

Factors Contributing To the Timely Completion of PhD at the Malaysian Public Higher Educational Institutions

Nurhazani Mohd Shariff¹, Kamal Izzuwan Ramli², Rozila Ahmad³

School of Tourism
Hospitality & Environmental Management
UUM COLGIS, Sintok, Kedah, Malaysia
¹hazani@uum.edu.my, ²izzuwan@uum.edu.my, ³rozila@uum.edu.my

Azlan Zainol Abidin

School of Accounting
UUM COB, 06010 Sintok, Kedah, Malaysia
azlan@uum.edu.my

Abstract: *This study investigated the perceptions of PhD candidates on factors contributing to the timely completion of PhD at the Malaysian Public Higher Educational Institutions. The study focused on six factors namely supervision arrangements factor, research skills factor, research work factor, institutional factor, motivational factor and de-motivational factor. 320 PhD candidates from Universiti Utara Malaysia were selected as respondents. The data gained were then statistically analyzed using descriptive statistics analysis. The findings revealed that the PhD candidates perceived research skills factor as the most contributing factor to the timely completion of their study. Supervision arrangements factor was considered as the second factor contributing to the timely completion of their PhD, followed by motivational factor, de-motivational factor and institutional factor. Eventually, the PhD candidates found that research work factor did not highly contribute to the timely completion of their PhD. The study significantly provides the institution specifically in the case of Malaysian Public Higher Educational Institutions with accurate factors which they need to consider in order to effectively planning and managing the postgraduate candidates for completing their PhD within the time frame.*

Keywords: *PhD candidates, timely completion, factors contributing, Malaysian Public Higher Educational Institutions.*

1. INTRODUCTION

The influence of education on the national level of productivity and innovation has made the success of research students and quality of graduates an important national issue (Grebennikov & Shah, 2007). Additionally, candidates, governments, universities, prospective employers and industry partners have increased their attention to quality research education, completion and attrition particularly for the Doctor of Philosophy (PhD) candidates. As the highest academic degree awarded by university, PhD is considered a vital discipline due to the fact that it gives rise to new knowledge, new interpretations and new explanations (Park, 2005). The ultimate goal of PhD programs is to produce new PhDs, and efficiency is higher when the candidates graduate as soon as possible (Stock, Finegan & Siegfried, 2009).

As for Malaysia, the government nowadays is also given serious attention to the importance of having doctorate training program for future researchers. In fact, the PhD candidates are seen as important financial sources in the Malaysian Public Higher Educational Institutions (IPTA). In the National Higher Education Strategic Plan 2020, the Ministry of Higher Education (MOHE) has targeted a total of 60 000 PhD candidates by the year 2020 to fulfill the two main objectives; increase Malaysian income and increase the status of Malaysian universities (Mohamed, Ismail, Mustafa & Mohd, 2011). Currently, issue regarding the timely completion of the PhD candidate which may involve longer than normal period even though it may result in successful completion of the degree has been the main focused of government, universities and doctorate candidates themselves. Hence, it is important to study the candidates' perceptions on factors contributing to

the timely completion of their PhD as they significantly represent the quality of the higher education institutions.

The study focuses on Universiti Utara Malaysia (UUM) as one of the Malaysian IPTA established to fulfill the objective towards training and producing professionals in the areas of business and management. The PhD program at UUM began in 1992 with the first enrolment of six candidates and in 2000, the number had increased to 30 candidates, an increment of 0.94%. By the year 2013, the number of PhD candidates enrolment is 602 indicated an increment of 18.78%. With the structuring of three colleges – College of Business (COB), College of Arts and Sciences (CAS) and College of Law, Government and International Studies (COLGIS), each college has established a postgraduate school to plan and effectively manage the candidates namely the Othman Yeop Abdullah (OYA) Graduate School of Business, Awang Had Salleh Graduate School of Arts and Sciences and Ghazali Shafie Graduate School of Government (GSGSG). The main purpose of the study is to explore and examine the PhD candidates' perceptions regarding factors contributing to the timely completion of their study namely supervision arrangements, research skills, research work, institutional, motivational and de-motivational factors.

