Successful research project supervision in science and agriculture: attitude of students and supervisor

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ABSTRACT: This descriptive research uses a questionnaire to determine supervisors and students attitude towards research project supervision in two different tertiary institutions in Southern Africa. A systematic sampling technique using a sampling interval of 3 with replacement was used to select 53 students. Simple random sampling was used to select 38 supervisors. A structured questionnaire which was subjected to face validity and reliability test was used to collect data. Data collected was analyzed with SPSS using means and standard deviations. Analysis confirmed matching academic interest, expertise, resources, matching expectations, mutual understanding, and stimulated and maintained student interest and motivation play vital role in successful supervision. Significant determinants of students attitude towards research supervision are gender (t = 1.95), age (t = 2.83), residences (t = -2.02), marital status (t = -3.89), weekly supervisor contact (t = 2.33), fortnight supervisor contact (t = 2.49).
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INTRODUCTION

Research project is a pre-requisite for completing degree courses in higher institutions as in many universities around the world, where students are expected to show knowledge and skills of conducting research using various sources in a specified format including identification of research problems, setting of research objectives and hypothesis, data collection, analysis and interpretation and report writing as well as referencing. This process includes the students and research supervisor who is usually one of the faculty members. The supervisors have the responsibility for providing academic guidance and an enabling environment in which research is seen as creative and exciting activity. The project is yearlong and runs in parallel with the other courses taken by students. All project supervisors are members of academic staff and are generally assigned about 6 undergraduate project students per year. Responsibilities include providing help and guidance with the planning of the project and the experimental aspects, giving students' encouragement throughout the module and developing their analytical, oral and writing skills. The help provided may also come in the form of courses such as computing, statistics and library information retrieval.

In the institution, the procedure for starting a research project includes a student identifying the area of concern, visit the lecturer and discuss the topic. The agreed topic has to be registered with the research coordinator; the student and supervisor then work together on the research topic for the proposal to be developed. The conduct of the research project is a learning process that is different from the conventional class room setting and based on more direct relationship and interaction between the supervisor and the supervisees. The relationship between the supervisor and the learner is crucial and could determine the success of the research. Research supervision involves training and development of students undertaking research courses. According to Norhasni (2008) research supervision is seeing, overseeing, directing, or managing a supervisee. It involves helping, psychosocial support, role modeling (Dickinson and Johnson, 2000). Supervision has been accepted as in whole or in part, a form of teaching, the implication then is that an effective teacher is an effective supervisor teacher. Good communication between students and their supervisor is the most important elements of supervision (Taylor 2005). Starting a research project marks the situation the student will need time and help to adjust to the new role of learning. The conventional teaching and learning literature are accustomed to the notion of teaching and learning styles and to the interrelations between them.

A learner should be responsible for his/her own research activity and hence the personal career development. The supervision of a student as a form of teaching aimed at developing the students and their potential to become an independent researcher focuses upon good communication between supervisor and students as opposed to supervisor or students training peers. The supervision experience for students and supervisor is likely to be varied with

good and bad supervision. In some cases student-supervisor agreements have been introduced. Some universities have established formal requirements for regular meetings between supervisors and students and for the establishment of adequate arrangements for supervision when the supervisor is away for an extended period (Hussain, 2009). Regular meetings ensure contact with supervisor and may assist introvert students to voice out their concerns. Clearly, the nature of the student–supervisor relationship will be influenced by the duration of the research, the level of research undertaken and the stage the student is at in research project (Latimer, 2009). Where no such student-supervisor relationship exist, it may be difficult for the supervisor to identify the training needs of the learner and adequately mentor the learner. It is expected that all supervisors act as mentor to the learner.

Despite the effort being made by the government to have an informed and educated nation, anecdotal information suggests that most of the students who graduate from universities have not shown adequate research skills, a situation for which many factors have been attributed. According to [4] beginning research students are faced with many responsibilities and challenges which include; attending other classes, unavailable research materials and concerned with departmental support and expectations, personalities in supervision and supervisors' insufficient knowledge of the research area, methodological difficulties. It is expected that a learner will have knowledge of the subject, be willing to learn, proactive, inquisitive, motivated, and follow timelines. Learners' expectation of the institution includes the service of an experienced supervisor who is accessible, sufficient amount of resources, and standard postgraduate format of work plan guidance. This is also supported by (Latimer (2005) that 'the success of the research students is based almost entirely on their experience of supervision.' The success of most students in research project is based on stimulating and challenging task of supervision, although there is diversity in the conception of supervision by both students and supervisor. Research supervision is an organized study; methodical investigation into a subject in order to discover facts, to establish or revise a theory with aid of the supervisor.

