

Journal of Turkish Science Education

<http://www.tused.org>

© ISSN: 1304-6020

Perceptions of Postgraduate Students on the Relationship Between Thesis Development and Performance of a Supervisor

Sussy Bayona-Oré¹

¹Unidad de Posgrado de Educación, Universidad Nacional Mayor de San Marcos, sbayonao@hotmail.com,
ORCID ID: 0000-0001-7133-9106

ABSTRACT

Although thesis supervision has been widely studied, little is known about supervisors' performance dimensions and thesis development from a quantitative perspective. For this reason, this research aims to analyse the relationship between thesis development and supervisors' performances according to the perceptions of postgraduate students. A quantitative research methodology and a Spearman's rank correlation was used. A survey was administered to 51 postgraduate students from a public university. The results indicated a significant correlation between thesis development and supervisor performance dimensions such as skills, roles, and personal qualities. The academic capacity, knowledge, research experience of supervisor is significant and the supervisors understand the regulations and rules of the supervision process. The supervisors must have knowledge of supervision styles and apply it taking into account the characteristics of the students. A framework of procedures and guidelines for postgraduate supervision must be established to improve the supervision process.

ARTICLE INFORMATION

Received:

22.01.2021

Accepted:

13.11.2021

KEYWORDS:

Cognitive skills,
personal qualities,
role function,
supervisor
performance, thesis.

Introducción

Different tertiary education entities in Peru have promoted several initiatives focused on improving the quality of higher education. Legal considerations, accreditations, ranking of top universities, and licensing are clear evidence of global competition and an "accelerator" of higher education reform (Lim & Ørberg, 2017). This reform can be regarded as a response to globalisation and growing competition among educational institutions (Proctor & Rumbley, 2018).

The new University Law 30220 (Law 30220, 2014) promotes the continuous improvement of teaching quality and research development in Peru. It states that students reading for a bachelor's degree must undertake a research project. Meanwhile, postgraduate students are required to present an original thesis about on a specific topic when they finish their studies. A thesis is an academic paper in research that involves producing a systemic, rigorous, novel, and creative text (Hernández et al., 2014). Thus, it entails research work that must be supported and approved by a jury, and it is a prerequisite for obtaining a degree.

Writing a thesis requires a supervisor with knowledge of and experience in research skills and personal conditions that allow to guide. Despite the relevance of research supervision in postgraduate programs, research skills are not a priority when employing academic staff (Bazrafkan et al., 2019). On the other hand, thesis development is related to developing and structuring the thesis and requires students' knowledge, research skills, motivation, and abilities. Indeed, research and development in postgraduate programmes necessitate high-quality skills (Jones, 2018). The purpose of a research

course is to develop research skills, provide training on how to construct the thesis, and develop postgraduate students' presentation skills. Skill dimension have many variables and it will be important to focus on 21st century skills (Ormanci, 2020).

Given the significance of the supervisory process, several guidebooks aim to support both the supervisor and the student in establishing good research habits and identifying how they might best navigate the postgraduate journey together (Phillips & Pugh, 2010; Bell & Waters, 2014). However, despite the prevalence of books and guides related to supervision, no book can truly take the place of a good supervisor (Bell & Waters, 2014).

Since thesis work is a lengthy undertaking, the interaction supervisor-student, as well as the supervisor's response to the student, are critical aspects of the supervisory process (Gedamu, 2018). Any research in postgraduate level requires close contact between the supervisor and the student (Zaheer & Munir, 2020; Muraraneza et al., 2020). Kaur et al. (2017) argued that postgraduate thesis supervision has been at the forefront of scholars' minds as an essential means of constructing new knowledge and developing knowledge workers.

Completing a thesis on time is a challenge because it requires considerable skills, knowledge, and determination (Nouri et al., 2019; Blind review, 2020). For many students, being unable to finish their thesis within the specified time is a highly unfavourable experience since many students finance their own postgraduate studies. It often means that money is wasted. The timely completion of a theses is a crucial issue faced by universities (Jeyaraj, 2020) that should not be underestimated (Nouri et al., 2019).

Several studies related to adequate supervision have proposed factors that influence whether a thesis is completed successfully. One of these factors is the relationship between supervisors and their students (Vera & Vera, 2015; Howells et al., 2017; Volkert et al., 2018; Bazrafkan, 2019; Roach et al., 2019; Nouri et al., 2019; Blind review, 2020; Muraraneza et al., 2020). While this relationship has been recognised as significant, the development of supervisors in supporting students during the research process is still a relatively new and under-researched area of study (Lee, 2018), undertheorized and poorly understood (Manathunga, 2014).

The purpose of the present research is to review aspects of supervisors' performances via the perceptions of postgraduate students. According to Muthanna and Alduais (2021) the role of supervisors in the research process is critical. Roach et al. (2019) asserted that it is a determinant of timely postgraduate degree completion. Unfortunately, however, few universities disseminate good supervision practices amongst postgraduate students.

A review of the literature (Muraraneza et al., 2020) in postgraduate research supervision show that existing studies have focused primarily on supervisor performance. In this research, the challenges were identified as insufficient preparation of research supervision and inconsistent feedback. However, there was any studies correlating the both variables such as supervisor performance and thesis development.

This research, therefore, addresses this gap in the literature by reviewing aspects associated with the supervisor performance dimensions such as cognitive skills, personal qualities, and the supervisor's role function (Rosas et al., 2006) in the supervision process. Having knowledge, experience in research and being a specialist in the subject of investigation improves the capacity of the supervisor. This academic capacity is significant for the success of a thesis (Simon, 2014) but not enough. Other skills are necessary such as personal qualities, emotional stability (Rosas et al., 2006; Simon, 2014), personal characteristics, and motives (Gatfield, 2005) in order to provide psycho-socio support for the student (Wanyama & Eyamu, 2021). In addition, the supervisor have role functions related to dedication of weekly time to provide feedback to student, defined the roles and responsibilities and knowing their functions (Rosas et al., 2006).

