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Awareness and Usage of Data Triangulation among University Students in Rivers State, Nigeria

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Abstract

The primary objective of the study is to examine the level of awareness and usage of data triangulation among under and post graduates in the tertiary institution. A descriptive survey was adopted and data collected from a sample of 114 selected randomly. A self-developed and validated instrument was used to collect data. Data collected were analysed with simple descriptive statistics. Findings show that although 40% of the students reported that they had knowledge of data triangulation, this is at the shallow level as 72% of the students have no in-depth knowledge of the concept. Only 23% of the students had applied data triangulation in a previous study. In order to correct this deficit, it is recommended that students should be exposed to learning experiences that is a blend between quantitative and qualitative research in order to enhance the student's skills and usage of triangulation of data.

Keywords: Data Triangulation, Qualitative Research, Quantitative Research, Usage, Knowledge

Introduction

Data collection is an important and central component of every study carried out within the domain of research. It affords the researcher the opportunity to interact with the various elements or subjects of the study that supply him/her with the appropriate information needed to answer the formulated research questions or testing of hypotheses. Basically, sources of data collection are dichotomized into primary and secondary sources. The primary source of data involves collecting information directly from the 'eyewitnesses' or subject being studied. This may be through the means of a questionnaire, ratio scale, checklist, case study, life history, longitudinal study, interview, observation, focused group, inventory, etc. On the other hand, secondary source involves data acquired from optional sources like books, magazines, archives, historical data, official statistics, diaries/log, letters, school records, films/tapes, documents, journals, encyclopedia, reports, web information, etc.

Collecting data for research purpose is an extremely challenging task which requires deliberate planning, diligent work, understanding, and determination to bring it to completion. However, the beauty of this task lies in the adoption of more than one source or means of data collection in a study. The intricacy underlying this task is not attained by just one or two but several applied experiences that eventually will culminate to skill acquisition in data gathering and researches that are robust in the true sense. The use of multiple data sources in an

investigation to produce understanding underscores the concept of data triangulation. Triangulation occurs when multiple theories, materials or methods are used in an investigation to produce understanding. This is because the main purpose of triangulation in research is to increase the credibility and validity of the research findings.

Conceptual Framework

The concept of triangulation originated from ancient Greek Mathematics which is applied in a wide range of spheres including geometry and surveying in navigation. It is used to establish a ship's position measuring a vessel's distance from more than one point on the shore and gives a more accurate reading of its location. Triangulation was first applied to research by Campbell and Fiske (1959) and later used by Webb, Campbell, Schwartz & Sechrest (1966), who argued that researchers should employ more than one instrument to measure variables. They introduced the notion of triangulating multiple sources of data to enhance the validity of the research.

Denzin (1978) and Patton (2002) identify four types of triangulation:

- **Methods triangulation** - it checks out the consistency of findings generated by different data collection methods. With this type, it is common to have qualitative and quantitative data in a study and these elucidate complementary aspects of the same phenomenon. Often the points where these data diverge are of great interest to the qualitative researcher and provide the most insights
- **Triangulation of sources** -it examines the consistency of different data sources from within the same method. For example: at different points in time, in public vs. private settings or comparing people with different viewpoints
- **Analyst Triangulation** - it uses multiple analysts to review findings or multiple observers and analysts. This can provide a check on selective perception and illuminate blind spots in an interpretive analysis. The goal is not to seek consensus but to understand multiple ways of seeing the data
- **Theory/perspective triangulation** - it uses multiple theoretical perspectives to examine and interpret the data

The importance of triangulation cannot be underestimated to ensure reliability and validity of data and results. This occurs when data is accurate and truthful (Roe & Just). A single method can never adequately shed light on a phenomenon. Using multiple methods can help facilitate a deeper understanding. The benefits of data triangulation include:

- Additional sources of information often give more insight into a topic
- Inadequacies found in one-source data is minimized when multiple sources confirm the same data
- Multiple sources provide verification and validity while complementing similar data
- More comprehensive data is obtained
- Data and information is supported in multiple places/types of research, which makes it easier to analyze data to draw conclusions and outcomes
- Inconsistencies in data sets are more easily recognized

Specifically, the problem with relying on just one method is to do with bias. Triangulation of data minimizes bias such as measurement bias that is caused by the way in which one collects data. Related to this is the 'Response bias' in which participants tend to tell one what one wants to hear. This is very common in self-reported data. Such a report could be combined with an observational source of data to help balance out the bias. Sampling bias has to do with when one does not cover all of the population under study (omission bias) or one covers only some parts because it is convenient (inclusion bias). The use of phone interview can make it easier and serve as a good substitute for the face-face interview. Another kind of bias that triangulation minimizes is procedural bias. This occurs when participants are put under some kind of pressure to provide information. This is common with the use of questionnaire especially when the respondents have to express their opinion on the spot for quick retrieval of the instrument. Participants are caught unaware, and this could affect

their answers. Triangulation of data allows one to combine short engagements with longer engagements where participants have more time to give considered responses.