In the institution, pre-requisites to research projects include a course on Research Methods in Education so that they are able to understand the process and procedure for conducting research projects. Most of the pre-service students choose research projectin their plan of study in the final year of their degree study or during honours as the case may be and there have been cases of students being unable to successfully complete their research project in their respective program within given frame-time. Another major factor for the nature of research projects in universities is the disposition towards the research by students and supervisors, because research supervision is not conventional teaching. Common problems include inadequate or negligent supervision. This study will attempt to answer the questions of how attitude affect the student-supervisors interaction during the research project course. This study examined attitude towards research supervision among Lecturers and students of a tertiary institution which includes professional and academic work practices. Specifically, their personal characteristics were identified and attitude ascertained.

METHODS

The study was a descriptive research using a questionnaire to determine supervisors and students attitude towards research project supervision in two different tertiary institutions in Southern Africa. The target population was 192 students who offered research project in their fourth year in the institutions (2008-2009 and 2010-2011) academic year and 96 supervisors who supervised the students in the institution. A systematic sampling technique using a sampling interval of 3 was used to select 53 students who offered research project, while simple random sampling was used to select 31 supervisors from five departments in the institutions. A structured questionnaire developed based on literature review and objectives of the study were used to collect data on attitudes towards research supervision among students and supervisors. This was measured on a % point Likert scale of on a five point Likert scale of strongly agree, agree, undecided, disagree and strongly disagree. To establish content validity of the instrument, three experts in the institutions were given the instrument to verify. The instrument was pre-tested with 30 students at other faculties of of the institutions. Data were analyzed using SPSS using frequencies, percentages while attitude was described with means and standard deviations.

RESULTS

Table 1 presents the personal characteristics of students, while Table 2 shows Students' attitude towards research supervision and Table 3 highlights the Multiple regression analysis showing relationship between personal characteristics and attitude towards research supervision.

Table 1. Personal characteristics of students

Variables	Frequency	Percentages
Gender		
Male	14	36.8
Female	24	63.2
Age		
Less than 25	14	36.8
25- 30	15	39.5
Above 30	9	23.7
Programme of study		
Agriculture	22	57.9
Science	16	42.1
Residence types		
Off campus	21	55.3
On-campus	17	44.7
Marital status		
Single	28	73.7
Married	10	26.3
Contact with supervisor*		
Once a week	21	55.3
Once a fortnight	14	36.8
Once a month	6	15.8
Once in two months	4	10.5
Satisfaction with supervision		
Very dissatisfied	3	7.9
Satisfied	13	34.2
Very satisfied	22	57.9
Satisfaction with research		
Very satisfied	6	15.8
Satisfied	15	39.5
Dissatisfied	9	23.7
Very dissatisfied	8	21.1
Causes of dissatisfaction*		
Loss of motivation and interest	8	21.1
Poor supervision	8	21.1
Dealing with uncertainty in research	12	31.6
Financial difficulties	17	44.7

