Demographic and Other Factors Influencing Successful Doctoral Completion

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ABSTRACT

Doctoral completion rates are of concern to human resources development policy of universities as they endeavour to enhance the academic excellence of their university. The purpose of this study is to investigate the factors influencing doctoral completion success rates amongst staff of a public university in Thailand. The categories of the binary outcome variable, doctoral achievement are successful and unsuccessful or incomplete. The determinant variables include gender, age at the commencement of the doctoral degree, country group of doctoral study and the major or field of doctoral study. Data were obtained from the university's database. Logistic regression was employed to model the effects of multiple determinants on doctorate achievement. The results showed that gender, country of study and field of doctoral study are significant factors leading to successful doctoral completion but age at the commencement of a doctoral degree was not a significant factor. Identification of such factors could be done for other universities so that they can modify their human resources development strategies to support candidates who may be at risk of failure.

Keywords: Doctoral study, successful completion, logistic regression

INTRODUCTION

Research and Development in Thailand has been a major concern of the Thai government with the particular aim of improving and developing the skills and research capabilities of the personnel involved in teaching and research activities in higher education institutions. These concerns were placed on policies on educational development (Office of the National Education Commission [ONEC], 1997). Furthermore, the National Research University Development project has

launched the policy to develop academic excellence at 9 universities so as to enhance their national competitiveness into world-class university (Office of the Higher Education Commission [OHEC], 2011; Junpeng & Tungkasamit, 2014). Universities have been the major sources of research work and research personnel in developing higher education academic excellence in Thailand, and also generating new bodies of knowledge and technologies appropriate to Thailand's needs (OHEC, 2011). University members have been encouraged to conduct pure and applied research to support the country's goal of self-reliance for continuing social and economic development (Thaima, 2012). Staff having attained doctoral completion is of benefit, not only for a teaching/research institution, but also for the individual staff. University priorities, plans and policies have subsequently been focused on employing staff with doctoral degrees. In fact, the Thai government provides scholarships for university staff to assist them to complete their doctoral degrees both in Thailand and abroad. Not all of them, however, complete these degrees. Doctoral completion rates and times for completion have become a major concern of the Thai national government. Therefore, finding the factors that are related to successful doctoral completions is essential for the success of Thailand's higher education initiative.

Most studies on doctoral completions have concentrated on doctoral students who enrolled in host universities (Seagram,

Gould, & Pyke, 1998; Wright & Cochrane, 2000; Bourke, Holbrokk, Lovat, & Farley, 2004; Visser, Luwel, & Moed, 2007; Wao & Onwuegbuzie, 2011; Wao, 2010; Jiranek, 2010; Bain, Fedynich, & Knight, 2011). In aspects of staff development investment of the host university, the doctoral studying of staff is an interesting issue concerning the host university. However, no previous studies have been carried out on doctoral completion of the host university's staff.

This paper explores demographic factors which influence the successful outcome of the doctoral candidates at one public university in Thailand. The research described in this study focused mainly on quantitative analysis using a statistical method to estimate the rate of doctoral completion considering as the factor variables that are available in the university database. Findings from this study will provide useful information for staff development planning, particularly to postgraduate studies, and assist with forming strategies which may reduce the risks of failure among doctoral candidates.

LITERATURE REVIEW

Doctoral completion is a crucial topic for research in higher education which has become a national issue. The existing literature falls into several main categories; completion rate and time to complete (Lovitts, 2001; Golde, 2005; Rodwell & Neumann, 2008; Visser *et al.*, 2007; Wao, 2010), attrition rates (Nettles & Millett, 2006; Gardner, 2009; Wamala, Ocaya, & Oonyu, 2012), and causes and

consequences of doctoral student attrition (Seagram *et al*., 1998; Ferrer de Valero, 2001; Visser *et al*., 2007). These variables have become important indicators of the efficiency and effectiveness of universities and postgraduate student associations (Wright & Cochrane, 2000; Bourke *et al*., 2004; Visser *et al*., 2007; Groenvynck, Vandevelde, & Rossem, 2013).

