Supervisor's Behavior as Predictor of Enhanced Research Performance among University Students

Muhammad Kashif
Ex-M.Phil. Scholar, Department of Education, University of Malakand Chakdara, Dir Lower
mkashifuom@gmail.com

Dr. Iqbal Ahmad
Assistant Professor, Department of Education, University of Malakand Chakdara Dir Lower
dr.iqbal.shah@uom.edu.pk

Dr. Farah Deeba (corresponding author)
Assistant Professor, Department of Education, Bahauddin Zakariya University, Multan
farahgillani@bzu.edu.pk

Abstract

This study examined the relationship between supervisors' behaviour and the research performance of university students. The study was conducted using a quantitative correlational research design. Data were collected through a self-constructed questionnaire based on a survey approach. A total of 266 research students enrolled in MPhil and PhD programs participated in the study from two public sector universities in the Malakand division of Khyber Pakhtunkhwa, Pakistan. The data were analyzed by using both descriptive and inferential statistics. The newly developed questionnaire used Factor analysis to get initial validation evidence. The mean score and standard deviation were calculated to analyze students' perceptions. Pearson's correlation coefficient was used to determine the degree and direction of relations between the independent and dependent variables. The study found that the gender and age of research supervisors are positively correlated with the research performance of university students. The study further confirmed that the experience and qualification of supervisors were also positively correlated with the research performance of university students. It is concluded that the behavior of supervisors is a strong predictor of their students' research performance.

Keywords: *Supervisor's Behavior, Research Performance, Experience, Qualification*

Introduction

In research process, supervisors play key role in shaping the academic behavior and personality of students through their knowledge and skills by providing them constructive and critical appraisal (Gyuris, 2018; Gray & Jordan, 2012). Research has revealed that poor relationship between supervisor and supervisee may affect the process of supervision as well as performance of student. A positive relationship between research student and supervisor facilitates the progress of student, leading to successful completion of a research project (Katz, 2016). The main role of research supervisor is to support, ensure sharpening student's research skills as well as provide time to the supervisee for timely completion of the research work (Ekpoh, 2016; Mouton, 2011& Heath 2002). Researchers have associated students' satisfaction in progression of research work

with supervisor's cooperative and hardworking behaviour in their research work (Min, Iqbal, Khan, Akhtar, Anwar, & Qalati, 2020; Ives & Rowley, 2005) and in return the supervisor avails a sense of satisfaction by facilitating the supervisee (Clynes, 2004). However, students sometimes face difficulties and challenges to complete research projects in the designated time. Many studies have found that failing of supervisor to maintain an understanding with supervisee leads to the failure in the research work (Johnson & Umphress, 2019; Leonard, Metcalfe, Becker & Evans, 2006).

The behavior of supervisor affects the research performance of students during the whole process of research including selecting the suitable research topic, designing the framework, deciding research methods, collecting and analyzing the data (Okolie, Ochinanwata, Ochinanwata, Igwe & Okorie, 2021; Lessing & Schulz, 2003). It is further highlighted that students' research work's progress and timely completion of research work depends on supervisor to provide guidance and direction during the process of research supervision. (Orellana, Darder, Pérez & Salinas, 2016). However, on many occasions students cannot complete their assigned projects in time due to lack of support from supervisor. It is believed that lack of appropriate and timely direction, irregular and infrequent meetings with the supervisor are considered some of the causes of turnover of research students without completing the research work (Frischer & Larsson, 2000). That's why the effect of supervisor's behavior is claimed to be one of the key success factors for research students (McIlroy, Parker & McKimmie, 2021; Abiddin 2007 & Buttery, Richter & Filho, 2005).

There is a specific duration of each degree program, in which any researcher has to complete the thesis and research projects, that is so important for a researcher to have good time management skills. It will facilitate the researcher to conclude the research work in time (Holsinger Jr, 2008). In traditional perspective, research performance is based on the amount of the publication of research work, citation score and assessing quality of work. In current times, many other indicators have been observed placing influence on performance of research students. Among these indicators, age and experience of supervisors have been found to be strongly correlated with the performance of research students. So, the trend has shifted from the emphasis to quantity to quality of research (Batterham, 2004). In literature, research performance has been discussed from diverse perspectives.

In research process, supervisor' supervision is of prime importance. He is the person who tends to influence this process by motivating and training the researcher for quality research while focusing on turning him into an innovative researcher. For this purpose, he guides him intellectually while counterbalancing the risks of research project and navigating the research process. Without supervisor's support, training and rapport, researcher's pursuit of innovation is not satisfied. Research supervisor plays the role of anchor in journey of research. He is the lead source of academic and intellectual guidance who assists the researcher to carry out research oriented task from the selection of topic till write up and compilation of thesis (Han,Liu and Wang,2022).

It is a general observation that the interaction between supervisor and supervisee deeply affects the research work positively as well as negatively. On the other hand, supervisor's behavior could be a key predictor of research students' performance. However, review of literature shows that

insufficient empirical evidence exists on the effect of behaviour of supervisor on research performance of research students. Additionally, general observation of the researchers has indicated that experience, qualification, gender and age are important demographic variables which significantly influence the process of supervision and progress of research students in the current research context. Hence, to fully understand the problem and its effects in terms of gender, age, qualification and experience, this study was conducted to examine the relationship of supervisor's behavior with the students' research performance in public sector universities of Malakand division.

Objectives of the study

The study was designed to meet the following objectives:

1) To examine the relationship between supervisor's behavior and research performance of students
2) To find out the relationship of demographic variables (gender, age, experience, and qualification) with research performance of students.

Literature Review

Behavior of supervisor

Supervision is a combination of cooperative and interactive elements of teaching-learning process (Zhang & Hyland, 2021). This interpersonal relationship between supervisor and supervisee provides base for the supervision (Bazrafkan, Yousefy & Amini, 2019). While research supervision is characterized by the commitment to share experiences and build trust. These aspects need dedication of both the parties from the initial to the last of research project (Murararaneza, Mtshali, & Bvumbwe, 2020). Beliefs of supervisor naturally reflect his behavior (Ünal, 2013). This behavior includes the listening attitude of supervisor, encouragement, giving feedback, providing direction, making things standardized and consolidation (Glickman, Gordon & Ross, 2004). Supervisor is expected to foster research inclination in his students.it is imperative for him to maintain balance between teaching of research and enabling them to conduct research independently. It can be possible only when he trains students as autonomous researchers who are authorized and competent enough to make their own choices due to their command over research process (Han et al., 2022).In view of scholars, in supervision, gender and qualifications of supervisor deeply affect the rate of progression and relationship of supervisor with supervisee (Orellana, Darder, Pérez, & Salinas 2016). Still there is no specified standard nor best model for the effective supervision on which all the researchers have shown agreement, but everyone has a unique way of supervision and displaying behavior. It depends on situations, contexts and on the supervisee (Wright, Murray & Geale, 2007).

