Postgraduate Research Students' and their Supervisors' Attitudes towards Supervision

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Abstract

There is a need for research exploring postgraduate research students' expectations from research supervisors, the characteristics of effective student-supervisor relationships, and the opinions of students and supervisors about research supervision. We also need instruments to explore the student-supervisor relationship. The present study investigated postgraduate research students' and research supervisors' views about postgraduate research supervision and the student supervisor relationship. It also reports on factor analysis conducted to identify the underlying dimensions in their views about postgraduate research supervision and the student supervisor relationship. Such information can be used to develop strategies to promote student-supervisor relationships and enhance the student experience.

Data were collected using an online questionnaire with 30 Likert-scale statements from 131 postgraduate research students and 77 supervisors. Following exploratory factor analysis, a three factor model consisting of leaderhip, knowledge, and support was extracted. Results indicate that students and supervisors agree about the attributes of effective supervision. Both supervisors and students consider that a supervisor should have an interest in the student's research. The supervisor must provide timely and constructive feedback and should help the student to manage time effectively. Students and supervisors believe a supervisor should help the students where limitations and learning needs are identified. Students believe supervisors must encourage students to work independently and use opportunities to present their work.

Keywords: supervision; effective supervisor; research students' expectation; supervisors' expectation; PhD supervision; opinion

Introduction

Enrolling in a postgraduate research (PGR) program such as a PhD is an important long-term commitment that has the potential to transform a student's life. Throughout the period of PhD studies, a key person in a student's life is his or her research supervisor; therefore, an effective working relationship between the supervisor and the student is crucial (Bair & Hawoth, 2004; Murphy, Bain, & Conard, 2007; Shariff, Ramli, & Ahmad, 2014; Tahir, Ghani, Atek, & Manaf, 2012). Sambrook, Stewart, and Roberts (2008) state that "the purpose of supervision is to steer, guide, and support students through the process of conducting a doctorate" (p. 72); they further state that a research supervisor's role is "… to provide both technical and emotional support..." (p. 72). Quality of supervision is one of the most significant issues affecting successful completion of PhD programs in Higher Education Institutions (HEIs) internationally (Latona & Browne, 2001; Petersen, 2007; Wright, 2003). The student-supervisor relationship is an important determinant of quality of supervision.

Some research has been conducted to investigate the students' level of satisfaction with their PGR supervision experiences, quality of supervision (Tahir et al. 2012; Zuber-Skerritt & Ryan, 1994), and students' and supervisors' beliefs about supervision (Murphy et al. 2007). The qualities of an effective supervisor and the research students' expectations of their supervisors have also been explored while investigating supervisory styles, supervisory relationships, attrition, and non-completion of the PhD (Latona & Browne, 2001; Sharif et al. 2014; Tahir et al., 2012). Evidence suggests that ambiguous and dissimilar assumptions and expectations on the part of the supervisor and the student give rise to problems in the supervisory relationship (Abiddin, Ismail, & Ismail. 2011; Aspland, Edwards, & O'Leary 1999; Hockey, 1996; Tahir et al. 2012; Talebloo & Baki, 2013). A clear understanding of the role of the supervisor and student is crucial to building a healthy and productive supervisory relationship (Thompson, Kirkman, Watson, & Stewart, 2005) and successful completion of the PhD degree. Empirical literature about the characteristics of an effective PGR supervisor suggests the supervisor should be an active, competent, knowledgeable researcher who is able to analyze and enhance his or her research students' research practices as a result of personal reflection and development (Abiddin & West, 2007a; Brown & Atkins, 1988; Donald, Saroyan & Denison 1995). Others believe that aeffective PGR supervisors should have a track record of research publications demonstrating a contribution to their field of research (Frischer & Larsson, 2000; Phillips & Pugh, 2000) and ideally, a track record of supervising a large number of PhD students (Yeatman 1995). The supervisor is also expected to have counselling skills (Abiddin, 2007a; Hockey, 1997), a willingness to be available to students when they need help, and an ability to give constructive feedback (Easterby-Smith, Thorpe, & Lowe 2002; Sambrook, et al. 2008; Talebloo & Baki, 2013; Wisker, 2007, 2012) to students. Supervisor's leadership style is also an important consideration as it can influence the outcome of doctoral study. For example, while attempting to identify the causes of doctoral students' failure to complete within the stipulated four year period, Frischer and Larsson (2000) interviewed 15 students who had dropped out from a Swedish university. Findings revealed that the *laissez-faire* leadership style of the supervisor, whereby the student was left without appropriate and timely direction, was not effective. Specific factors leading to the students' failure to complete the PhD program included irregular and infrequent meetings with the supervisor, inability of the supervisor and the student to set research goals, and a general lack of direction of the student from the supervisor. The authors suggested development of a "working alliance" between the supervisor and the student at the start of the program.