In this paper, the following questions are considered:

- *What is the relationship between a supervisor's cognitive skills and thesis development?*
- *What is the relationship between the personal qualities of the supervisor and thesis development?*
- *What is the relationship between the role function of the supervisor and thesis development?*

- *What is the relationship between a performance of supervisor and thesis development?*

Theoretical Framework

In the process of writing a thesis, the supervisor is a person with the knowledge, research experience and others skills is who guides the student. In this section, general aspects of the supervising process and thesis development are under investigation. Also, the supervisor performance dimensions are described such as Supervisors' Cognitive Skills, Supervisors' Personal Qualities, and Supervisors' Role Functions.

Supervision and Thesis Development

According to Acker et al. (1994), it is vital to analyse students' perceptions of a supervisor. As such, this study examines the attitudes that students have towards their supervisors' performance and the development of their theses. Supervision is an interactive, collaborative element of the teaching and learning process of thesis preparation in a higher education context. These interactions are central to achieving research skills and abilities and academic writing proficiency (Zhang & Hyland, 2021). Supervision is based on interpersonal relationships between the supervisee and the thesis supervisors (Bazrafkan et al., 2019). Adequate thesis supervision is characterised by the willingness to share experiences, trust, commitment, and independence. These are all aspects that require the dedication of both the supervisee and the supervisor from the beginning and throughout the process (Muraraneza et al., 2020).

A thesis supervisor provides advice, expertise, time, knowledge, and support during thesis preparation to assist the learner in developing research skills (Heath, 2002). A supervisor has expertise in a particular area of study and is appointed to the most appropriate candidate (Jeyaraj, 2020). During the thesis writing process, the relationship between supervisee and supervisor serves in the betterment of the thesis (Muthanna & Alduais, 2021).

Thesis development is a systematic and rigorous process that sees a postgraduate student focusing on obtaining a degree and applying scientific research. The dimensions of thesis development are (a) informative, related to state-of-the-art analysis and criticism; (b) methodological, which relates to the methodology used to resolve the problem; (c) technological, which refers to the use of tools and technology necessary during the thesis preparation; and (d) communicative, which relates to the competencies necessary to organise the thesis content (Mejia, 2013). Writing a thesis has been considered relevant in the academic life of postgraduate students (Yusuf, 2018).

The supervisor facilitates the supervision process, but it is not a straightforward undertaking (Jeyaraj, 2020) because it is affected by diverse and multiple factors (Van Biljon & De Villiers, 2013). Despite the importance of supervisor performance (Vera & Vera, 2015), few studies have been concerned with students' perceptions of this performance and its relation to the thesis supervision process. Although there are several studies underlined the help of supervisors to students to be independent researchers by empowering and training them (Fenge, 2012; Muraraneza et al., 2020), the role that supervision plays is not yet entirely understood (Firoz et al., 2013).

Supervisor Performance

Supervisor performance can be defined as the way a supervisor fulfils their assigned tasks and obligations in the process of a postgraduate student's thesis development. It is related to the role functions that a supervisor performs during the teaching-learning process throughout the research period. Supervisor performance comprises three dimensions: cognitive skills, personal qualities, and role function (Vera & Vera, 2015).

Cognitive skills refer to knowledge, research skills, and experience as a researcher. Personal qualities are related to supervisors' motivation, emotional stability, and individual characteristics (Vera

& Vera, 2015), as well as assertive communication, empathy, and openness to new experiences and learning (Rodriguez et al., 2008). The role function is related to a supervisor's responsibilities. Zuber-Skerrit and Roche (2004) described the most desirable characteristics of a thesis supervisor as knowledgeable, intelligent, multidisciplinary, ingenious, friendly, and organised.

Supervisors' Cognitive Skills

A supervisor's cognitive skills are related to the knowledge and expertise on topics of research proposed by postgraduate students. They also refer to the research experience and ability to supervise research work. Rosas et al. (2006) argued that a supervisor must be an expert in the subject area, teach a subject-related research topic, and be actively involved in the research to fulfil their role.

A supervisor is considered central to the research process, even in terms of the student's selection of their thesis topic due to students' inexperience in research (Keshavarz & Shekari, 2020). According to Roach et al. (2019), postgraduate students value academic integrity in the process of supervision. Additionally, supervisors must have a robust knowledge of research methods, techniques, and procedures to guide students adequately (Dogan & Bıkmaz, 2015).

Dogan and Bıkmaz (2015) noted that some teachers who fulfil the role of thesis supervisors do not have the necessary prerequisites to supervise students. Given that supervisors have a positive impact during the thesis development process, lacking the required skills may hinder the process. This may explain why thesis candidates do not always achieve their desired qualifications or, in unfavourable circumstances, do not finish their thesis. Under these conditions, students show signs of anxiety and the inability to address their thesis (Dogan & Bıkmaz, 2015).

Other desirable characteristics of supervisors that have been identified in the literature are the ability to prepare a detailed plan with the thesis candidate, an environment whereby no restrictions are placed on students' comments and opinions, encouragement in academic studies, timely feedback on academic studies, ease of communication (Rosas et al., 2006), and open communication (Roach et al., 2019).

Supervisors' Personal Qualities

A supervisor's personal qualities refer to the supportive characteristics of a supervisor during the supervision process. In the process of preparing the thesis, the postgraduate student is subject to situations which may influence their progress. The supervisor is required to demonstrate emotional stability, stimulate the student's self-development, show persistence in the thesis supervision, and provide emotional support to the student. Roach et al. (2019) argued that in the supervision process, students value supervisors who foster supportive relationships.

The personal circumstances of the supervisor are related to their research experience and skills in academic assessment, including the ability to address students' needs and encourage self-improvement to help the thesis candidate prepare a satisfactory thesis and achieve the competencies of a high-quality researcher (Vera & Vera, 2015).

