

Quality assessment of undergraduate student's research projects in Gombe State University Library, 2014 to 2019

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Abstract

Analyses of students' researches that are conducted by universities will often indicate the direction in which a specific subject field is moving as well as regards the issue of the quality of students' research work. This research carried out a content analysis of undergraduate degree projects submitted by undergraduate students of Gombe State University, Gombe in all the 32 disciplines that had graduated at least a set of undergraduate students between 2014 and 2019. Through the use of Statistical Package and Service Solution (SPSS), each project was analyzed thoroughly in terms of research paradigm, research questions, research design, data collection instruments, type or form of data collected, procedures for collection, data analysis as well as presentation of results. Data were presented analyzed with frequencies and percentages. The study revealed that the largest percentage of research design employed by the students is the mixed research method that involves the use of both Qualitative and Quantitative methods. Despite the advancement of information and communication technologies in conducting researches, online method to collect data through the use of questionnaire was underutilized; this is also true of focus group. The students preferred to use hard copies of questionnaire and physically distribute to their research respondents. Moreover, despite the presence of advanced software for qualitative data analysis such as ATLAS.ti, NVivo, MAXQDA, RQDA. Hyper RESEARCH, etc. no such software was used to analyzed any qualitative data collected by the students. The study recommends that, there is an urgent need of teaching students' online data collection and use of various data analysis software/statistical packages in the university.

Keywords: Quality assessment, undergraduate research projects, Gombe State University Library

Introduction

The undergraduate research project is one of the major requirements for the award of degrees in every Nigerian university. Usually, a student conducts a research on an approved topic in any aspect of his area of study. Evaluating and scoring of research projects of undergraduate students is one of the most important issues for rewarding success (Ozcan, Dogan & Soylemez, 2016). Although the undergraduate research projects may not necessarily be ground breaking, they usually serve as the foundation for the acquisition of knowledge and skills in conducting advance researches. In addition, the types, nature and approaches

to conducting such research projects may serve as indicators of the skills acquired and possible quality of research projects at higher levels.

Studying students' research projects assists in evaluating the quality of students' researchers, the productivity level of supervisors and their departments. Such assessment also serve as a formative evaluation of areas that need to be improved on by lecturers in teaching of research methodology. Hanine, Boutkhoul, Tikniouine, & Agouti (2016) argued that analysis of students' research works helps the discipline to monitor its progress, identify areas in need of further research as

well as underutilized research methods. Khalili-Damghani, Sadi-Nezhad and Tavana (2013) have stressed that such analysis is necessary to improve teaching in any given field of study.

Gombe State University was established in 2004 as a full-fledge and autonomous degree awarding institution. The university is categorized in Nigeria as a conventional university offering several degrees in 43 academic departments that cut across 6 faculties. The faculties are Faculty of Science; Faculty of Education; Faculty of Arts and Social Sciences; Faculty of Pharmaceutical Sciences; Faculty of Law and College of Medical Sciences (Gombe State University Annual Report 2017). The University also has School of Postgraduate Studies (SPS), School of Basic and Remedial Studies (SBRS), and Directorate of Human Resource Development (DHRD).

According to Ya'u and Adamu (2020), in demographic terms, the university had approximately 17,000 students, 1,148 full time teaching and non-teaching staff, 285 out Sourced staff, 180 visiting lecturers and 13 sabbatical staff. These staff members have been engaged in teaching, research and community service; the three key components of a university's operation.

Objectives of the Study

The objectives of the study are to:

1. Empirically document the quality status (as regards areas of strengths and weaknesses), of the undergraduate research projects submitted by students of Gombe State University between 2014 and 2019.
2. Carry out a quality assessment of the undergraduate research projects submitted by students of Gombe State University between 2014 and 2019.

3. Compare the quality status of the undergraduate research projects submitted by students of Gombe State University between 2014 and 2019 faculties, departments and years of submission.