Interest in the issue of doctoral completion has gained considerable momentum in higher education circles over the last few decades. The variation of both attrition and completion rates range by institution and country (e.g., Lovitts, 2001; Martin, Maclachlan, & Karmel, 2001; Elgar, 2003) also reports average completion rates for full-time students ranging from 50 to 60% (Latona & Browne, 2001; Martin *et al*., 2001; Bourke *et al*., 2004). Doctoral completion rate in UK was reported to be around 57% of the overall cumulative ten-year (CGS, 2008). Similarly, the completion rate in ten years after the US students began their doctoral programme was 56.6% (Sowell, Zhang, Redd, & King, 2008). In Australia, an average completion rate was around 50% to 60% (Rodwell & Neumann, 2009). Meanwhile, the average completion rate in the Netherlands is around 75% (Van de Schoot, Yerkes, Mouw, & Sonneveld, 2013). Several studies such as those conducted by Lovitts (2001), Golde (2005), and Nettles and Millett (2006) reported varying rates of attrition, i.e. from 11 to 68% across disciplines. Disciplinary attrition rates, however, range greatly with a low

percentage of 24% in the biomedical and behavioural sciences (Pion, 2001) to a high percentage of nearly 67% in the humanities and social sciences (Bowen & Rudenstine, 1992). The estimated projections regarding doctoral attrition range from 40 to 70% (Bowen & Rudenstine, 1992; Bourner, Bowden, & Laing, 2001; Abiddin & Ismail, 2011).

The completion rates also vary by disciplines (e.g., Lovitts, 2001; Martin *et al.*, 2001; Elgar, 2003). The science fields have the best completion rates (Bowen & Rudenstein, 1992; Seagram *et al*., 1998; Wright & Cochrane, 2000; Martin *et al*., 2001). A study by the University of California reported that life science and health science had the highest completion rates, with humanities and arts showing the lowest rates (UCOP, 2014). Council of Graduate Schools (CGS) (2008) examined completion rates at the North American Institutions and found the tendency for higher completion rates in the sciences, engineering and mathematics fields.

Many previous studies also reported that time to doctoral completion varied by fields of study. Students in the natural sciences were more likely to complete their doctorate and did so much faster than those in the arts and humanities (Sheridan & Pyke, 1994; Wright & Cochrane, 2000)

Moreover, personal factors play an important role in the time to doctoral completion and they affect completion rates. The known variables regarding the candidates are previous qualification, ethnicity, gender and age (Seagram

et al., 1998; Wright & Cochrane, 2000; Van de Schoot *et al.*, 2013). For example, Mastekaasa (2005) found that Norwegian males had a slightly higher doctoral completion rate and faster time to completion than their female counterparts, while the opposite results showed that women had the length of time taken to earn a doctorate (Maher *et al.*, 2004; Wao, 2010). An earlier study found an unclear gender difference in time to complete the doctoral study (Sheridan & Pyke, 1994; Wilson & Reschly, 1995; Seagram *et al.*, 1998; Wright & Cochrane, 2000; Rodwell & Neumann, 2008), while a study of academic progress of the US doctoral students (Castro, Cavazos, Garcia, & Castro, 2011) found that fewer females completed professional and doctoral degrees than males but that females had higher graduation rates at most preceding levels of education. A study also reported completion rate among difference age group. The age group of 20-26 years at commencement of doctoral study, when compared with older age groups, demonstrated higher completion rates and shorter time to complete their doctorate (Castro *et al.*, 2011) but other studies (see Wright & Cochrane, 2000; Martin *et al.*, 2001; Rodwell & Neumann, 2008) found unclear significance in age difference and time to complete their studies for doctoral students.

In comparison to the western institutions, the body of literature examining completion rate in Thai universities is quite small. Of the few studies that have been published, the majority focusing on undergraduate student drop out (Sittichai, Tongkumchum, & McNeil, 2008; Sittichai, Tongkumchum, & McNeil, 2009; Sittichai, 2012). Lack of database that contains basic information on all students is the main reason and it is also the same concern in other countries (Monsour & Corman, 1991; Bowen & Rudenstine, 1992; Golde, 2005). Moreover, some are written in Thai and thus unavailable to the international research community.