Students place significant value on supportive qualities such as being pleasant, thoughtful, and inspiring confidence (Mainhard et al., 2009). Mainhard et al. (2009) stated that thesis supervisors are also involved in students' private and intimate lives (for example, personal problems, social events, and their worldview) and thus go beyond a purely academic relationship.

Since thesis preparation is a solitary process and most graduate students balance their studies with work and family life. They are often subject to stress or anxiety. Indeed, scholars have maintained that postgraduate students experience stress (Woolston, 2019; Guo et al., 2021) due to imbalances between life and work (Woolston, 2019), or different expectations between supervisors and the supervisee (Volkert et al., 2018).

Students have named accessibility, interest, and enthusiasm as qualities of an ideal supervisor (Davis, 2019). Trust is another aspect considered to be at the core of research and supervision (Muthanna

& Alduais, 2021) to achieve research integrity. Particularly in the context of the recent Coronavirus pandemic and social distancing regulations, supervisors and students must create an environment of trust and confidence to achieve results. In this way, the supervisor is the one who socialises with the student and introduces norms and values. Similarly, gratitude between the two parties can be a catalyst for change (Howells et al., 2017).

Supervisors' Role Functions

The role function of a supervisor is to exercise control of the tasks carried out by postgraduate students during the development of the thesis in accordance with the functions and roles established by the academic organisation. To perform the research development efficiently and effectively, the thesis supervisor knows and assists with technical and methodological tools to discuss alternative solutions, strategies, and procedures and use the most suitable means to achieve the goal.

The supervisor plays an advisory, academic, and institutional role. The first relates to students' affection, attitudes, and emotions. Supervisors offer support when students are discouraged and have doubts about how to deal with academic demands. Supervisors can choose different supervision styles, and these mechanisms influence the students' creativity (Jibao et al., 2017). The second role is understood as a means to help the student develop self-learning and become a facilitator of processes rather than a knowledge broker, encouraging the student to make use of the library and to look for complementary information via different methods. The final role is played because the supervisor is a link between the institution and the student.

The supervisor should be aware of their role of being accessible to the educational needs of the student and giving timely responses (Rose, 2003). The supervisor should also inform students of the roles and tasks to be carried out and track their progress and needs. However, some challenges may arise, such as inconsistent feedback or the supervisor's insufficient preparation (Muraraneza et al., 2020). According to Denicolo (2004), students regard being instructive as a positive attribute on the part of the supervisor.

Considering the theoretical aspects about the dimensions of supervisor performance in this study investigates their correlation with thesis development according to the postgraduate students' perceptions. Aspects related to supervisor such as knowledge in research methodology, ability as researchers and supervisor, emotional stability, research experience, teamwork, commitment with the student, effective interpersonal relationships, roles and responsibilities, and others are explored in this study.

Methodology

The Context of the Study

This study focuses on the thesis supervision of students from two master's programmes related to Information and Communications Technology (ICT) at a public university. The master's programmes have a duration of two years, distributed in two academic cycles per year. Thus, there are four cycles in total. The programmes include refresher courses and research courses. The research courses oriented towards thesis development are performed in the last three cycles. To obtain their degree, master's students must meet the requirement of presenting and supporting the thesis before an examining jury.

Research Design

In this research, students' perceptions of their supervisors' performance during the postgraduate programme were analysed using a quantitative research method to measure the variables. The application of the variable is transversal and the study is correlational because it determines the correlation that exists between the variables.

Population and Sample

The population of the current study comprised 76 students from master's programmes offered by a public university related to ICT. The sample consisted of 51 participants enrolled in research courses designed to scaffold the thesis writing process. The majority of participants were aged 30–39 (26%); 5% were 20–29, 15% were 40–49, and 2% were aged 50 and above. Women accounted for 37.3% and men for 62.7% of the participants. The majority (78%) of participants were reading a master's in Information Technology (IT) Governance, and 22% belonged to a master's in ICT. Most of the participants were Systems Engineers, Managers, and Analysts. Thesis topics were related predominately to IT governance, security, software quality or process improvement, while other thesis topics were e-commerce, e-government, business intelligence, and artificial intelligence.

The courses complemented students' work with that of their research supervisors. The selection criteria were that participants had (a) finished research courses on thesis preparation; (b) accepted, participated in, and contributed to this research; (3) been assigned a supervisor; and (4) completed or were in the process of completing their thesis. All the information gathered was kept strictly confidential.

Data Collection

Two questionnaires were developed and administered to the participants to collect the data. The questions of the first questionnaire were related to the supervisor performance variable and the other questionnaire focused on the development of students' theses. The items of the first questionnaire were adapted by the questionnaire created by Vera and Vera (2015) and an Australian university (Griffith University, 2017). A 4-point Likert rating scale was used where 1 = *strongly disagree*; 2 = *disagree*; 3 = *agree*, and 4 = *strongly agree*. Table 1 presents each of the variables studied in each questionnaire. Supervisor performance comprised three dimensions: cognitive skills, personal qualities, and role function. The second questionnaire was adapted from Olivares (2014), and its questions were based on the existing literature. A panel of three experts validated the questionnaires prior to data collection. Furthermore, the questionnaires were tested in a pilot study to ensure the reliability of the instrument.

Table 1

Variables Studied

Variable	Items related to	Items
Supervisor performance	Cognitive skills: the ability to supervise research work characterised by academic background (academic qualifications, responsibility, mastery of knowledge, and social skills)	20
	Personal qualities: aspects related to emotional stability, persistence on thesis supervision, motivation, and interest in the topic of research.	5
	Role function: a set of supervisory functions that the supervisor of a research project must perform (e.g., thesis support for the candidate, planning and knowledge of the research process)	25
Thesis development	Students' perceptions of their thesis preparation, where items are related to the ability to review and analyse studies, defining the problem, the methodology to be used, instruments, data collection, analysis of results, and the thesis' writing.	33

Cronbach’s alpha was used to measure reliability. A value greater than or equal to 0.9 is considered acceptable. Thus, the value was satisfactory. Table 2 shows the results of reliability analysis.

