

Supervisors' Experience and Area of Specialization as Determinants of the Quality of Students' Project Report Writing Skills in Tertiary Institutions

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Abstract Project report writing is important and compulsory for every final year student in tertiary institutions, however adequate attention has not been given to the supervision of project report writing. Some teething problems always accompany project report writing. This expo-facto study therefore seeks to investigate the effects of supervisors' experience and area of specialization on the quality of students' project report writing skills. The population for the study comprised all the 60 supervisors in the school of science, out of which 42 were sampled. One research question and three hypotheses were formulated for this study. The main hypotheses raised were: the quality of students' project report is not significantly affected by Supervisors Experience and the quality of students' project report is not significantly affected by Supervisors Area of specialization. The results show that there was significant main effect of supervisors' experience on the quality of students' project report and also there was significant main effect of supervisors' area of specialization on the quality of students' project report. As a result of these findings, it was recommended that there should be a format for project writing, research report requirements/guidelines should be part of students' handbook and mentoring should be encouraged in project supervision.

Keywords: *experience, area of specialization, project report, supervision, report writing, mentoring, writing skills*

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1. Introduction

1.1. Background to the Study

Students' project report can be likened to the case of the computer where information could be "garbage in garbage out". The quality of the students' reports is as a result of both the efforts of the supervisors and the students. Supervising students undertaking research projects at all levels of tertiary institutions is a significant part of tertiary education [1] since students cannot graduate without completing a research project. Ref [2] in [3] sees project supervision as a process in which the supervisor, because of lack of experience and knowledge of the students, provides assistance, guidance and support to the students. The extent to which a supervisor can support a student can be viewed in two ways – the supervisor treats the student as an independent researcher who takes the initiative in carrying out research work, or the student could also be treated as being dependent on the supervisor [4].

However, too much control or not having control at all may not help the work of the student. The intervention of a supervisor may at best lie between the two extremes. It means a supervisor comes in at the right time when his support is needed, while the researcher should be cautioned that too much control by the supervisor threatens the originality of his research work ([5,6]).

Based on experience, the supervisor's role is three fold: expertise in the research area, support for the student and balancing creativity and critique. In addition, supervisor's role includes guiding, advising, ensuring scientific quality and providing emotional support ([2,7]). It is the duty of the supervisor to ascertain if the student is knowledgeable about the component of the research process. Supervisors should be ready to spend a lot of time and effort at the beginning of research. The supervisor needs to assist students in selecting a research topic and research design; formulate research questions/hypotheses; and ensure that topic selected presents a researchable problem, etc.

The supervisors should also have the skill of monitoring the students' work with less interaction and also be receptive of difficulties encountered by the students in the research process.

In summary, some researchers (e.g. [8]) highlighted the role of a supervisor as:

- Confidante
- Facilitator
- Guide
- Mentor
- Coach
- Co-learner
- Source of intellectual inspiration
- Resource Manager
- Grant application writer
- Navigator of institutional tangles to steer the student through the administrative jungle of regulations

- Manager of charge – from novice to experienced researcher
- Writing editor
- Career mentor
- Networker

The above roles could not be played if the supervisors have not gained enough experience and skills to carry out the task. The gap between the qualities of a report project supervised by high and low experienced supervisors may also be due to a lack of training or induction on project writing and supervision. According to [2] in [3], it is possible for student to have a supervisor who does not know what the research process requires or having limited or no supervision experience. It shows that little attention is given to development of supervisors. This is not limited to college of education as [3] discovered that not much attention is given to supervisors' development at different universities. They asserted that most supervisors do not have formal training but learn from each other. In addition to training, supervisors need supports in the area of facilities. It was also found out that gaining research qualification alone was not sufficient preparation; because one has actually done a PhD does not necessarily mean to say one is adequately prepared for a supervisory role. It thus shows that formal training is needed to compliment supervisors' qualification.

Apart from the above, other factor like, area of specialization of the supervisor, have been identified as very important in project supervision. Ref. [1], in his work on developing research supervision skills explained that some institutions do not distribute student to supervisors based on experience alone but also based on the area the supervisor is working. This enhances transfer of skills from the supervisors to students. It was also found that students are encouraged to seek out potential supervisors in their specialist fields. This is done to enhance role modeling and broad notions of practice and context required by the students [1].