METHODOLOGY

This study was based on a survey of staff who had enrolled for their doctoral studies between 1991 and 2011 in one public university in Thailand. The data were obtained from the database of the university's personnel department. There were 964 staff enrolled in a doctoral degree programme both in Thailand and abroad during the period. Of these, 547 persons had successfully completed their doctorate while 153 did not complete their doctorate. There were 264 persons continuing their studies after 2011, and these were excluded from the analysis because the outcome was still not known. Thus, 700 subjects with known results were selected for this study. Information on gender, age at the point of starting doctoral study, country in which they studied and major or field of doctoral studies was obtained. These four factors were considered as determinants and analysed for their effects on the successful completion of a doctoral degree. Age at the commencement of the doctoral

degree was divided into four groups: under 27 years, 28-31 years, 32-35 years and over 36 years. Meanwhile, the country or region where students studied doctorate was grouped into five regions: Australia and New Zealand, USA and Canada, Europe, Asia, and Thailand. The major, or field of study, was divided into four categories of science, applied science and technology, health science, and social science. The outcome of doctoral completion was binary, successful and unsuccessful or incomplete.

The factors associated with doctoral completion were explored using chi-squared tests, while multivariate analysis was performed using logistic regression to generate the proportions or percentages of expected completions, 95% confidence intervals and p-values. The model formulates the proportion p_{ijk} of this outcome in gender i, country group j, and major of study k as an additive linear function of the determinants, as follows:

$$\ln\left(\frac{p_{ijk}}{1-p_{ijk}}\right) = \mu + a_i + \beta_j + \gamma_k \qquad (1)$$

The model was fitted using sum contrasts (Venables & Ripley, 2002; Tongkumchum & McNeil, 2009). All statistical analyses were performed using the R programme.

RESULTS

Of the 700 persons enrolled in the doctoral study programme, 409 were females and 291 were males, with the average age of 32 years at the start of a doctoral degree and the median duration of study was 4.83 years. The Faculty of Science had the largest number of staff enrolled in a doctoral programme (n=106), while a major in applied science and technology was the most popular field for doctoral study (n=262). The overall successful doctoral completion was 78.1%.

Table 1 shows the proportions and results of the chi-squared tests. The proportion of doctoral completion was substantially higher for female than male staff (83.9% and 70.1%, respectively). The completion rate among those aged 27 years or younger at the commencement of their doctoral study was 83.8%, while the completion rate of age over 36 years was around 10% lower at 73.6%, although this difference is not significant. Meanwhile, the completion rate of those who studying in Europe and in USA or Canada was 88.3%, and 86.7%, respectively, which is significantly higher than those studying elsewhere. Those whose major field of study in science and health science were 83.3%, and 83.9% respectively, but the completion rate in major field of social science was only 66.7%. The low p-values (≤ 0.01) resulting from the chi-squared tests showed that gender, country or region of doctoral study and major or field of doctoral study are significant factors associated with successful completion of doctoral degrees. However, the age at the commencement of starting for a doctoral study was not a significant factor (p-value = 0.156).

TABLE 1
The Association between Determinants and Doctoral Completion

Factors	Achievement		χ^2	p-value
	Successful	Unsuccessful		
	Number (%)	Number (%)		
Gender			18.8	<0.001
Male	204(70.1)	87(29.9)		
Female	343(83.7)	66(16.1)		
Age at the start of doctoral study			5.2	0.156
≤ 27 years	129(83.8)	25(16.2)		
28-31 years	153(78.1)	43(21.9)		
32-35 years	123(78.3)	34(21.7)		
≥36 years	142(73.6)	51(26.4)		
Country group of doctoral study			32.8	<0.001
Thailand	169(69.3)	75(30.7)		
Australia and New Zealand	49(75.4)	16(24.6)		
Europe	143(88.3)	19(11.7)		
USA and Canada	143(86.7)	22(13.3)		
Asia	43(67.2)	21(32.8)		
Major group of doctoral study			15.7	0.001
Science	80(83.3)	16(16.7)		
Apply science & tech.	232(78.6)	63(21.4)		
Social science	94(66.7)	47(33.3)		
Health science	141(83.9)	27(16.1)		