Table 2
Cronbach’s Alpha

Variable	Dimensions	Items	Cronbach’s Alpha
Supervisor performance	Cognitive skills	20	0.984
	Personal qualities	5	0.958
	Role function	25	0.900
Thesis development	Thesis process	33	0.971

The questionnaires were personally administered to the participants who then filled them out.

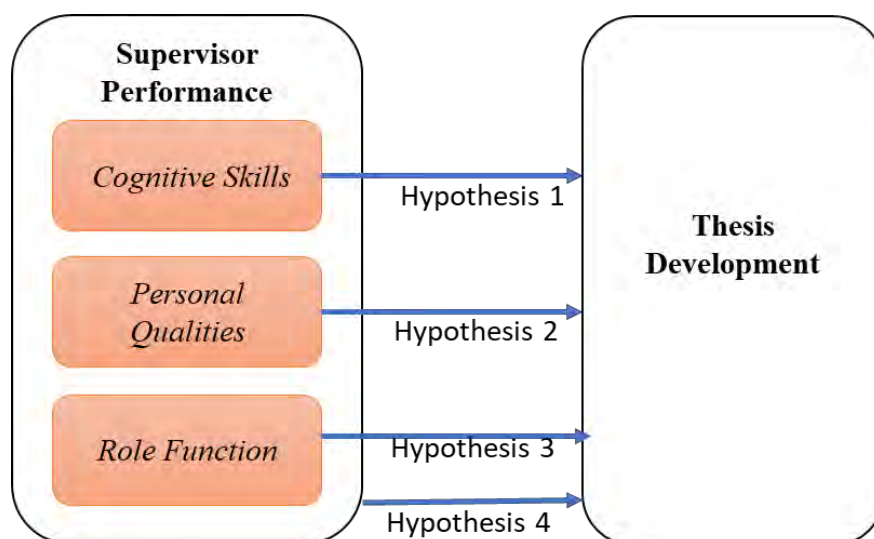
Data Analysis

Responses to the closed questions were imported into the SPSS Statistics package programme (version 16.0) to analyse the data. A Spearman’s rank correlation test was used to determine the significance of correlations between studied variables. The hypotheses to test (Figure 1) were as follows.

- *Hypothesis 1: There is a significant relationship between the supervisor’s cognitive skills and thesis development.*
- *Hypothesis 2: There is a significant relationship between the personal qualities of the supervisor and thesis development.*
- *Hypothesis 3: There is a significant relationship between the supervisor’s role function and thesis development.*
- *Hypothesis 4: There is a significant relationship between the performance of supervisor and thesis development*

Figure 1.

Hypothesis to Test



Findings

This section presents the research results. Table 3 illustrates the students’ perceptions of their supervisors’ performance.

Table 3*Results of Students' Perceptions*

Results for the items related to	Mean	Standard Deviation
Supervisors demonstrate responsibility with the fulfilment of their functions	3.67	0.47
Supervisors share their knowledge with students	3.65	0.48
Supervisors demonstrate knowledge in research methodology	3.65	0.48
Supervisors are confident about their ability as researchers and supervisors	3.59	0.48
Supervisors exhibit emotional stability	3.57	0.50
Supervisors demonstrate research experience	3.57	0.53
Supervisors know the regulations and rules of the thesis assignment	3.57	0.57
Supervisors work as a team	3.51	0.61
Supervisors demonstrate competence in the field of knowledge	3.49	0.61
Supervisors exhibit commitment to the student	3.24	0.76
Supervisors demonstrate effective interpersonal relationships	3.43	0.64

Table 3 presents the average values and standard deviations for each item. It also quantifies the students' perceptions of the supervisors' performance related to the questions from which the highest average values were obtained. The results based on the students' perceptions show that supervisors demonstrating responsibility for the fulfilment of their functions received the highest score of 3.67, with an ideal value of 4.

According to the student perceptions gathered, an average score of 3.65 was obtained by items related to knowledge of research methodology and knowledge sharing. The average score for the item concerning supervisors showing confidence in their ability as supervisors and researchers was 3.59. It appears that supervisors demonstrated research experience and competence in their field of knowledge. Thus, they knew the thesis material and showed commitment to the student.

The percentages obtained for each of the dimensions of the supervisor performance on the Likert scale with a score of 3 (*agree*) and 4 (*strongly agree*) are shown in Table 4.

Table 4*Results According to the Likert Scale*

Dimensions of supervisor performance	Strongly agree	Agree
Supervisor's cognitive skills	58.8%	39.2%
Supervisor's personal qualities	24.8%	59.1%
Supervisor's role function	24.2%	57.6%

The values obtained in the analysis of the correlation test between the dimensions of the supervisors' performance and thesis development were greater than 0.5. Table 5 presents the results obtained.

Table 5*Correlation Tests of the Dimensions of Supervisor Performance*

Dimensions	Spearman's r	p
Supervisor's cognitive skills and thesis development	$r = 0.611$	0.01
Supervisor's personal qualities and thesis development	$r = 0.734$	0.01
Supervisor's role function and thesis development	$r = 0.677$	0.01

Supervisors' Cognitive Skills and Thesis Development

According to the survey, the respondents indicated that their supervisors possess knowledge and competence as researchers (58.8% strongly agreed, 39.2% agreed; see Table 4).

A correlational analysis found that cognitive skills are positively correlated to thesis development ($r = 0.611, p < 0.01$; see Table 5). As there was a bilateral significance of 0.000 that is within the accepted value (0.01). Thus, the Hypothesis 1 was accepted.