In view of the above, this study seeks to determine the effect of supervisors' experience and area of specialization on the project report writing skills of tertiary institution students.

1.2. Research Question

Do Lecturers receive professional training on project supervision?

Hypotheses:

H₀₁:- Quality of students' project report is not significantly affected by the supervisors' experience.

H₀₂: Quality of students' project report is not significantly affected by the supervisors' area of specialization.

H₀₃: The interaction effect between the supervisors' experience and area of specialization is not significantly affected by the quality of students' project report

2. Methodology

The study adopted a 3 x 7 expo-facto design. The experience is at three levels: Low (Asst/LI/III), middle (L₁/SL) and High (PL/CL). (Table 1). The experience was crossed with area of specialization at seven levels (the seven departments in the School of Science). This design

was chosen to ensure the proper matching of the variables involved in the study. It also allowed separate determination of the main effect as well as interaction effects of supervisors' experience and area of specialization the quality of students' project report writing skills.

Table 1. Design Lay Out

Variables	AI	A2	A3	A4	A5	A6	A7	TOTAL
Low	2	2	2	2	2	2	2	14
Middle	2	2	2	2	2	2	2	14
High	2	2	2	2	2	2	2	14
Total	6	6	6	6	6	6	6	42

The variables in the study which were of interest to the investigator are:

Dependent variable scores – Student project report

Independent Variables – Experience (Status of Supervisors) and Areas of specialization (Departments).

Supervisors' experience is synonymous to the cadre of the supervisors/lecturers. A lecturer /supervisor stays for three years before being promoted to the next cadre. E.g Lecturer II to Lecturer I. Therefore, the lecturer cadre/status was used to determine the experience of the supervisor for this study. The most senior (e.g Chief lecturer) was classified as most experienced while Assistant lecturer is least experienced.

The area of specialization in this study bothers on the seven (7) departments in the school of science (i.e. Biology, Chemistry, Computer, Integrated Science, Mathematics, Physics and Health Education). Each department was taken as an area of specialization.

2.1. Population and Sample

The population of the study consisted of all project supervisors in the School of Science. A stratified sampling approach was used for the study. Stratified random sampling was chosen because the subjects were in strata of seven units with each stratum having three levels of independent variable (supervisor experience). Two (2) subjects were randomly selected from each stratum of supervisors' status in all departments (units) in the School of Science. A total of six (6) subjects were randomly selected from each unit. In all, 42 subjects were selected for the study.

2.2. Instrument

The study made use of, and adopted the Federal College of Education assessment form for students' project to score each student's project report supervised by the supervisors. The instrument had been approved by the College and it is currently in use. The adopted instrument was considered appropriate because it has consistently been used and most importantly was designed to assess the quality of students' project report writing skills. The instrument has been reviewed and standardized by the College authority.

2.3. Validity and Reliability

The adopted instrument was validated by a panel of three jurors from the school of education. The jurors were experts in education evaluation. The ten items students assessment instrument was used to score 30 students'

project reports supervised by different cadre of supervisors. Split half method was used and the scores were subjected to cronbach alpha analysis. The reliability value of 0.86 was obtained.

2.4. Analyses

The study data analysis involved analysis of covariance (ANCOVA) of the project reports scores. In case of significant effect, pair wise comparisons were used. Furthermore, graphical illustrations were used to support the simple effect and interaction analyses.

3. Results

Research Question: Do Lecturers receive professional training on project supervision?

Interview conducted by the researcher with three (3) groups of supervisors as participants in this study showed that all the supervisors attested to the fact that they were not given project/research supervision training.

Hypothesis H₀₁:- Quality of students' project report is not significantly affected by the supervisors' experience. (Table 2).