Fig.1 displays the variability in the completion rates for each category of the determinants. The bar width represents the number of successful doctoral completion and the height represents the observed percentage of doctoral successful. The results from the logistic regression model are displayed using 95% confidence intervals for the percentage of doctoral completions in each category superimposed on the bar chart. The overall doctoral completion rate (78.1%) is shown as the horizontal line and the 95% confidence intervals of the completion rates for each factor after adjusting for other factors are shown as vertical lines. A confidence interval completely above or below, the mean line indicates that factor is significantly higher or lower than expected, after adjusting for other factors. Hence, all the determinants of gender, country or region of doctoral study and major group of doctoral study (with the exception of age) were found to be statistically associated with doctoral completion. Females were more likely to achieve successful completion of doctoral studies than males. Studying in Europe, and USA

and Canada were more likely to end in successful completion whereas the success rates for those studying in Thailand, Australia, New Zealand and Asia were not different from the overall completion rate. Those pursuing doctoral studies in science and health science were more likely to be successful than those pursuing the other major fields.

The results of the logistic regression analysis are in agreement with those found from the chi-squared analyses (see Table 1).
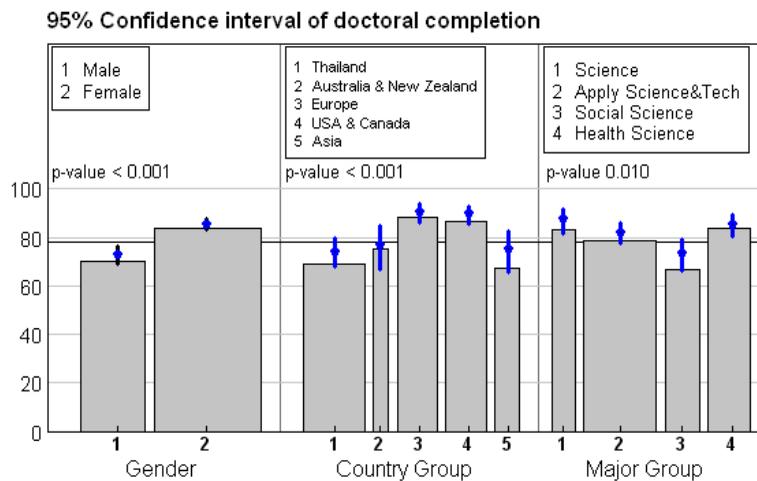

Fig 1: The completion rates for each category of the determinants, with 95% confidence intervals of success rates in doctoral studies.

DISCUSSION AND CONCLUSION

This study has examined factors associated with the achievement of a doctoral degree of the university academic staff. The completion rate of the university's staff was 78.1%. It was difficult to compare the current work with other studies because the subjects in this study were staff from one public university in Thailand.

Females had higher achievement rates than males, both in absolute numbers graduating with doctorate degrees and in the proportions of successful completions after commencement. Female staff at this university outperformed the male staff in doctoral studies. Similarly, the study by Martin *et al*. (2001) reported a higher completion rate among females. This is in contrast to some other findings (see Schroeder & Mynatt, 1993; CGS, 2008). However, Castro *et al*. (2011) reported that females had higher graduation rates at most levels of education in the US, though not at doctoral level. As to whether the gender difference in doctoral studies found in this study is true of the whole country and elsewhere remains to be researched further.