Studies exploring students' experiences of PhD supervision suggest that students prefer to have frequent meetings with their supervisor, especially in the first year of their study (Abiddin & West, 2007b; Talebloo & Baki, 2013). Students expect their supervisor to act as a guide who helps them throughout their doctoral studies, from the selection of the topic to the completion of

their research. They also expect their supervisors to provide regular, timely, and constructive feedback on their written work and overall progress in the program (Abiddin, 2007a; Abiddin et al., 2011; Abiddin & West, 2007b; Tahir et al. 2012; Talebloo & Baki, 2013). Much of the evidence related to students' expectations of their supervisors comes from reflective, or theoretical and scholarly papers. There is, however, very little empirical evidence available on supervision from the perspective of PGR students and supervisor (Jones, 2013), though, some studies have explored students' and supervisors' expectations of supervisory practices and the characteristics of good supervisors. There is still a need for empirical inquiry to explore the views and opinions of students and supervisors regarding PGR supervision to understand the expectations of students and supervisors (Lee, 2007, 2008).

At the same time, there is a need to develop robust instruments that can be used to explore the student-supervisor relationship in various contexts and settings. Over the years, factor analysis has been applied in studies of research student supervision. For example, Drennan (2008), in a 27 item questionnaire, used factor analysis to distinguish six dimensions; only one of these (Supervision) was specific to the research student-supervisor relationship, the remainder were concerned with structural phenomena, e.g., 'Intellectual climate' and 'Infrastructure'. Similarly, Bagaka, Badillo, Brantester, and Rispinto (2105) studied the quality of supervisor support alongside other aspects of the research student experience such as 'quality of program support' and 'general quality and structure of the program'. Mainhard, van der Rijst, va Tartwijk, and Wubbels (2009) examined research student-supervisor relationships by analyzing the results from eight separate scales. In the individual studies examined by Mainhard et al. (2009), the research student–supervisor relationship was envisaged as a single dimension. However, Mainhard et al. identified that there were different aspects of the student–supervisor relationship, such as 'Dominance' and 'Cooperation'. Therefore, there is a need to develop robust instruments that can investigate the student-supervisor relationship and to explore and report psychometric properties of such instruments. Such tools will help various stakeholders such as universities, PGR supervisors and students themselves to identify important aspects of PGR student-supervisor relationships within different contexts. Such information can be used to identify, develop, and implement strategies to promote student-supervisor relationships and enhance student PhD experience. Considering this, the present paper aims to report on the findings of a study that investigated PGR students' and supervisors' opinions about PGR supervision and student supervisor relationship.

The paper also reports on the factor analysis conducted to identify the underlying dimensions in the supervisors' and students' views about postgraduate research supervision and the student supervisor relationship. The findings of the study will help to enhance our understanding of students' expectations of their supervisors. The findings will also help in the appreciation of research supervisors' expectations of themselves as supervisors. The paper also reports on the factor analysis conducted to identify the underlying dimensions in the questionnaire. The findings of the study may help to enhance our understanding of students' expectations of their supervisors. The findings may also help in the appreciation of research supervisors' expectations of themselves as supervisors. The unique aspect of the present study is that it focuses solely on the research student–supervisor relationship and interrogates it in detail.

Method

The study presented here was conducted using a quantitative descriptive design (Creswell, 2013) at an English University. As described below, a lengthy questionnaire was developed aimed at exploring the research student-supervisor relationship. It is unlikely that there is only a single dimension to the multifaceted research student-supervisor relationship. Therefore, this study uses a multivariate statistical method called *factor analysis*, specifically exploratory factor analysis (EFA), which is used to identify the underlying dimensions in multivariate datasets (Watson &

Thompson, 2006) and has been applied to previous studies of different aspects of research student supervision. Ethical approval for the study was obtained from the University Ethics Committee. The study required respondents to complete an online questionnaire; therefore, attempting the survey was considered consent to participate in the study.

