Engineering Education Research Supervision: Communicating Expectation Using Supervisory and Student Learning Styles

Suriana Nasir[1, a] and Alias Masek[2, b]

[1]Faculty of Technical and Vocational Education, Universiti Tun Hussien Onn Malaysia (UTHM), 86400 Batu Pahat, Johor, Malaysia.

[2]Faculty of Technical and Vocational Education, Universiti Tun Hussien Onn Malaysia (UTHM), 86400 Batu Pahat, Johor, Malaysia.

[a]suriana_nasir@yahoo.com, [b]aliasmasek@uthm.edu.my

Abstract. Establishing congruence relationship between students and supervisor in research supervision has been highlighted by many authors in the literature, especially in communicating expectation at the beginning of the research. It is particularly in engineering education research, engineering students normally activating multiple dimensions of learning styles and supervisors on the other hand, have their own supervisory styles and expectation. The literature suggests that in-congruence between students' learning and supervisory styles are one of the key factors that slow a student study progress. Therefore, this research attempts to establish congruence student-supervisor relationship using supervisory and student learning style in communicating expectation. This study will employ a three phase mix method approach for data collection. The first phase will be a survey to students and supervisor on expectation of supervision and supervisory style of supervisors, as well as learning style of research students; the second phase will be a comparative analysis of students and supervisor's expectation mediated by students learning styles and supervisory styles; and the third phase will be the post analysis in establishing congruence relationships framework. The participants will be engineering education research students and supervisors from technical and vocational education faculties in local universities. Data will be analyses using Structural Equation Modelling (SEM) and computer aided software. It is expected that the model will help to expedite graduation, increase graduation rates, and improve the quality of research in engineering education.

Introduction

Successful studies completion is a key performance indicator for universities and a significant criterion for the accreditation of their staff [1]. However, successfully completing a studies is complex, demanding and time consuming and is commonly associated with a variety of potential problem, far too numerous to explore in one single paper [2]. Previous research have pointed out that there are high proportions of graduate students who fail to complete their studies within the time given [3]. Many authors on this area identified there are multiple factors contributed to failure completing studies on time [3, 4].

According to Ismail, Abiddin and Hassan [3], one of the most factors of completing a study successfully and on time is related to the student-supervisor relationship. Other research indicates that the supervisor- student interpersonal relationship is important for the success of a project for example reported that good interpersonal working relationships between supervisors and their students were associated with good progress and student satisfaction [4]. Supervision is concerned as the mechanics of ensuring that the students make good progress towards completion [5]. Effective supervision of research students is acknowledged as a crucial factor in the latter success completion of the research [6]. Supervision is a process to met the individuals goals that comprised of three basic tracks; administrative, educational and supportive [19].

This paper describes the supervisory and learning styles. If the supervisor's and student's learning styles are similar, research supervision may go well, but recent research seems there was a different between the supervisor's and student's learning styles [7]. The aim of this study is to communicating expectation using supervisory and student learning styles.

Related Works

Research Supervision. Academic institutions has defined research as an original investigation undertaken in order to gain knowledge and understanding and, while gaining knowledge might be narrowly seen as amassing facts, understanding necessarily involves explanation: finding out why the phenomenon is as it is [8]. While, in the educational and learning process, supervision is the most important part in the development of students or the continuing professional development of student [9]. The concept of research project supervision is the combination of three inter-related areas: the learning and teaching process; developing the student; and producing the research project/outcome as a social practice [10]. Supervision is centrally a teaching/learning process but also a practice that has parallel processes which are student development and the research itself [8]. Previous studies have been proved supervisors significant contribution on students successful in research and dissertation (11; 12; 13). Ives and Rowley [12] pointed that relationship between students and supervisor was associated with student's progress and satisfaction with their students and thesis project. Besides, the different expectation between students and supervisors also contribute to unsatisfied students with their supervisor [14]. Students seem to need more supports with all aspects of empirical research but supervisors might insufficiently communicate their expectation and fully delegate research progress to students with minimal support [14].

