



Development of a dissertation quality value-added model for humanities and social sciences programs for private higher education institutions in Thailand

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ABSTRACT

The purposes of this study were: (1) to evaluate the quality of dissertations in the humanities and social sciences of private higher education institutions, (2) to analyze factors affecting the quality at the student, advisor, and institute levels, and (3) to develop a quality, value-added model of the dissertations. Samples consisted of: (1) 750 student dissertations in the humanities and social sciences and (2) 753 questionnaire responses consisting of 633 students, 108 dissertation advisors, and 12 senior administrators in the participating institutions. A 5-point rating dissertation evaluation scale was developed for use by the researcher and her assistants. Three sets of a dissertation attribution questionnaire used by the students, advisors, and senior administrators were also developed and administered. Descriptive statistics were used with the 5-point rating data. The 3-level HLM package was used to analyze the quality, value-added model of the dissertations. The findings of the study were: (1) the overall quality of the 750 dissertations was at the standard level; (2) there were 5 factors at 3 different levels influencing the dissertation quality with 1 student factor (favorable characteristics in conducting research), 3 advisor factors (experience in research, up-to-date knowledge in research, and the advisor-student ratio), 1 institutional factor (close monitoring and management system); and (3) the quality value-added model was able to predict the variance of the dissertation quality at 36 percent.

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Introduction

In recent statistics published by the Office of the Higher Education Commission (2015), 33 out of the 43 Thai private universities (77%) offered doctoral degree programs. Out of the 33 programs, 26 programs (79%) were in the social sciences and humanities. With this expansion, Office of the

Education Council (2011) found that the number of doctoral graduates during 2008–2010 has increased tremendously. In 2008, 2009, and 2010 the graduate figures were 1,641, 1,798, and 1,864, respectively. Tatiyakavee (2014), the Secretary-General of OHEC, found that a number of private universities offered low quality doctorate programs. It is very likely that the number of these low quality programs will increase.

A dissertation is part of the requirement of the doctorate program. The dissertation process makes the students learn

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how to learn and to search. The quality of the dissertation therefore, reflects how much effort the student has invested in the program as well as how much society can benefit from the higher education doctoral program. Hamilton, Johnson, and Poudrier (2010) found that in conducting a dissertation, students would have opportunities to search for new knowledge and that they needed to have analytical, problem solving, and ICT skills. Zhai, Song, Dai, Zhao, and Zhang (2012) did not see study directly relating to the examination of the dissertation quality. However, there has been study relating to the examination of the thesis quality. Office of the Education Council (2009) studied the quality of Thai research in education during 1999–2007 and found that 25.0 percent, 41.7 percent, 30.0 percent, and 3.3 percent were at the “very good,” “good,” “average,” and “need improvement” levels, respectively. Bray and Belcher (1987) claimed that value-added assessment, which has been popularly used in other fields besides education, was a powerful tool that could help a higher education institute to determine its strengths and weaknesses. With valid, reliable, and sufficient data, this simple tool can easily gain cooperation and support from administrators, faculty members, and students and thus help the institute to identify its dissertation quality's strengths and weaknesses. Bray and Belcher, therefore, recommended the value-added model. Similarly, OECD (2008) found that the value-added model was an education innovation that could help improve the quality and efficiency of education.

With the above mentioned situation and the need for improvement in the quality of education, the researcher sees the importance of and the need for a thorough investigation into this issue. The findings of the study should be beneficial for dissertation advisors, university administrators, and educators who are responsible for the improvement of Thai education quality. Therefore, the objectives of the study were: (1) to evaluate the quality of dissertations of private higher education institutions in the field of humanities and social sciences, (2) to study student, advisor, and institutional factors that affect the quality of dissertations of private higher education institutions in the humanities and social sciences, and (3) to propose a value-added model for the improvement of dissertations of private higher education institutions in the humanities and social sciences.

Scope of the Study

1. The dissertations selected for this study were being carried out during 2007–2013 in four areas: (1) education, (2) political science/public administration/development administration/human resource development, (3) business administration/management, and (4) law.
2. The researcher employed a 3-level hierarchical linear model in determining the quality of the dissertations. The levels consisted of the student as the first level, the dissertation advisor as the second level, and the institution as the third level.
3. The researcher used the residual models of Goldstein (1997) and Fitz-Gibbon (1996), which are 3-level hierarchical linear models, in the study.