Franke and Arvidsson (2011) have analyzed different styles for research supervision based on two main structures of supervision namely, practice-oriented and relation-oriented supervision. They suggested that these approaches separately may not be considered effective but the combination of both can maximize the result of research students. These roles and performance of supervisor encompass three aspects: cognitive skills, personal qualities, and role function. The cognitive skills are related to knowledge, experiences and other research related skills along with openness, assertive communication and empathy of supervisor while reacting to novel situation

and experiences. The personal qualities are concerned with the motivation level of supervisor, personal individual characteristics and emotional stability (Vera & Vera, 2015).

Social Learning is focusing the idea that learning takes place when we interact with other in a social setting (Nabavi, 2012). That is the reason many researchers are concerned with the behavior of supervisor in research supervision. The interaction between the supervisor and supervisee affects the result of research projects, while for the successful completion of the research work, it is far necessary to have quality supervision. It comes from social support and the manner of communication of the supervisor in research program (Basturkmen, East & Bitchener, 2014). A study conducted on research supervision has highlighted that it is required to have healthy and sound academic interaction among the supervisor and supervisee for the better outcome and timely completion of a research work (Hamid and Shah, 2018).To train researchers with problem solving skills, experimentation, analytical skills, research ethics and academic writing skills are the core responsibilities of supervisor. These skills can not be developed without creating positive, effective and literary interaction between supervisor and supervisee. Timely completion rate and quality of research are also considered as success predictors of supervisor's work with his researcher (Le,Pham,Kim & Bui,2021).

Research supervision is a collaborative relationship in which both supervisor and supervisee play their role. However, success of research work as joint venture depends upon quality of this relationship. Quality of this relationship can be maintained by employing verbal and non-verbal communication, proper body language, and emotional support.Therefor, from the very beginning of research process, supervisor sets goals and expectations before researcher and defines roles and responsibilities played by him and his researcher. However, mismatched expectations can break the trust level. Mismatch expectations regarding roles and responsibilities both by supervisor and his researcher can only be reduced by strong inter-personal communication. Sometimes, researcher is inspired by his supervisor's intense experience of research that he avoids to perform any task independently. Contrary to it, researcher tries to get enough time and assistance by his supervisor as supervisor proves to be non-cooperative with him. A supervisor can create balance between dependence and independence by a harmonious behavior (Polkinghorne, Taylor, Knight & Stewart, 2023).

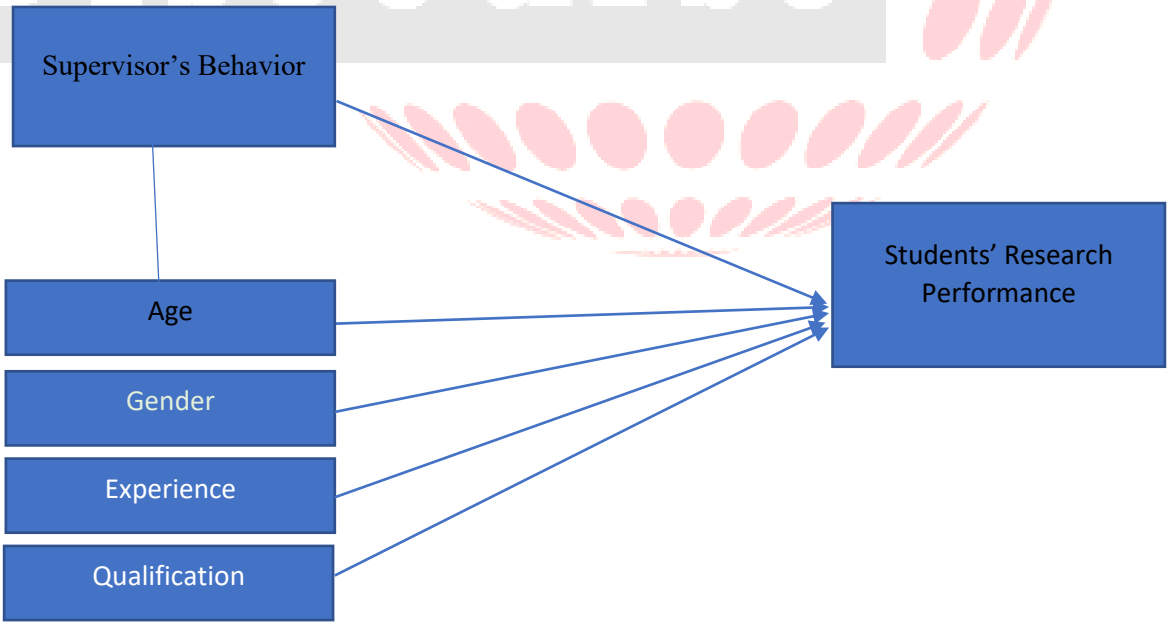
Research Performance of students

Various studies have been conducted on the roles and responsibilities of the supervisor, but less attention has been paid to the responsibilities of the students in the supervision process. Different studies suggest that along with supervisor's effective supervision, students also should be devoted and obligated (Hoque, Kenayathulla, Subramaniam & Islam, 2020; Todd, Smith & Bannister, 2006). A study has revealed that on the part of students, it is demanded to be independent in the research work (Roberts & Seaman, 2018; Anderson, Day & McLaughlin, 2006). Many researchers have found that supervisors want their supervisee to come up with substantial ideas or draft of the research work. It has been acknowledged by supervisors as well as students to play collectively an active role in the decision making and other management activities of research work (Sunaryu, 2020; Todd et al., 2006). The academic skills, problem solving techniques, generating new ideas, presenting ideas, analysis, planning and handling novel problems are the skills suggested by Marsh, Rowe & Martin (2002) and many other researchers. The research

students are expected to create new knowledge, write thesis and then publish it along with paper presentations in any conference and confidently complete their degree (Abiddin, Ismail & Ismail, 2011).

Supervisor's style of guidance, research conducting mechanism, knowledge sharing style, playing the role as mentor and being a role model for researcher for academic writing, analysis techniques and compilation of study are the key indicators for keeping him on track. To meet these indicators ultimately become cause of enhanced research performance of researchers in universities (Hadi & Muhammad, 2017). Researcher's continuous involvement in joint work with supervisor contributes to the effectiveness of research work and is predictor of improved research performance. Researchers prefer supervisors who throw an intellectual and stimulating challenge, who are veteran in research, who not only explain the research method but also elaborate the mechanism to be successful and competent researcher (Moskvicheva, Bordovskaia & Darinskaya, 2015). Journey of research is always loaded with various challenges encountered by the researcher. Various obstacles arise in front of researcher. At this time, supervisor's role is more vital as he is expected to offer his researcher both academic and personal support depending upon nature of the problem. Researcher needs academic support by his supervisor to better perform research-based tasks as availing research grants, designing the research material and methods, conducting experiment, analysis and interpretation, learning research skills and various analysis soft wares. But when he is confronted with hurdles and problems, he is emotionally disturbed. At this time, supervisor comes forward to provide him personal support to overcome stress and burn out while enhancing his psychological and social well-being in a proactive manner. In this way, he prepares his researcher for research process in a productive way (Han et al., 2022).