Setting

The study was conducted in in a University in North of England, United Kingdom (UK). All PhD students (full time and part time) enrolled in any department of the university were invited to participate. Similarly, academic staff acting as primary supervisor for PhD students were eligible to participate. Considering that doctoral supervision models vary in different countries (Watson, Thompson, & Amella, 2011), it is important to describe the UK context to help the reader understand the study setting. In the UK, the prevailing arrangement for doctoral supervision is the appointment of a very small team of supervisors—most commonly two—with one taking the primary role as first supervisor and the other as second supervisor. As far as possible, substantive and methodological interests are balanced between the supervisors and match the interests of the student. The supervisory team usually remains in place and intact throughout the doctoral research project (three years for full-time and four years for part-time) and play no part in the examination of the final thesis. The examination of the thesis is organized by an internal examiner from the supervising university who liaises with an external examiner and a major part of the examination process is by oral examination (*viva voce*). The internal examiner plays an equal role to the external examiner in examining the PhD. The role of internal examiner is probably unique to the UK and Australia only.

Participants

In this study, a total of 269 participants (168 PhD students and 101 PhD supervisors) attempted the questionnaire. Completed questionnaires were received from 208 participants (131 students and 77 supervisors) and were included in the analysis. Table 1 summarizes the demographic characteristics of the respondents of the study. The average number of students supervised to date by the supervisor respondents ranged from 1- 68 (Mean = 11.4; SD = 12.1) students. The number of current full time students supervised by the respondents ranged from 1-15 (Mean = 3.05; SD = 2.5) students. The number of current part time students supervised by the supervisor respondent ranged from 1-13 (Mean= 1.53; SD= 3.1) students.

Table 1: Demographic characteristics of the Study Participants

Characteristics	Students N (%)	Supervisors N (%)
Gender Male Female	48 (36.6) 83 (63.4)	55(71) 22 (29)
Age Range	21-58 years (Mean=30.75; SD=10.64)	29-63 years (Mean=45; SD= 8.3
Registration Full time Part time	112(86) 19 (14)	

Characteristics	Students	Supervisors
	N (%)	N (%)
Language		
English	90(69)	
Arabic	4(03)	
Chinese	5(04)	
German	6 (05)	
Malay	4(03)	
Spanish	4 (03)	

Instruments

Data were collected through a questionnaire designed for the study by the authors. Items in the questionnaire were derived from the literature (Abiddin, 2007a; Abiddin & West, 2007a; Brown & Atkins 1988; Donald et al. 1995; Easterby-Smith, et al. 2002; Frischer & Larsson, 2000; Hockey, 1997; Phillips & Pugh, 2000; Sambrook, et al. 2008; Wisker, 2007, 2012), discussions with experts and colleagues within the profession, and from the researchers' personal experiences and observations. The questionnaire contained 30 items that assessed the respondents' views about PGR supervision. There were two sections in the questionnaire. The first section required respondents to provide demographic information about themselves, and the second section consisted of 30 statements regarding supervision. Respondents were required to rate each item, for example: 'Shows an interest in the students' research' or 'Help the students in choosing the research topic', on a five point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

Pilot Testing

After development, the questionnaire was reviewed by three experienced supervisors to determine face validity and the appropriateness of the content. The questionnaire was then piloted with five PhD students and four supervisors. Respondents provided feedback about the questionnaire relating to its length, and comprehensibility. The authors used this feedback to improve the questionnaire by reducing the length of the questionnaire and deleting repetitive statements.

Reliability and Validity

In addition to exploring PGR students' and supervisors' opinions about PGR supervision and student supervisor relationship, the purpose of the study was to conduct a factor analysis to investigate the psychometric properties of the new instrument. The content validity was established—as described above—using a combined approach of extracting items from the existing literature, personal experiences of supervision as supervisors and students, and pilot testing. Following this, the factorial validity of the instrument and reliability of the questionnaire was explored using exploratory factor analysis (Watson & Thompson 2006).

Data Collection

Data were collected using an online questionnaire. Emails inviting PGR students and supervisors to participate in the study along with the link to the online questionnaire were sent with the assistance of the university's computing service. A reminder email was sent following two weeks of the initial invitation to encourage participation.