Literature review

Elbulok-Charcape (2021) defined a research project as a purposeful collection of student work that exhibits to the students and others, the students' efforts, progress, or achievement in a given area. The major goal of project work is to assess the ability to apply knowledge to solve real-life problems. Odu (2018) analyzed 371 final year undergraduate projects submitted to the Department of Biological Sciences, University of Calabar, between 1972 and 1983. Their study showed that the aspect of Biology which most of the students concentrated on was physiochemical parameters in domestic waters, plant diversity, habitat utilization by animals, and the geographical area most covered by the researchers was Kaduna state.

Okafor (2011) carried out statistical analysis of final year undergraduate chemistry projects at the University of Maiduguri, between 1981 and 1990. The findings of the study showed that extraction and characterization of oil was the most concentrated subject area. It recommends that heavily concentrated areas should be de-emphasized while the future focus should be on the least/non-discussed areas. Rose, Dennis, Zhao and Li (2017) analyzed graduate projects between 2011 and 2014, with a view to ascertaining how their respective departments implemented the recommendations from the projects. The analysis takes the form of the type and year of the research, and the topic covered. In the same vein, Aliyu and Abba (2009) analyzed 39 Master of Library Science dissertations accepted by the School of Postgraduate

Studies University of Maiduguri between 1996 and 2008 academic sessions. Their analysis revealed that the 2006 academic year recorded the highest productivity of dissertations with nine (9) representing 23 percent, the most researched subject area was information science, the type of library most researched was academic librarianship and Borno State was the most focused geographical area in the dissertations presented during the years covered by the study.

Literature review has revealed that analysis of students' research work is not new, however, most often; the focus has always been on specific components of the research reports as well as the scope being limited to a specific programme. This justifies the need for this study taking a more compressive approach to covering the whole disciplines/programmes of a university.

Methods

All the undergraduate research projects submitted to Gombe State University Library between 2014 and 2019 were used for the study. As at the time of this study, 5,176 undergraduate research projects from 32 programmes in 25 departments of the 6 faculties (that had graduated students) of the Gombe State University had been submitted to the university library.

Simple random sampling was used to select 10% of research projects from each of the 32 programmes in each of the years 2014 and 2019. In all, the sampled projects were 518 research projects from the 32 degree programmes of the university that had graduated students.

Data collected were analyzed with frequencies and percentage using statistical product and service solution (SPSS).

Table 1: Relevance and adequacy of introduction and background of the study

Relevance and adequacy	Frequency	Percent
Relevant/adequate	239	57.6
Not relevant/not adequate	19	4.6
Relevant/not adequate	144	34.7
Not relevant/adequate	13	3.2
Total	415	100.0

Table 1 indicates that, that the introduction and background information of the underground of 239 (57.6%) of the projects studied are adequate and relevant to the topics studied, while 19 (4.6%) of the projects are not adequate and not relevant to the topics. Moreover, 144 (34.7%) of the projects are relevant to the topics even

though not adequately presented. 13 (2.3%) of the projects presents adequate discussion as the background of the study but not relevant to the topics of the study. The relevance and adequacy of introduction and background of the study is further illustrated in Figure1.