Table 2. Summary of Descriptive Statistics of Supervisors' Experience

Supervisor Experience	Mean	SD	N
Low	46.14	5.90	14
Middle	47.71	10.83	14
High	52.36	11.91	14
Total	48.74	10.02	42

Table 2 displays the mean, standard deviation and the number (N) of the subjects for each level of the supervisors. The means for low, middle and high experienced supervisors are 46.14, 47.71 and 52.36 respectively. The standard deviation (SD) of the supervisors score are 5.90, 10.83 and 11.91 for low, middle and high respectively, while the number for the subjects at each level is 14.

A 3 x 7 analysis of covariance of students' project report scores by experience and area of specialization of supervisors was done. (Table 3).

Table 3. Summary of Ancova for Experience and Area of Specialization

Sources	Sum of Sq	df	Mean sq	F	Sig
Intercept	99766.881	1	99766.881	6903.145	0.000
Exp-Status	292.333	2	146.167	10.114	0.001*
Dept/Unit	2225.619	6	370.937	25.666	0.000*
Status * Dept	1290.667	12	107.536	7.442	0.000*
Total	103879.000	42			

$\alpha = 0.05$.

The table shows that there was a significant main effect of experience on quality of student project report ($F(2, 42) = 10.114, P < 0.05$). Thus, the hypothesis H₀₁ was rejected. This shows that there were statistically significant main effects of supervisors' experience on students' project report.

In order to determine the quality of report associated with the three groups of the supervisors' pair wise comparisons were conducted (Table 4).

Table 4. Pair wise Comparisons

Experience	Low	Middle	High
Low	-	-	*
Middle	-	-	*
High	*	*	-

*= Sig Diff; - No Sig Diff.

Table 4 shows that the project reports supervised by the high experienced supervisors is significantly higher in quality than those supervised by low and middle experienced Supervisors. It therefore means that the significant main effect of supervisors experience comes from the high experienced supervisors. (Figure 1)

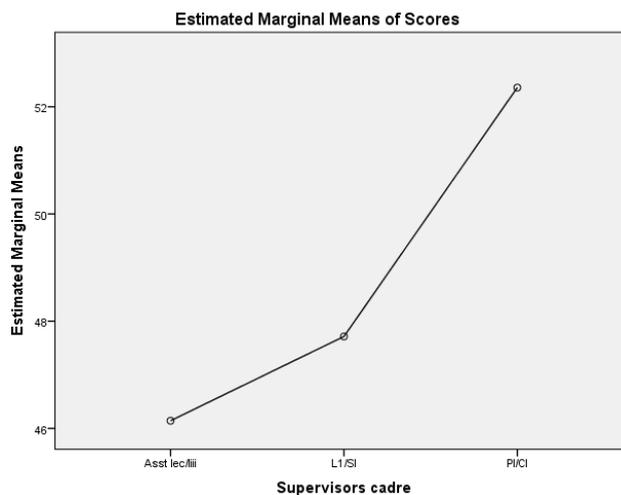


Figure 1. Supervisors experience

H₀₂: Quality of students' project report is not significantly affected by the supervisors' area of specialization.

Table 3 reveals that there was a significant main effect of supervisors area of specialization on the quality of students project reports ($F(6, 42) = 25.666, P < 0.05$). Therefore, the hypothesis H₀₂ was rejected. This reveals that there were statistically significant main effects of supervisors' area of specialization on the quality of students' project report.

In order to determine the quality of project reports associated with the supervisors' area of specialization, pair wise comparisons were conducted (Table 5). There are variations among the quality of students' project reports.

Table 5. Pair wise Comparisons of supervisor area of specialization

Area of specialization	CHE	CSC	ISC	PHY	BIO	MAT	PHE
CHE	*	*	*	*	*	*	*
CSC	*	(*)	*	-	*	*	*
ISC	*	*	(*)	*	*	-	-
PHY	*	*	*	(*)	*	*	*
BIO	*	*	*	*	(*)	*	*
MAT	*	*	*	*	*	(*)	-
PHE	*	*	*	*	*	*	(*)

*= sig diff; - No sig. diff.

The significant difference occurred among most areas of specializations. The non-significant difference occurred between Computer Science and Physics, Integrated Science and Physical and Health Science; and Mathematics and Physical and Health Sciences. The results are reflected in Figure 2.