Data Analysis

Data were first downloaded to Excel spreadsheets and then imported into SPSS version 22 for analysis. Data were analyzed in two steps. Descriptive analysis was conducted to summarize the

participants' responses to each item on the questionnaire. Independent t-tests were used to explore differences between the students and supervisors' views about PGR supervision. In addition, EFA was conducted on the questionnaire using principal components analysis (PCA) followed by varimax rotation. PCA is not strictly factor analysis, but is probably the most commonly applied method of data reduction and provides almost identical results to other forms of factor analysis (Watson & Thompson, 2006) and is ideal for preliminary identification of the number of dimensions to be rotated and studied using confirmatory factor analysis. Sampling adequacy was checked via Kaiser-Meyer-Olkin (KMO) statistic. The KMO statistic for the scale was 0.80. The number of components to extract were determined on the basis of eigenvalues >1 (Kaiser, 1970); inspection of the scree plots for the eigenvalues (Cattell, 1966), and Monte Carlo parallel analysis. Following the procedure described by Ferguson and Cox (2007), the initial matrices were inspected for crossloading of any items loading at more than 0.30 on more than one factor. Any crossloading item was removed before repeating the rotation. The process was repeated until the structure shown in Table 2, was obtained with loading of items on putitive factors > 0.4.

Table 2: Principal component analysis with varimax rotation

Item	Communalities	First principal unrotatted component	Component		
			1	**2**	**3**
26	0.617	0.766	**.755**	.213	.036
28	0.590	0.686	**.753**	.097	-.119
30	0.491	0.650	**.685**	-.006	.147
21	0.449	0.580	**.662**	.020	-.104
20	0.480	0.664	**.633**	.079	.271
17	0.401	0.601	**.623**	.116	-.009
29	0.334	0.511	**.573**	.030	-.070
27	0.407	0.636	**.559**	.274	.138
4	0.319	0.528	**.520**	.017	.222
16	0.286	0.527	**.454**	.184	.214
13	0.238	0.487	**.430**	.173	.152
6	0.603	0.672	.102	**.765**	-.091
11	0.377	0.419	.107	**.591**	.125
10	0.362	0.445	.244	**.532**	.142
1	0.299	0.524	-.052	**.528**	-.133
12	0.353	0.467	.265	**.476**	.236
22	0.523	0.545	.024	-.121	**.713**
14	0.479	0.612	.065	.235	**.647**
19	0.266	0.458	-.037	.030	**.513**
23	0.285	0.360	.178	.009	**.503**
	Cronbach's alpha for factors		0.84	0.61	0.54
	Cronbach's alpha for total scale		0.81		

Findings

Views about PGR Supervision:

Table 3 presents descriptive statistics for each statement related to respondents' views about supervision. Means and standard deviations are presented for the whole group of respondents and for students and the supervisors separately. Respondents identified 'show an interest in the student's research' (Mean= 4.78; SD =0. 59), 'provide critical feedback on the student's written work in good time' (Mean = 4.65; SD = 0.61) and 'encourage the student to present their work at seminars and conferences' (Mean = 4.59; SD = 0.74) as the most important expectations of research supervisors. The least important expectations of the research supervisor included that the supervisor should 'ensure that the student has conducted a training needs analysis to identify their personal and professional skill requirements' (Mean = 3.56; SD = 0.96), 'continually motivate the student' (Mean = 3.85; SD = 1.01) and 'be accessible outside appointment times when the student needs help' (Mean = 3.86; SD = 0.99).

An independent sample *t*-test was conducted to explore differences in the student and supervisors' views about PGR supervision. There was no significant difference in the students' (Mean = 123.32; SD = 11.79) and supervisors' (Mean = 126.34; SD = 8.59) views about PGR supervision t (206) = 1.96, $p < 0.05$.

Factor Analysis

Loadings on the first unrotated principal component ranged from 0.36 to 0.77, and the mean loading was 0.56 (based on results shown in Table 2). A three-factor solution containing 20 items that explained 41% of common variance was accepted for the dataset. These factors were labelled as 'leadership', 'knowledge' and 'support' respectively (Table 4).