Materials and Methods

Samples

The study sample was divided into two groups: (1) 750 dissertations in the humanities and social sciences carried out between 2007 and 2013 at 12 private higher education institutions; and (2) the responses from a questionnaire by 633 doctoral graduates in the humanities and social sciences who graduated from those 12 private higher education institutions between 2007 and 2013, 108 student advisors in the humanities and social sciences of those 633 doctoral graduates, and 12 senior administrators of the 12 participating private higher education institutions. The latter sample was selected through multistage random sampling. A selection of the sample at each stage was carried out. Twelve private higher education institutions offering doctoral degree programs in the humanities and social sciences (46% of the total number) and 750 dissertations produced during 2007–2013 of the 12 institutions were randomly sampled. The 750 doctoral graduates in the humanities and social sciences who wrote those 750 dissertations, all advisors of the graduates, and 12 senior administrators for academic affairs were selected as questionnaire respondents.

Materials and Tools

Dissertation Quality Evaluation Forms

A 5-point rating scale for the evaluation of the dissertations was developed and used by the researcher and her assistants. The scale covered 30 questionnaire items such as title, objectives, literature, methodology, analysis, and findings. The rubric method was used in each scored item. The item objective congruence (IOC) values of the 30 items selected for the quality evaluation of the dissertation ranged between .71 and 1.00. The concurrent validity values of the 30 items ranged between .849 and .959. The inter-rater reliability values of the items ranged between .810 and .959, and the validity values of the items through the test-retest method ranged between .944 and .966.

Questionnaire Development

Three sets of questionnaire were developed: (1) the doctoral graduate questionnaire, (2) the advisor questionnaire, and (3) the senior administrator questionnaire. The doctoral graduate questionnaire was divided into four parts: (1) personal data, (2) research competency of the respondent, (3) internal motivation, and (4) further suggestions for higher quality of the dissertation. The IOC values of the questionnaire ranged between .71 and 1.00 and the reliability values of the items ranged between .806 and .929. The advisor questionnaire was divided into three parts: (1) personal data, (2) advisor knowledge and competency, and (3) further suggestions for higher quality of the dissertation. The IOC values of this questionnaire ranged between .57 and 1.00 and the reliability values of the items ranged between .874 and .953. The senior administrator questionnaire consisted of five parts: (1) personal data, (2) general information on the

institution, (3) academic administration, (4) institutional support, and (5) further suggestions on program management. The IOC values of the questionnaire ranged between .86 and 1.00 and the reliability values of the items ranged between .859 and .964.

Statistical Analysis

The analysis was divided into two steps: the study of dissertation quality and the analysis of the quality value-added model. The dissertation quality was analyzed through descriptive statistics. The hierarchical linear model was used in the analysis of the quality value-added model of the dissertations. The analysis was divided into three steps: (1) null model analysis; (2) hypothetical model analysis; and (3) comparison of the quality value-added scores obtained through the hypothetical model analysis. The statistical tools used were *t*-test, one-way analysis of variance, and *post hoc* tests. To compare differences between pairs, the Scheffe' statistical analysis technique was applied. SPSS version 20 and the HLM version 7.01 were used.

Results

Quality Level of the Dissertation in the Field of Humanities and Social Sciences

It was found that the quality of dissertations in the fields of education, political science (which included public administration, development administration, and human resource development), business administration/management, and law was rated at the "standard" level with scores of 66.11, 60.80, 49.39, and 80.80 percent, respectively. Details of the findings are presented in Table 1.

Looking into further details of the quality of the 750 dissertations based on the 30 quality items, it was found that three items scored at the above standard level (over 60% of the respondents). These three items were: (1) the clarity and the attractiveness of the title (64.53% with $\bar{X} = 3.97$ and $SD = .74$); (2) the clarity of the purposes and congruency between the purpose and the dissertation title (70.93% with $\bar{X} = 4.08$ and $SD = .61$); and (3) the high quality of the research tools (72.93% with $\bar{X} = 3.67$ and $SD = .84$). There were six items scored at the standard level (over 60% of the respondents). These items were: (1) the clarity of the background and the importance of the

problem (64.53% with $\bar{X} = 3.14$ and $SD = .76$); (2) the clarity and the principle-binding of the research hypothesis (76.29% with $\bar{X} = 3.08$ and $SD = .75$); (3) the clarity and the principle-binding of the conceptual framework (65.87% with $\bar{X} = 3.21$ and $SD = .78$); (4) the originality of the finding (71.33% with $\bar{X} = 2.88$ and $SD = .73$); (5) the applicability level of the finding (65.20% with $\bar{X} = 2.90$ and $SD = .73$); and (6) the overall quality of the report (74.67% with $\bar{X} = 3.02$ and $SD = .51$). Two items, as perceived by over 60 percent of the respondents, scored below standards. These two items were: (1) the literature reviewed was contemporary and was less than 5 years old (70.93% with $\bar{X} = 2.48$ and $SD = .86$), and (2) the academic applicability of the findings (79.47% with $\bar{X} = 2.27$ and $SD = .61$).