2. LITERATURE REVIEW

Many studies exploring the factors influence either the candidates' completion or attrition of their study showed several factors that influence student persistence in doctoral education in five specific areas: recruitment/admissions; financial aid; mentoring and socialization; research productivity; health and wellness (Bourke, Holbrook, Lovat & Farley, 2004; Carter, 2008, Latona & Browne, 2001; Rodwell & Neumann, 2005). Bourke *et al.* (2004) found that organizational culture of the graduate school may also affects students' candidature of their study. According to Pyhalto and Helsinki (2012), students in a department whose culture and practices facilitate academic and personal integration are more likely to complete a PhD compared to students in a department whose culture is hostile and laissez faire.

Additionally, Cobb (2013) emphasized that students in science-based subjects are more likely to complete a PhD than those in arts, humanities or social sciences. Moreover, the engineering candidates generally have longer candidacy compared to candidates in all other disciplines (Bourke *et al.*, 2004). Further, studies also found that supporting physical resources and infrastructure includes car parks, lecture halls, office space and library services man also contribute to the timely completion of the candidates (Pitchforth, Beames, Thomas, Falk, Gasson, Thamrin & Mengersen, 2012). Library services are important to enhance PhD student's experience. This includes computer access, ease of access to the library when needed, access to electronic library resources, remote access to the library catalogues, intercampus books and materials' delivery services, library staff assistance and interlibrary loan services (Grebennikov & Shah, 2007; Pitchforth *et al.*, 2012).

Other researches on PhD completion also suggest that, within a discipline, the quality of supervision is the key factor determining the successful and timely completion of a PhD (Dinham & Scott, 1998; Knowles, 1999; Seagram, Gould & Pyke, 1998). At a basic level it is also noted that more frequent supervision is strongly correlated with successful completion (Woodward, 1993). The characteristics of good supervisors are approachable, friendly, supportive, have positive attitude, open minded, prepared to acknowledge error, organized, thorough, stimulating, conveys enthusiasm for research (Delany, 2013). The other most important factor for completion is relationship with faculty adviser (Bourke *et al.*, 2004). It is essential to have positive relationship between students and supervisors because the quality of the interaction and personal quality of the supervisor are important factors for the completion (Latona & Browne; 2001).

In another study, Rodwell and Neumann (2005) stated that the most important variable for PhD completion is attendance or mode of study (part-time against full time) in terms of full time equivalent years of study. According to Kearns, Gardiner and Marshall (2008), self-handicapping behaviour for instance overcommitting, busyness, perfectionism, procrastination, disorganization, not putting in effort, and choosing performance-debilitating circumstances makes PhD such a difficult process and prevents candidates from completing on time. To date, there is only one study found to investigate the timely completion of PhD candidates in Malaysia. Mohamed *et al.* (2011) studied factors contributing to the success of PhD candidates in completing their studies

Factors Contributing To the Timely Completion of PhD at the Malaysian Public Higher Educational Institutions

using Universiti Kebangsaan Malaysia (UKM) engineering graduates as the research sample. Based on the graduates' survey responses on five aspects of PhD studies that are comprised of supervisor, skills, research work, research outcome and research constraint, it is concluded that more than half of the respondents agreed that it is important to read past and current literature every semester, have a helpful supervisor, frequently attend conferences, choose a supervisor who is well known in the research area, publish more than three journal papers throughout PhD studies, work independently and have weekly discussion with supervisors.