Table 3: Postgraduate research students' and supervisors' views about PGR supervision

The supervisor should	Combined	Supervisors	Students
	Mean (SD)	Mean (SD)	Mean (SD
1. Shows an interest in the students' research	4.78(0.59)	**4.74(0.77)**	4.80(0.45)
2. Provide critical feedback on student written work in good time	4.65(0.61)	**4.71(0.48)**	4.62(0.67)
3. Encourage the student to present their work at seminars/conferences	4.59 (0.74)	**4.77(0.42)**	4.48(0.86)
4. Be friendly	4.55(0.72)	**4.61(0.59)**	4.51(0.79)
5. Encourage the student to work independently	4.53(0.61)	**4.74(0.50)**	4.40(0.64)
6. Be knowledgeable about the standards expected	4.47(0.74)	4.57(0.72)	4.40(0.75)
7. Ensure that the student is aware of the shortcomings of their work and progress	4.44(0.66)	4.51(0.56)	4.40(0.69)
8. Be approachable	4.39(0.95)	4.40(0.92)	4.39(0.97)
9. Ensure that arrangement for upgrade from MPhil to PhD are appropriate	4.34(0.74)	4.39(0.76)	4.31(0.78)
10. Ensure that the student's research is manageable in the time available	4.32(0.67)	4.34(0.58)	4.31(0.772

The supervisor should	Combined Mean (SD)	Supervisors Mean (SD)	Students Mean (SD)
11. Provide assistance in orientating the student towards appropriate behavior in the oral examination	4.30(0.84)	4.39(0.65)	4.24(0.89)
12. Share the student's research interests	4.28(0.70)	4.29(0.72)	4.28(0.69)
13. Be available whenever the student needs help with their research	4.26(0.92)	4.36(0.87)	4.21(0.94)
14. Help the student develop their writing	4.25(0.74)	4.35(0.62)	4.18(0.79)
15. Have good verbal communication skills	4.23(0.69)	4.27(0.66)	4.20(0.72)
16. Gives the student information about appropriate meetings, conferences and training opportunities	4.20(0.72)	4.23(0.72)	4.18(0.72)
17. Be knowledgeable about the student's research topic	4.17(0.75)	4.23(0.56)	4.14(0.85)
18. Ensure that the student meets deadlines	4.15(0.87)	4.43(0.73)	3.99(0.91)
19. Be an active researcher	4.13(0.88)	4.45(0.69)	3.94(0.92)
20. Ensure all practical arrangements are made for the oral examination, including liaison with examiners	4.07(1.0)	3.83(1.21)	4.21(0.84)
21. Be a good role model to the student	4.07(0.82)	4.19(0.79)	4.00(0.83)
22. Help the students in choosing the research topic	4.07(0.84)	4.21(0.83)	3.98(0.84)
23. Ensure that the student acquire appropriate specialist research and generic skills	4.05(1.23)	4.38(1.07)	3.85(1.29)
24. Give detailed advice and set deadlines for the submission of reports and parts of the thesis	4.04(0.84)	4.14(0.76)	3.98(0.88)
25. Ensure that any student whose first language is not English is given the opportunity to attend University courses to develop his/her English language skills	4.03(0.94)	4.27(0.83)	3.89(0.97)
26. Have leadership skills	4.00(0.83)	3.94(0.88)	4.03(0.80)
27. Ensure that supervision records are written, agreed and subsequently filed	3.92(0.88)	3.99(0.85)	3.89(0.90)
28. Be accessible outside appointment times when the student needs help	3.86(0.99)	3.90(0.93)	3.84(1.03)
29. Continually motivate the student	3.85(1.0)	3.94(0.89)	3.80(1.07)
30. Ensure that the student has conducted a training needs analysis to identify his/her personal and professional skill requirements	3.56(0.97)	3.52(0.94)	3.58(0.98)

NB. Please note that the table contains all statements in the questionnaire prior to EFA. The numbering here does not reflect the actual numbering of the statement used for PCA reported in Table 2. These statements have been ranked in ascending order according to the combined mean value.

Table 4. Factors and underlying items related to students' and supervisors' views about PGR supervision

Factor	Item statement	Variance Explained
Leadership	• Ensure that arrangements for the upgrade from MPhil to PhD are appropriate and timely • Give detailed advice and set deadlines for the submission of reports and parts of the thesis • Provide assistance in orientating the student towards appropriate behavior in the oral examination • Ensure that the student has conducted a training needs analysis to identify his/her personal and professional skill requirements • Ensure that supervision records are written, agreed and subsequently filed • Continually motivate the student • Ensure all practical arrangements are made for the oral examination, including liaison with examiners • Ensure that any student whose first language is not English is given the opportunity to attend University courses to develop his/her English language skills • Provide critical feedback on his/her student's written work in good time • Be knowledgeable about the standards expected • Have leadership skills	21.636
Knowledge	• Be knowledgeable about the student's research topic • Helps in choosing the research topic • Be a good role model to the student • Share the student's research interests • Have good verbal communication skills	10.043
Support	• Ensure that the student acquires appropriate specialist research and generic skills • Encourage the student to work independently • Be accessible outside appointment times when the student needs help • Encourage the student to present their work at seminars/conferences	9.120