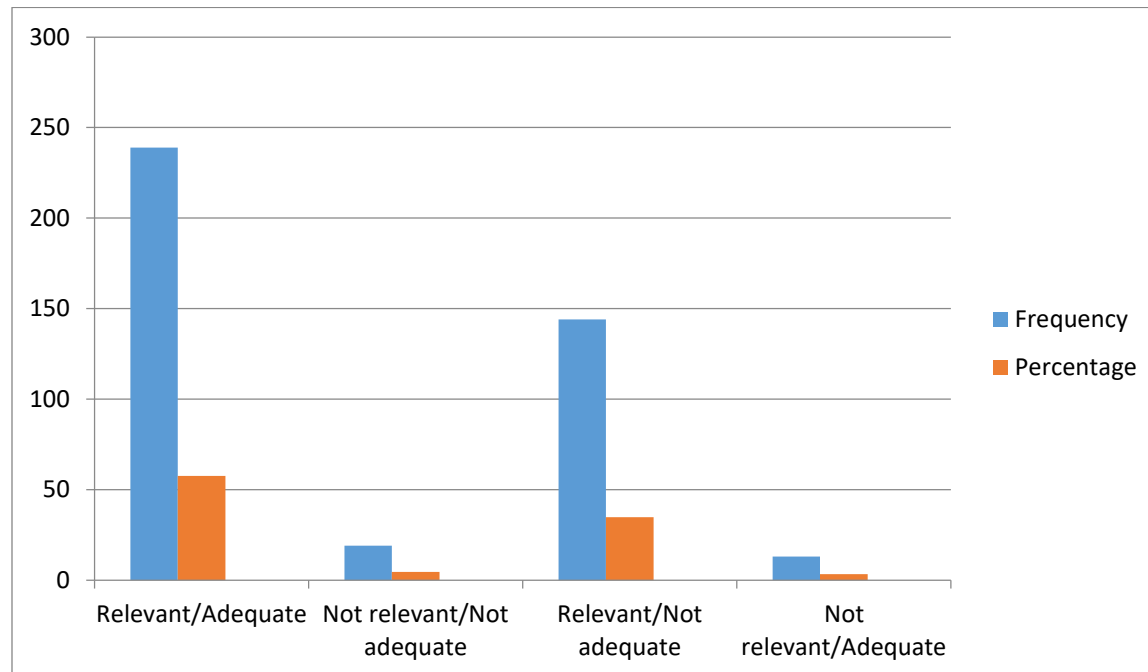


Figure 1: Relevance and adequacy of introduction and background of the study

Table 2: Relevance and adequacy of research questions/ hypotheses

Research questions/ hypotheses	Frequency	Percent
Relevant/adequate	144	34.7
Not relevant/not adequate	19	4.6
Relevant/not adequate	233	56.1
Not relevant/adequate	19	4.6
Total	415	100.0

Table 2 shows that the research questions/hypotheses of 144 (34.7%) of the projects studied are adequate and relevant, while 19 projects representing (4.6%) of the project are not adequate and not relevant to the topics. Moreover, 233(6.1%) are relevant to the topics even though not adequately presented. 19 (4.6%) of the project presents adequate Research questions/Hypothesis but not relevant to the topics of the study.

Table 3 indicates that the literature reviewed of 347 (83.6%) of the projects are current and adequately provided. Whereas 19(4.6%) contain current literatures, the literatures are not current. Even though, 45 (10.8%) contain current literatures, the literatures are not adequately provided. 4 (1%) of the projects are not adequate and not current. This is further illustrated in the Figure 2.

Table 3: Adequacy and currency of literature review

Literature review	Frequency	Percent
Adequate/current	347	83.6
Adequate/not current	19	4.6
Not adequate/current	45	10.8
Not adequate/ not current	4	1
Total	415	100.0