Figure 1: Conceptual Framework



Material and Method

This study was conducted based on a correlational research design. The correlation research method helps in explaining the direction, strength and degree of relationship between the research variables and suitable for testing assumed relationships between theoretical concepts (Van-Meerkerk, Edelenbos, & Klijn, 2019; Arikunto, 2013 & Sekaran, 2003). A survey approach was used for data collection as survey is easier to administer and collect data from larger number of respondents (Ahmad, Khan & Deeba, 2022). Kelley, Clark, Brown & Sitzia (2003) also confirm that survey approach provides a great quantity of general capability in representing a large population.

Population and sample

The total population of the study consisted of all research students enrolled in M.Phil. and PhD programs in all the public sector universities of Malakand division.

Sample of the Study

There are five public sector universities in Malakand Division such as University of Chitral, University of Buner, University of Swat, University of Malakand, and University of Sheringal SBBU. However, in first stage, due to time and resource constraints, cultural and geographical homogeneity in these universities, two universities were selected, University of Malakand and University of Sheringal, as these universities were easily accessible for data collection. In second stage, based on Arikunto (2013) as mentioned in Sipayung (2019) who states that if the research subject is less than 100, it is better to take all. And if the research subject is more than 100, it is better to take 10%-15% or 20%-25%. So based on it, 20% sample was taken out of the total population (1330) of the two selected universities as mentioned in Table 1.

Table 1: *Sample of the Study*

S.#	Name of University	M.Phil. Students enrolled in 2019-20	PhD Students enrolled in 2019-20	Total	20 % of the total population
1	University of Malakand	500	230	730	146
2	University of Sheringal	531	69	600	120
	Total	1031	299	1330	266

(Source: University website)

Instrumentation

Two types of scales were developed and used for data collection. The supervisor's behavior scale consisting of 16 items was used to measure the supervisor's behavior and the student's research performance scale consisting of 14 items was used for measuring research performance of university students. The scales were constructed by using the 5-phase model of Meerah, Osman, Zakaria, Ikhsan, Krish, Lian & Mahmod, (2012), 1), review of Literature 2), operational definitions of construct and development of items 3), field testing by experts for content validation 4), item analysis and preparing the final drafts and pilot study for calculating the reliability. The reliability of the scales was within acceptable ranges as shown in Table 2.

Table 2: *Reliability of scales*

S.#	Scale	Total items	alpha value
1	Supervisor's behaviour scale	16	.74
2	Research performance scale	14	.81
Overall alpha			.82

Data collection

Data were collected through personal visits to the universities. Before data collection, permission was obtained from the respondents. For this purpose, a consent letter was prepared and distributed to the respondents.

Data analysis

The perceptions of students were tested based on Mean score and standard deviation. Exploratory Factor Analysis was used to get evidence for initial validation for both the scales. Pearson's r test was used for testing the hypothesis. The Pearson's correlation coefficient r is one of the common ways to measure a linear correlation between and among variables. It measures the direction as well as the strength of relationship between independent and dependent variables (Samules & Gilchrist, 2014).

Results

Table 3: *Demographic profile of respondents*

Variables	**Frequency**	**Percentage**
Gender		
Male	171	64.2
Female	95	35.7
Age		
Less than 30 years	155	58.2
Less than 40 years	96	36.09
More than 40 years	15	5.63
Qualification		
MS/M.Phil.	150	56.39
PhD	116	43.6
Gender of supervisor		
Male	215	80.8
Female	51	19.1
University		
University of Malakand	146	54.88
University of Sheringal	120	45.11

Table 3 shows the demographic information of the respondents. Out of the 266 respondents, 64.2 % were male and 35.7 % were female. Out of the 266 respondents, 58.2 % age were less than 30 years, 36.09 % age were less than 40 years, and 5.63 % age were more than 40 years old. Out of the sampled respondents, 56.39 % respondents were M.Phil. students and 43.6 % were PhD students. Out of the sampled respondents, 80.8 % students were under the male supervisors and 19.1 % students were under the supervision of female supervisors. Out of the 266 respondents, 54.88 % students were from University of Malakand, and 45.11 % students were from University of Sheringal (SBBU).

Normality of scales

Before data analysis, the normality of the data was checked. The normality test was conducted to determine the normal distribution of data based on the values of Skewness and Kurtosis which needs to be between the range of -2 to +2 for Skewness test and Kurtosis within the range of -3 to +3 for normality. The combined normality values of variables in the questionnaire having two sub-scales: Supervisor's Behaviour (SB) and student research performance (SRP) in this study fall within the acceptable and appropriate ranges as shown in Table 4.

Table 4: *Maximum, Minimum, Skewness and Kurtosis*

	N	Minimum	Maximum	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
SB1	266	1.00	5.00	-.375	.149	1.093	.298
SB2	266	1.00	5.00	-.358	.149	.518	.298
SB3	266	1.00	5.00	-.572	.149	.025	.298
SB4	266	1.00	5.00	-.882	.149	1.161	.298
SB5	266	1.00	5.00	.214	.149	-.898	.298
SB6	266	1.00	5.00	-.931	.149	1.078	.298
SB7	266	1.00	5.00	-.319	.149	.164	.298
SB8	266	1.00	5.00	-.839	.149	1.372	.298
SB9	266	1.00	5.00	-.632	.149	.743	.298
SB10	266	1.00	5.00	-.234	.149	-.138	.298
SB11	266	1.00	5.00	-1.166	.149	1.444	.298
SB12	266	1.00	5.00	-.489	.149	-.521	.298
SB13	266	1.00	5.00	-.816	.149	.859	.298
SB14	266	1.00	5.00	-.537	.149	.005	.298
SRP15	266	1.00	5.00	-.386	.149	.367	.298
SRP16	266	1.00	5.00	-.673	.149	1.140	.298
SRP17	266	1.00	5.00	-.601	.149	.821	.298
SRP18	266	1.00	5.00	-.958	.149	1.561	.298
SRP19	266	1.00	5.00	-.595	.149	.750	.298
SRP20	266	1.00	5.00	-.809	.149	1.072	.298
SRP21	266	1.00	5.00	-.585	.149	.905	.298
SRP22	266	1.00	5.00	-.764	.149	1.271	.298
SRP23	266	1.00	5.00	-.176	.149	-.839	.298
SRP24	266	1.00	5.00	-.748	.149	.702	.298

SRP25	266	1.00	5.00	-.644	.149	-.011	.298
SRP26	266	1.00	5.00	-.910	.149	.808	.298
SRP27	266	1.00	5.00	-.938	.149	1.320	.298
SRP28	266	1.00	5.00	-1.055	.149	1.317	.298
SRP29	266	1.00	5.00	-.846	.149	1.277	.298
SRP30	266	1.00	5.00	.248	.149	-1.049	.298
Valid N (list wise)	266						

Table 4 shows that the values of total variables in the scale based on the skewness test range from -.234 to -1.166 and kurtosis range from -.011 to -1.078 fall within the acceptable range of (± 2) providing clear evidence for data normality.

