A Pilot Study on the Relationship between Postgraduate Students' Perception of Thesis Supervision Role and Their Research Skills in a Thai University

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Abstract

This quantitative pilot study aimed to test the extent of the relationship between and effect of postgraduate students' perception of thesis supervision role and their research skills. A questionnaire, constructed based on guidelines from the handbook for supervisors in Thai universities (OHEC, 2006) with a Cronbach's alpha of 0.955, was used as an instrument to collect data using a case study approach on one graduate faculty at a university in southern Thailand with 30 participants. Principal factor analysis was carried out, as well as correlation and regression analysis.

The results showed statistically significant positive relationships between essential student research skills and their critical thinking/synthesizing skills; their critical thinking/synthesizing skills and research ethics; their critical thinking/synthesizing skills and systematic thinking skills; and their critical thinking/synthesizing skills and supervisor relationships with students. However, supervisor character was not correlated with any student research skill variables, but highly correlated with the other remaining supervision roles. The strongest predictor of student research skills is the relationship between supervisor and student.

Keywords: *Supervision role, research skills, graduate student, postgraduate student*

Introduction

Postgraduate education is important for human resource development (Ghadirian, Sayarifard, Majdzadeh, Rajabi, & Yunesian, 2014), and is a key element that contributes to the growth of national income (Sidhu, Kaur, Choo, & Fook, 2015). The demand for graduate study is growing, not only in developed countries, but also in developing countries. Several studies such as those conducted by Yellowley and Farmer (2005), Mistry, White, and Berardi (2009), and Celik (2011) have reported that postgraduate studies are one of the fastest growing markets in developed countries. Similar reports are found regarding developing countries. The increased number of graduate students is evidenced in many developing countries, for example, Poland (Rozanski, 2008), Thailand (Chien & Chapman, 2014) and Malaysia (Sidhu, Kaur, Choo, & Fook, 2015).

Polziehn (2011) argued that graduate educational research skills (critical and creative thinking, personal effectiveness, integrity and ethical conduct, teaching competence, societal and civic responsibilities, and leadership) are attained through doing research, or in other words, the thesis. Research projects at the postgraduate level of education are aimed at enabling students to develop sound research skills, acquiring the latest theoretical knowledge, and becoming critical thinkers in their chosen fields of study, as well as conducting research enquiries in their areas of specialization in a professional and ethical manner (Office of Postgraduate Education, 2016). Because doing research or preparing a thesis helps develop research skills in graduate students, the need to look at how such skills can be developed may thus result in valuable improvements. Several studies have highlighted that the quality of the final thesis or research produced by postgraduate students depends very largely on thesis supervision; for example, Mainhard, van der Rijst, van Tartwijk, and Wubbels (2009); Garcia, Malott, and Brethower (1988); Ghadirian et al. (2014); de Kleijn, Mainhard, Meijer, Pilot, and Brekelmans (2012); Borders, Wester, Granello, Chang, Hays, Pepperel, and Spurgeon (2012). It thus implies that thesis supervision contributes to the development of research skills via preparation of a thesis. However, there has been minimal focus on how supervisors' roles in thesis supervision affect the quality of research and students' research skills. A lot of research have been done on interpersonal relationships between supervisors and advisees; for example, Mainhard et al. (2009), de Kleijn et al.

(2012), de Kleijn, Meijer, Pilot, and Brekelmans (2014), but not on how the supervision role develops research skills.

Thai universities are under the purview of the Thai Office of the Higher Education Commission (OHEC). This organisation has published a handbook, which became the principal manual for all Thai universities, entitled "Thesis Supervisor: Duties and Roles" (2006) to provide guidelines for desirable supervisors' roles. This handbook addresses significant issues of graduate study, with details on supervisory roles, duties, ethics, morality and instructions. It also includes the quality of desirable outputs expected of graduate students. Many supervisors, however, have not been trained to deliver supervisory service to students as recommended or guided by OHEC. Many students are left to find their way by themselves, creating frustration, and sometimes leading them to drop out of the program. There is no guarantee that those who remain will receive sufficient guidance and appropriate learning to ensure their ability to become competent researchers.

It would therefore be worthwhile to investigate the extent to which the roles in the handbook actually relate to the results of students' research skills. In this present paper, the researchers aimed to present the findings from a pilot study which focused on:

1) testing the reliability of the instrument constructed;
2) testing the relationship between student perceptions of the supervision role as suggested in the OHEC handbook, and student research skills; and
3) testing the effect of student perceptions of the supervision role and student research skills.