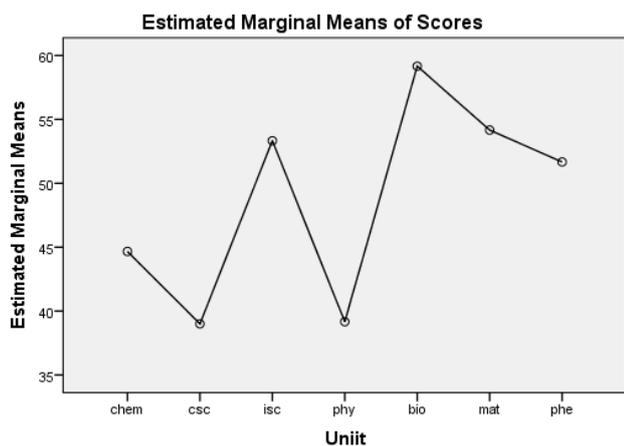


Figure 2. Supervisors Area of Specialisation

H₀₃: The interaction effect between the supervisors' experience and area of specialization is not significantly affected by the quality of students' project report.

Table 2 shows that there was a significant interaction effect between supervisors' experience and area of specialization on the quality of students' project report ($F(12, 42) = 7.44, P < 0.05$). Thus, hypothesis H₀₃ was rejected. As a result an effort was made to display the interaction through simple effect analysis which is illustrated graphically in Figure 3.

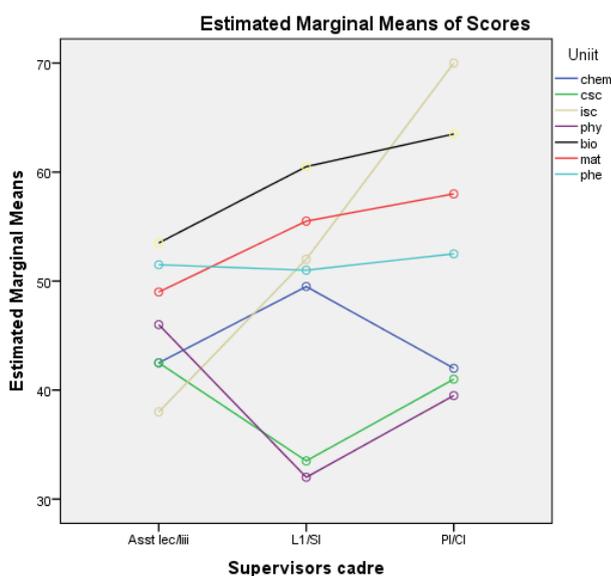


Figure 3. Supervisors Experience X Area of specialisation.

From the figure, it was observed that the interaction is disordinate. However, if the quality of students' project reports of area of specialization of Biology and Mathematics are isolated, it is observed that the two had ordinal interaction. It shows that for the two areas of specialization the quality of students' project reports supervised by experience supervisors is higher than those of students supervised by middle and low experienced supervisors.

As assumed before the study, the quality of project reports supervised by the middle experienced supervisors was higher than those supervised by the low experienced supervisors. Holistically, the graph revealed that the quality of students' project reports supervised by high experienced supervisors in ISC, Biology and Mathematics is higher than the quality of student project report

supervised by middle and low experienced supervisors. Surprisingly, in the area of specialization of Computer Science and Physics, the quality of project reports supervised by low experienced supervisors is higher than those supervised by middle and high experienced supervisors. Surprisingly too, the quality of project reports supervised by middle experienced supervisors in the area of Chemistry is higher than that of reports supervised by the low and high experienced supervisors. In the area of physical and health science, the quality seems to be normal.

4. Discussion

The significant main effect of supervisors experience in Table 3 and the pair wise result in Table 4 shows that the significant main effect of supervisors experience comes from high experience supervisors i.e. the Chief and Principal lecturers. This result may be due to the supervisors' long years of experience in supervising students. This result supports the work of [3] where he stressed that a supervisor assists students in research process by sharing his/her knowledge and experience in the scientific approach to researchable issues. This result is also corroborated by [1] who explained that most research students spoke of, not only drawing on memories of supervisors, but also transferring skills from other areas of their professional and personal lives to enhance their supervisory practice.