Majoring in science and health science at a doctoral level was a significant

advantage in terms of likelihood to succeed. This finding agrees with a study in Canada which indicates that discipline is important for completion, and that those studying in humanities were less likely to complete than those studying in science (Elgar, 2003), as well as with a study of doctoral completion rate in the UK (Wright & Cochrane, 2000) and a study of doctoral international students studying in the US (CGS, 2008). The reasons could be due to the fact that in natural sciences, the theses are based on the outcomes of specific experiments and/or observed phenomena, while in the social science, the dissertations are often based on the strength of the arguments of certain phenomena. Anecdotal evidence seems to suggest that within the social sciences, the research topics tend to be less specific and this causes difficulties for doctoral students in gaining a clear and definite focus in their research. Heath (2002) claimed that higher doctoral achievements of science, and science and technology students could be due to the specificity of their studies; however, no statistical difference was found between the groups in this study. Studying in Europe, USA and Canada was associated with successful completion of doctoral degrees. It would be interesting to investigate the factors influencing students' choice of study place. Confounding factors such as academic ability or previous academic success might have affected access to scholarships to study in another country or region. Alternatively, those with more significant commitments in addition to their studies, ones that might diminish available study time, might be more reluctant to leave Thailand. Such commitments might include family commitments or the requirement to maintain employment. Further studies could focus on these issues.

The possible advantage in commencing studies at a younger age was not statistically significant in this study. Wright and Cochrane (2000) found that the science doctoral students starting younger age group (20-26 years) demonstrated higher completion rates and shorter times to complete their doctoral degrees but there was no effect in arts and humanities. If the university policy of increasing the percentage of staff with a doctorate continues, then perhaps the university should also focus on providing consultation and support for male staff and those studying in the major field of social science. Studying on part-time basis is another interesting factor that may influence completion rates.

This quantitative study has some limitations as the data were retrieved from a database which contained only a few variables of interest. Hence, a further study is planned to investigate other factors that may influence successful completions of doctoral degree. These included factors associated with supervisors' influence, the availability of financial support and whether full-time or part-time study influences the successful completion of a doctoral degree.

ACKNOWLEDGEMENTS

REFERENCES

Abiddin, N. Z. & Ismail, A. (2011). Attrition and Completion Issues in Postgraduate Studies for Student Development. *International Review of Social Sciences and Humanities*, *1*(1), 15-29. Retrieved from http://irssh.com/yahoo_site_admin/assets/docs/2_NZB-1.15015009.pdf

Bain, S., Fedynich, L. V., & Knight, M. (2011). The successful graduate student: a review of the factors for success. *Journal of Academic and Business Ethics*, *3*, 1-9. Retrieved from http://www.aabri.com/jabe.html

Bourke, S., Holbrokk, A., Lovat, T., & Farley, P. (2004, November). *Attrition, Completion and Completion Time of PhD Candidates*. Paper presented at the Australian Association for Research in Education Conference, Melbourne.

Bourner, T., Bowden, R., & Laing, S. (2001). Professional doctorates in England. *Studies in Higher Education, 26*, 65–83. doi: 10.1080/03075070124819

Bowen, W. G. & Rudenstein, N. L. (1992). *In pursuit of the PhD*. Princeton, NJ: Princeton University Press.

Castro, V., Cavazos, J. Jr., Garcia, E., & Castro, A. (2011). The Road to Doctoral Success and Beyond. *International Journal of Doctoral Studies*, *6*, 51-78. Retrieved from http://www.informingscience.org/Journals/IJDS/Overview

Council of Graduate Schools (CGS). (2008). Ph.D. Completion and Attrition: Analysis of Baseline Demographic Data from the Ph.D. Completion Project. *Communicator, 41*(6), 1-3. Retrieved from http://www.phdcompletion.org/information/book1.asp

Elgar, F. J. (2003). *PhD Degree Completion in Canadian Universities: Final Report*. Halifax, Nova Scotia: Graduate Students Association of Canada. Retrieved from http://www.careerchem.com/CAREER-INFO-ACADEMIC/Frank-Elgar.pdf

Ferrer de Valero, Y. (2001). Departmental Factors Affecting Time-to-Degree and Completion Rates of Doctoral Students at One Land-Grant Research Institution. *The Journal of Higher Education, 72*(3)*,* 341-367. doi: 10.2307/2649335

Gardner, S. K. (2009). Student and faculty attributions of attrition in high and low-completing doctoral programs in the United States. *Higher Education*, *58*(1), 97–112. doi: 10.1007/s10734-008-9184-7