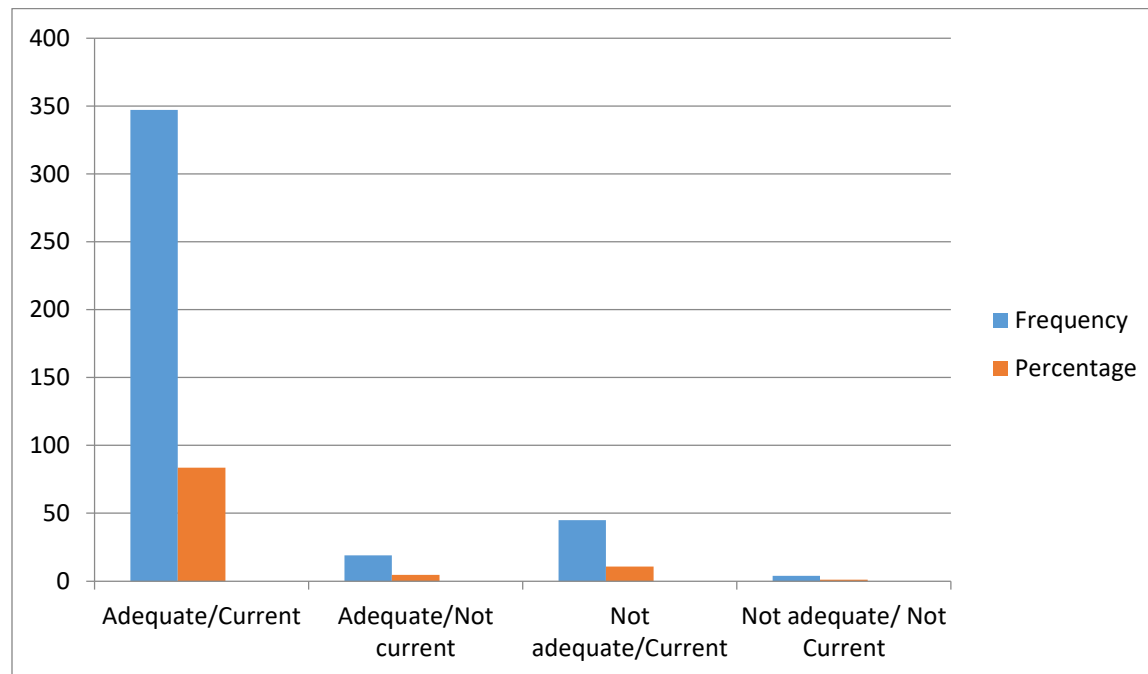


Figure 2: Adequacy and currency of literature review

Table 4: Appropriateness of population

People	Frequency	Percent
Population appropriate	339	81.7
Population Not appropriate	74	18.3
Total	415	100.0

Table 4 shows that a total of 339 (81.7%) of the projects indicate that the population used in the studies are appropriate, 74 (18.3%) of the projects revealed that, the population used in the researches are not appropriate.

Table 5 reveals that, the sampling technique used in 267(64.3) of the projects is appropriate, while sampling techniques used in 148 (35.7%) projects are not appropriate.

Table 5: Appropriateness of sampling technique

Sampling technique	Frequency	Percent
Sampling appropriate	267	64.3
Sampling not appropriate	148	35.7

Total	415	100.0
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Table 6: Appropriateness of sample size

Sample size	Frequency	Percent
Sample size appropriate	239	57.6
Sample size not appropriate	176	42.4
Total	415	100.0

Table 6 reveals that a total of 239 (57.6%) of the projects analyzed are appropriate to the research conducted, while 176 (42.4%) are not appropriate to the population of the study.

From Table 7, the research instrument used in 341 (82.2%) of the projects are relevant to the research conducted, while 74 (17.8%) are not relevant to the topics of researches conducted.

Table 7: Relevance of research instrument

Research instrument	Frequency	Percent
Instrument Relevant	341	82.2
Instrument not Relevant	74	17.8
Total	415	100.0

Table 8: Relevance of data collection strategy

Data collection strategy	Frequency	Percent
Data collection strategy Relevant	328	79.0
Data collection strategy not relevant	87	21.0
Total	415	100.0

Table 8 shows that the research instrument used in 328 (79.0%) of the projects are relevant to the research conducted, while 87 (21.0%) are not relevant to the topics of researches conducted.

adequate and appropriate. Whereas 47 (11.3%) provide adequate but not appropriate data analysis. Even though, 45 (10.8%) provide appropriate data analysis, the analysis is not adequate. In 11 (2.7%) of the projects, the analysis is neither adequate no appropriate.