Regarding the supervisors' academic experience, the postgraduate students thought that the supervisors demonstrated knowledge and expertise to supervise the research project they are executing. It must be noted that a percentage of teachers are not experts in the given research area due to the variety of research topics and the problem of finding experts for each research topic. However, this would not be a problem if the student had the necessary knowledge and experience in carrying out research and solely needed methodological support.

Supervisors' Personal Qualities and Thesis Development

The respondents expressed the belief that their supervisors exhibit personal qualities (24.8% strongly agreed, 59.1% agreed; see Table 4).

A correlational analysis revealed that supervisor personal qualities are positively correlated to thesis development ($r = 0.734, p < 0.0$; see Table 5). The bilateral significance was within the accepted value at 0.000. As a result, the Hypothesis 2 was accepted. Nevertheless, some supervisors do not help in some dimensions of the research, such as personal life, employment, and training. Interpersonal relationships are an essential dimension that should exist between a supervisor and thesis candidate.

According to the students, an ideal supervisor must have affective qualities, both in personal and relational (Davis, 2019). Howells et al. (2017) observed that the practice of gratitude has a positive impact on desertion rates and improves social and emotional communication between students and supervisors to such an extent that it facilitates better results during the research process. Supervisors show emotional stability in supervisory research tasks, which is positive. They encourage student independence and show interest in the topic of research. Nonetheless, not all of them offer to supervise theses, which may be partly due to the available time they have to participate in academic life after work.

Supervisors' Role Function and Thesis Development

The survey responses suggest that the supervisors fulfil their role as supervisors (24.2% strongly agreed, 57.6% agreed; see Table 4).

A correlational analysis showed that a supervisor's role function is positively correlated to thesis development ($r = 0.677, p < 0.01$; see Table 5). Much like the previous hypotheses, the bilateral significance was 0.000, within the accepted value (0.01). So, the Hypothesis 3 was accepted.

Supervisors hold weekly meetings based on a fixed schedule. However, not everyone has a flexible timetable for supervision. Therefore, infrastructure that allows teachers to have an office for supervisory meetings with students is needed. Moreover, not all supervisors keep a list of all the supervision meetings that reflects the advice given and pending tasks. Implementing such a practice would help to maintain better control of the research activities and their compliance by the thesis candidate. The responses indicate that supervisors contribute their ideas, offer constructive suggestions, and foster the students' academic work. Meanwhile, most of them share their knowledge with the thesis candidate. Nevertheless, information on the progress of the project during the supervisory process must be improved.

Performance of the Supervisor and Thesis Development

A correlational analysis found that supervisors' performance is positively correlated with thesis development ($r = 0.739$, $p < 0.01$; see Table 6). It can be also inferred that other aspects must be considered because the value of r is not equal to 1.

Table 6

Correlation Test of Supervisor Performance and Thesis Development

Variable	Spearman's	p
Supervisor performance	$r = 0.739$	0.00

The above results show that the acceptable values for each of the supervisors' performance dimensions were 4. The medians were less than 4. It is, therefore, necessary to take action to improve the rates. The results suggest the need to establish a process of continuous improvement in those items with low scores. Students require supervisors who have the flexibility to give support, supervise the thesis preparation process, be readily available, effective communication and schedule weekly meetings. For most students, developing a thesis is an opportunity and their first experience in research, and, in some cases, thesis development is considered a significantly demanding task. A critical change that must be made is for supervisors to remain in place for the duration of the thesis. In turn, supervisors need students committed to their research, responsible, persistent, self-motivated, self-organised, independent, and persevering.

The responsibilities and roles of supervisors in charge of theses and students must be clearly defined to achieve the desired level. Also, the supervisor give support to students to be independent professional researchers and scholars in the thesis field. The findings of this study show that the supervisory relationship contributes to student progression and satisfaction.

Since the present study is limited to only one university – in this case, a public university – and the sample size is relatively small and solely considers two periods, the results cannot be generalised. Future studies should continue this research by drawing from more universities, both public and private. In future works, the sample must increase with the participation of postgraduate students of other specialities so that results can be generalised.

Discussion

Determining the relationship between performance of supervisors and thesis development has been the primary purpose of the present research. This study also aimed to explain the relationship between the dimensions of supervisors' performance and thesis development. In both cases, the existence of a significant and positive correlation has been verified, which shows how essential the supervisor is in the thesis preparation process. fulfil their functions and responsibilities, and have personal qualities to succeed in a process that has been regarded as complex and multifactorial.

There must be infrastructure in place that allows teachers to have offices for student-supervisor meetings. Furthermore, not all supervisors keep a record of all supervision meetings that denote the advice given and the tasks pending. Implementing this system will help to facilitate better control of the supervisor's activities and fulfilment by the thesis student.

Scholars have emphasised the relevance of the relationship between supervisors' performance and students' successful completion of their thesis. Nevertheless, despite this scholarly consensus, the development of supervisors to support students in the research process is an area of interest that must be addressed.

Supervisors' Cognitive Skills and Thesis Development

Thesis preparation is a complex process that necessitates postgraduate students' research skills and abilities. The process is compounded by the participation of the thesis supervisor who must possess cognitive skills to guide the student in advancing their research.

A supervisor has research experience, provides time, and supports the thesis development process. However, postgraduate supervision is not yet fully understood since two actors are involved: the supervisor and the supervisee. Renske (2013) posited the professionalisation of supervisor and supervisee to enhance the quality of the thesis. Bazrafkan et al. (2019) argued that a factor contributing to research is the expertise of supervisors on research supervision.