Golde, C. M. (2005). The role of the department and discipline in doctoral student attrition: Lessons from four departments. *The Journal of Higher Education, 76*(6), 669–700. doi:10.1353/jhe.2005.0039

Groenvynck, H., Vandevelde, K., & Rossem, R. V. (2013). The Ph.D. Track: Who Succeeds, Who Drop Out? *Research Evaluation*, *22*(4), 199-209. doi:10.1093/reseval/rvt010

Heath, T. (2002). A Quantitative Analysis of PhD Students: Views of Supervision. *Higher Education Research & Development*, *21*(1), 41-53. doi: 10.1080/07294360220124648

Jiranek, V. (2010). Potential Predictors of Timely Completion among Dissertation Research Students at an Australian Faculty of Sciences. *International Journal of Doctoral Studies*, *5*, 1-13. Retrieved from http://www.informingscience.org/Journals/IJDS/Overview

Junpeng, P. & Tungkasamit, A. (2014). The Continuing Professional Development of the Assessment through Research-based Learning in Higher Education of Thailand. *Procedia-Social and Behavioral Sciences*, *143*, 737–742. doi: 10.1016/j.sbspro.2014.07.474

Latona, K. & Browne, M. (2001). Factors Associated with Completion of Research Higher Degrees. *Higher Education Series, Report No.37*. Higher Education Division, Department of Education, Training and Youth Affairs, Canberra.

Lovitts, B. E. (2001). *Leaving the ivory tower: The causes and consequences of departure from doctoral study*. Marryland: Rowman and Littlefield.

Maher, M. A., Ford, M. E., & Thompson, C. M. (2004). Degree Progress of Women Doctoral Students: Factors that Constrain, Facilitate, and Differentiate. *The Review of Higher Education*, *27*(3), 385–408. doi:10.1353/rhe.2004.0003

Martin, Y. M., Maclachlan, M., & Karmel, T. (2001). *Postgraduate Completion Rates*. Canberra: Higher Education Division, Department of Education, Training and Youth Affairs.

Mastekaasa A. (2005). Gender Differences in Educational Attainment. The Case of Doctoral Degrees in Norway. *British Journal of Sociology of Education*, *26*(3), 375-394. doi:10.1080/01425690500128908

Monsour, M. & Corman, S. (1991). Social and task functions of the dissertation partner: One way of avoiding terminal ABD status. *Communication Education*, *40*(2), 180-186. doi:10.1080/03634529109378839

Nettles, M. T. & Millett, C. M. (2006). *Three magic letters: Getting to Ph.D*. Baltimore: The Johns Hopkins University Press.

Office of the Higher Education Commission (OHEC). (2011). *Thailand's National Research Universities: Enhancing Academic Excellence and Competitiveness*. Retrieved from http://www.inter.mua.go.th/main2/files/file/NRU/NRU.pdf

Office of the National Education Commission (ONEC). (1997). *National Education Planning 1997*. Office of the Prime Minister, Bangkok, Thailand.

Pion, G. M. (2001). *The early career progress of NRSA pre-doctoral trainees and fellows (No. 00-4900)*. National Institutes of Health and Vanderbilt University. Retrieved from http://grants.nih.gov/training/career_progress/

Rodwell, J. & Neumann, R. (2009). *Predicting timely doctoral completions: an institutional case study of 2000-2005 doctoral graduates,* Paper presented at the Australasian Association for Institutional Research (AAIR 2007), Sydney.