*multiple response

Table 2. Students' attitude towards research supervision

Variables	SD	D	U	A	SA
Has similar research interests	3(7.9)	1(2.6)	3(7.9)	15(39.5)	15(39.5)
Interested and committed to research	0(0)	0(0)	3(7.9)	16(42.1)	19(50.0)
Seek relevant literature	0(0)	0(0)	1(2.6)	20(52.6)	17(44.7)
Good writing skills	0(0)	3(7.9)	1(2.6)	23(60.5)	11(28.9)
Provision of critical feedback on written reports	1(2.6)	0(0)	8(21.1)	19(50.0)	10(26.3)
Available when needed for project discussion	0(0)	0(0)	7(18.4)	13(34.2)	18(47.4)
Knowledgeable and resourceful	0(0)	0(0)	7(18.4)	18(47.4)	13(34.2)
Friendly, approachable and flexible	0(0)	4(10.5)	6(15.8)	14(36.8)	14(36.8)
Willing to learn	0(0)	3(7.9)	7(18.4)	7(18.4)	21(55.3)
Plan and work independently	0(0)	4(10.5)	5(13.2)	8(21.1)	21(55.3)
Meet deadlines	0(0)	3(7.9)	2(5.3)	12(31.6)	21(55.3)
Active researcher	0(0)	3(7.9)	3(7.9)	10(26.3)	22(57.9)
Pro-active in choosing the research topic	1(2.6)	7(18.4)	0(0)	12(31.6)	18(47.4)

Effective communicator	0(0)	3(7.9)	1(2.6)	16(42.1)	18(47.4)
Good listening skills	0(0)	3(7.9)	1(2.6)	7(18.4)	27(71.1)
Understand the nature of research, the literature, theories, methodologies and the standards expected	0(0)	6(15.8)	1(2.6)	8(21.1)	23(60.5)
Balance between independence and supervisors direction	2(5.3)	4(10.5)	3(7.9)	24(63.1)	5(13.1)
Self-Motivated	2(5.3)	7(18.4)	4(10.5)	12(31.6)	13(34.2)
Seeks personal counseling	2(5.3)	8(21.1)	7(18.4)	10(26.3)	11(28.9)
Keep within research limits	1(2.6)	10(26.3	12(31.6)	14(36.8)	1(2.6)
Submit written work as appropriate and within a reasonable time	1(2.6)	3(7.9)	7(18.4)	19(50.0)	8(21.1)
Establish professional relationships with supervisors	0(0)	3(7.9)	3(7.9)	15(39.5)	17(44.7)
Available for the research work and advice	2(5.3)	3(7.9)	5(13.2)	17(44.7)	11(28.9)
Maintain contact through the frequency of meetings with supervisors	1(2.6)	8(21.1)	1(2.6)	18(47.4)	10(26.3)
Keep a written record of the content of meetings	1(2.6)	8(21.1)	6(15.8)	13(34.2)	10(26.3)
Seeks to learn and acquire research and generic skills	1(2.6)	7(18.4)	10()	9(23.7)	11(28.9)
Seeking appropriate opportunity and willing to talk about his or her work in seminars	2(5.3)	7(18.4)	8(21.1)	8(21.1)	13(34.2)
Seeks meetings, courses, conferences and training opportunities relevant to the research	2(5.3)	6(15.8)	6(15.8)	5(13.2)	19(50.0)
Acknowledges the inadequacy of his/her progress or if his/her standard of work is below what is generally expected	2(5.3)	7(18.4)	3(7.9)	14(36.8)	12(31.6)
Seeks detailed advice and set deadlines for submission within the scheduled time	6(15.8)	6(15.8)	5(13.2)	13(34.2)	8(21.1)
Provide a good example as a leader	1(2.6)	6(15.8)	1(2.6)	17(44.7)	13(34.2)
Seeks guidance and comment that he/she finds most helpful	0(0)	2(5.3)	4(10.5)	9(23.7)	22(57.9)
Have a timetable of research	1(2.6)	3(7.9)	1(2.6)	17(44.7)	16(42.1)
Initiate consultation with the supervisor where necessary and set the agenda for them	1(2.6)	9(23.7)	4(10.5)	8(21.1)	16(42.1)
Take the initiative in raising problems or difficulties	1(2.6)	6(15.8)	9(23.7)	9(23.7)	13(34.2)
Ensure that the progress of work is in accordance with the stages agreed with the supervisor	1(2.6)	9(23.7)	4(10.5)	13(34.2)	11(28.9)
Make submissions within the time limits specified in the regulations	1(2.6)	6(15.8)	1(2.6)	13(34.2)	17(44.7)
Provide written work to the supervisor	1(2.6)	7(18.4)	3(7.9)	14(36.8)	13(34.2)

Figures in parentheses are percentages

Table 3. Multiple regression analysis showing relationship between personal characteristics and attitude towards research supervision