Table 5: *Mean and Standard Deviation*

	N	Minimum	Maximum	Mean	Std. Deviation
SB1	266	1.00	5.00	3.4173	.85711
SB2	266	1.00	5.00	3.5414	.80105
SB3	266	1.00	5.00	3.3759	.94451
SB4	266	1.00	5.00	3.5150	.85658
SB5	266	1.00	5.00	2.7782	1.14251
SB6	266	1.00	5.00	3.8459	.94506
SB7	266	1.00	5.00	3.4286	.78942
SB8	266	1.00	5.00	3.6429	.72443
SB9	266	1.00	5.00	3.9173	.81999
SB10	266	1.00	5.00	3.5639	.79483
SB11	266	1.00	5.00	4.1429	.94084
SB12	266	1.00	5.00	3.4248	1.14100
SB13	266	1.00	5.00	3.6579	.94343
SB14	266	1.00	5.00	3.3421	.93540
SRP15	266	1.00	5.00	3.8609	.74188
SRP16	266	1.00	5.00	3.5940	.78223
SRP17	266	1.00	5.00	3.6541	.77260
SRP18	266	1.00	5.00	3.5301	.75301
SRP19	266	1.00	5.00	3.5977	.79612
SRP20	266	1.00	5.00	3.5902	.73288
SRP21	266	1.00	5.00	3.7331	.74238
SRP22	266	1.00	5.00	3.6090	.71464
SRP23	266	1.00	5.00	3.0188	.93749
SRP24	266	1.00	5.00	3.5789	.72903
SRP25	266	1.00	5.00	3.3158	.82296
SRP26	266	1.00	5.00	3.4812	.89106
SRP27	266	1.00	5.00	3.5752	.73970
SRP28	266	1.00	5.00	3.5376	.80124
SRP29	266	1.00	5.00	3.6090	.71990

SRP30	266	1.00	5.00	2.6165	1.05130
Valid N (list wise)	266				

Table 5 indicated that all the items in the 30-items questionnaire have high mean score ranging from 2.61 to 4.142 and standard deviation ranging from .7199 to 1. 1425. The means scores of the items in the questionnaire were above 3.00. It becomes clear that the respondents strongly agree with all the variables in the study.

Factor Analysis

For the validation of both scales, factor analysis was opted by following the principles of appropriateness of the items in the scale. These conditions were maintained while applying Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of Sphericity for the questionnaire. In the first place, the Exploratory Factor Analysis was applied to explore the factor structure based on the data (n=266). The Principal Component Analysis (PCA) method was used to extract the underlying components based on varimax rotation.

Table 6: *KMO and Bartlett's Test*

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.770
Bartlett's Test of Sphericity	Approx. Chi-Square	2414.606
	Df	435
	Sig.	.000

Table 6 indicated that the KMO values for the scale was found at .770 and Bartlett's Test of sphericity was significant at (p < 0.00) supporting the factorial correlation matrix based on the data collected from 266 participants.

Table 7: *Total Variance Explained*

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.756	19.188	19.188	5.756	19.188	19.188	2.717	9.056	9.056
2	2.504	8.347	27.534	2.504	8.347	27.534	2.649	8.832	17.888
3	2.305	7.682	35.216	2.305	7.682	35.216	2.561	8.536	26.424
4	1.682	5.608	40.824	1.682	5.608	40.824	2.232	7.440	33.863
5	1.518	5.062	45.886	1.518	5.062	45.886	1.907	6.357	40.220
6	1.328	4.427	50.313	1.328	4.427	50.313	1.892	6.305	46.526
7	1.281	4.270	54.583	1.281	4.270	54.583	1.671	5.571	52.097
8	1.195	3.984	58.567	1.195	3.984	58.567	1.660	5.535	57.632
9	1.118	3.727	62.294	1.118	3.727	62.294	1.399	4.662	62.294
10	.979	3.262	65.556						

11	.904	3.012	68.568
12	.835	2.782	71.350
13	.806	2.686	74.037
14	.718	2.393	76.430
15	.700	2.334	78.764
16	.649	2.163	80.927
17	.612	2.040	82.967
18	.588	1.960	84.926
19	.514	1.715	86.641
20	.487	1.623	88.264
21	.472	1.573	89.838
22	.464	1.548	91.385
23	.425	1.418	92.803
24	.411	1.371	94.174
25	.341	1.137	95.310
26	.324	1.080	96.390
27	.315	1.051	97.441
28	.271	.902	98.343
29	.268	.892	99.235
30	.230	.765	100.000

Extraction Method: Principal Component Analysis.

Table 7 indicates the PCA method used for exploring the components in the scale. Based on the 30 items the factor analysis 9 components emerged based on the varimax rotation method. The first component explained 62.294 variance in the scale followed by the other components. The scree plot (Figure 1) was also used to estimate the total of components by indicating the cutting point where the elbow bends to show the number of components in the instrument which starts bending at the point 9 as shown in the Scree plot Figure 1.