The findings of this study will be useful in preparation for future studies of student perspectives of the role of supervisors on research skills development.

Definition of Key Terms

Supervision is defined by Islam, Amin, Ali, Alam, Alam, and Rasul (2013) as a two-way interactional process which requires both student and supervisor to consciously engage each other with a spirit of professionalism, respect, collegiality, and open-mindedness. In this study, however, it will mainly focus on the process delivered by thesis supervisors.

The supervision role in this study is summarized from the concepts given by OHEC (2006), which state that the supervision role is the responsibility of the teacher who serves as a thesis advisor (supervisor) to individual students and the institution in administering, academic advising, counselling, and assuring successful outcomes for postgraduate students.

Research skills in this study also followed OHEC (2006) definitions, which mean skills that postgraduate students should possess relating to the ability to do research well – for example, critical thinking skills, analytical skills, synthesizing skills, and self-reliance (ethics).

Literature Review

Supervision and Thesis Success

Alam, Alam, and Rasul (2013) stated that the success and quality of postgraduate education largely depend on multiple factors, where supervisor roles determine postgraduate students' overall satisfaction, retention, and completion. Vilkinas (2008) mentions other possible indicators, such as attendance status, level of research funding available, age, completion of an honours degree, discipline areas, and gender. Furthermore, other factors identified as significant predictors of completion are suitability of research topic, intellectual environment of the department, and access to equipment and computers. However, supervisor capability is a key factor in candidates' success.

Many elements influence supervisor performance and their relationships with postgraduate students. Supervisors, for example, must have research knowledge and related skills, possess management and interpersonal skills, be able to coordinate research program activities, mentor students, where appropriate and useful, and develop supportive relationships among research students themselves (Vilkinas, 2008). On the other hand, there are various reasons for students' failure to complete their doctoral degrees, and supervisors may affect some of these. Sheikh Abdullah,

Osman, Mohamad, Meerah, Osman, Zakaria, and Mahmod (2012) indicate one of the main causes for students' failure to complete their doctoral degrees is the lack of preparation in knowledge and skills to conduct research.

Students are often expected to have, for example, skills in seeking and selecting information using the library, or from on-line/web sources, in their fields of interest. They should also be well equipped in research methodology, including data collection and using data analysis tools, and of course, writing up and disseminating the research findings. Keser, Ozcinar, Kanbul, and Meerah (2010) suggested that students' readiness in research skills will affect completion time and the quality of the research or thesis they produce. They also suggested that students need to acquire these skills early. Thus, in order to ensure the successful completion of postgraduate study, the supervisor must play a role in aiding them to gain these skills as much as possible.

Another area that is vital for thesis success is supervisory mentoring skills. Mentoring as a concept becomes prominent in advising students, being an exemplary model for them, supervising them, and transferring knowledge and experience to them (Arabaci & Ersözlü, 2010). According to Clutterbuck and Megginson (1999), the mentoring skills of a supervising professor are extremely important in educating postgraduate students. Some prominent qualities of a mentor are having gained experience out of good organization, good questions, reliability, being a good listener, patience, building networks, helping mentees be themselves, mutual understanding, keeping a balance between methods and contents, helpfulness, facilitating supportiveness, helping people use information, and trustworthiness. In this study, we call these qualities as the supervisors' ability to understand students and their works (psychological qualities).

Roles of Thesis Supervisors

Schulze (2011) reviewed six supervisory styles and roles. These are the functional model (gives practical advice); qualities model (identifies flexibility and high emotional intelligence of supervisors as important); mentoring process (which requires supervisors to support and challenge students); enculturalisation model (enables students to become members of a research community); critical-thinking model (develops critical thinking in students by questioning them); and feminist model (promotes same-gender supervision). A mismatch in styles may lead to poor success rates. The author also reported supervisors' roles and responsibilities in distance education, which can also be applied to face-to-face supervision. These include maintaining regular contact with students; returning written work in a timely manner; involving students in seminars; being knowledgeable about the literature available and the key debates in the student's research field; giving encouragement and emotional support; and being role models. These may be summed up through the supervisor's role as hypothesized by Kayrooz and Pearson (2004), found in Bitzer and Albertyn (2011), which includes mentoring, sponsoring, progressing the candidature, and coaching. Other related roles are presented in Table 1 below.