Table 9 indicates that the data analysis in 312 (75.2%) of the projects are

Table 9: Adequacy and appropriateness of data analysis

Data analysis	Frequency	Percent
Data analysis adequate/appropriate	312	75.2
Data analysis adequate/not appropriate	47	11.3
Data analysis not adequate/ appropriate	45	10.8
Data analysis not adequate/ not appropriate	11	2.7
Total	415	100.0

Table 10: Appropriateness of reporting result

Reporting result	Frequency	Percent
Reporting result appropriate	367	88.4
Reporting result not appropriate	48	11.6
Total	415	100.0

Table 10 indicates that the results of the studies conducted in 367 (88.4%) of the projects are appropriately presented while 48 (11.6%) are not appropriately presented.

Table 11 shows that the research questions used in 325 (78.3%) of the

projects are descriptive, 38 (9.2%) of the projects used normative questions, and 32 (7.7%) used correlation, while 20 (4.8%) of the total number of projects used impact questions.

Table 11: Research questions

Research questions	Frequency	Percent
Descriptive	325	78.3
Normative	38	9.2
Correlation	32	7.7
Impact	20	4.8
Total	415	100.0

Table 12: Data type

Data type	Frequency	Percent
Data in Numbers	286	68.9
Data in words	129	31.1
Total	415	100.0

From Table 12 above, 286 (68.9%) of the projects shows that the type of data used is in numbers, while 129 (31.1%) are in words.

Table 13 indicates that 298 (71.8%) of the projects used positivist paradigm, 65

(15.7%) used constructivist paradigm, 45 (10.8%) used transformative while 7 (1.7%) of the projects used pragmatic or mix methods as the research paradigm.

Table 13: Research paradigm

Research paradigm	Frequency	Percent
Research paradigm post positivist (quantitative)	298	71.8
Research paradigm constructivist (qualitative)	65	15.7
Transformative	45	10.8
Pragmatic (mix methods)	7	1.7
Total	415	100.0

Table 14: Research design

Research design		Frequency	Percent
True experimental (quantitative)	Posttest equivalent group	15	3.6
	Pretest posttest	45	10.9
	Solomon four	17	4.1
	Analytical survey	42	10.1
Quasi experimental (quantitative)	Descriptive survey	88	21.2
Non experimental (qualitative)	Ex post facto	39	9.4
	Case study	8	1.9
	Content analysis	59	14.2
	Historical	10	2.4
Mixed methods	mixed methods	92	22.2
	Total	415	100.0

Table 14 reveals that 15 (3.6%) of the projects studied, used quantitative post equivalent design; 45 (10.9%) used pretest posttest design; 17 (4.1%) used Solomon four; while 42 (10.1%) used qualitative analytical research design. With regard to quasi experimental quantitative design, 88 (21.2%) of the projects used descriptive research design. For non-experimental qualitative research design, 39 (9.4%) of the projects used ex post factor design; 8 (1.9%) used case study; 59 (14.2%) used content analysis; while 10 (2.4%) used historical research design. The research design used in 92 (22.2%) is both qualitative and quantitative design (mixed method).

Table 15 shows that 100 (24.1%) of the projects used test method as data collection tool, while 84 (20.2%) used questionnaire. 65 (15.7%) used documents and records to collect the data; 30 (7.2%) used questionnaire and document and records; 22 (5.3%) used observation and test method; while 21 (5.1%) used the combination of test and document and records to collect the data. Other methods used in data collection include questionnaire and interview, interview and documents and records, observation, each with frequency 14 (3.4%) respectively. All the other methods used as instrument for data collection represent less than 3% each of the total number of projects studied.

Table 15: Data Collection Instruments

Data Collection instruments	Frequency	Percent
Questionnaires	84	20.2
Questionnaire and documents and records	2	.5
Questionnaire and interview	14	3.4
Questionnaire, interview and observation	2	.5
Questionnaire, interview and observation and documents and records	3	.7
Questionnaire, interview and documents and records	5	1.2
Questionnaire, interview and observation	1	.2
Questionnaire, interview and documents and records	1	.2
Questionnaire and observation	4	1.0
Questionnaire and tests	2	.5
Questionnaire, tests and documents and records	2	.5
Questionnaire and documents and records	30	7.2
Interview	7	1.7

