the highest mean score of 18.84 followed by Health Information Management students.

Hypothesis three: There is no significant influence of school location on the application of research skills in terms of problem articulation, formulation of hypothesis, literature review, and statistical analysis.

Table 5A-D: Independent t-test analysis of influence of school location on the application of research skills in terms of:

Table 5A: Problem articulation (n=230).

School location	N	$\bar{X}$	SD	t-value
Urban school	215	13.05	1.66	
				-.021
Rural school	15	13.06	1.83	

Not significant at .05, df = 228, critical t = 1.97

Table 5B: Hypotheses formulation (n=230)

School location	N	X	SD	t-value
Urban	215	12.58	1.78	
				-.984
Rural school	15	13.06	1.83	

Not significant at .05, df = 228, critical t = 1.97

Table 5C: Literature review (n=230).

School location	N	X	SD	t-value
Urban	215	17.38	1.99	
				-1.329
Rural	15	18.06	1.91	

* Significant at .05, df = 228, critical t = 1.97

Table 5D: Statistical analysis (n=230).

School location	N	X	SD	t-value
Urban	215	7.17	2.02	
				-1.738
Rural	15	8.06	1.91	

Not significant at .05, df = 228, critical t = 1.97

To test this hypothesis, independent t-test analysis employed. The results of the analysis are presented in Table 5A-D. Table 4A shows that the calculated t-value of -.021 is lesser than the critical t-value of 1.97 at .05, with 228 degrees of freedom. This means that school location does not significantly influence application of research skills in terms of problem articulation.

Table 5B shows that calculated t-value of -.984 is lesser than the critical t-value of 1.97. This means that school location does not significantly influence the application of research skills in terms of hypothesis formulation. The result in table 5C shows that calculated value of -1.329 is lesser than the critical t-value of 1.97 required for significance at .05 with 228 degree of freedom. This implies that school location does not significantly influence the application of research skills in terms of literature review. The result in table 5D shows that calculated value of .63 is lesser than the tabulated value of -1.738 required for significant at .05 with 228 degrees of freedom. This means that school location does not significance influence the application of research skills in term statistical analysis.

Discussion of Findings

The result of the analysis revealed that students' application of research skills is significantly high. From this result, what can be said about the students in health training institutions generally is that their application of research skills is high, and they properly applied the skills in their research projects. On the basis of this result, the t-values associated with problem articulation, and hypotheses formulation are positive, indicating that students research skills with respect to those two skills are significantly high. On the other hand, the t-values associated with literature review and statistical analysis skills are negative, indicating that students' research skills in these two areas are significantly low. Isangedighi, Joshua, Asim, Ekuri (2004) emphasized on the importance of adequate problem articulation and hypotheses formulation that provide opportunities to gain ideas, and provide insight into the research.

The results of the analysis show that area of specialization has a significant influence on the application of research skills in terms of hypothesis formulation, literature review, and statistical analysis, but not on the skill of problem articulation. The findings in the skills of hypothesis formulation, literature review, statistical analysis skills influence application of research skills in favour of Midwifery, Health Information, Nursing students. However, significant differences existed between Midwifery, Health Information management, Nursing, with Midwifery in the lead, followed by Health Information Management, Nursing while Health Technology was the least in the application of research skills. This result is in agreement with

the finding in a study conducted by Howard University (2010) where it was discovered that outcome of research project was positive and irrespective of the location, the students are committed to research skills application in the school.

Also, the results of the analysis show that school location has no significant influence on application of research skills in terms of problem articulation, hypotheses formulation, literature review, and statistical analysis skills. This result implied that whether a student attends an urban or rural school, it does not significantly matter, when it comes to application of research skills. This result is in agreement with the findings in the study conducted by Howard University (2010) where it was discovered that outcome of research project was positive and irrespective of the location, the students are committed to research skills application in the school.

Conclusion

Based on the findings of this study, it was concluded that students in health training institutions have benefited significantly from the teaching they went through in research methodology. However, they demonstrated deficiencies in skills relating to organization of literature review and statistical analysis. Also, school location do not significantly influence research skills of problem articulation and hypotheses formulation, but significant in skills of literature review and statistical analysis. The study also noted that students in Midwifery are better equipped to apply research skills properly than their counterpart in other health institutions. To this end, it is the opinion of the researcher, that if the recommendations made in this study are strictly adhered to, then health training institutions research projects shall become useful and the needed research skills can be applied, thereby enhancing better performance.

Recommendations

Based on the findings, the following are the recommendations from the study

1. Workshops should be organized on a regular basis for students to update skills in research work, especially in the area of literature reviews and data analyses.
2. Evaluators and researchers should properly teach and apply appropriate research skills to create confidence in research results including that of health training students.
3. Internet facilities should be made accessible in rural and urban school locations so as to boost adequate application of research skills.

References

1. Ali, H. O. (2005). Understanding the philosophical foundations of science, Port Harcourt: Pre-Joe Publishers.
2. Bako, S. (2005). University research & development in Nigeria: time for a pragmatic shift. Paper presented at 11th general assembly of CIRDESRIC, on Rethink African Development: Beyond Impasse, Nsukka, Nigeria. February 3.
3. Denga, D. I. & Ali, A. (1983). An introduction to research methods and statistics in education & social science, Calabar: Rapid Educational Publisher.
4. Hart, C. (1998). Doing a literature review: releasing the social science research imagination. London: Sage.
5. Hoffman, K., Antwi-Nsiah, Feng, V. & Stanlsy, M. (2008). Library research skills: A need assessment for gradate students' workshop. Ontario: Allyn & Betty Taylor Library.
6. Howard University (2010). Institutional report on students' research. Retrieved 30th January, 2010 from Howard University, Washington DC.
7. Isangedighi, A. J., Joshua, M. T., Asim A. E. & Ekuri E. E. (2004). Fundamentals of research and statistics in social sciences. Calabar: University of Calabar Press.
8. Joshua, M. T. (2005). Survival skills in graduate research. Retrieved 25th September, 2008. Website NO: www.gradschool.nmsu.edu/4596/htm.