Table 1. Supervisor Roles across Different Studies

Study	Mizany, Khabiri, & Sajadi, 2012	Nasir & Masek, 2015	Mhunpiew,2013	Orellana, Darder, Perez, Salinas, 2016
Supervisor Role	Choose a suitable research topic; encourage students in thesis writing; establish good relationships with students; have sufficient research capabilities	Guide in topic selection; monitor progress of thesis writing and research; managing research timeline; provide emotional support	Support in terms of technical, intellectual, administrative, management, and personal	Competent researcher who communicates well, offers appropriate support and suitable skills to enhance the students' research experience

The OHEC Handbook, on the other hand, reviews and describes various roles of thesis supervisors. Most of the roles from the literature that the handbook reviewed are similar. The summarized roles include the supervisor being an up-to-date academic researcher, possessing the spirit of a teacher, being a role model for students, capable of critical thinking and guiding students' work, being ready to help students psychologically and academically, being knowledgeable in both contents and administrative issues, availability, capable in managing research projects, being an evaluator, and being a colleague. Furthermore, supervisors take responsibilities in guiding students' research, involving both academic and social aspects of advising, getting them involved in the wider research community, finding financial support and finding a position after graduation (Thai Office of the Higher Education Commission, 2006).

Supervision and Student's Research Skills

While both the supervisor and supervisee assume various roles, a crucial required skill is research ability. Keser et al. (2010) suggested that research skills are important to all university graduates, regardless of whether they aim to work as researchers, in the public or the private sector.

Research skills can be broadly categorised into two types: (i) skills needed to read and evaluate surveys, experiments, and other studies dealing with substantive problems in the research area; (ii) skills needed to do research including designing, conducting, analysing the data, interpreting and generalising a study's results. Both categories of skills also rely on statistical and methodological competencies. These skills can only be learnt by someone who is actively engaged in the practice of doing research. Aside from these, there are also other meta-skills necessary for a productive research experience. In a PhD study, Blenkinsop (2003) stated that these include planning skills, communication skills, ethical awareness, self-confidence, self-awareness and self-protection, analytical skills, reflection, and self-criticism. The author also expands that learning, which takes place by undertaking a research project, is the kind of student-focused "deep learning", which is an example of good educational practice.

OHEC Handbook* (*2006*): *Thesis Supervisor*: *Duties and Roles

To contextualize these attributes, we will consider the expectations listed by OHEC. In its handbook, guidelines for university supervisors were discussed through six chapters: 1) concepts and purpose of postgraduate students; 2) qualifications of thesis supervisors; 3) duties and roles of thesis supervisors in research steps; 4) obstacles in thesis supervising; 5) good practices for supervising; and 6) regulations and ethics for thesis supervisors.

Chapter 1 of the handbook focuses on the concepts and purposes of postgraduate students, and emphasises the significance of postgraduate education as a conduit that enhances a country's capacities in competition and development. It states clearly that research is the most significant part of postgraduate studies for students to practice how to conduct research, and how to contribute to new knowledge. This chapter also compiles the desired qualifications of postgraduate students, which can be summarised as having professional academic thinking skills, research skills, creativity, leadership, communication skills, and research ethics capacities.

Chapter 2 discusses the qualifications of thesis supervisors, which should be comprised of academic competence and enthusiasm, being a role model, advisor, and counsellor.

Chapter 3 describes the duties of thesis supervisors in the first part, and roles in the latter. For duties, the chapter discusses various types of supervisor behaviours. For the roles, it compiles and cites different sources for thesis supervisor roles. However, these roles are often repetitive. The last part of this chapter helps readers with the steps of thesis guiding, and what thesis supervisors should do in each step of the research: pre-proposal, proposal defense, post-proposal, and thesis defense.

Chapter 4 outlines obstacles often encountered during thesis guiding, which include the ambiguous standard and quality of theses; lack of good thesis guiding mechanisms; problems of student abilities; and problems concerning supervisors and the supervising system.

Chapter 5 discusses the factors lead to success theses including structural factors, support factors, and exogenous variables. It also provides different strategies of thesis supervision.

Chapter 6 includes the laws and regulations relating to preparing theses, which mostly cover general issues. However, several past cases of legal issues between students and institutions were given as examples. The last part of this chapter discusses research and supervision ethics.

Research Methodology

Participants

For this pilot study, thirty graduate students from an interdisciplinary faculty in a southern Thai university were asked to respond. The participants were selected according to their willingness to participate. However, in a more complete research study, graduate students from all faculties in this same university will be included.

Instrumentation

A purposely-designed questionnaire was used as a tool for collecting quantitative data in this study. This was because the specific attributes of supervisor roles and student research skills outlined in the Thai university's handbook had not been previously used in any measurement instrument. The questionnaire was divided into 5 sections: demographic data, perception toward students' own research skills, perception toward supervisor roles, supervision type, and suggestions from students for better supervision.