3. METHODOLOGY, FINDINGS AND DISCUSSION

3.1. Methodology

The research adopted a quantitative research method through generalizing results from the sample to population. Based on purposive sampling technique, a total of 320 respondents was selected from the total of 1827 PhD candidates at UUM. The selected sample size was considered appropriate and sufficient for such population (Krejcie & Morgan, 1970). The respondents were approached at the Postgraduate's Room available at every postgraduate's school of the three colleges. Questionnaire survey was used to obtain responses from the respondents and was divided into two sections namely Section A consisted of candidate's background such as gender, age, religion, marital status, country of origin, mode of current study, current year of enrolment, tuition fee and research focus. Additionally, Section B consisted of 51 items within six variables representing factors contributed to the timely completion of PhD. The data was then analyzed using descriptive analysis technique.

3.2. Findings

The analysis of candidates' background indicated that 77.0% respondents were male and the remaining 23.0% were female. 64.0% completed a Master's Degree by Research, 6.5% completed a Master's Degree by Coursework, 2.2% completed a Bachelor's Degree with First Class Honors and the remaining 27.3% obtained other degree. The highest percentage was full time PhD candidates (92.8%) and the remaining was part time PhD candidates (7.2%). Majority respondents were in their second year (40.3%), followed by first year (39.6%), third year (7.2%) and fourth year (3.6%). Additionally, majority respondents used their own personal fund to pursue study in PhD (39.6%). 33.1% were sponsored by the government, 18.0% were sponsored by their parents/family, 2.9% were sponsored by the private institution and the remaining 6.5% were sponsored by other financial sources. As for their areas of study, most respondents conducted research on human resource management (18.7%), followed by education (16.5%), revenue management (9.4%), marketing (8.6%) and environmental management (1.4%).

The findings of supervision arrangements factor indicated 12 items with average mean above 0.3 (Table 1). Most respondents stated their supervisors were wise and knowledgeable whilst few of them relied on their supervisors in conducting their PhD work. 78.4% respondents expressed their supervisors as wise and knowledgeable, 76.2% frequently consult their supervisors and 75.5% rated their supervisors as helpful in guiding them in completing their PhD. Additionally, 73.4% respondents stated their supervisors as very committed and well-known academician. Further, 72.0% respondents found their supervisors to be critical and constructive in providing feedback regarding their thesis. The respondents also indicated that their supervisors had many research students (71.2%) and were able to provide feedback on time (66.9%). The percentage of responses also indicated that 66.2% respondents had supervisors who were recommended by their friends and 64.1% of their supervisors had vast experiences in supervising postgraduate students. In fact, 64.1% respondents relied on their supervisors for completing their PhD studies. Finally, 64.0% respondents indicated that their supervisors were available for consultation.

Table1: Descriptive Analysis of Supervision Arrangements Factor

Items	Mean	Standard Deviation	Slightly agree (%)	Strongly agree (%)	Total Percent
Wise and knowledgeable	4.11	.899	40.3	38.1	78.4
Frequently consult	4.04	.896	42.4	33.8	76.2
Helpful in guiding	4.02	.943	41.7	33.8	75.5
Very committed	4.00	.989	38.1	35.3	73.4

Well known academician	3.94	.946	43.2	30.2	73.4
Critical and constructive feedback	3.92	.909	43.9	28.1	72.0
Many research students	3.92	1.043	36.7	34.5	71.2
Recommended by friends	3.79	.967	41.7	24.5	66.2
Vast experiences	3.78	1.048	35.3	28.8	64.1
Available for consultation	3.76	1.114	33.8	30.2	64.0
Timely feedback	3.75	1.008	44.6	22.3	66.9
Can be relied on	3.68	.941	46.8	17.3	64.1

Eight items of research skills factor also indicated highest mean value between 4.26 – 3.91 (Table 2). The respondents agreed that thinking skill is the most important skill they must possess in completing their thesis whilst multi-task work skill as the least skill they need to have in conducting their PhD studies. The percentage of responses depicted that 84.9% respondents agreed they need to possess the thinking skill in order to complete their PhD studies on time, followed by the research skill (80.6%) and the decision making skill (79.2%). Further, the respondents felt that interpersonal skill (77.7%) and oral communication skill were factors contributed to their completion of PhD studies. They also stressed that PhD graduates must possess the technical writing skill to complete their PhD studies (75.5%). In addition, PhD graduates must work independently in conducting their thesis and must not totally rely on their supervisors (72.0%). Interestingly, 69.8% respondents agreed that the multi-task work skill played important role in determining the timely completion of their PhD studies.