Supervisory Styles. Three styles of supervision had been pointed by Abiddin [15], which are highly directive approach at the early stage by giving a lot of advice; highly directive at the beginning and end of the project, with highly non- directive in between; and highly directive with close monitoring of the student throughout the whole project. Direct research, supervisors help in critical analysis of research, methodological problems, precise direction and management of project. Indirect research, supervisors help in providing contacts, equipments and locating references. According to Newton and Napper [8], supervision can be ethical and effectiveness by kept in balances the three function of supervision which are management, support and education or development. Agreed by Al-Naggar [14], supervisory process involved all stages from the topic selection, monitoring the progress, time management, scientific writing skills and emotional support. Supervisors may expectation their students to have a clear idea of what they would like to research on, to be self-motivated, to work consistently, to take responsibility for keeping notes of meetings, to work on the feedback given to them, to complete on time, to take ultimate responsibility for their own work, to be independent, to be proficient in the language, to do their own or outsource editing and proof-reading, and to keep to appointments for meetings [9]. In supervisor's perspective, there has been included supervisory relation, joint supervision, record keeping and documentation, and identifying the needs of student [2]. Supervisory styles have been influenced by the supervisor's characteristics such as background of study, level of expertise, age, and numbers of supervised students, languages, and joint publication [17]. Agreed by Lee [16], the quality of supervisors is depends on the level of supervision experiences. Similarly to Ismail and Abiddin [13], an effective supervisor should have larger experience base, encouraging, facilitator, resourceful, committed to student, multidisciplinary, highly organized and insightful.

Student Learning Styles. Learning has been known as the process of changing domains skills, knowledge, and attitudes [7]. Even though there are default modes for the learning of particular content, students adopt their own personal learning styles. Learning styles had been defined in terms of where they position themselves on the following five scales [8]: Sensing-intuitive: preferring to perceive information through the senses (sights, sounds, physical sensations) versus intuition (memories, ideas, insights); Visual-verbal: perceiving sensory information most effectively through the visual channel (pictures, diagrams, graphs, demonstrations) versus the verbal (sounds, written and spoken words and formulae); Inductive-deductive: preferring information to be organized inductively (facts and observations presented first from which underlying principles are inferred) versus deductively (the principles are given first and from these consequences and applications are deduced); Active-reflective: processing information actively (through engagement in physical activity or discussion) versus reflectively (through introspection); Sequential-global: progressing towards understanding sequentially (in a logical progression of small incremental steps) versus globally (in large jumps, holistically). According to Abiddin [13], students may expectation their supervisors to identifying/ finalizing the topic of research, describing research issues, deciding on the theoretical framework, helping or facilitating the preparation of a research proposal, helping with oral presentations, familiarizing students with the appropriate services and facilities of department and the university, obtaining reading materials, helping in reading, understanding and critically evaluating the reading material, facilitating funding, helping to find part-time employment if necessary, helping with networking and encouraging conferencing and publishing.

Relationship. Several problems in supervisory relationship have been lists by Tim, Rijst, Tartwijk, and Wubbles [15], which are the supportive helping role of supervisor and the requirements of the role to warrant dissertation quality, supervisory style, and lack of evaluation for supervisory experience or purpose of supervision. Effective communication is important for a successful placement of dissertation. According to Abiddin [13], the most important elements of supervision are remains good communication between students and supervisors. Previous study had shown the different between satisfaction level on supervisory relationship characteristics due to communicating at the first meeting, accommodation, methods of connection, and guidance [16]. The gap in communication arises due to age, cultural, or language, or personal differences in the approach work may lead personal clashes [17]. Agreed by Al-Naggar [14], student's intellectual development can be boost when supervisors read student's written work and provide constructive criticism and suggestions. However, majority students had been complaint that supervisors not provide a time to revise their work and may contributes to lack of motivation and communication by each of them.

Methodology. This study will employ a three phase mix method approach for data collection. The first phase will be a survey to students and supervisor on expectation of supervision and supervisory style of supervisors, as well as learning style of research students; the second phase will be a comparative analysis of students and supervisor's expectation mediated by students learning styles and supervisory styles; and the third phase will be the post analysis in establishing congruence relationships framework. The participants will be engineering education research students and supervisors from technical and vocational education faculties in local universities. The instrument will verify by Structural Equation Modelling (SEM), Amos software. The method of data collection (instrument) will be according to objective as follows:

    Phase 1 (Preliminary research). Objective i - to come out with a list of supervisory styles that has been practices by research students' supervisors. *Method:* Questionnaire will be distributed to supervisors, supported by focus group unstructured interview. Objective ii - to determine research students' learning style (first semester, final semester, and drop-out students).
    Method: Questionnaire will be distributed to students (first semester, final semester, and drop-out students), and supported by focus group unstructured interview.