All questions about student perception of research skills and supervisors' roles were extracted from the supervisors' handbook published by the Office of the Higher Education Commission (2006). For student research skills, 30 items were extracted mainly from Chapter 1 of the handbook. A scale from one to ten was chosen for self-assessment (1 = 'the least' and 10 = 'the most'). This scale was designed to allow for a wide range of scores to aid decision-making on the part of respondents as they evaluated and assessed their own skills. A sample of research skills questions is shown in Table 2.

Table 2. Sample Items for Student Research Skills

Item No.	Statement
S7	You are knowledgeable both in theory and practice.
S8	You have ability to think and analyse systematically.
S9	You have good ethics and can rule yourself proudly in the wider society.
S10	You have knowledge, ability, skills, attitudes, and ethics in your field of study.
S13	You can think critically, can evaluate and use facts appropriately and logically.
S19	You can help others or society by giving advice or suggestions and solutions to solve problems in an academic manner.
S25	You have search the literature skilfully, and structure your thoughts from a review of the literature.

For research supervisory roles, items were compiled from any roles recommended in the handbook that were relevant to helping research students (mainly from Chapters 2 and 3). Redundant statements were either grouped or eliminated to keep the questionnaire within an appropriate length. All together there were 35 items on the supervisory role section. The scale for this attitudinal perception was from one to four (1 = 'strongly disagree' and 4 = 'strongly agree'). No neutral scale was provided in the questionnaire in order to aid respondents in making their decisions on their supervisor's role, which the researchers anticipated might be hard for students to decide, for in Thai culture, criticizing their teachers is not accepted nor is it a norm. A sample of items on supervision roles is shown in Table 3.

Table 3. Sample Items on Supervisor's Roles

Item No.	Statement
T1	You had a good student-teacher relationship with your supervisor.
T2	Your supervisor set a regular time for you to meet.
T3	Your supervisor was academically competent and enthusiastic in academic work.
T5	Your supervisor had sufficient knowledge and understanding in the problems you investigated.
T9	Your supervisor was a good role model who showed passion toward research.
T11	Your supervisor understood psychological principles and applied them to learn about their students, in both their academic and personal habits.
T14	Your supervisor was interested in your research problem and paid attention.
T17	Your supervisor respected your opinion.

The questionnaire was reviewed for its suitability to use as a research tool by an expert panel.

Data Collection

The names and email addresses of all graduate students were gathered from the Registrar's Office, and thirty samples were then selected. All questionnaires were sent via email with a letter of introduction to the selected samples. In the introduction letter, emphasis was put on describing that after the surveys were completed, the participants would return them via email to a third party (a faculty employee who was not a lecturer) so that student names and opinions would not be disclosed to lecturers. This was to ensure maximum truthfulness of their answers, as well as anonymity for the researcher.

Data Analysis

The data from returned questionnaires was processed using Predictive Analytic Software (PASW). The descriptive statistics, factor analysis, reliability analysis, correlation analysis, and multiple regression were run.

Results

Demographic Characteristics of Sample

The demographic characteristics of 30 graduate students in the studied Faculty who were sampled in this study are shown in Table 4. The study investigated their perceptions toward their supervisor's role in thesis guidance, using a questionnaire as a research tool.

The results of the survey on perception of graduate students of the studied Faculty using a questionnaire to draw data from 30 participants (Table 1) show that 22 (73.3%) of the participants were females and eight (26.7%) were males. Almost all participants (29, or 99%) were younger than 40 years old (M = 31.5, SD = 5.63). Eighteen students (60%) reported that they spent 5-8 hours on their thesis daily, while only four (13.30%) worked longer hours on their thesis (M = 6.01, SD = 2.58). Most of them (27, or 90%), were studying for a Master's degree, whereas three (10%) were working on their PhDs.

The number of participants who were studying in the Social Sciences (13, or 43.30%) was almost equal to those studying in the Sciences (12, or 40%), while five (16.70%) used both approaches to integrate their study. A majority of participants (23, or 76.7%) graduated within four years of study (M = 3.66, SD = 1.08). A large number of participants (25, or 83.3%) never had to change supervisors during their course of study, whereas five (16.7%) needed to. About one third of the participants (11, (36.7%) received supervision more than six times in a month (M = 4.82, SD = 2.43). Twenty-three (76.7%) of participants' supervisors were females, and seven (23.30%) were males. A little over half, (16, 53.3%) of the supervisor's age was between 41-50 years old (M = 45.5, SD = 6.95).