Table2. Descriptive Analysis of Research Skills Factor

Items	Mean	Standard Deviation	Slightly agree (%)	Strongly agree (%)	Total Percent
Thinking skill	4.26	.935	35.3	49.6	84.9
Research skill	4.12	.993	39.6	41.0	80.6
Decision making skill	4.12	.925	39.6	39.6	79.2
Interpersonal skill	4.12	.956	36.0	41.7	77.7
Technical writing skill	4.10	1.031	30.9	44.6	75.5
Work independently	4.04	.904	35.3	36.7	72.0
Oral communication skill	4.02	.981	40.3	36.0	76.3
Multi-task work skill	3.91	.962	39.6	30.2	69.8

The findings of research work factor indicated moderate mean values for all the four items (Table 3). The item *receive prompt feedbacks* derived with the highest mean value and the item *write a clear and concise report* derived with the lowest mean value. The respondents stated that they received prompt feedbacks from the supervisor regarding their research work (65.5%). In fact, they also felt that literature search played important role in completing their PhD thesis (59.7%). Further, the respondents indicated that they could write a clear and concise research report (51.8%) however, they still found difficulty in identifying the topic of their thesis particularly at the beginning of writing their proposal (51.7%).

Table3. Descriptive Analysis of Research Work Factor

Items	Mean	Standard Deviation	Slightly agree (%)	Strongly agree (%)	Total Percent
Receive prompt feedbacks	3.74	.961	44.6	20.9	65.5
Literature search	3.59	.970	44.6	15.1	59.7
Problem identifying the topic	3.44	1.040	38.8	12.9	51.7
Write a clear and concise research report	3.46	.950	39.6	12.2	51.8

Five items representing the institutional factor showed average mean values between 3.32 – 3.83 (Table 4). The findings of descriptive analysis indicated high mean value for the item *natural environment* whilst low mean value was found for the item *only few workshops*. The respondents expressed natural environment of the institution played important role in contributing to their completion of PhD studies (73.4%). They also found that location of the institution is important in order for them to complete their studies on time (63.3%). The findings depicted that the institution

Factors Contributing To the Timely Completion of PhD at the Malaysian Public Higher Educational Institutions

also provide sufficient services to the respondents in completing their PhD studies (61.1%). Further, 56.8% respondents found the counseling and career support provided by the institutions contributed to the timely completion of their studies. However, 45.3% respondents stated that the institution only conducted few workshops regarding their research work.

Table4. Descriptive Analysis of Institutional Factor

Items	Mean	Standard Deviation	Slightly agree (%)	Strongly agree (%)	Total Percent
Natural environment	3.83	.922	51.8	21.6	73.4
Counseling and career support	3.50	1.038	41.7	15.1	56.8
Provide sufficient services	3.65	1.075	38.1	23.0	61.1
Location	3.62	1.176	38.8	24.5	63.3
Only few workshops	3.32	1.030	33.1	12.2	45.3

Table 5 depicts the findings of descriptive analysis on the motivational factor. It was noted that the average mean values derived for all the seven items was 2.72 – 4.01. The item *self-fulfillment* derived with the highest mean value whilst the item *promote in current job* derived with the lowest mean value. The findings of the survey also indicated that 74.1% respondents were motivated to complete their PhD studies based on their self-fulfillment desire. Additionally, 65.5% respondents were motivated by their future career development once they have finished their PhD. 61.8% respondents stated that they had to complete their PhD on time due to the requirement of their current jobs and similarly because of the motivation from their spouses. Further, the findings of the survey also showed that 58.3% respondents were motivated to finish up their studies due to the financial aspect. Interestingly, 57.6% expressed that they need to complete their PhD on time because of its prestige degree. The respondents also stated that timely completion of PhD studies were important since it would be considered in their current job promotion (51.1%).