Statement of Problem

A perusal of several research studies carried out in our tertiary institutions shows a one-sided source of data collection as against multiple sources of data collection. Most often, the present class of young researchers has limited or no knowledge and skill in the use of more than one source of data in research. They are deprived of that euphoria of fun and sense of adventure associated with direct observation of data collection. No wonder several studies carried out are plagued with faulty, manipulated, cooked and plagiarized data, and researching is perceived as drudgery by upcoming researchers. As an attempt to collaborate the above assertion, a research study carried out showed the extent of awareness and usage of data triangulation (multiple methods of data collection) among undergraduates and postgraduates in a tertiary institution.

Research Questions

These questions guided this study:

1. What is the level of awareness of data triangulation among the students?
2. What are their sources of students' awareness?
3. What is the level of usage of data triangulation among the students?
4. What method of data collection is mostly used among the students?

Methodology

The survey design which is descriptive in nature was adopted in this study. Information was retrieved from a sample of 114 undergraduates and postgraduates via a simple random sampling technique, from Rivers State University of Science and Technology. An instrument of data collection was developed by the researcher and tagged 'Questionnaire on Triangulation of Data Collection (QTDA).' It consisted of sections A and B. While section A retrieved the bio-data of the respondents, section B entailed 16 item statements with the alternate option of response format. An additional component where respondents were to pick from the list of sources of data complements this section. Reliability index of 0.85 was established with the use of Cronbach Alpha. Data collected were analysed using simple descriptive statistics.

Results

Research Question 1: What is the level of awareness of data triangulation among the students?

Table 1: Descriptive statistics of the degree of awareness of data triangulation

Item Statements	TM NTM		N	M	SD	MIN	MAX
	%	%					
I have an idea of what triangulation of data collection (TDC) is about	51	49	114	8.13	1.71	2	12
I have an in-depth knowledge of what TDC is							
I could easily define the term TDC	27	72					
I had once thought of using TDC in my study/project	44	54					
I have not heard of TDC	33	65					
I have not read about TDC	33	65					
	37	59					

TM=True of me. NTM=Not of me.

Table1 statistics of mean = 8.13, standard deviation = 1.71 imply that 40% of the respondents are aware of the concept of data triangulation.

Research Question 2: What are the sources of students' awareness?*Table 2: Descriptive statistics of sources of awareness of data triangulation*

Item Statements	YES NO		N	M	SD	MIN	MAX
	%	%					
From reading journal articles that applied triangulation of sources of data collection	33	64	114	10.82	3.02	0	16
From reading related textbooks	42	56					
From reading abstracts	35	63					
From reading students' projects or dissertation or thesis	33	63					
From web information	59	38					
From organized workshop/ Seminar	39	58					
From students' seminar presentation	27	68					
From direct classroom teaching	38	60					

Statistics from Table 2 show respondents' most sources of awareness to include web information (58%), textbook (42%) and the least is seminar presentation (27%)

Research Question 3: What is the level of usage of data triangulation among the students?*Table 3: Descriptive statistics of the level of usage of data triangulation*

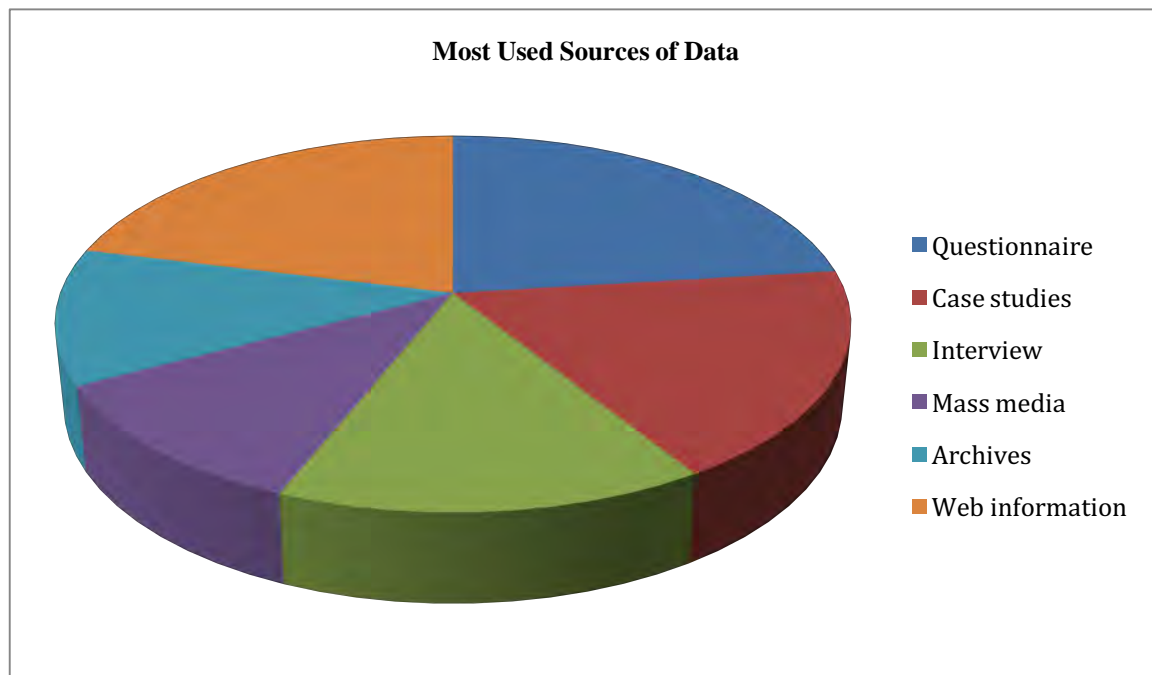
Level of Usage	N	Mean	Standard deviation	Minimum	Maximum
	114	2.31	0.80	1	4