The first factor was labelled '*Leadership'* and contained 11 items related to supervisors' ability to lead the supervision process to facilitate and enhance learning by the student. The items in this factor were related to leading the supervision process, helping the students to identify their learning needs, ensuring arrangements of the progression exams of the students, maintaining supervision records, motivating the students, and ensuring standards are met. Table 4 provides details of

the items included in Factor One that explained 21.6% of the variability in respondents' views about PGR supervision.

The second factor was named '*Knowledge'* and contained five items concerning knowledge and skills of a supervisor such as knowledge of a research topic, ability to help the student to choose a research topic, being a good role model, and the ability to communicate effectively. This factor explained 10% of variation in respondents' views about PGR supervision. The third factor was labelled '*Support'* and consisted of four items related to supervisor's ability to support students in acquiring appropriate research skills, working independently, and developing confidence and abilities to present their work in seminars and conferences. The factor also contained an item about supporting the student by being accessible outside appointment time. This factor explained 9% of the variance. Table 4 provides details of the items included and the variability explained by each factor.

This study found three important aspects of students' and supervisors' views about PGR supervision. Supervisors' leadership skills in steering the supervision process was clearly the most important factor for respondents. Supervisors' knowledge and support offered to students were also important.

Discussion

The present study explored PGR students' and supervisors' opinions about PGR supervision and student supervisor relationship. The study also reported underlying factors in the questionnaire as identified by factor analysis. Respondents in this study indicated that a supervisor is expected to show an interest in the student's research, provide timely and constructive feedback, and encourage the students to work independently, as well as present their work when opportunities arise. A supervisor is also expected to help students understand their shortcomings and to help them manage their research in a timely manner. An effective supervisor is expected to be friendly, approachable, and aware of the standard of work expected from a student. The findings of this study are consistent with the literature available, as similar expectations of an effective supervisor have been reported previously (Abiddin, 2007b; Abiddin & West, 2007b; Easterby-Smith, et al. 2002; Sambrook, et al. 2008; Thompson et al., 2005; Wisker, 2007, 2012). It is interesting to note that the supervisor's and students' views about PGR supervision were very similar. As shown in Table 3, there was a consensus between supervisors and students about the most important and least important expectations from a supervisor. For instance, both supervisor and students felt that any students with English as a second language should be given the opportunity to develop their English language skills. Other examples include the statements about supervisor's leadership skills and completion of supervision records. The supervisors should have the leadership abilities to not only provide appropriate direction for the student, but to help students to develop appropriate networks in their field. Similarly, appropriate completion and safe keeping of supervision record is essential to document the progress of a student in the PhD program and to keep an audit trail of the decisions made during supervision meetings. One explanation of the similarities may be that supervisors, while responding to the questionnaire, may have been reflecting upon their own experience of supervision when they were graduate students. The findings support research conducted by Wolderink and colleagues (2015) who explored relational aspects of PhD supervision in the Netherlands using a qualitative approach. According to the findings of the study, supervisors and students' views about supervisor's personality, personality, knowledge, skills, communication, and coaching overlapped. Both groups identified these as major factors contributing to a successful PhD.

There is a need to further explore various issues in different contexts and settings to undertand the rationale behind similarity of student and supervisor expectations. More specifically, the relevance and need of supervisor's leadership skills should be explored. Respondents who were su-

pervisors in this study expressed a concern that the arrangements for the final examination of the thesis was not the responsibility of the supervisor and, therefore, should not be expected of them. It may be that the supervisors see this as more of an administrative than academic process; however, this finding needs further exploration and analysis. There are many other issues that may impact on a supervisor's ability to support their PhD student appropriately. For instance, the provision of appropriate support and training opportunities to supervisors through structured, formal training and/or practice based learning activities is encouraged in many universities throughout Europe, Australia, and New Zealand (Halse, 2011; Halse & Malfroy, 2010). Other student-related factors that may have an impact on the supervisory process and student progress may include student's personal (family, financial issues) or professional responsibilities (work and work related stress) outside the PhD. There could be additional factors related to relocation and settlement to a new country for international students, which affect their academic progress and PhD supervision process (Sherry, Thomas & Chui, 2010; Son & Park, 2014). Exploration of these issues was outside the scope of present study. However, further research to explore these issues and their impact on the student supervisor relationship would be useful.