Table5. Descriptive Analysis of Motivational Factor

Items	Mean	Standard Deviation	Slightly agree (%)	Strongly agree (%)	Total Percent
Self-fulfillment	4.01	.989	37.4	36.7	74.1
Career change	3.89	1.032	31.7	33.8	65.5
Prestige degree	3.69	1.009	33.1	24.5	57.6
Requirement of current job	3.68	1.221	30.9	30.9	61.8
Financial	3.65	1.039	37.4	20.9	58.3
Spouse	3.50	1.204	42.4	19.4	61.8
Promote in current job	3.44	1.257	28.8	22.3	51.1

The de-motivational factor consisted of eight items and the findings of the descriptive analysis indicated that all items derived with moderate mean values of 2.36 – 2.89 (Table 6). The highest mean value was presented by the item *financial difficulties* whilst the lowest mean value was presented by the item *health problem*. The respondents expressed financial difficulties as a major factor de-motivated them in completing their PhD studies (45.0%). They also emphasized that changing institutions as another important factor de-motivated them to complete their studies on time (35.0%). The findings also depicted other relevant factors that de-motivated the candidates to complete their PhD studies for instance lack of interest (32.5%), lack of confident (30.0%), health problems (30.0%), emotional stress (25.0%), commuting distance (22.5%) and burnout (20.0%).

Table6. Descriptive Analysis of De-motivational Factor

Items	Mean	Standard Deviation	Slightly agree (%)	Strongly agree (%)	Total Percent
Financial difficulties	2.89	1.326	22.5	22.5	45.0
Emotional stress	2.79	1.215	12.5	12.5	25.0
Lack of interest	2.72	1.279	22.5	10.0	32.5
Lack of confident	2.70	1.311	15.0	15.0	30.0
Commuting distance	2.69	1.235	12.5	10.0	22.5
Burnout	2.63	1.242	7.5	12.5	20.0
Change institutions	2.52	1.309	25.0	10.0	35.0
Health problems	2.50	1.344	17.5	12.5	30.0

3.3. Discussion

Supervisor arrangements factor is noted as the second factor mostly contributing to the timely completion of PhD among the candidates of UUM. The postgraduate candidates of UUM also perceive their supervisors as wise and knowledgeable, can be frequently consult and very helpful in guiding them to complete their study. Hence, to complete PhD on time, the candidates need to have an easy access to and good communication with their supervisors. What more, they must also have well known supervisors which in this case refers to experience and expertise particularly in the area studied (Grebennikov & Shah, 2007). Consequently, these aspects represent the quality of the supervisor which is noted to be the key factor determining the successful and timely completion of a PhD (Dinham & Scott, 1998; Knowles, 1999; Seagram *et al.*, 1998).

Research skills factor is strongly and significantly perceived by the candidates as a major factor contributing to the timely completion of PhD. The study is consistent to previous studies where it is noted that lack of hand-on skills consequently contributing to the timely completion of PhD (Mohamed, *et al.*, 2011; Ssegawa & Rwelamila, 2009). The postgraduate candidates of UUM believe that it is very important for them to possess several research skills in order to complete their studies on time for instance thinking skill, research methodology skill, independent working skill, decision making skill and technical writing skill. These skills are believed to present the development of an ability to think critically, the development of the latest knowledge and further, the independent skill required for conducting research work (Grebennikov & Shah, 2007).