Interview and observation	5	1.2
Interview, observation and tests	2	.5
Interview, observation and documents and records	1	.2
Interview and tests	1	.2
Interview, tests and documents and records	1	.2
Interview and documents and records	14	3.4
Observation	14	3.4
Observation and tests	22	5.3
Observation, tests and documents and records	2	.5
Observation and documents and records	6	1.4
Test	100	24.1
Tests and documents and records	1	.2
Tests, documents and records	21	5.1
Document and records	65	15.7
Total	415	100.0

Discussion

Table 1 has shown that majority of the students have highlighted the overall issue or area of concern of their research topics as research background or introduction; and communicated vital information to the reader's comprehension. The data also show that, the students have good familiarity with the existing knowledge in their chosen research area by placing their work in the context of existing studies. This may be attributed to the availability of recent online information resources that student can lay their hands and assessed through simple internet search such Google.

The appropriateness of research method (the population, sampling technique and the sample sizes) used in the researches as shown in tables 4., 5, and 6 indicate that the students used appropriate research method to conduct the investigations. This clearly indicates that the procedure for employing particular method and techniques of investigations are followed in such a manner that another investigator can replicate the study.

The instrument used and strategy for data collection as shown in tables 7 and 8 respectively suggests that, majority of the students utilized relevant tools and used right strategies to extract information that

lead to answering their research questions. This might be attributed to the knowledge gained by the students on research methodology as a course during their 300 Level; in which several instruments consisting of series of questions and other prompts for the purpose of gathering information from research respondents are thought.

Table 9 revealed that, most of the students used good process of analyzing the data in order to make purposeful discoveries, suggest conclusion, support decision-making and support or debunk previous studies. Even though, some of the projects analyzed do not follow an appropriate and adequate process of analyzing the data, this suggests that students follow similar pattern of data analysis using statistics and tables to do the data analysis.

After a research project has been completed or executed to a significant level, the researcher then has to communicate the findings to a larger audience. This section as revealed by the study shows that, student's effort in communicating the research findings in the area of study is commendable; as majority most of the students have followed an appropriate

method of reporting their discoveries to the larger scientific community.

What lies at the core of any systematic investigation is the research question, because recording accurate research outcome is tied to asking the right research question when conducting the research. This study reveals that, majority of the projects use descriptive research question to obtain information regarding their research topics. This might be because this type of research question tends to gather quantifiable data about the attributes or characteristics of the research subjects.

Though other types of research questions exist that tends to ask what have been believe to be right or wrong (normative) or type of questions that seek to assess the relationship between the strength and/or direction of two or more variable (correlation); etc. they are not familiar among the students going by the little number of students that makes use of them.

In terms of set of ideas, beliefs, or understanding of research within which theories and practices can function, this study reveals that majority of the students prepare to use post positivist research paradigm in form of quantitative research. This was followed by those who used constructivist research paradigm in form of qualitative research. The reason for this might not be unconnected with the fact that, quantitative and qualitative researches are the two most common type of research as argued by Pickard (2013).

The highest percentage of research design employed by the students is the mixed research method that involves the use of both series of predetermined questions in form of questionnaires; as well as set of conversations between the researcher and respondent in order to gain in-depth understanding of individual perceptions. This might be because of the flexibility students have in using the design as argued

by Yin (2018) stating that "The biggest benefit of mix research method is that, it combine specific, detailed insights, from qualitative research (such as focus groups) and the generalizable, easily replicable data from quantitative research (such as surveys)".

Mix method research was followed by descriptive survey in form of quasi experimental quantitative research. The reason may be because it is less expensive to use and less time consuming than the other cluster randomized trials. Content analysis and True experiment design also receive appreciable number of users as revealed by table 10. For true experimental which is mostly done in the laboratory because of the suitability of the environment, most student from sciences utilized the design so that the test variable can be controlled and unwanted variables removed.