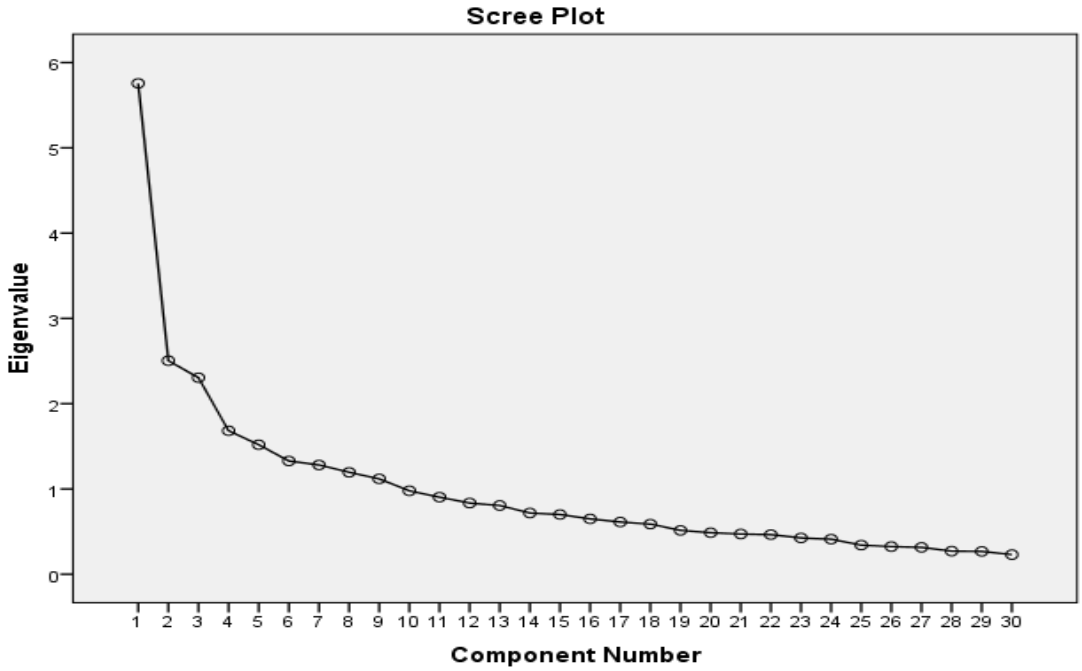


Table 8: *Reliability of the Questionnaire*

S. No	Name of scale	N of Items	Alpha
1	Supervisor's Behavior (SB)	14	.622
2	Student's Research Performance (SRP)	16	.793
3	Overall	30	.789

Table 8 indicates the reliability of the sub-scales (SB=.622) and (SRP= .793) and the overall reliability (.789) of the questionnaire showing strong reliability which is above .70

Table 9: *Corrected Total Item Correlation*

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SB1	102.0789	87.824	.210	.787
SB2	101.9549	86.964	.289	.783
SB3	102.1203	87.080	.224	.786
SB4	101.9812	88.668	.157	.789
SB5	102.7180	88.460	.101	.795
SB6	101.6504	84.349	.385	.778
SB7	102.0677	88.365	.198	.787
SB8	101.8534	86.978	.327	.782
SB9	101.5789	85.414	.385	.779
SB10	101.9323	86.977	.291	.783
SB11	101.3534	85.165	.338	.781
SB12	102.0714	84.814	.276	.785

SB13	101.8383	87.970	.173	.789
SB14	102.1541	90.070	.055	.794
SRP15	101.6353	86.323	.367	.780
SRP16	101.9023	85.621	.393	.779
SRP17	101.8421	83.983	.519	.774
SRP18	101.9662	84.471	.498	.775
SRP19	101.8985	85.888	.366	.780
SRP20	101.9060	84.735	.493	.775
SRP21	101.7632	84.129	.532	.773
SRP22	101.8872	85.263	.466	.776
SRP23	102.4774	92.892	-.102	.802
SRP24	101.9173	86.355	.372	.780
SRP25	102.1805	85.333	.389	.779
SRP26	102.0150	86.022	.309	.782
SRP27	101.9211	84.813	.482	.775
SRP28	101.9586	83.791	.511	.773
SRP29	101.8872	85.300	.459	.777
SRP30	102.8797	91.782	-.048	.802

Table 9 shows the corrected total item correlation statistics of the questionnaire. The scale variance, total item correlations and alpha values are high and within acceptable ranges. The Cronbach's alpha values of all the items in the questionnaire are high and range between .773 to .802 showing strong inter-item consistency among all the variables.

Correlation Analysis

Table 10: *Correlation between Supervisor's behavior and student's Research Performance*

		Supervisor's Behaviour	Students' Research Performance
Supervisor's Behaviour	Pearson's Correlation	1	.370**
	Sig. (2-tailed)		.000
	N	266	266
Students' Research Performance	Pearson's Correlation	.370**	1
	Sig. (2-tailed)	.000	
	N	266	266

**. Correlation is significant at the 0.01 level (2-tailed).

Table 10 indicates that simple linear correlation between the independent variable (supervisor's behavior) and dependent variable (students' research performance) by using the Pearson's r correlation coefficient. The analysis showed a positive correlation between the variables as the r=.370 and $p<$ .001. The analysis confirms that the first hypothesis *"there is a positive relationship between supervisor's behavior and research performance of university students in Malakand division"* is accepted.

Table 11:
Correlation between Supervisor's behavior and Student's Research Performance based on Gender

Control Variables			Student Research Performance	Supervisor Behaviour
Gender	Student Research Performance	Correlation	1.000	.370
		Significance (2-tailed)	.	.000
		Df	0	266
	Supervisor Behaviour	Correlation	.370	1.000
		Significance (2-tailed)	.000	.
		Df	266	0

Table 11 shows that simple linear correlation between the independent variable (supervisor behaviour) and dependent variable (student research performance) based on gender as controlling variable by using Pearson's r correlation coefficient. The analysis showed a positive correlation between the variables as the r=.370 and $p< .001$. The analysis confirms that hypothesis *"there is a positive relationship between supervisor's gender and research performance of university students"* is accepted.

Table 12: *Correlation between Supervisor's Behavior and Student's Research Performance based on age*

Control Variables			Student Research Behaviour	Supervisor Behaviour
Age	Student Research Behaviour	Correlation	1.000	.364
		Significance (2-tailed)	.	.000
		Df	0	266
	Supervisor Behaviour	Correlation	.364	1.000
		Significance (2-tailed)	.000	.
		Df	266	0

Table 12 showed that simple linear correlation between the independent variable (supervisor behaviour) and dependent variable (student research performance) based on age as controlling variable by using Pearson' r correlation coefficient. The analysis showed a positive correlation between the variables as the r=.364 and $p< .001$. The analysis confirms that hypothesis *"there is a positive relationship between supervisor's age and research performance of university students"* is accepted.

Table 13:
Correlations between Supervisor's Behavior and Student's Research Performance based on Experience

Control Variables			Student Research Behaviour	Supervisor Behaviour
Experience	Student Research Performance	Correlation	1.000	.369
		Significance (2-tailed)	.	.000
		Df	0	266
	Supervisor	Correlation	.369	1.000

	Behaviour	Significance (2-tailed)	.000	.
		Df	266	0

Table 13 revealed that simple linear correlation between the independent variable (supervisor behaviour) and dependent variable (student research performance) based on experience as controlling variable by using Pearson's r correlation coefficient. The analysis showed a positive correlation between the variables as the r=369 and $p< .001$. The analysis confirms the hypothesis *"there is a positive relationship between supervisor experience and research performance of university students"* is accepted.

Table 14:
Correlation between Supervisor's Qualification and Student's Research Performance

Control Variables			Student Research Performance	Supervisor Behaviour
Qualification	Student Research Behaviour	Correlation	1.000	.368
		Significance (2-tailed)	.	.000
		Df	0	266
	Supervisor Behaviour	Correlation	.368	1.000
		Significance (2-tailed)	.000	.
		Df	266	0

Table 14 showed that simple linear correlation between the independent variable (supervisor's behaviour) and dependent variable (student research performance) based on qualification as controlling variable by using Pearson's r correlation coefficient. The analysis showed a positive correlation between the variables as the r=.368 and $p< .001$. The analysis confirms that the hypothesis *"there is a positive relationship between supervisor's qualification and research performance of university students"* is accepted.