One of the objectives of the study was to explore psychometric properties of the questionnaire. EFA was used to determine the dimensionality of the scale. The factors were extracted using principal component analysis, and factors with eigenvalues greater than 1 were retained. Varimax rotation was requested because it was anticipated that the factors would be correlated. The solution yielded three factors (leadership, knowledge, and support), explaining 21.6%, 10%, and 9% of the variability in respondents' views about PGR supervision, respectively. This suggests that researchers should use subscale scores when applying this measure in research contexts as failing to do so may prevent the identification of meaningful relationships between the scale factors and various external variables. The value added in this study, by using EFA to analyze a questionnaire solely designed to measure the research student-supervisor relationship, is that underlying dimensions to that relationship have been identified. Previous studies—reviewed in the introduction to this article—using EFA incorporated only a small number of questions dedicated to the research student-supervisor relationship (Bagaka et al., 2015; Drennan, 2008; Mainhard, 2009) and assumed that this was a single dimension of the overall experience of students. Reviewing several studies on the research student experience facilitated generation of a relatively long questionnaire exhibiting different aspects of the research student-supervisor relationship. The utility of this information is where relationships between research students and supervisors encounter difficulties, for example, it may be clear that some aspects of the relationship are working whereas other aspects are unsatisfactory. Future studies with large samples of both students and supervisors would be required to explore the generalizability of the findings and usefulness of the developed instrument. In the structure we present here, our interpretation of the major factor as being concerned with 'leadership' could be viewed differently by students and supervisors. Supervisors may well consider the traits gathered under this factor to reflect their ability (or lack of it) to lead a supervisory team, gain new knowledge, and publish peer-reviewed articles; alternatively, students may just wish to have a good manager who will steer them smoothly through the process. The factor we label as '*Knowledge*' again could be viewed very differently by students and supervisors with the latter seeking the security that comes from having their questions answered but supervisors may see this as an expression of their eruditeness. Finally, the '*Support*' factor could be viewed by students as an assurance that their career development will be supported in the long term, whereas supervisors could be viewing these items through the lens of the work they have to dedicate to a doctoral student.

Limitations

The present study has some limitations. The findings of the study have limited generalizability, as the data for this study were collected from only one university. There is a large qualitative ele-

ment to labelling factors in EFA (as it is a subjective process), and clearly alternative explanations could be hypothesized for the factors named in this study. Also, the data were combined from supervisors and students and while in theory there should be some congruence in views, it is possible that separate samples may yield alternative structures.

Recommendations

Further research is needed to explore supervisors' and students' expectations of a research supervisor. It would be useful to examine the difference in students' views with respect to ethnicity, and registration status (full or part time study) as these factors may have an impact on experiences. Qualitative research may provide more insight into the subjective feelings of various stakeholders. In addition, views of other academics (PGR tutors, research directors) and professional staff supporting and coordinating PhD programs who may have a more holistic view of the supervisory process and student and supervisor related issues that affect this process should be explored. Further examination of the dimensionality of the scale using confirmatory techniques is recommended. It may also prove useful to study the concurrent validity of the instrument developed here, e.g., the extent to which supervisors meet the desirable qualities or report themselves as having those qualities could be compared with their personality types or levels of emotional intelligence using validated inventories.

Conclusion

The study has reported PGR students' and supervisors' opinions about PGR supervision and the student-supervisor relationship. In addition, the study also reported the psychometric properties of the questionnaire developed to explore student supervisor relationships. This research concludes that an effective PhD supervisor is expected to be interested in the student's research, provide timely and constructive feedback, help the student manage his/her time effectively, and recognize his or her areas for improvement. The supervisor should also encourage the student to work independently and to use opportunities to present his or her work at conferences and seminars. A good supervisor is also expected to be friendly, approachable, and aware of the standard of work expected from a student. The study provided valuable information with regard to the expectations of research supervisors, not only from a postgraduate research students' perspective, but also from the research supervisor's perspective. As research students are consumers or customers of HEIs, it is important for HEIs and research supervisors to be aware of students' expectation from their supervisors, so that students may be provided with more individualized and student-centered services.

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