Regarding supervisors' academic preparation, this study's findings suggest that students perceived their supervisors as demonstrating knowledge in the research methodology. Supervisors also have the experience necessary to advise the research that they are developing. Nonetheless, there is a percentage of supervisors who are not experts in the subject of research. This situation is explained by the variety of research topics and the difficulty of recruiting teachers with expertise in each of the research topics. This would not, however, constitute a problem if the student had knowledge and experience in the research topic and needed only methodological support. Effective communication between the student and the supervisor is crucial during the supervision process. An effective communication can help students for the master's degree who are inexperienced in thesis writing.

While a supervisor may demonstrate research experience in the context of scientific publications, it is necessary to improve this experience. So that, this knowledge can be transmitted to the students. With this in mind, it is advised that supervisors attend supervision workshops, read papers related to supervision and different supervision styles, and update their existing knowledge (Muthanna & Alduais, 2021).

Supervisors' Personal Qualities and Thesis Development

In the process of thesis development, the participation of supervisor is crucial. The supervisor must possess the personal qualities needed to provide emotional support to the supervised. The supervisors have knowledge and research skills but require improve their personal qualities due to supervision is governed by the rules of human communication and interaction (Andriopoulou & Prowse, 2020). In supervision, the relationships are considered complex and multi-dimensional for that reason. The supervisors must maintain the motivation of their students. A student can feel motivated if the supervisor conveys enthusiasm (Gray & Crosta, 2018). Although it is true that teachers demonstrate information management and claim to have interpersonal skills, they are not necessarily open to expressing their own feelings or those of students.

Supervisors' Role Functions and Thesis Development

The thesis supervisor must guide the student in advancing their research. Kirkland (2018) found that some students hope that the role of supervisor is to facilitate the thesis successful presentation or to be concerned with any problematic experiences that the student will face in the thesis process. However, supervisors need to pay more attention to students' work progress. These instances can be improved by providing full-time teachers in master's programmes since most of them are specialists in the subjects offered by the programme but they are not part of the full-time teaching staff. Concerns are compounded by the fact that, in almost all cases, universities' postgraduate programmes are financed by the students.

Supervisors typically set up weekly meetings according to a fixed schedule. However, not all of them have flexible hours for supervision since teachers attend only by the hour. Two aspects – the time that the supervisors can provide and the dedication that the students expect – can influence both satisfaction (Del Rio et al., 2017).

Supervisors provide constructive ideas and suggestions and guide the student's academic work and the student's thesis, primarily. This study's findings suggest that the delivery of information on the progress (feedback) of the project should be improved. Most of the students surveyed either agreed or strongly agreed with each of the questions related to the supervisor. This is positive but strategies can and should be established to improve these results and ensure that everyone is entirely in agreement. Other studies have examined the role of the supervisor in socialising the postgraduate student.

Supervisor Performance and Thesis Development

Since there was a positive and significant correlation between thesis development and supervisor performance, it can be inferred that if the supervisor's performance improves, the process of preparing the thesis also improves. This result is supporting the approach of Rosas et al. (2006) concerning how the quality of supervision affects thesis development. When a supervisor gives support and guidance in the writing of the thesis, they must have rubrics to improve the quality of the thesis and harmonise the criteria of the panel of examiners who will evaluate the thesis. The use of rubrics can reduce subjectivity and favour equity and quality in the thesis evaluation process (Pérez et al., 2021).

It is essential that academic authorities train teachers who are professional and knowledgeable but who do not have studies to teach (Soto et al., 2020). Teachers leading thesis courses must have experience in research, conducting research projects, being part of research groups, and statistical knowledge. Andriopoulou & Prowse (2020) considered that effectiveness of supervisor depends on administrative support. A framework of procedures and guidelines for postgraduate supervision must be established to improve the supervision process.

Conclusions and Implications

A challenge for numerous universities is that many students who finish their studies do not obtain their degree. The thesis development process is complex and necessitates knowledge concerning methodology and research skills. This study has analysed whether there is a correlation between cognitive skills, personal qualities, and functional roles and the development of theses.

Related to thesis development, the results show a positive correlation with performance of supervisor and $r = 0.739$; a positive correlation with supervisor's cognitive skills and $r = 0.649$; a positive correlation with personal qualities of the supervisor and $r = 0.571$; a positive correlation with supervisor's role function and $r = 0.624$.

The findings indicated that supervisors understand the regulations and rules of the supervision process. In addition, they demonstrate knowledge regarding research methodology, research skills and experience, and commitment to the student. However, it is essential that the supervisors arrange flexible time for counselling and maintain regular contact with the student.

Therefore, it is not only necessary to have supervisors with experience in research and thesis supervision but also essential that supervisors are available to attend to the student and answer their questions. The supervisor must have personal qualities to maintain motivated the student, showing persistence in the task of supervise the research and showing interest in the research topic. Students, in turn, must (1) improve their capacity for self-motivation, (2) read scientific articles related to the research topic with the purpose of having enough knowledge to carry out research and develop research skills, (3) to have a real research plan and (4) fulfil their assigned tasks and activities to achieve the goals allocated by the supervisors.

As a result of this research and in order to achieve better results, academic authorities should emphasise the formal training of supervisors in thesis supervision, which includes methodological aspects, statistical techniques, interpersonal skills, leadership, supervision management, and the use of rubrics for thesis evaluation, among other elements.

The courses related to thesis must be taught by research professors with experience and research practice. Some practices mentioned in the literature such as perform a diagnosing students' research

skills or assess the learning style of students, can be applied by supervisors. Supervisors must have knowledge of supervision styles and apply it taking into account the characteristics of the students.

Although universities have regulations for postgraduate studies, it is necessary to develop clear policies and guidelines for thesis supervision to facilitate postgraduate research supervision and potentially improve supervision practices and thesis completion results.

The findings of this study provide a foundation for future research. Studies could establish which dimensions of the supervisor's performance have the most significant influence on the phases of thesis development, determine which parts of the thesis process presents greater difficulties, or identify the primary causes of students not completing the thesis on time.