Table 4. Demographic Data of Research Participants

Variables	Frequencies	Percentage	Mean	Standard Deviation
N=30				
Gender			-	-
Male	8	26.7		
Female	22	73.3		
Age Range			31.5	5.63
20-30	13	43.3		
31-40	16	53.3		
41-50	1	3.3		
Hours Working on Thesis			6.01	2.58
1-2 hours/day	2	6.7		
3-4 hours/day	6	20.0		
5-6 hours/day	9	30.0		
7-8 hours/day	9	30.0		
>8 hours/day	4	13.3		
Degree Studied			-	-
Master	27	90.0		
PhD	3	10.0		
Field of Study			-	-
Science	12	40.0		
Social Science	13	43.3		
Integrated of both	5	16.7		
Total Years of Study			3.66	1.08
< 2 years	2	6.7		
2-3 years	11	36.7		
3-4 years	10	33.3		
> 4 years	7	23.3		
Change of Supervisor			-	-
Yes	5	16.7		
No	25	83.3		
Supervision Frequencies			4.82	2.43
1-2 times/month	7	23.3		
3-4 times/month	8	26.7		
5-6 times/month	4	13.3		
> 6 times/month	11	36.7		
Supervisor Gender			-	-
Male	7	23.3		
Female	23	76.7		
Supervisor Age			45.5	6.95
31-40	7	23.3		
41-50	16	53.3		
51-60	7	23.3		

Factor Analysis

The main applications of factor analytic techniques are: (1) to reduce the number of variables; and (2) to detect structure in the relationships between variables – that is, to classify variables. Therefore, factor analysis is applied as a data reduction or structure detection method (StatSoft, 2017). Since there were 30 items on students' perception, and 35 items for supervision roles, which were quite a number of variables, factor analysis was necessary to group, reduce, and classify the variables under the similar themes. For the 30 items on perceptions in Section 2 of the questionnaire, two items investigated students' perception of success, and another three items about supervisor's role in their research success. These items were grouped into students' perception of success (items 2 and 3), and perception of supervision role for their success (items 4, 5, and 6), and were not included in factor

analysis. Item number 1 asked about students' role in writing the thesis, so it was also not included in factor analysis.

A principal factor analysis (PFA) of the remaining 24 items was then conducted, using varimax rotation. The analysis extracted four factors that successfully explained 73.54% of the variance. The labels for each factor were given according to the theme of the items, which were: Students' Essential Research Skills (10 items), Student Critical Thinking and Synthesizing Skills (7 items), Student Research Ethics (5 items), and Student Systematic Thinking Skill (2 items). Samples of each items of these themes are given in Table 5.

Table 5. Sample of Students' Research Skills Items under Each Factor Analysis Theme

Skills	Items
Students' Essential Research Skills	S17 - You can creatively produce academic work and can conduct your own research correctly according to the right methodology.
	S19 - You can help others or society by giving advice or suggestions and solutions to solve problems in an academic manner.
Student Critical Thinking and Synthesizing Skills	S13 - You can think critically, evaluate, use facts appropriately and logically.
	S25 - You can search the literature skilfully, and structure your thoughts from a review of the literature.
Student Research Ethics	S9 - You have good ethics and can rule yourself proudly in the wider society.
	S10 - You have knowledge, ability, skills, attitudes, ethics in field of study.
Student Systematic Thinking Skills	S7 - You are knowledgeable in both theory and practice.
	S8 - You have ability to think and analyse systematically.

A PFA was also conducted for 35 items on supervision roles in Section 3 of the questionnaire. Eight factors were extracted which explained 84.5% of the variance. However, due to limited space of this article, only four variables were used as independent variables in multiple regression analysis, which included Supervisor Characteristics (7 items), Supervisor's Dedication to Thesis Supervision (6 items), Relationships with Students (7 items), and Supervisor's Understanding of the Thesis (6 items).

Table 6. Sample of Supervisor's Roles Items under Each Theme of Factor Analysis

Roles	Items
Supervisor Characteristics	T3 - Your supervisor was academically competent and enthusiastic in academic work.
	T9 - Your supervisor was a good role model who showed passion toward research.
Supervisor's Dedication to Thesis Supervision	T2 - Your supervisor set a regular time for you to meet.
	T14 - Your supervisor was interested in your research problem and paid attention.
Relationships with Students	T1 - You had a good student-teacher relationship with your supervisor.
	T17 - Your supervisor respected your opinion.
Supervisor's Understanding of the Thesis	T5 - Your supervisor had sufficient knowledge and understanding in the problems you investigated.
	T11 - Your supervisor understood psychological principles and applied them to learn about their students, both in academic and personal habits.