Variables	B	SE	Beta	t	p
Constant	52.19	20.76		2.51	0.02
Gender	22.69	11.63	0.34	1.95	0.06
Age	3.37	1.19	0.52	2.83	0.009
Programme of study	-4.99	3.43	-0.24	-1.45	0.16
Residences	-26.72	13.20	-0.42	-2.02	0.05
Marital status	-25.65	6.59	-0.70	-3.89	0.001
Weekly supervisor contact	13.85	5.94	0.34	2.33	0.03
Fortnight supervisor contact	18.48	7.40	0.52	2.49	0.02
Monthly supervisor contact	-7.16	8.95	-0.19	-0.80	0.43
Bimonthly supervisor contact	-16.12	10.71	-0.39	-1.51	0.14
Satisfaction with supervision	12.43	10.04	0.30	1.24	0.22
Satisfaction with research	6.65	4.23	0.26	1.57	0.13
F	6.15				
P	0.00				
R	0.85				
R square	0.72				

DISCUSSION

Table 1 presents the personal characteristics of students. Table 2 presents the results of students and supervisors attitude towards research supervision. The respondents were asked to rate the statements using 5 Likert scale as follows; 1 (strongly disagree), 2 (Disagree), 3(Uncertain), 4 (Agree) and 5 (Strongly agree). The actual mean is 3 due to the rating scale and a mean of greater than 3 denoted a positive attitude while a mean less than 3 denoted negative attitude towards, the analysis of the data for Table 2 relates supervisors and students. Firstly students evaluated their supervisor characteristics and their role as effective supervisor from the students' point of view. The results show that, the lowest standard deviation of the students who stated that they strongly disagree or disagree with a statement, did so in relation to 'My supervisor' seek relevant literature 0.69, provide written work to the students 0.78, keep a written record of the content of meetings 0.83 and discuss with student the type of guidance and comment that he/she finds most helpful 086. Written work provided to the supervisor may enhance the research to the level of publishing the research findings. The results may reflect the fact that minorities of the respondents are those who are committee members and therefore their schedule does not give them enough time to supervise. The highest SD 1.35 and 1.34 shown by statements 'initiate supervisory sessions where necessary and set agenda for them and have a timetable of research respectively. Students should expect to work within deadlines (Latimer, 2005). The other issues addressed in the survey with SD included has good writing skills and decide when to submit the thesis within time limits specified in the regulation, both 1.29 provide a good example as a leader and is interested and committed to my research both 1.25. Lastly have research interests that are similar to my topic 1.21. Our on-the-job experience has shown that research interest depend on value for independence in choosing research area, project-based research funding, less-than ideal candidate, co-supervision and joint supervision (interdisciplinary research). Supervisors rated students low in 3 items (availability, research skills, provision of written work). The results may reflect that majority of the supervisors have supervised before and the topic is researchable and as well as working within timetable. Thus, students who chose high standard deviation in relation to the supervisors were happy with the role played by their supervisors. Therefore some of statements were purposely designed to check the balance between the reality and expected role of the supervisor from the student's point of view. It should be noted that the supervisor cannot be all things to the project student (Powell, 2006) but "enabling the 'substantiated' opinion of mentors to become a credible part of proficiency assessment" (Cassidy, 2009) is crucial to mentors professional thinking and necessary for student pedagogical validity. Similar other factors that may hinder successful student research supervision (Hodges, 2009) as well as mentors' perception about students (Webb and Shakespeare, 2008) are mentioned in previous studies.

In Table 2, a supervisor is considered very important to the students. The roles of supervisors in upbringing of young research scholars are well stated (Haynes et al, 2008). The results from Table 2, shows that the students tended to choose the statement 'pro-active in choosing the research topic 1.39 regarding the responsibility of a supervisee. In response to the last statement 1.36, student should provide written work to the supervisor. Most supervisors chose this statement as an important responsibility of a student. Many authors in the literature wrote about student/supervisee's timetable. Regarding the statement 'is available for the research work and advice 1.30 and takes initiative in raising problems or difficulties as well as self-motivated both 1.22, reveal that what is expected of the supervisee by the supervisor. So from this result, it can be seen that most students agree that they are responsible for providing the progress report. Therefore the statement 'provide written to the supervisor 1.30 shows relationship between the supervisor and a supervisee. This statement matches the literature since Spear (2000) mentions that students should submit written work in some form as early as possible in their course so that writing problems can be recognized and corrected.