Future research should extend the sample to establish the influence of supervisor performance dimensions, such as informative aspects, methodology, technological elements, and communication, on the stages of thesis preparation. Finally, additional research should determine the impact of the organisation's support on the performance of the supervisor and the development of the thesis.

References

- Acker, S., Hill, T. & Black, E. (1994). Thesis supervision in the social sciences: Negotiated or managed? *Higher Education*, 28(4), 483-499.
- Andriopoulou, P. & Prowse, A. (2020), "Towards an effective supervisory relationship in research degree supervision: insights from attachment theory", *Teaching in Higher Education*, 25(5), 648-66.
- Bazrafkan, L., Yousefy, A., Amini, M. et al. (2019). The journey of thesis supervisors from novice to expert: a grounded theory study. *BMC Med Educ*, 19,320, 1-12.
- Bell, J. & Waters, S. (2014). *Doing your research project. A guide for first-time researchers*. McGraw-Hill Education.
- Bayona-Oré, S. & Bazan, C. (2020). Why Students Find It Difficult to Finish their Theses? *Journal of Turkish Science Education*, 17(4), 591-602.
- Davis, D. (2019): The ideal supervisor from the candidate's perspective: what qualities do students actually want? *Journal of Further and Higher Education*, 44(9),1220-1232.
- Del Rio, M., Diaz-Vasquez, R. & Masid, J. (2017), Satisfaction with the supervision of undergraduate dissertation. *Active Learning in Higher Education*, 19(2), 159-172.
- Denicolo, P. (2004). Doctoral supervision of colleagues: Peeling off the veneer of satisfaction and competence. *Studies in Higher Education*, 29(6), 693-707.
- Dogan, N. & Bıkmaz, O. (2015). Expectation of students from their thesis supervisor. *Procedia - Social and Behavioral Sciences*, 174, 3730-3737.
- Fenge, L. (2012). Enhancing the doctoral journey: The role of group supervision in supporting collaborative learning and creativity. *Studies in Higher Education*, 37(4), 401-414.
- Firoz, A., Quamrul, A. & Mohammad, G. (2013). *A pilot study on postgraduate supervision*. In BSME 5th International Conference on Thermal Engineering. Engineering proceeded, 56, 875-881.
- Gatfield, T. (2005). An Investigation into PhD Supervisory Management Styles: Development of a Dynamic Conceptual Model and its Managerial Implications. *Journal of Higher Education Policy and Management* 27(3), 311-325
- Gedamu, A. (2018). TEFL Graduate supervisees' views of their supervisors' supervisory styles and satisfaction with thesis supervision. *Iranian Journal of Language Teaching Research*, 6(1), 63-74.
- Golde, C. (2000). Should I stay or should I go? Student descriptions of the doctoral attrition process. *The Review of Higher Education*, 23(2), 199-227.
- Gray, M. & Crosta, L. (2018). New perspectives in online doctoral supervision: a systematic literature review. *Studies in Continuing Education*, 1-18. Doi:10.1080/0158037x.2018.1532405
- Grealy L., Laurie T. (2019) The ethics of postgraduate supervision: A view from cultural studies. In: Aksikas J., Andrews S., Hedrick D. (eds) *Cultural Studies in the Classroom and Beyond*. Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-030-25393-6_16.

- Griffith University (2017) <https://intranet.secure.griffith.edu.au/research/griffith-graduate-research-school/training-and-workshops/expectations-in-supervision-questionnaire>.
- Guo, L., Fan, H., Xu, Z., Li, J., Chen, T., Zhang, Z., & Yang, K. (2021). Prevalence and changes in depressive symptoms among postgraduate students: A systematic review and meta-analysis from 1980 to 2020. *Stress and Health*, 2021, 1-13.
- Heath, T. (2002). A quantitative analysis of PhD students' views of supervision. *Higher Education Research & Development*, 21(1), 41- 53.
- Hernández, R. Fernández, C. & Baptista, P. (2014). *Metodología de la investigación* [Research Methodology]. Mc Graw Hill.
- Hodza, F. (2007). Managing the student-supervisor relationship for successful postgraduate supervision: A Sociological Perspective. *South African Journal of Higher Education*, 21(8), 1155-1165.
- Howells, K., Stafford, K., Guijt, R. & Breadmore, M. (2017). The role of gratitude in enhancing the relationship between doctoral research students and their supervisors. *Teaching in Higher Education*, 22(6), 621-638.
- Jeyaraj, J. (2020). Academic writing needs of postgraduate research students in Malaysia. *Malaysian Journal of Learning and Instruction*, 17(2), 1-23.
- Jibao, G., Changqing, H. & Hefu, L. (2017). Supervisory styles and graduate student creativity: the mediating roles of creative self-efficacy and intrinsic motivation. *Studies in Higher Education*, 42(4), 721-742.
- Jones, B. J. (2017). Improving the PhD through provision of skills training for postgraduate researchers. In: Williams, A., Casella, J., and Maskel, P. (Eds), *Forensic Science Education and Training*, pp. 103–117. John Wiley & Sons Ltd.
- Juntunen, M., & Lehenkari, M. (2021). A narrative literature review process for an academic business research thesis. *Studies in higher education*, 46(2), 330-342.
- Kam, B. (1997). Style and quality in research supervision: The supervisor dependency factor. *Higher Education*, 34(1), 81-103.
- Kaur, S., Sarjit, K., Lim, P. & Chan, Y. (2017). Developing a framework for postgraduate supervision. G.B. Teh and S.C. Choy (eds.), *Empowering 21st Century Learners Through Holistic and Enterprising Learning*, Springerlink, 255-267.
- Keshavarz, H. & Shekari, M. (2020). Factors affecting topic selection for theses and dissertations in library and information science: A national scale study. *Library & Information Science Research*, 101052. Doi:10.1016/j.lisr.2020.101052.
- Kirkland, M. (2018). *Professional doctoral students and the doctoral supervision relationship: negotiating difficulties*. Tesis doctoral. School of Education University of Stirling, UK.
- Kropf, K. (2018). *The Handbook of Urban Morphology*. New Jersey. Wiley.
- Law 30220 (2014). Diario oficial El Peruano [The Peruvian Official Newspaper], July 9, 52713-527233. <http://www.leyes.congreso.gob.pe/Documentos/Leyes/30220.pdf>.
- Lee, A. (2007). Developing effective supervisors: Concepts of research supervision. *South African Journal of Higher Education*, 21(4), 680-693.
- Lim, A & Ørberg, W. (2017). Active instruments: on the use of university rankings in developing national systems of higher education. *Policy Reviews in Higher Education*, 1(1), 91-108
- MacDonald, R. (1996). *The Guardian Master Guide for more effective tutoring*. Cambridge Stratford Ltd.
- Madueño, M., Márquez, L. & Manig, A. (2020). The engineering professors' teaching identity formation as university teachers: A process of sociocultural construction. *Journal of Turkish Science Education*, 17(4), 504-519
- Mainhard, T., Rijst, R., Tartwijk, J. & Wubbels, T. (2009). A model for the supervisor–doctoral student relationship. *Higher Education*, 58, 359-373.
- Manathunga, C. (2012). Team' supervision: New positioning in doctoral education pedagogies. In Lee, A. & Danby, S. (Eds). *Reshaping doctoral education: International approaches and pedagogies* (pp. 42–55). Routledge.