The average quality score of the 750 dissertations on the 30 quality items was 3.30 with a standard deviation of .46 using the 5-point rating scale.

Results of Analysis of Quality Value-added Model

Results of Null Model Analysis

The average grand mean of the quality of dissertations was 3.427. The test of the fixed effects found that the intercept value significantly affected the average quality of the dissertation at the .01 level ($t = 38.194$). The researcher also found that, through the analysis of the random effects, there was significant variation in the average quality value of the dissertation among the advisors at this second level at the .01 level with variance = .026 and $\chi^2 = 229.613$ ($df = 96$). In the third level analysis, the average quality value of the dissertation varied significantly among the institutions at the .01 level with variance = .090 and $\chi^2 = 213.974$ ($df = 11$). Thus, the variances of the average quality value of the dissertations at the first, the second, and the third levels were 49.30 percent, 11.40 percent, and 39.30 percent, respectively. Therefore, these factors were worth further detailed investigation to determine if the variables under individual levels (student, advisor, and institutional), had some effects on the average quality values of the dissertation.

Hypothetical Model Analysis

The average grand mean of the quality value of the dissertations of the 12 institutions was 3.189. The test of the fixed effects indicated that the intercept significantly affected the average quality value of the dissertation at the .01 level ($t = 18.658$).

It was also found that based on the regression coefficient of the variables affecting the dissertation quality, the student variable (the first level variable) significantly affected the average quality value of the dissertation at the .01 level; which was a favorable characteristic of students conducting research with a coefficient = .016 ($t = 2.745$). This indicated that the students with higher favorable characteristics for conducting research produced higher quality dissertations and consequently produced a higher average quality value of the dissertations. Once other variables in the prediction equation were controlled, the favorable characteristic for conducting research of the students reliably predicted the average quality value of the dissertation at 99 percent.

Table 1

Number of 750 dissertations classified according to their quality level and fields of study (percentage in parentheses)

Quality level	1	2	3	4
Excellent	1 (.28)	2 (1.01)	0 (.00)	0 (.00)
Above standard	112 (31.37)	63 (31.66)	77 (46.95)	0 (.00)
Standard	236 (66.11)	121 (60.80)	81 (49.39)	24 (80.00)
Below standard	8 (2.24)	13 (6.53)	6 (3.66)	6 (20.00)
Total	357 (100.00)	199 (100.00)	164 (100.00)	30 (100.00)

Notes 1 = education, 2 = political sciences/public administration/development administration/human resource development, 3 = business administration/management, and 4 = law

There were two advisor variables affecting the average quality value of the dissertations: up-to-date knowledge in research, and their experience in research. The advisor variables significantly affected the average quality value of the dissertations at the .01 level. The coefficients of the up-to-date knowledge in research and their experience in research were .007 and .341, respectively ($t = 3.066$ and 3.959 , respectively). This indicated that up-to-date knowledge in research and their experience in research significantly affected the quality value of the dissertation. In particular, once the other prediction variables were controlled, the two advisor variables reliably predicted the average quality value of the dissertation at 99 percent. It was also found that the advisor-student ratio significantly affected the average quality value of the dissertation at the .05 level, with a coefficient value of $-.017$ ($t = -2.428$). This indicated that the advisor-student ratio negatively affected the quality of the dissertation. Once other prediction variables were controlled, a lower advisor-student ratio helped increase the average quality value of the dissertation with a reliability value of 95 percent.

There was one institutional level variable that significantly affected the quality value of the dissertation. The management, monitoring, and controlling systems on research of the institution significantly affected the average quality value at the .05 level, with a coefficient of .077 ($t = 4.035$). The management, monitoring, and controlling system positively affected the average quality value of the dissertations. Once other prediction variables were controlled, the systematic management, monitoring and controlling system of the dissertation works reliably increased the average quality value of the dissertation at 95 percent.