Discussion

In universities, M.Phil. and PhD programs are research-oriented degrees. This research takes place under the supervision of a research supervisor. The supervisee seeks guidance and instruction from the supervisor to obtain the research training and skills for contributing to the existing knowledge (Cryer, 2000). Due to constant and perpetual interaction between supervisor and supervisee, there occurs some effect of supervisor's behavior on the performance of research students. It varies from supervisor to supervisor in terms of many factors, specifically differences in behavior, gender, age, qualification and experiences. The researchers compared the findings of the study with the existing literature. The previous studies are supporting some of the findings of our study as Katz (2016) has revealed that the research project and students' performances are based only on productive interaction and communication of both parties. There may be many other factors that support and help the completion of research study, but a sound and healthy relationship can never be ignored. The good or worst research performance of students has been associated with the status of relationship of supervisor with supervisee.

Multiple studies have found this relationship as influential determinant for any research work. Another study that supports our findings regarding the relationship of supervisor's behavior with students' research performance is conducted by Le et al.(2021) who have revealed that the behavior of supervisor in terms of supervision style and supervisory practices affect the research performance of research students. A warm behavior positively boosts up their satisfaction level and improve their skills required for research. They have further revealed that sometimes, it is necessary for the supervisor to tighten the situation and deal the research students strictly for making them to be more conscious about the progress of their research study. However, majority of the researchers have proved and supported our findings that the most thrilling indicator that enhances the students' research performance to complete the research work effectively, depended on the behavior of supervisors in terms of their interaction and social support and the consequences have been observed in failure or successful timely completion of research work (Hamid & Shah, 2018; Pyhältö, Vekkaila & Keskinen, 2015;Basturkmen, East & Bitchener, 2014; Mainhard, Rijst, Tartwijk, & Wubbels., 2009; Armstrong ,2004; Eley & Jennings, 2005).

This study further found that there is a positive relationship between supervisor's gender and students' research performance. Our findings revealed that gender also affect the performance of research students. If the supervisor is male, so it will have different impact on supervisee and if supervisor is female so it will have different impact on research performance of students. Rodwell and Neumann (2007) are supporting our findings by revealing that certain predictor elements including gender have an impact on the performance of supervisee. Bernard & Goodyear (2004) have mentioned that along with the personal characteristics, the similar and cross gender of supervisor and supervisee have an impact on quality of relationship and hence affect the performance of supervisee. Many other studies including Hindes & Andrews (2011) have found a good connection of supervisee with male supervisor than female supervisor. They have further explained that no such differences were found based on openness or directedness of both genders. Based on their findings, they have further suggested that supervisors should take into consideration the type of supervisee's gender in term of communication, perceptions, and spirituality. Anyhow, in comparison to findings of our study, Jordan (2007) has conducted a study on the importance of relationship variables like experience and gender-match in supervisor-supervisee context who found that students were more concerned about the care, attention and what they experienced with supervisor than the gender of supervisor. It was revealed that gender does not affect the students' performance, until and unless the supervisor is concerned about the supervisee.

This study further found that supervisor's age has positive relationship with research performance of university students. The study revealed that age is an important factor in research supervision. An aged supervisor will have different style and perception towards supervision while the younger supervisors will have different. Both provide different type of support due to age factor. As age is not just the chronological identity but a culturally formed identity that influences a person's sociocultural status throughout life period (Pichler et al., 2018). Due to it, aging is thought to be one of the core predictors of varieties in behavior and attitude of a person (Center, 2015). While comparing our findings regarding age of the supervisor, a study conducted by Rodwell & Neumann (2007) have supported our findings. They have revealed that along with

many other factors, age of supervisor is a main factor affecting research performance of students. Anyhow, there are some studies whose findings are not supporting our findings. Fernando (2013) has found no significant impact of the supervisor's age over the students' research performance in terms of supervision outcome.

This study further found that there is a positive relationship between supervisor's experiences and students' research performance. An experienced supervisor leads students and research study in a systematics pattern. The supervisor takes right decision for the better consequences and timely completion of the research work. Our finding regarding the experience of supervisor is supported by different researchers in the literature. The nature of supervisor's interaction with students have relation with the experiences of supervisor (Dietz, Jansen & Wadee, 2006). The supervision practices are affected when supervisor does have enough research experiences (Manderson, Bondjers, Izugbara, Egesah, Ezeh, & Fonn, 2017 & Dietz et al., 2006). The need of research supervisor's experience has been realized by Wadesango & Machingambi (2011) in their studies. They further suggested that there is a need of training for the research supervisor on many issues including the technical expertise of the research supervisor. Although, literature is abundant with effective supervision techniques, role, responsibilities and importance of research supervisor, but no previous studies were found on the relationship between supervisor's experience and qualification with student's research performance. So, the experience and qualifications of supervisor and its relationship with research students' performance is a unique finding of this study.

Conclusion

It was concluded that supervisor's behavior has positive correlation with research performance of university students. It indicates that the manner of research supervisor in terms of attitude, interaction, communication, support and guidance put positive or negative effect on the performance of research students. The study also concluded that a positive relationship existed between supervisor's gender and research performance of university students. It indicates that both genders have different impact in terms of their supervision style, perception, flexibility, openness, and accessing the supervisor for the support. The study revealed a positive relationship between supervisor's age and research performance of university students. It indicates that both young and aged supervisors have different support system and have differences in providing instructions, explaining things and nature of accommodation. The study further concluded that there was a positive relationship between supervisor qualification and research performance of university students. It indicates that both less qualified and highly qualified supervisors vary in explaining ideas, theories, research process and giving in-time support to students.

Future Direction

Findings of the study can become guideline in fabrication of policies regarding the supervisory practices and specifically, research supervision at higher education level. These findings assist the research supervisors about their manner of behavior that affect the performance of research students. It further upgrades the supervisors' knowledge about the impact of their gender, age, experience and qualification on the performance of their research students. It paves the way for research students to consider the gender, age, experience and qualification of their research supervisor at the initial stage of supervisor selection. It further motivates the researcher to work

on this under explored area and find out the intensity of relationship and impact of supervisor's behavior, gender, age, experience and qualification over the performance of research students.

Acknowledgment
This research paper has been extracted from an M.Phil. research thesis by 1st author, Mr. Muhammad Kashif of this paper. For the publication of this paper, the Turnitin clearance certificate as generated by QEC, University of Malakand has been forwarded to the editor of the journal.

References

Abiddin, N. Z., Ismail, A., & Ismail, A. (2011). Effective supervisory approach in enhancing postgraduate research studies. *International Journal of Humanities and Social Science*, *1*(2), 206-217.