- Mejia, E. (2013). *Investigación científica en Educación* [Scientific research in Education]. CEPREDIM. Lima.
- Muraraneza, C., Mtshali, N., & Bvumbwe, T. (2020). Challenges in postgraduate research supervision in nursing education: Integrative review. *Nurse education today*, 89, June 2020, 104376.
- Muthanna, A. & Alduais, A. (2021) A thematic review on research integrity and research supervision: Relationships, Crises and Critical Messages. *J Acad Ethics* 19, 95–113.
- Nouri J., Larsson K., Saqr M. (2019) Identifying factors for master thesis completion and non-completion through learning analytics and machine learning. In: Scheffel M., Broisin J., Pammer-Schindler V., Ioannou A., Schneider J. (eds) *Transforming learning with meaningful technologies*. EC-TEL 2019. Lecture Notes in Computer Science, vol 11722. Springer, Cham.
- Ormanci, Ü. (2020). Thematic Content Analysis of Doctoral Theses in STEM Education: Turkey Context. *Journal of Turkish Science Education*, 17(1), 126-146.
- Pérez-Ros, P., Chust-Hernández, P., Ibáñez-Gascó, J., & Martínez-Arnau, F. (2021). An undergraduate thesis training course for faculty reduces variability in student evaluations. *Nurse Education Today*, 96, 104619.
- Phillips, E. & Pugh D (2010). *How to get a PhD: A handbook for students and their supervisors*. Open University Press
- Proctor, D. & Rumbley, L. (2018). *The future agenda for internationalization in higher education: Next Generation Insights into Research, Policy, and Practice*. Routledge
- Renske de Kleijn (2013). *Master's thesis supervision: Feedback, interpersonal relationships, and adaptivity*. Doctoral Thesis. Universiteit Utrecht. <http://www.dart-europe.eu/full.php?id=1139716>
- Roach, A., Christensen, B., & Rieger, E. (2019). The essential ingredients of research supervision: A discrete-choice experiment. *Journal of Educational Psychology*, 111 (7), 1243–1260.
- Rodriguez, A., Sanchez, M. & Rojas, B. (2008). Mediation, support and individual learning. *Research and Graduate Studies*, 23(2), 349-381.
- Rosas, K., Flores, D. & Valarino, E. (2006). Rol del Tutor: competencias, condiciones personales y funciones [Rol of the tutor: competences, personal conditions and function]. *Investigación y Postgrado*, 21(1), 154-185.
- Rose, G. (2003). Enhancement of mentor selection using the ideal mentor scale. *Research in Higher Education* 44, 473–494.
- Simon, S. (2014). The supervised as the supervisor. *Education + Training*, 56(6), 537–550.
- Van Biljon, J. & De Villiers, M. (2013). Multiplicity in supervision models: The supervisor's perspective. *South African Journal of Higher Education*, 27(6), 1443-1463.
- Vera, L. & Vera, C. (2015). Performance tutor in the process of accompanying scientific production. *TELOS Journal of Interdisciplinary Studies in Social Sciences*, 17(1), 58-74.
- Volkert, D., Candela, L., & Bernacki, M. (2018) Student motivation, stressors, and intent to leave nursing doctoral study: a national study using path analysis *Nurse Educ. Today*, 61, 210-215.
- Wanyama, S. B., & Eyamu, S. (2021). Perceived organizational support, graduate research supervision and research completion rate. *Employee Relations: The International Journal*. <https://doi.org/10.1108/ER-05-2020-0205>
- Woolston, C. (2019). PhDs: The tortuous truth. *Nature*, 575, 403–406.
- Yusuf, A. (2018). Factors influencing post graduate students' choice of research topic in education at Abubakar Tafawa Balewa University, Bauchi-Nigeria. *Sumerianz Journal of Education, Linguistics and Literature*, 1(2), 35–40.
- Zaheer, M., & Munir, S. (2020). Research supervision in distance learning: issues and challenges. *Asian Association of Open Universities Journal*, 15(1), 131-143.
- Zhang, Y. & Hyland, K. (2021). Advice-giving, power and roles in theses supervisions. *Journal of Pragmatics*, 172, 35-45.
- Zuber-Skerrit, O. & Roche, V. (2004). A Constructivist model for evaluating postgraduate supervision: A Case Study. *Quality Assurance in Education*, 12(2), 82–93.