From the results, lowest standard deviations 0.79 of statement' seek relevant literature' and this might be due to the fact that majority of the students used few sources of information 77% that is less than 2 sources. Most students failed seeking appropriate opportunity and willing to talk about his or her work in seminars 0.84 and seek meetings, courses, conferences and training opportunities relevant to the research 0.91. Regarding the statements above, the supervisors and students should both be involved in seminars and talk about their work. From the results, it has been shown by high SD in supervisors with 1.02 and 1.03 in which basic science department ensured that all the students who register with them do project, had to choose, agreed the topic with department not the supervisor only. If good facilities are provided to students, they can make full use of them to speed up their work (Taylor, 2005). Students desire to have supportive supervisors, who will be accessible and available, interested in the student's

research project, willing to share expertise, and adequately give constructive feedback. In this study, it was observed that certain expectations do not match each other. Out of 38 items, students rated supervisors low on 10 (e.g. expected standards, availability, research skill, research opportunities).

The multiple regression analysis showing relationship between personal characteristics and attitude of students towards research supervision is highlighted in Table 3. The independent variables were significantly related to students' attitude towards research supervision. The F value of 6.15 at $p< 0.05$ shows that there was strong correlation between the independent variable and students' attitude towards research supervision. The R value is 0.85 while the R square is 0.72; this implies that the independent variables predict 27% of the dependent variable. The significant determinants are gender (t = 1.95), Age (t = 2.83), Residences (t = -2.02), Marital status (t = -3.89), weekly supervisor contact (t = 2.33), fortnight supervisor contact (t = 2.49). Only residences and marital status are inversely related to students' attitude towards research supervision. These findings imply as more students live off campus and they are married the attitude to research supervision will be unfavorable.The main issues in this research have been the attitudes of the supervisor, the attitudes of the student, their personal characteristics and frequency of contact between supervisors and agriculture and science students in tertiary institutions. Most of both supervisors and supervisee prefer to meet frequently, especially when they start proposal. This means that the further they progress, the fewer meetings they have with their supervisors. The results indicate that a student timetables are essential for better planning in order to manage and occupy their time more effectively. The findings reveal that lack of supervision; not seeking relevant literature and willing to talk about his/her work make students unable to complete their study within the time given.

The results show that responsibility of supervisor is guide and advice on the student's research, in relation to topic selection, data collection and giving feedback on the progress of written work. Supervisors should also be seen by students as close to them and always be there when needed. Also it has been found that an effective supervisor must have good knowledge and experience in their respective field of study. As the student is the owner of the research, it is he/she who has ultimate responsibility for decision taken. This includes selecting the research topic searching the literature, devising the methodology and collecting data. So, they need to produce written work in order to make progress. The results also show that a good student should grasp opportunities to develop professional skills by attending seminars and making presentations. Therefore, cooperation by the supervisor also plays a fairly important role in the process of speeding up students work. Regarding the personal characters, the results shows that most of the lecturers were males which is associated to the field of agriculture and most of them were satisfied with the researches undertaken by their supervisee. This paper recommends that the students indicated that they met more than once a week, as to keep within the limits of the research therefore research projects should have fixed times in timetable like any other course rather than scheduled for journal clubs as it had been. Though the students showed that they are active up-coming researchers, most of them used less than 2 sources of information, therefore good research should have other researchers view about the topic and the libraries should have enough materials.The conclusions were based on attitudes towards research supervision by supervisors and students, therefore the effective method to communicate their problems was to be identified which could have reduced students problems without them having to wait and fix an appointment. The results showed that both supervisors and students were satisfied with supervision but few indicated difficulties like number of courses registered when doing project and number of student supervised on project as still a major challenge. Therefore department should set a specified number of students per supervisor as well as courses registered. Time spent on other engagements was negatively affecting supervision effectiveness. Therefore supervisors who are involved in number of committees should be avoided or dedicate more to supervision.

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