The random effects of the quality value indicated that the average quality value of the dissertation significantly varied among the second level variable (advisors) at the .01 level, with variance = .019, $\chi^2 = 197.434$ ($df = 89$). The average quality value of the dissertation also varied significantly at the third level variable (institution) at the .01 level, with variance = .022, $\chi^2 = 57.845$ ($df = 3$). This indicated that the average quality value of the dissertations varied among advisors within an institution and among institutions offering doctoral programs. With other variables controlled, the variances of the average quality value of the dissertation at the first, second, and third level variables were at 72.11 percent, 12.93 percent, and 14.97 percent, respectively.

Based on the hypothetical model analysis, the researcher found that the first, second, and third level models could explain the variance of the variables at the three levels at 6 percent, 27 percent, and 76 percent, respectively. The models at the three levels could explain the variance of the variables at 36 percent.

Based on the above findings, there were five factors affecting the average quality value of dissertations: one student factor, three advisor factors, and one institutional factor. With the regression coefficient value of .016, the favorable characteristic of the student significantly affected the quality value of the dissertation at the .01 level. At the advisor level, the three factors affecting the quality value ranging from highest to lowest were experience in research, up-to-date knowledge in research, and the

advisor-student ratio. The experience in research and the up-to-date knowledge in research significantly and positively affected the quality value at the .01 level, with regression coefficients of .341 and .007, respectively. The advisor-student ratio significantly and negatively affected the quality value at the .05 level, with a regression coefficient of $-.017$. There was one factor at the institution level affecting the quality value of the dissertation, being the management, monitoring and controlling system on research of the institution. With a regression coefficient of .077, this factor significantly affected the quality value of the dissertation at the .05 level. The variables affecting the quality value of the five factors are illustrated in Figure 1.

Comparison of the Quality Value-added Scores of Dissertations in Humanities and Social Sciences

The quality value-added scores of the dissertations under the advisors with less than 10 years of experience, 10–20 years of experience, and more than 20 years of experience were significantly different at the .05 level.

To investigate the differences in quality value-added scores among dissertations where the advisors had different years of advisory experience, the researcher applied *post hoc* test analysis by pairing groups of advisors and using the Scheffe' technique. It was found that the advisors who had more than 20 years of experience, between 10 and 20 years of experience, and less than 10 years of experience had quality value-added scores of the dissertations that were significantly different at the .05 level. The advisors with more than 20 years of advisory experience received higher quality value-added scores than those who had 10–20 years of experience and less. However, there was no difference in the value-added scores between advisors with 10–20 years of experience and less.

There was no significant difference in the value-added scores of the dissertations where the advisors had different academic ranks and research experience at the .05 level.

Discussion

1. Among the 750 evaluated dissertations, it was found that among the 30 items being used for the evaluation, three were rated “above standard,” six were rated “standard,” and two were rated “below standard”. These two latter items were the not very up-to-date literature and the low potential of academic usage of the findings. It was found that the mean score of the literature reviewed within 1–5 years was only 2.48 with $SD = .86$. Most students reviewed a limited number of items and not from the original source. A thorough and in-depth review of literature was rarely carried out. Little up-to-date and contemporary knowledge was reviewed. These weaknesses corresponded with the findings of Kyvik and Thune (2015), who used “Originality,” “Depth and Coverage,” and “Methodological Level,” as some of the criteria for the evaluation of dissertations. The current finding corresponded with Isaac, Quinlan, and Walker (1992) who concluded that a dissertation needed sufficient support from related literature.