However, the PhD candidates of UUM perceive research work as factor less contributing to the timely completion of their PhD. This is supported by previous study by Seagram *et al.* (1998) where the issues that co-vary with field of study, such as making an early start on the dissertation and maintaining the same topic may explain the differences in completion times. The candidates believe that receiving prompt feedback regarding their work from the supervisor may not actually be the major reason for them to complete their PhD on time. In fact, they also have a perception that an extensive literature search would not cause them to finish their work within the timeframe provided. Having problem in identifying the research topic probably is important aspect contributing to the timely completion of PhD but most candidates did not believe it is the major cause since it is only at the first phase of their study (Mohamed *et al.*, 2011; Seagram *et al.*, 1998).

Contradict to other previous studies institutional factor on the other hands indicates a small contribution to the timely completion of PhD among the postgraduate candidates of UUM (Bourke *et al.*, 2004; Latona & Browne, 2001; Rodwell & Neumann, 2005). The natural environment of UUM itself probably serves as an important factor represents relaxation and enjoyment in completing the PhD degree. This is considered as a new factor based on the fact that no study has taken into account to investigate this aspect. In the case of UUM, it is noted that the natural environment may probably determine the process of selecting a place to further PhD degree among the candidates. The candidates may be looking for a university which is able to make them feel relax in pursuing their PhD, taking into account it may be stressful to complete the study on time. Hence, location and natural environment has strong relationship in determining the timely completion of PhD among the candidates.

Motivational factor is considered a new factor which has been studied in the context of determining factors contributing to the timely completion of PhD. Positive emotional state, continuity of study and personal circumstances are among the aspects included in the study of motivational factor (Pitchforth *et al.*, 2012). Hence, the study of motivational factor contributes as a new source for the timely completion of PhD in literature. Having a strong desire to complete their PhD is believed to be one of the factors significantly motivated them to work hard. The PhD candidates of UUM also perceive the de-motivational factor as one of the vital aspects contributing to the timely completion of their PhD. They believe financial difficulty is the major item de-motivating them to complete their PhD. Additionally this is in line with other studies regarding PhD which emphasize the influence of financial assistance in the timely completion and attrition of PhD degree (Bourke *et al.*, 2004; Stock *et al.*, 2009). In fact, it is noted that self-support and graduate teaching assistant posts increase the time to completion and the likelihood of non-completion of PhD (Cobb, 2013; Mohamed *et al.*, 2011).

4. CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

The study has explored the Malaysian IPTA PhD candidates' perceptions on factors contributing to the timely completion of their study. The case refers to PhD candidates of UUM covering three major postgraduate schools namely OYA COB, Awang Had Salleh Graduate School CAS and GSGSG COLGIS. Five factors are found to be significantly contributed to the timely completion of PhD among the candidates of UUM. Research skills factor derives as the most contributing factor, follows with supervisor arrangements factor, de-motivational factor, motivational factor and institutional factor. Additionally, research work is found to have a small contribution to the timely completion of PhD among the candidates of UUM. The findings specifically would assist the postgraduate schools in efficiently planning and managing their PhD candidates in the future. However, the data used in this study involved the postgraduate which in this case refer to the doctoral candidates only, and who are still in the process of completing their studies. Hence, the study focused on the candidates' perceptions on the factors contributing to the timely completion of PhD. Subsequently, the results may be constrained with the perceptions of doctoral candidates who have already completed their PhD.

It is suggested that for future research, the candidates' characteristics should be examined in order to understand the influence of PhD degree completion. This would include characteristics such as age, gender, country of origin and marital status as previously conducted (Bourke *et al.*, 2004; Cobb, 2013). Further, an in-depth study on motivational factor should also be considered in other academic institutions among different countries since it is proven to be a significant factor in contributing to the timely completion of PhD. Further, a qualitative study focusing on the attitudes and practices of both postgraduate candidates and the administration particularly the deans should be conducted to determine the outcomes regarding factors contributing to the timely completion.

ACKNOWLEDGEMENTS

This paper is under scholarship of Universiti Utara Malaysia.