The significant main effect of a supervisor's area of specialization on the quality of students' project report shows that there were variations in the quality of students' project report with regards to area of specialization of the supervisors.

The variations cut across all areas of specialization except between Integrated Science and Physics, Integrated Science and Mathematics, Integrated Science & Physical and Health Science and Mathematics and Physical and Health Science where there was no variation. It means the quality of students' project reports varied across areas of specialization. This implies that the quality is not uniform across the units of the school. The result was corroborated by [9] where he noted that selection of supervisor is based on "if you happen to be working on that paper, not because of your experience in supervision"

The significant interaction effect between supervisors' experience and area of specialization on the quality of student's project report shows from Figure 3 that the graph is disordinate. It reveals the fact that there are variations in the quality of students' project report, irrespective of the experience of the supervisors. In some units, the quality of students' project reports supervised by low experienced supervisors were higher than those supervised by middle experienced and high experienced supervisors respectively. Figure 3 further reveals a unit in which the quality of research report supervised by the middle experienced supervisors was higher than the one supervised by the low and high experienced supervisors respectively. However, in most units, the quality of projects supervised by highly experienced supervisors was higher than those of the middle and low supervisors respectively.

This shows that supervisors do not have any formal uniform training as regards the supervision of students'

projects. In addition there is no students and supervisors' guide on project report writing. Hence, the variation in the quality of supervision. The three groups of supervisors interviewed also revealed that there has not been any training on project writing and supervision. Supervisors come into the profession with varied knowledge and experience.

5. Implications and Recommendations of the Study

The following are the implications and recommendations based on the findings of this study.

- The significant main effect of supervisors' experience on the quality of student project reports shows that experience is the best teacher. This could be used to the advantage of new supervisors. The novice supervisor could be attached to experienced supervisors, who would serve as mentors for the first two or three years. This was supported by [10] who explained that mentoring transfers knowledge, skills, attitudes, belief and values between the mentor and the mentee. Mentorship was also corroborated by [11] who sees mentoring as a form of academic and disciplinary self-reproduction which can have paternalistic impulses located within it. Mentoring could be likened to apprenticeship whereby less experienced personnel learn by doing under the supervision of an experienced person. Experience could be gathered by entering into a mentoring or buddying-up relationship with a senior colleague. To support this a new supervisor report cited by [9] has this to say:

"The very first time I was supervisor for a student, we had a piggyback system, so there was the principal supervisor, who was supervising me supervising a student... Sometimes he would just, literally, sit back and let me talk to the student and then tell me the things that I had done..."
- The significant main effect of supervisors' areas of specialization on the quality of students' project report is an indication that there are variations in the supervisory knowledge and style of supervisors. Each supervisor comes into the profession with a different knowledge base and exposure. There is need to harness this knowledge base and come up with a uniform format for project writing supervision which all departments can use.
- The significant interaction effect of supervisors' experience and areas of specialization on the quality of the students' project report revealed: that if any training is to be conducted, trainers should concentrate on middle experienced supervisor in Computer and Physics units; while in Chemistry, the lower the high experienced supervisor should be concentrated on. However, trainers should concentrate on the lower experienced supervisors in the unit of Biology, Mathematics, Physical and Integrated Science Unit. This result confirmed the fact that supervisors entered the teaching profession with varied knowledge bases and experiences.

As a result of the above, it is recommended that:

- Training should be organized for all cadre of supervisors especially the new ones.
- There should be a format/template for project writing.
- Research report requirements/guide guidelines should be part of students' hand book
- Mentoring should be encouraged in project supervision.
- Supervisor should be encouraged to include students in their research work.

6. Conclusion

Any task that needs to be carried out with skills and knowledge need to be prepared for. Project writing and supervision are not tasks excluded from this requirement.

Research by [6] has shown that guidelines on how to prepare a professional research report are not always routinely available. This study has shown that there is need for training and guidelines on research report writing. This will make the work of both the supervisor and student more effective. If all supervisors use the same guidelines, the grading and assessment of research report will be standardized and this would reduce the variation in the quality of research report across the departments.

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