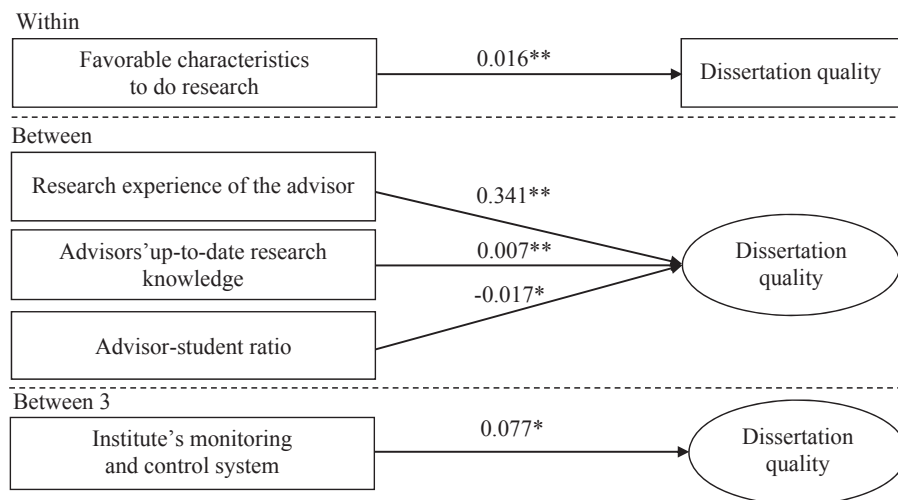


Figure 1 Dissertation quality value-added model in humanities and social sciences programs, with variance ratio of the variables as explained by the three-level model = 36 percent; * and ** indicate .05 and .01 levels of significance, respectively

The academic usage of the findings is another matter of concern. The mean score of the academic usage of the finding was only 2.27 with $SD = .61$. Findings were mostly used by the individual students who conducted the dissertations. They were rarely used for the generalization of new principles or theories. This finding corresponded with that of [Office of the Education Council \(2009\)](#) who pointed out that the weakness of the dissertations conducted recently was the low academic applicability of the findings.

2. Analysis of the hypothetical model. It was found that the favorable characteristics of the student, such as high creativity, self-discipline, integrity, and enthusiasm to learn, positively affected the dissertation quality. This finding corresponded with [Srisuwan \(2007\)](#) who found that the favorable characteristics of the students positively affected the quality and indirectly affected their research behavior.

At the advisor level, the experience of the advisor positively affected the quality. The advisors with more research experience, that is those who had served as a research project director or a research counselor, could help the students to produce higher quality dissertations than those with less research experience. This was also consistent with [Mahmood \(2011\)](#) who reported that advisors who had more advisory experiences and were better trained for advisory works could help their students to produce high quality dissertations.

The up-to-date knowledge in research of the advisor positively affected the quality of the dissertation. Advisors with up-to-date knowledge in research (knowledge about new research methodologies and software packages) could help their students to produce higher quality dissertations than those with less knowledge about new methodologies and new software packages. This finding corresponded with [Bloomberg and Volpe \(2012\)](#) who found that the advisor up-to-date knowledge in research could help the

student to choose the proper research methodology which consequently led to a utilizable finding.

The student-advisor ratio negatively affected the quality. A low student-advisor ratio helped improve the quality, whereas in contrast, a high student-advisor ratio led to low quality. This finding corresponded with [Tongsamsi and Phatthararangrong \(2010\)](#) who reported that the student-advisor ratio related to the quality of the dissertation.

The monitoring and the control system of the institute was the one institutional factor that affected the quality of the dissertation, having a positive effect. Institutions with a better monitoring and control system helped the students to produce higher quality dissertations. This finding corresponded with [Trigwell and Goddet \(2005\)](#) who found that the monitoring and controlling mechanism could help improve the quality. In another study, [Hirunwong and Chatraphorn \(2005\)](#) found that favorable university policies encouraged faculty members to conduct research.

3. The advisors with different advisory experience resulted in quality value-added scores of their students' dissertations being significantly different at the .05 level. Advisors with more than 20 years of advisory experience received higher quality value-added scores than those who had 10–20 years of experience and less. In other words, the advisors with higher years of advisory experience helped their students to generate higher quality value-added dissertations. This finding corresponded with the finding made by [Ruksapollmuang and Pitayanuwat \(2006\)](#).

Conclusion

1. Through the evaluation of the 750 sampled dissertations, it was found that the quality level of the dissertations in the fields of education, political sciences (public administration, development administration, and human resource development), business

administration/management, and law was at the “standard” level.

Taking into account the 30 items used as evaluation indicators, it was found that three items were rated at the “above standard” level, six items were rated at the “standard” level and two items were rated at the “below standard” level. However, the overall quality of the 750 dissertations was at the “standard” level.

- Five factors affected the quality value-added model of the dissertations: one factor at the student level, three factors at the advisor level, and one factor at the institutional level. The favorable characteristics of the student positively affected the quality of the dissertation, being from highest to lowest: experience in research and the advisor's up-to-date research knowledge. A high student-advisor ratio negatively affected the quality. As well, a close monitoring and control system of the institution positively affected the quality.
- Dissertation advisors with different academic ranks and research work experience did not result in any significant differences in the quality value-added scores of the dissertation at the .05 level. However, the dissertation advisors with differences in dissertation advisory experience generated a significant difference in the quality value-added scores at the .05 level. The advisors with over 20 years of dissertation advisory experience generated a higher quality dissertation than did the advisors with 10–20 years and less.