REFERENCES

- Bourke, S., Holbrook, A., Lovat, T. & Farley, P. (2004). *Attrition, Completion and Completion Times of PhD Candidates*. Paper presented at the AARE Annual Conference, Melbourne, 28 Nov – 2 Dec 2004.
- Carter, D. (2008). *Doctoral Degree Completion: Conceptual Framing*. A Report Presented to Rackham Leadership Team. Center of the Study Higher & Postsecondary Education Carmen McCallum, Doctoral Student, CSHPE.
- Cobb, F. (2013). *Factors Affecting Postgraduate Research Student Completion Rates: Literature Review and Reflections for Research*. A Report Prepared for the University of East London.
- Delany, D. (2013). *A Review of the Literature on Effective PhD Supervision* retrieved from <http://www.mostlyreadingya.com/read-file/a-review-of-the-literature-on-effective-phd-supervision-pdf-1656319/> in 6 May 2014.
- Dinham, S. & Scott, C. (1999) *The Doctorate: Talking about the Degree*, University of Western Sydney, Nepean.
- Grebennikov, L. & Shah, M. (2007). *Enhancing the Research Student Experience at University*. A report submitted to the Australasian Association for Institutional Research 2008 Forum, 15 September 2007.
- Kearns, H., Gardiner, M. & Marshall, K. (2008). Innovation in PhD Completion: The Hardy shall Succeed (and be happy!). *Higher Education Research & Development*, 27, 77-89.
- Knowles, S. (1999). Feedback on Writing in Postgraduate Supervision: Echoes in Response-Context, Continuity and Resonance. *Supervision of Postgraduate Research in Education*, 113-128.
- Krejcie, R. V. & Morgan, D. W. (1970). Determining Sample Size for Research Activities. *Educational and Psychological Measurement*, 30, 608.
- Latona, K. & Browne, M. (2001). *Higher Education Series: Factors Associated with Completion of Research Higher Degrees*. Higher Education Division, Sydney.

- Mohamed, A., Ismail, A. H., Mustafa, M. M. & Mohd, N. (2011). *Factors Contributing to the Success of Engineering Doctoral Students at UKM*. Paper presented at the Seminar Pendidikan Kejuruteraan Kongres Pengajaran dan Pembelajaran & AlamBina (PeKA'11) UKM 2011.
- Park, C. (2005). New Variant PhD: The Changing Nature of the Doctorate in the UK. *Journal of Higher Education Policy and Management*, 27(2), 189-207.
- Pitchforth, J., Beames, S., Thomas, A., Falk, M., Farr, C., Gasson, S., Thamrin, S.A., & Mengersen, K. (2012). Factors Affecting Timely Completion of a PhD: A Complex Systems Approach. *Journal of the Scholarship of Teaching and Learning*, 12(4), 124-135.
- Pyhalto, K. & Keskinen, J. (2012). Doctoral Students' Sense of Relational Agency in Their Scholarly Communities. *International Journal of Higher Education*, 1(2), 136-149.
- Rodwell, J. & Neumann, R. (2007). *Predictors of Timely Doctoral Student Completions by Type of Attendance: The Utility Pragmatic Approach*. Sydney, Australia: Macquarie Graduate School of Management.
- Seagram, B., Gould, J. & Pyke, S. (1998) An Investigation of Gender and Other Variables on Time to Completion of Doctoral Degrees, *Research in Higher Education*, 39(3), 319-335.
- Ssegawa, J. K. & Rwelamila, P. D. (2009). The Research Skill Factor as a Cause for High Postgraduate Attrition Rate, *Journal of Engineering, Design & Technology*, 7(3), 293-322.
- Stock, W. A., Finegan, T. A., & Siegfried, J. J. (2009). Completing an Economics PhD in Five Years: Let the Data Literally Speaks for Themselves. *American Economic Review: Papers and Proceedings*, 99(2), 624-629.
- Woodward, R. J. (1993). *Factors Affecting Research Student Completion*. In 15th Annual Forum of the European Association for Institutional Research. Turku, Finland.