Abiddin, N.Z. (2007). Postgraduate students' perception on effective supervision: A case study at one public university in Malaysia. *Journal of International Social Research.*

Ahmad,Khan & Deeba.(2022). An analysis of teachers' perceptions concerning issues and challenges with online teaching during Covid-19 in the universities of Malakand Division. *The Discourse,*8(2),16-26.

Anderson, C., Day, K., & McLaughlin, P. (2006). Mastering the dissertation: Lecturers' representations of the purposes and processes of master's level dissertation supervision. *Studies in Higher Education*, *31*(2), 149-168.

Arikunto, S. (2013). Research Procedure: An Approach to Practice. *Jakarta: Rineka Cipta.*

Armstrong, S. J. (2004). The impact of supervisors' cognitive styles on the quality of research supervision in management education. *British Journal of Educational Psychology*, 74(4), 599–616.

Asnake, M. (2015). The importance of scientific publication in the development of public # health. *Ciência & Saúde Coletiva*, *20*(7), 1972-1974.

Almusaed, A., & Almssad, A. (2020). The role of the supervisor on developing PhD students' skills. In *Proceedings of International Conference on Humanities, Social and Education Sciences* (.25).

Basturkmen, H., East, M., & Bitchener, J. (2014). Supervisors' on-script feedback comments on drafts of dissertations: socializing students into the academic discourse community. *Teaching in Higher Education*, *19*(4), 432-445.

Batterham, R. (2004). Measuring excellence: A chief scientist perspective. *Measuring excellence in research and research training*, 3-8.

Bazeley, P. (2010). Conceptualizing research performance. *Studies in Higher Education,* 35(8), 889-903.

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.

Bernard, J., & Goodyear, R. (2004). Fundamentals of clinical supervision (3rd ed.). Boston, MA: Pearson Education.

Brew, A. (2001). Conceptions of research: A phenome graphic study. *Studies in higher education*, *26*(3), 271-285.

Buttery, E.A., Richter, E. M., & Leal Filho, W. (2005). An Overview of the Elements that Influence Efficiency in Postgraduate Supervisory Practice Arrangements. *International Journal of Educational Management, 19*(1), 7-26.

Clynes, M. (2004). *An exploratory study of preceptor's views and experiences of providing feedback on clinical performance to post-registration student nurses (sick children's nursing)*. (Unpublished master's thesis*)*,Dublin: University of Dublin.

Cryer, P. (2000). The Research Student's Guide to Success. Buckingham: Open University Press

Dietz, A. J., Jansen, J. D., & Wadee, A. A. (2006). *Effective PhD supervision and mentorship: workbook based on experiences from South Africa and the Netherlands: South Africa Netherlands Research Programme on Alternatives in Development (SANPAD)*. Rozenberg Publishers

Ekpoh, U. I. (2016). Postgraduate studies: The challenges of research and thesis writing. *Journal of education and social research.*

Eley, A., & Jennings, R. (2005). *Effective postgraduate supervision: Improving the student/supervisor relationship: Improving the student/supervisor relationship*. McGraw Hill Education (UK).

Fernando, D. M. (2013). Supervision by doctoral students: A study of supervisee satisfaction and self-efficacy, and comparison with faculty supervision outcomes. *The Clinical Supervisor,* 32(1), 1-14.

Franke, A. & Arvidsson, B. (2011). Research supervisors' different ways of experiencing supervision of doctoral students. *Studies in Higher Education*, 36(1), 7-19.

Frischer, J., & Larsson, K. (2000). Laissez-faire in research education – An inquiry into a Swedish doctoral program. *Higher Education Policy, 13*(2), 131-155.

Glickman, C. D., Gordon, S. P., & Ross-Gordon, J. M. (2004). Action research: the school as the center of inquiry. *Supervision and instructional leadership: A developmental approach*.

Gray, P. W., & Jordan, S. R. (2012). Supervisors and academic integrity: Supervisors as exemplars and mentors. *Journal of Academic Ethics, 10*(4), 299–311.

Gyuris, E. (2018). Evaluating the effectiveness of postgraduate research skills training and its alignment with the Research Skill Development framework. *Journal of University Teaching & Learning Practice, 15(4), 5*.

Hadi, N. U., & Muhammad, B. (2017). Role of supervisor in the performance of postgraduate research students. *Journal of Research and Reflections in Education, 11*(2).178-186.

Hamid, Z., & Shah, S. A. (2018). Exploration of the interactions between supervisors and their research scholars at University of Kashmir. *International Journal of Education Movement and Social Science, 7*(2), 320-325.

Han, J., Liu, N., & Wang, F. (2022). Graduate students' perceived supervisor support and innovative behavior in research: The mediation effect of creative self-efficacy. *Frontiers in Psychology*, *13*.

Heath, T. (2002). A quantitative analysis of PhD students' views of supervision. *Higher Education Research & Development*, *21*(1), 41-53

Hindes, Y. L., & Andrews, J. J. (2011). Influence of Gender on the Supervisory Relationship: A Review of the Empirical Research from 1996 to 2010. *Canadian Journal of Counselling and Psychotherapy*, *45*(3).

Holsinger Jr, J. W. (2008). Situational leadership applied to the dissertation process. *Anatomical Sciences Education*, *1*(5), 194-198.

Houghton, J., Steele, C., & Henty, M. (2003). *Changing research practices in the digital information and communication environment* (Unpublished, doctoral dissertation) Department of Education, Science and Training. Victoria University, Australia.

Hoque, K. E., Bt Kenayathulla, H. B., D/O Subramaniam, M. V., & Islam, R. (2020). Relationships between supervision and teachers' performance and attitude in secondary schools in Malaysia. *Sage Open*, *10*(2), 2158244020925501.

Ives, G., & Rowley, G. (2005). Supervisor selection or allocation and continuity of supervision: PhD students' progress and outcomes. *Studies in Higher Education*, *30*(5), 535–555.

Jordan, K. (2007). Beginning supervisees' identity: The importance of relationship variables and experience versus gender matches in the supervisee/supervisor interplay. *The Clinical Supervisor*, *25*(1-2), 43–51.

Johnson, H. H., & Umphress, E. E. (2019). To help my supervisor: Identification, moral identity, and unethical pro-supervisor behavior. *Journal of Business Ethics*, *159*, 519-534.

Kaharudin, I. H., Ab-Rahman, M. S., Abd-Shukor, R., Zaharim, A., Mohd Nor, M. J., Mohd

Ihsan, A. K.A., & Idrus, R. (2022). How does supervision technique affect research? Towards sustainable performance: publications and students from pure and social sciences. *Sustainability, 14*(9), 56-96.

Katz, R. (2016). Challenges in doctoral research project management: A comparative study. *International Journal of Doctoral Studies*, *11*, 105.

Kelley, K., Clark, B., Brown, V., & Sitzia, J. (2003). Good practice in the conduct and reporting of survey research. *International Journal for Quality in Health Care*, 15(3), 261-266.