Table 3 statistics imply that the level of usage among students is 33% i.e. (Mean = 2.31, SD = 0.80)

Research Question 4: What method of data collection is mostly used among the students?*Table 4: Descriptive statistics of the method of data collection*

Methods		Undergraduates	Postgraduates	Sum	
		%	%		
Questionnaire	Primary Source	8	32	40	
Ratio Scale		2	6	8	
Checklist		2	2	4	
Case Studies		5	26	31	
Life Histories		5	0	5	
Longitudinal Studies		2	0	2	
Interview		5	21	26	
Observation		5	4	9	
Focused Group Discussion		2	0	2	
Inventory		0	2	2	
Official Statistics		Secondary Source	3	15	18
Government reports			0	11	11
Historical data	3		4	4	
Mass Media	8		11	19	
Archives	3		17	20	
Diaries/logs	3		2	5	
Letters	0		2	2	
School Records	0		6	6	
Anecdotal records	0		0	0	
Web Information	3		34	37	
Films/Tapes	2	0	2		

From Table 4, the most common method of data collection is Questionnaire (40%), followed by Web information (37%), and the least applied is Anecdotal records (0%)



Discussion

Statistics on table 1 show that 40% of respondents agreed that they were aware of the concept of data triangulation. However, it is deduced that their awareness is on the shallow level. This is corroborated by the same students' responses that showed that 72% does not have in-depth knowledge of what triangulation of data collection is; 54% cannot define the concept; 65% has not heard of it; while 59% has not read about triangulation of data collection. These findings imply that the students are actually used to one method of data collection in carrying out research studies in their disciplines of study. It could also mean that most of the studies conducted by these students are premised on the inadequacies associated with one-sourced data collection. This asserts the researcher's opinion that as a result of using only one source of data collection for research purpose, most likely, students in our tertiary institutions perceived research study as a task that is boring, difficult or unpleasant work through a compulsory academic activity needed before graduation.

Finding from table 2 indicates the most accessible sources of related literature on data triangulation for the students. Common sources of literature readily available to researchers such as journal articles, textbooks, abstracts, students' project, dissertations or theses, seminar presentations, and direct classroom teaching provide little or no information about the knowledge and application of triangulation of data collection. It is thus not surprising that our upcoming researchers lack in the use of triangulation of data collection. This probably indicates the quality of education made available in our institutions; especially when an important function and component of university education shall be knowledge generation (or research) in extending the frontiers of knowledge relevant to the nation's developmental goals. (NPE, 2014).

23% of the students reported that they had applied triangulation in one or more previous studies they had participated in. The implication of this finding is that 73% of the students had never applied multiple sources of data collection in a research study. That the undergraduates had not participated in a study that involved triangulating is understandable since they are assumed to be neophytes in researching. But that postgraduate students particularly the Ph.D. students had never adopted triangulation in any previous studies, especially when it is considered that they must have been exposed to experiences in research either at the first or second-degree level; is an issue of great concern. This missing gap is probably linked to the one-sided learning experiences that

overemphasized quantitative research at the detriment of qualitative research. What a drudgery for a student researcher who must have passed through the university system and acquired the first, master and doctoral degrees but only equipped or skilled in the use of one sourced data to arrive at findings. This is a recurring scenario enacted in university research and pass on to the younger generation of researchers.

Consequently, the dire need to restructure the experiences offer to the students in the domain of research particularly in the faculty of education cannot be overemphasized. It is therefore suggested that a synergy of quantitative and qualitative research should be an imperative component of researching. Policy and document on research should underscore mixed methodology in the researches carried out by tertiary institution in order to make university research stands a better position to engineer innovation in education relevant to the nation's development goals.

Enabling and enriching learning environment when created will expose the students to the acquisition of knowledge, skills, and attitude that will reflect robustness in research via multiple sources of data collection and triangulation. However, to achieve this, it implies the retraining of university teachers to acquire, improve and perfect the skills of triangulating. Short-courses, workshops, seminars can easily be utilized to increase their expertise.

Conclusion

This study examined the level of students' knowledge, and usage of data triangulation and findings showed that most of the younger researchers have little or no knowledge and adoption of this concept. This is explained in line with the learning experiences made available to these researchers. Therefore the need to restructure the learning experiences that they are exposed to, to evolve into the production of mixed methodologists in the research domain.

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