Recommendations

- The findings showed that most dissertations were rated at the “standard” level. Not many dissertations were rated “excellent” and “above standard.” There were two quality factors that needed urgent attention from the parties involved: the limited amount of literature reviewed and that within published with the last 1–5 years, and the academic usage of the findings. The private higher education institutions should seriously take these into consideration and look for effective means for improvement.
- The private higher education institutions may use the factors affecting the dissertation quality at each level in the value-added model in preparing their quality improvement plan.

Conflict of interest

There is no conflict of interest.

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References

- Bloomberg, L. D., & Volpe, M. (2012). *Completing your qualitative dissertation: A road map from beginning to end* (2nd ed.). London, UK: Sage.
- Bray, D., & Belcher, M. J. (Eds.). (1987). *Value-added assessment college education and student growth*. San Francisco Bay, CA: Jossey-Bass.
- Fitz-Gibbon, C. T. (1996). *Monitoring education: Indicators, quality and effectiveness*. New York, NY: Bloomsbury Publishing.
- Goldstein, H. (1997). Methods in school effectiveness research. *School Effectiveness and School Improvement*, 8(4), 369–395.
- Hamilton, P., Johnson, R., & Poudrier, C. (2010). Measuring educational quality by appraising thesis and dissertations: Pitfalls and remedies. *Teaching in Higher Education*, 15(5), 567–577.
- Hirunwong, A., & Chatraphorn, S. (2005). Causal factors of research productivity of vocational educators in higher education. *Kasetsart Journal: Social Sciences*, 26(1), 72–81. [in Thai]
- Isaac, P. D., Quinlan, S. V., & Walker, M. M. (1992). Faculty perceptions of the doctoral dissertation. *The Journal of Higher Education*, 63(3), 241–268.
- Kyvik, S., & Thune, T. (2015). Assessing the quality of PhD dissertations: A survey of external committee members. *Assessment & Evaluation in Higher Education*, 40(5), 768–782.
- Mahmood, S. T. (2011). Factors affecting the quality of research in education: Student's perceptions. *Journal of Education and Practice*, 2(11), 34–40.
- OECD. (2008). *Measuring improvements in learning outcomes: Best practices to assess the value-added of schools*. Paris, France: Author.
- Office of the Education Council. (2009). *A synthesis of research of education quality in Thai: Meta-analysis* (Research report). Bangkok, Thailand: Author. [in Thai]
- Office of the Education Council. (2011). *Thailand education statistics 1992–2009, classified by education levels*. Retrieved from http://www.social.nesdb.go.th/SocialStat/StatReport_Final.aspx?reportid=42&template=3R1C&yeartype=M&subcatid=23
- Office of the Higher Education Commission. (2015). *Education institutes under the commission of higher education*. Retrieved from <http://www.mua.go.th/university.html>
- Ruksapollmuang, C., & Pitiyanuwat, S. (2006). *Thesis adviser: Role and responsibility*. Bangkok, Thailand: Aroonkarnpim. [in Thai]
- Srisuwan, P. (2007). A causal relationship model of research quality of air command and staff college curriculum B.E. 2547 graduates. *Journal of Research Methodology: JRM*, 20(2), 211–226. [in Thai]
- Tatiyakavee, K. (2014, October 11). The 30 days deadline for doctoral programs' quality improvement. *Daily News*, 1–15. [in Thai]
- Tongsamsi, K., & Phatthararong, N. (2010). Indicators that have relationship with the quality of graduate students and the quality of research works: A case study at Prince of Songkla University. *Songklanakarin Journal of Social Sciences & Humanities*, 16(2), 299–318. [in Thai]
- Trigwell, K., & Goddet, H. D. (2005). *The research experience of post-graduate research students at the University of Oxford*. Retrieved from <http://www.tapsystem.org/policyresearch/policyresearch.taf?page=valueadded>
- Zhai, G., Song, C., Dai, X., Zhao, L., & Zhang, Y. (2012). Construction and implementation of the graduation thesis teaching system for modern distance education. *International Journal of Digital Content Technology and its Applications (JDCTA)*, 6(18), 427–433.