Reliability Analysis

Internal consistency or reliability for each factor was examined using Cronbach's alpha, which resulted in a Cronbach's alpha of 0.955. The alphas for factors shown in Table 7 were as follows: 0.930 for Students' Essential Research Skills (10 items); 0.913 for Student Critical Thinking and Synthesizing Skills (7 items); 0.846 for Student Research Ethics (5 items); 0.856 for Student Systematic Thinking Skills (2 items); 0.949 for Supervisor Characteristics (7 items); 0.954 for Supervisor's Dedication to Thesis Supervision (6 items); 0.933 for Relationships with Students (7 items); and 0.894 for Supervisor's Understanding of the Thesis (6 items).

Table 7. Descriptive Statistics for Four Student Skill Factors & Four Supervision Role Factors (N = 30)

Factors	No. of Items	Mean (S.D.)	Skewness	Kurtosis	Cronbach's Alpha
Student Skill Factors					
Essential Research Skills	10	7.32 (1.04)	-0.478	0.864	0.930
Synthesizing Skills	7	7.79 (0.92)	-0.294	-0.686	0.913
Research Ethics	5	8.43 (0.79)	-0.214	-0.361	0.846
Systematic Thinking Skills	2	7.37 (0.80)	-0.621	-0.229	0.856
Supervision Role Factors					
Supervisor Characteristics	7	3.67 (0.48)	-1.400	0.738	0.949
Supervisor's Dedication to Thesis Supervision	6	3.59 (0.52)	-1.098	0.180	0.954
Relationships with Students	7	3.61 (0.43)	-1.080	-0.182	0.933
Supervisor's Understanding of the Thesis	6	3.12 (0.35)	-0.223	-1.544	0.894

Correlation Analysis

Correlations were computed among the four supervisor's roles, and student perceptions of their research skills as shown in Table 8. The results suggest that 16 out of 56 correlations were statistically significant, and 14 of them were highly significant at the level of $p < 0.01$, two tailed. The remaining two correlations were statistically significant at the level of $p < 0.05$, two tailed.

The correlation analysis indicates that there are strong positive relationships with high statistical significance between Students' Essential Skills and Students' Critical Thinking and Synthesizing Skills ($r = 0.69$, $n = 30$, $p < 0.001$), and between Students' Essential Skills and Students' Research Ethics ($r = 0.57$, $n = 30$, $p < 0.001$).

Student Critical Thinking and Synthesizing Skills and Student Research Ethics were positively correlated with a high level of statistical significance ($r = 0.69$, $n = 30$, $p < 0.001$), as well as Student Systematic Thinking Skills ($r = 0.51$, $n = 30$, $p < 0.01$). These skills were also moderately correlated to Supervisor's Relationships with Students ($r = 0.37$, $n = 30$, $p < 0.05$) and Supervisor's Understanding of the Thesis ($r = 0.39$, $n = 30$, $p < 0.05$).

We also found that Student Research Ethics were positively correlated with a high level of statistical significance to Students' Systematic Skills ($r = 0.48$, $n = 30$, $p < 0.01$), Supervisor's Dedication to Thesis Supervision ($r = 0.48$, $n = 30$, $p < 0.001$), Relationship with Students ($r = 0.57$, $n = 30$, $p = 0.001$), and Supervisor's Understanding of the Thesis ($r = 0.55$, $n = 30$, $p < 0.005$). This variable is the most interesting, as it is correlated with all remaining variables except for Supervisor Characteristics.

Supervisor Characteristics was not correlated with any student research skill variables, but was highly correlated with the other remaining supervision roles: Supervisor's Dedication to Thesis Supervision ($r = 0.75$, $n = 30$, $p < 0.001$), Relationships with Students ($r = 0.76$, $n = 30$, $p < 0.001$), and Supervisor's Understanding of the Thesis ($r = 0.62$, $n = 30$, $p < 0.001$).