Rodwell, J. & Neumann, R. (2008). Predictors of timely doctoral student completions by type of attendance: the utility of a programmatic approach. *Journal of Higher Education Policy and Management*, *30*(1), 65-76. doi: 10.1080/13600800701745069

Seagram, B. C., Gould, J., & Pyke, S. W. (1998). An Investigation of Gender and Other Variables on Time to Completion of Doctoral Degrees. *Research in Higher Education*, *39*(3), 319-335. doi: 10.1023/A:1018781118312

Schroeder, D. S. & Mynatt, C. R. (1993). Female graduate students' perceptions of their interactions with male female major professors. *The Journal of Higher Education*, *64*(5), 555-573. doi: 10.2307/2959993

Sheridan, P. M. & Pyke, S. W. (1994). Predictors of Time to Completion of Graduate Degrees. *The Canadian Journal of Higher Education*, *24*(2), 68-88. Retrieved from http://ojs.library.ubc.ca/index.php/cjhe

Sittichai, R., Tongkumchum, P., & McNeil, N. (2009). Discontinuation among University Students in Southern Thailand. *International Education Studies*, *2*(2), 17-21. Retrieved from http://www.ccsenet.org/journal/index.php/ies/index

Sittichai, R., Tongkumchum, P., & McNeil, N. (2008). Discontinuation among University Students in Pattani. *Songklanakarin Journal of Social Sciences and Humanities*, *14*(3), 400-408.Retrieved from http://kaekae.oas.psu.ac.th/ojs/psuhsej/index.php

Sittichai, R. (2012). Why are there dropouts among university students? Experiences in a Thai University. *International Journal of Educational Development*, *32*(2), 283–289. doi:10.1016/j.ijedudev.2011.04.010

Sowell, R., Zhang, T., Redd, K., & King, M. (2008). *Ph.D. completion and attrition: Analysis of baseline program data from the PhD. Completion Project.* Washington, D.C.: Council of Graduate Schools.

Thaima, W. (2012). Internal Quality Assessment in Thai Higher Education.*International Journal of Multidisciplinary Thought*, *2*(2), 389–396. Retrieved from http://www.spu.ac.th/graduate/files/2013/07/Waraporn1.pdf

Tongkumchum, P. & McNeil, D. (2009). Confidence intervals using contrasts for regression model. *Songklanakarin in Journal of Science and Technology, 31*(2), 151-156. Retrieved from http://kaekae.oas.psu.ac.th/ojs/psuhsej/index.php

University of California Office of the President (UCOP). (2014). *Doctoral Persistence and Completion Rates, Fall 2000-2002 Entry Cohorts.* Retrieved from http://www.ucop.edu/institutional-research-academic-planning/data-reports/key-reports/index.html

Van de Schoot, R., Yerkes, M. A., Mouw, J. M., & Sonneveld, H. (2013). What Took Them So Long? Explaining PhD Delays among Doctoral Candidates. *PLoS ONE*, *8*(7), e68839. doi:10.1371/journal.pone.0068839

Venables, W. N. & Ripley, B. D. (2002). *Modern Applied Statistics with S.* NewYork: Springer-Verlag.

Visser, M. S., Luwel, M., & Moed, H. F. (2007). The Attainment of Doctoral Degrees at Flemish Universities: A Survival Analysis. *Higher Education*, *54*(5), 741-757. doi:10.1007/s10734-006-9021-9

Wamala, R., Ocaya, B., &Oonyu, J. C. (2012). Extended Candidature and Non-completion of a Ph.D. at Makerere University, Uganda. *Contemporary Issues in Education Research*, *5*(3), 175-183. Retrieved from http://www.cluteinstitute.com/

Wao, H. O. (2010). Time to Doctorate: Multilevel Discrete-Time Hazard Analysis. *Education Assessment, Evaluation and Accountability*, *22*(3), 227-247. doi:10.1007/s11092-010-9099-6

Wao, H. O. & Onwuegbuzie, A. J. (2011). A Mixed Research Investigation of Factors Related to Time to the Doctorate in Education. *International Journal of Doctoral Studies*, *6*, 115-134. Retrieved from http://www.informingscience.org/Journals/IJDS/Overview

Wilson, M. S. & Reschly, D. J. (1995). Gender and school psychology: Issues, questions and answers. *School Psychology Review, 24*(1), 45-61. Retrieved from http://www.nasponline.org/index.aspx

Wright, T. & Cochrane, R. (2000). Factors Influencing Successful Submission of PhD Thesis. *Studies in Higher Education*, *25*(2), 182-195. doi:10.1080/713696139