Phase 2 (Comparative analysis). Objective iii - to compare supervisory styles and research students' learning style. *Method:* Inferential statistic (ANOVA) will be used for comparing quantitative data, while qualitative data will be compared thematically.

Phase 3 (Post analysis). Objective iv - to draw a guideline on a congruent styles of students-supervisor of the research students supervision. *Method*: Post data analysis, integration, and interpretation of the findings from the first, second, and third objective.

Conclusion

Effective supervision is important to produce and enhance the quality of dissertation at the end of study. Existing literature offers various model/styles of supervision, but effective supervision model and learning styles that meets both the student-supervisor needs remain elusive. Therefore, this research attempts to draw a model on a congruent style of students-supervisor of the research students' supervision for educational research. The outcome expected is that the model of technical-best approaches of supervising research students that will help to expedite graduation, increase graduation rates, and improve the quality of research in education.

References

[1] B. M. Yam, Professional doctorate and professional nursing practice, *Nurse Educ Today*, 25(7) (2005), 564-572.

[2] P. Gill and P. Burnard, The student-supervisor relationship in the phD/Doctoral process, *British Journal of Nursing*, 17(10) (2008), 668-672.

[3] A. Ismail, N.Z. Abidin and A. Hassan, Improving the development of postgraduates' research and supervision, *International Education Studies*, 4(1) (2011), 78-89.

[4] C. M. Golden, Should I stay or should I go? Student descriptions of the doctoral attrition process. *The Review of Higher Education*, 23(2) (2000), 199-227.

[5] J. Hockey, Getting too close: a problem and possible solution in social science PhD supervision, *British Journal Guide Council*, 23(2) (1996), 199-210.

[6] J. Frischer and K. Larsson, Laissez-faire in research Education – An inquiry into a Swedish Doctoral Program. Higher Education Policy, 13(2) (2000), 132-155.

[7] T. Newton and R. Napper, The bigger picture: Supervision as an educational framework for all fields, *Transactional Analysis Journal*, 37(2) (2007), 150-158.

[8] V. Kumar and B. B. K. Huat, A handbook for postgraduate supervision, *Ministry of Higher Education*, (2011), 1-112.

[9] A. Ismail and N.Z. Abiddin, Train the research supervisors for continuing professional development, *Graduate Research in Education*, (2013), 204-207.

[10] T. W. Maxwell and R. Smyth, Theorizing about higher degree research supervision: A tripartite view, *Higher Education Research and Development*, 21(3) (2009), 34-41.

[11]M. Pearson and A. Brew, Research Training and Supervision Development, *Studies in Higher Education*, 27(2) (2002), 135-159.

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

[13] N.Z. Abiddin, Postgraduate students' perception on effective supervision: a case study at one public university in Malaysia, *The Journal of International Social Research*, 1(1) (2007), 7-19.

[14] R.A. Al-Naggar, M. Al-Sarory, A.G.A. Al-Naggar, and M. Al-Muosli, Doctorate international students' satisfaction and stress on academic supervision in a Malaysian University: a qualitative approach, International Research Journals, 3(3)(2012), 264-269.

[15] T. Mainhard, R. V.D. Rijst, J. V. Tartwijk, and T. Wubbles, A model for the supervisor-doctoral student relationship, *High Educ*, 59 (2009), 359-373.

[16]A. Lee, How are doctoral supervised? Concepts of research supervision, *Studies in Higher Education*, 33(4) (2008), 267-281.

 [17]E. K. Ghani and J. Said, The PhD supervisory relationship gap in the accounting discipline: a study in a Malaysian Public University, *International Research in Education*, 2(1) (2013), 73-92.

[18]J. G. Donald, Graduate student supervision policies and procedures: A case study of issues and factors affecting graduate study, *The Canadian Journal of Higher Education,* XXXV(3) (1995), 1-29.

[19] A. Kadushin, Supervision in Social Work (2nd Ed.). New York, NY, Columbia University Press 1985.