Table 8. Correlation Analysis

		Students' Essential Research Skills	Students' Critical Thinking and Synthesizing Skills	Students' Research Ethics	Students' Systematic Thinking Skills	Supervisor's Characteristics	Supervisor's Dedication to Thesis Supervision	Relationships with Students	Supervisor's Understanding of the Thesis
Students' Essential Research Skills	Pearson Correlation	1	0.693**	0.571**	0.299	-0.034	0.091	0.282	0.317
	Sig. (2-tailed)		0.000	0.001	0.109	0.860	0.634	0.131	0.088
Student Critical Thinking and Synthesizing Skills	Pearson Correlation	0.693**	1	0.690**	0.510**	0.084	0.290	0.370*	0.399*
	Sig. (2-tailed)	0.000		0.000	0.004	0.661	0.119	0.044	0.029
Student Research Ethics	Pearson Correlation	0.571**	0.690**	1	0.481**	0.310	0.484**	0.567**	0.552**
	Sig. (2-tailed)	0.001	0.000		0.007	0.095	0.007	0.001	0.002
Student Systematic Thinking Skills	Pearson Correlation	0.299	0.510**	0.481**	1	-0.001	0.182	0.231	0.104
	Sig. (2-tailed)	0.109	0.004	0.007		0.996	0.335	0.219	0.583
Supervisor's Characteristics	Pearson Correlation	-0.034	0.084	0.310	-0.001	1	0.752**	0.764**	0.620**
	Sig. (2-tailed)	0.860	0.661	0.095	0.996		0.000	0.000	0.000
Supervisor's Dedication to Thesis Supervision	Pearson Correlation	0.091	0.290	0.484**	0.182	0.752**	1	0.795**	0.732**
	Sig. (2-tailed)	0.634	0.119	0.007	0.335	0.000		0.000	0.000
Relationships with Students	Pearson Correlation	0.282	0.370*	0.567**	0.231	0.764**	0.795**	1	0.674**
	Sig. (2-tailed)	0.131	0.044	0.001	0.219	0.000	0.000		0.000
Supervisor's Understanding of the Thesis	Pearson Correlation	0.317	0.399*	0.552**	0.104	0.620**	0.732**	0.674**	1
	Sig. (2-tailed)	0.088	0.029	0.002	0.583	0.000	0.000	0.000	

* Correlation is significant at the 0.05 level (2-tailed).

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

Multiple Regression Analysis

The results of multiple regression analysis are shown in Table 9.

Table 9. Multiple Regression with Reverse Scale

R	R^2	F	Standardized Coefficients	Beta	t	P
0.636	0.404	4.23	Supervisor Characteristics	-0.635	-2.459	0.021
			Supervisor's Dedication to Thesis Supervision	-0.177	-0.595	0.557
			Relationships with Students	0.728	2.560	0.017
			Supervisor's Understanding of the Thesis	0.461	1.978	0.059

The multiple regression model used in this study was comprised of the following independent variables: Supervisor Characteristics, Supervisor's Dedication to Thesis Supervision, Relationships with Students, and Supervisor's Understanding of the Thesis. The multiple regression model with all four predictors produced $R^2 = 0.404$, $F(4, 25) = 4.23$, $p < 0.005$.

Supervisor Characteristics had a negative statistical significance effect on student research skills ($\beta = -0.635$, $t = 2.459$, $p = 0.021$).

Supervisor's Dedication to Thesis Supervision had a positive effect on student research skills ($\beta = -0.177$, $t = -0.595$, $p = 0.557$), but with no statistical significance.

Relationships between supervisors and students was the strongest predictor of student research skills, with a statistical significance ($\beta = 0.728$, $t = 2.560$, $p = 0.017$).

Supervisor's Understanding of the Thesis had no significant effect on student research skills ($\beta = 0.461$, $t = 1.978$, $p = 0.059$).

Discussion

The results from this pilot study showed the potential for conducting a larger study on this topic with some improvements. For instrument testing, factor analysis grouped similar items under common themes, totalling four themes for student research skills and eight themes for supervisor roles, with four considered in this paper. For student research skills, the items under the same theme were related, and names for the new variable could be easily given: Students' Essential Research Skills, Student Research Ethics, Student Critical Thinking and Synthesizing Skills, and Student Systematic Thinking Skills.

On the contrary, for the supervisor's role, only Supervisor Characteristics seemed to group all similar items together. For the remaining three themes, which were Supervisor's Dedication to Thesis Supervision, Relationships with Students, and Understanding of the Thesis, some items that were not similar were grouped within the same theme. For example, three items were placed under Relationships with Students – item No. 4 "Your supervisor had ability to evaluate the quality of research in the field", item No. 18 "Your supervisor possessed the ability to think critically and analytically", and item No. 27 "Your supervisor had potential to evaluate the thesis and the student's ability to prepare the thesis." However, it seems that not all of these belong under this theme. Likewise, there were two items each under Supervisor's Dedication to Thesis Supervision and Understanding of the Thesis variables that were not so related to the rest of the items. This problem was probably caused by the complexity and ambiguity of the statements, which needs to be improved to make the statements shorter and clearer if the questionnaire is to be used in the future.