Le, M., Pham, L., Kim, K., & Bui, N. (2021). The impacts of supervisor–PhD student relationships on PhD students' satisfaction: A case study of Vietnamese universities. *Journal of University Teaching & Learning Practice*, *18*(4), 18.

Leonard, D., Metcalfe, J., Becker, R. & Evans, J. (2006). Review of literature on the impact of working context and support on the postgraduate research student learning experience. *New York, NY: The Higher Education Academy.*

Lessing, A., & Schulz, S. (2003). Postgraduate supervision: students' and supervisors' perceptions. *Acta Academica*, *35*(3), 161-184

Mainhard, T., Van Der Rijst, R., Van Tartwijk, J., & Wubbels, T. (2009). A model for the supervisor–doctoral student relationship. *Higher education*, *58*, 359-373.

Manderson, L., Bondjers, G., Izugbara, C., Cole, D. C., Egesah, O., Ezeh, A., & Fonn, S. (2017). Enhancing doctoral supervision practices in Africa. *Journal of Higher Education in Africa/Revue de l'enseignement supérieur en Afrique*, *15*(2), 23-40.

Marsh, H. W., Rowe, K. J., & Martin, A. (2002). PhD students' evaluations of research supervision: issues, complexities, and challenges in a nationwide Australian experiment in benchmarking universities. *The Journal of Higher Education*, *73*(3), 313-348.

Masek, A. (2017). Establishing supervisor-students' relationships through mutual expectation: A study from supervisors' point of view. In *IOP Conference Series: Materials Science and Engineering* (Vol. 226, No. 1, p. 012200). IOP Publishing.

Meerah, T. S. M. (2010). Readiness of preparing postgraduate students in pursuit of their doctoral program. *Procedia Social and Behavioral Sciences*, 9,184–188.

Meerah, T.S.M., Osman, K., Zakaria, E., Ikhsan, Z. H., Krish, P., Lian, D.K. C., & Mahmod, D. (2012). Developing an instrument to measure research skills. *Procedia-Social and Behavioral Sciences, 60*, pp.630-636

McIlroy, T. D., Parker, S. L., & McKimmie, B. M. (2021). The effects of unanswered supervisor support on employees' well-being, performance, and relational outcomes. *Journal of Occupational Health Psychology*, *26*(1), 49.

Mouton, J. (2011). How to succeed in your master's and doctoral studies: A South African (p.280). *Hatfield: Van Schaik Publishers.*

Moskvicheva, N., Bordovskaia, N., & Darinskaya, L. (2015). Role of students and supervisors' interaction in research projects: expectations and evaluations. *Procedia-Social and Behavioral Sciences*, *171*, 576-583.

Min, J., Iqbal, S., Khan, M. A. S., Akhtar, S., Anwar, F., & Qalati, S. A. (2020). Impact of supervisory behavior on sustainable employee performance: Mediation of conflict management strategies using PLS-SEM. *PLoS One*, *15*(9), e0236650.

Murararaneza, C., Mtshali, N., & Bvumbwe, T. (2020). Challenges in postgraduate research supervision in nursing education: Integrative review. *Nurse Educ Today*, 89, June 2020, 104376.

Nabavi, R. T. (2012). Bandura's social learning theory & social cognitive learning theory. *Theory of Developmental Psychology*, *1*, 24.

Orellana, M. L., Darder, A., Pérez, A., & Salinas, J. (2016). Improving doctoral success by matching PhD students with supervisors. *International Journal of Doctoral Studies, 11, 87.*

Okolie, U. C., Ochinanwata, C., Ochinanwata, N., Igwe, P. A., & Okorie, G. O. (2021). Perceived supervisor support and learner's career curiosity: the mediating effect of sense of belonging, engagement and self-efficacy. *Higher Education, Skills and Work-Based Learning*, *11*(5), 966-982.

Pew Research Center. (2015). The whys and how's of generations research. Pew Research Center.

Pichler, H., Wagner, S. E., & Hesson, A. (2018). Old-age language variation and change: Confronting variationist ageism. Language and Linguistics Compass, 12, 1–21. doi:10.111/Inc3.12781

Pyhältö, K., Vekkaila, J., & Keskinen, J. (2015). Fit matters in the supervisory relationship: doctoral students and supervisors' perceptions about the supervisory activities. *Innovations in Education and Teaching International*, *52*(1), 4–16.

Polkinghorne, M., Taylor, J., Knight, F., & Stewart, N. (2023). Doctoral Supervision: A Best Practice Review. *Encyclopedia*, *3*(1), 46-59.

Roberts, L. D., & Seaman, K. (2018). Good undergraduate dissertation supervision: Perspectives of supervisors and dissertation coordinators. *International Journal for Academic Development*, *23*(1), 28-40.

Rodwell, J., & Neumann, R. (2007). Predicting timely doctoral completions: an institutional case study of 2000-2005 doctoral graduates. In *Australian Association for Institutional Research Annual Forum* (pp. 1-22). Australasian Association for Institutional Research.

Samules, P., & Gilchrist, M. (2014). Pearson Correlation, Statsutor, Community Project. *Encouraging Academics to Share Statistics Support Resources*

Sekaran, U., & Bougie, R. (2003). Research Methods For Business, A Skill Building Approach, John Willey & Sons. *Inc. New York*, *29*.

Sipayung, R. W. (2019). Improving the Students' Ability in Reading Comprehension by Using Cooperative Integrated Reading Composition. *Budapest International Research and Critics Institute-Journal (BIRCI-Journal)*, *2*(2), 247-253.

Sunaryo, Y. S. (2020). Academic Supervision of School Principals and Teacher Performance: A Literature Review. *International Journal Pedagogy of Social Studies*, *5*(2), 17-34.

Todd, M. J., Smith, K., & Bannister, P. (2006). Supervising a social science undergraduate dissertation: staff experiences and perceptions. *Teaching in Higher Education*, *11*(2), 161173.

Ünal, A. (2013). Development and validation of supervisory behaviour description scale. *Educational Research and Reviews*, 8(2), 69.

Van-Meerkerk, I., Edelenbos, J., & Klijn, E. H. (2019). Survey approach. In *Networks and Collaboration in the Public Sector* (pp. 64-81). Routledge.

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.

Wadesango, N., & Machingambi, S. (2011). Post graduate students' experiences with research supervisors. *Journal of Sociology and Social Anthropology*, 2(1), 31-37.

Wright, A., Murray, J. P., & Geale, P. (2007). A phenaomeno graphic study of what it means to supervise doctoral students. *Academy of Management Learning & Education*, *6*(4), 458 474.

Zhang, Y. & Hyland, K. (2021). Advice-giving, power and roles in theses supervisions. *Journal of Pragmatics*, 172, 35-45.ull-Mooring model. *Sustainability*, *13*(14), 8062.