This study found that tools and methods used to gather and record information for the research or evaluation project range from questionnaires, documents and records, test, interviews, etc. these are the fact finding strategies where the researcher essentially ensures that the instrument chosen is valid and reliable. The validity and reliability of any research project depends to a large extent on the appropriateness of the instruments. As revealed in table 11, data collection done through the use of test has received the highest percentage of the projects analyzed. Probably this is because of the advantages which pre-test, post-test design has of repeated measures of statistical analysis that tend to be more powerful and thus requires considerably smaller sample sizes than other type of analysis.

Questionnaire, which contains a systematically compiled and well organized series of questions intended to elicit the information which will provide insight into the nature of the problem under study, has

received the second highest percentage of the projects studied. This might not be unconnected to the fact that, questionnaires are the single most popular data collection tools in any research involving human subjects; and that a researcher can reach a large and geographically dispersed community at relatively at relatively low cost and can harvest data from a larger sample than would be possible using any other technique.

Documents and records as instruments for data collection does not receive much attention by the undergraduate students of Gombe State University (GSU) as revealed in Table 11. This procedure involve the use of existing data and records such as religious scriptures, reports, minutes of meeting, financial records, newsletters, etc. this finding may likely be due to the expensive nature and time consuming of getting and utilizing these records and documents. Not all organizations are ready to make available any related document for the purpose of research, probably because of the fear of unknown.

Though, an interview is one of the most popularly known instruments of data collection, it has not received much utilization by the students. This might not be unconnected with relatively low awareness of process of interviewing and ethical process involved in it.

Conclusion

Research is the key to academic achievement and it is also a basis for further studies. This study analyzed 518 projects accepted by the Gombe State University Library between 2014 and 2019 academic sessions. The analysis focused on the content analysis of research projects submitted by undergraduate students of

Gombe State University, Gombe in all the 32 disciplines that had graduated at least a set of undergraduate students between the years under study. Each project was analyzed thoroughly in terms of research paradigm, research questions, research design, data collection instruments, type or form of data collected, procedures for collection and data analysis and presentation of results. The analysis revealed that though students make effort to use the basic procedures of conducting scientific research, some important aspects of collecting and analyzing the data are neglected. For instance, despite the advantages of interview method in data collection, the use of interview process is grossly underutilized by the students.

Also, despite the advancement of information and communication technologies in conducting researches, use of online method to collect data through the use of questionnaire or focus group is not utilized. The students prepare to use hard copies of questionnaire and physically distribute to respondents. Moreover, despite the presence of advanced software for qualitative data analysis such as ATLAS.ti, NVivo, MAXQDA, RQDA, HyperRESEARCH, etc. which make it possible for larger amounts of data to be organized more quickly and more flexibly in order to support a more comprehensive analysis of such data and therefore increased its reliability; no student project was analyzed using any of the software. The most frequently used software is the SPSS for quantitative research analysis. There is a need for inculcating the use of online resources and enlightening the students on the availability and advantages of qualitative data analysis using the software mentioned.

Acknowledgement



All thanks and praises be to God almighty who give us the opportunity to conduct this research in a good time despite the tight schedules we found our self into. Let me also used this opportunity to thank the efforts of the Executive Secretary Tertiary Education Trust Fund (TETFund) and his management team for finding this our research worthy of sponsorship as part of year 2022 Institutional Based Research Grant (IBR) Intervention allocated to our noble institution. I would also like to commend and appreciate the effort of the Ag. Provost of Gombe State College of Education and Legal Studies, Nafada and his abled management team for their efforts in nominating me as one of the beneficiaries of this intervention and their tireless efforts to see that this research work comes to reality. I am also delighted with the timely support and contributions of my co-researcher Dr. Saidu Muhammad Jika for his tireless efforts whenever the need arises, also my appreciation goes to the team of my research assistants more especially my good friends; Hussaini Mathias, Attahiru Abubakar, (scientist) Mohammed Bello Ahmed, Saadatu Aliyu, Haruna Abdullahi, Simon Malgwui to mentioned but a few. May God almighty rewards you all abundantly.

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