Despite the issue mentioned above, however, the items when grouped under the reported themes attained a satisfactory level of reliability, meaning that the questionnaire could be used as an instrument in a larger study.

The findings of this pilot study show the correlations between perception of supervision role and postgraduate research skills. In summary, the results showed positive statistically significant relationships between Student Essential Research Skills and Student Critical Thinking and Synthesizing Skills; Student Critical Thinking and Synthesizing Skills and Student Research Ethics; Student Critical Thinking and Synthesizing Skills, and Student Systematic Thinking Skills; and Student Critical Thinking and Synthesizing Skills and Supervisor Relationships with Students. These results supported the work of de Kleijn et al. (2012) who also reported a relationship between perceptions of the supervisor and student learning. Thus, these findings support a further and more detailed study with larger samples.

Some correlations show interesting relationships that should be investigated in the future. For example, Student Critical Thinking and Synthesizing Skills and Student Research Ethics were correlated with all of the remaining skills, implying that students who possess these two skills may also possess other skills as well. In other words, it can be argued that these skills are vital for postgraduate students as an advanced researcher. Thus, supervisors should nurture these skills in young researchers, which is in part consistent with Egan et al. (2009), who argued that effective supervision is a crucial factor to help students succeed in their thesis development. Furthermore, only one variable, Student Research Ethics, was associated with most supervisor roles (Supervisor's Dedication to Thesis Supervision, Relationships with Students, and Supervisor's Understanding of the Thesis). Interestingly, this one variable also shows association with all Student Skills. This can generate an assumption that supervisor roles can probably create student research ethics, which are strongly associated with all the remaining student skills. Several studies have been carried out to examine different models of supervision such as Nordentoft et al. (2013) and Agu and Odimegwu (2014). However, not many studies have been carried out to focus on creating particular skills. This finding points to a research gap that need to be further explored.

Relationships with Students was shown to have a statistically significant effect on student research skills. Thus, the study confirms what has been previously found regarding this issue by other researchers such as Mainhard et al. (2009) and de Kleijn et al. (2012). It would be worthwhile to study these factors in detail in future research. However, the Supervisor Characteristics variable had a negative statistically significant effect on student research skills, which is contrary to most of the literature. No sufficient logical explanation is offered for this phenomenon through this pilot study. A more comprehensive study may need to be carried out to verify this finding.

It is also important to point out that despite several studies showing that supervisor roles are vital for thesis completion (for example, Keser et al., 2010; Sheikh Abdullah et al., 2012), with Keser et al. (2010) also mentioning the importance of building research skills for graduate students, a study that associates the two factors is not yet available. Most of these research projects studied the two factors separately; therefore, at this juncture, it is not possible to discuss the findings based on previous works. The authors hope that this paper will bring more light to this area.

Conclusions and Recommendations

This pilot study was conducted in preparation for a deeper study to examine the relationship between students'perception of supervision role and research skills, following the OHEC guidelines for supervision. A questionnaire was constructed and used to collect demographic data and perceptions from 30 graduate students in a Faculty at a southern Thai university. A ten-point ranking scale was used to evaluate students' perception of supervisors' roles and their own research skills. Student research skills were assessed through 24 items in the questionnaire. Factor analysis grouped the research skills into four components; all of them had a high Cronbach's reliability score ranging between 0.846 and 0.930, whereas the supervision role was grouped into eight components. Only four of these were included in this study, and all of them also had a high Cronbach's reliability score of between 0.894 – 0.954.

The correlation analysis showed many variables that had statistically significant relationships with student research skills, between supervision roles, and between student research skills and supervision

roles. However, the regression analysis predicted that their effect on research skills depended significantly on relationships between supervisors and students, which agrees with earlier research studies. Even though not much can be summarised from this pilot study, it has shown interesting variables that should be given attention. These variables are supervisor characteristics (which are associated with all other supervisory roles), supervisor's dedication to the thesis, supervisor's comprehensive understanding of the student's work, and supervisor's good relationship with student. Therefore, supervisors should consider investing in developing these skills to provide better help to students. In other words, postgraduate research supervision should also receive formal supervision training (Orellana et al., 2016) in order to ensure better quality and completion of research theses.

Since there is minimal research work done on the association between supervisor's role in thesis supervision and student research skills, a larger study should focus on these factors in particular, in order to determine with certainty the association and effect between these factors.

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