Determinants of Performance in Thesis: Evidence from Selected Filipino Graduate Students

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Abstract

The researcher made an investigation on the determinants of performance of the graduate students in master's thesis, taking into account their grades in research course, thesis manuscript, and oral defense as independent variables, while the final thesis grade as dependent variable. To carry out the research undertaking scientifically, after data has been collected, the researcher employed the statistics for a line using the least squares method that specifically calculates for each point the squared difference between the estimated and actual y-values. The findings revealed that all the independent variables, except grades in the research course, when taken singly and collectively through regression equation, are consistently functional in predicting the students' final thesis grade. The investigation finally disclosed that the students' ratings in the thesis manuscript and oral defense are considered determinants of performance in master's thesis which are found evident from the selected Filipino graduate students considered in the study.

Keywords: master's thesis, determinant of performance, final thesis grade, research course, thesis manuscript, oral defense, graduate students

1. Introduction

A master's degree is an academic degree conferred by a college or university upon individuals who successfully demonstrate a higher level of expertise in a particular field of study. Typically, the master's degree requires a minimum of thirty-credit course and entails completing a thesis to be presented in written and oral.

If others find writing by just translating into words the images of thoughts, in thesis writing, graduate students learned how to transform thoughts, redefine them, and give shape to the ideas. The success of a thesis does not only depend on the students' writing skill but also on their ability to present themselves and their research output effectively and confidently. Writing a thesis is a creative process, thus, its nature and progress can depend very much on the students' capability.

A thesis serves the primary purpose of training the student in the processes of scholarly research and writing under the direction of the members of the graduate faculty. Typically, students in a master's program have a thesis committee consisting of five faculty members in the graduate school that serve as an adviser, a reader, and three thesis examiners. The roles of the adviser and

reader are to supervise the student during the thesis process. The thesis examiners are the evaluators of the master's thesis at the end of the student's research work. The thesis committee members are the gatekeepers who ensure that the quality of the research output meet certain professional standards.

Master's thesis is a substantial piece of work, written with a view to prove or disprove something, add to, or create new knowledge. This research undertaking requires students to demonstrate a mastery of the subject area being researched. It encompasses both intellectual and skills development and for majority of graduate students, thesis is the most challenging piece of academic work (Hamizad et al., 2012).

Consequently, a number of studies reported that there are high proportions of graduate students who struggle to complete their studies (Zainal and Ismail, 2009). Writing a thesis is often a source of great anxiety for many students because of its nature characterized as the ultimate self-regulated learning task (Sachs, 2002). Moreover, this has been found to be the most prominent factor leading to graduate students' attrition and untimely completion of their degree in a stipulated duration (Ngozi, 2014).

With these perspectives of several authors and with the aim to examine these concerns by presenting scientific bases, the researcher made an investigation on the determinants of performance of the graduate students in thesis, taking into account their grades in research course, thesis manuscript, and oral defense as independent variables, and the final thesis grade as dependent variable.

2. Methodology

To adopt a methodical inquiry, the researcher considered Pamantasan ng Lungsod ng Maynila (PLM) as research locale. PLM is a chartered university created by the Congress of the Philippines in 1965, now with twelve (12) colleges, two (2) professional schools, and seven (7) graduate schools. Samples were collected at random in one of the graduate schools where forty-three (43) students who earned their master's degree during the consecutive academic years 2011-2014 were considered as participants in the study.

Data on grades in research course, thesis manuscript, oral defense, and final thesis were collected from the graduate student-respondents. Students' grade in the research course were based on their performance in the three-credit course with class work requirements such as written examination, class participation, and thesis proposal. Grades in the thesis manuscript were based on the ratings given by the thesis examiners in the final paper submitted by the students. The areas of consideration in writing are: (1) content, (2) organization, and (3) style and mechanics.

Ratings in the oral defense were based on the students' performance in the final paper presentation. Thesis examiners graded them based on the following criteria: (1) mastery of content, (2) research skills, (3) open-mindedness, (4) effective visuals, and (5) response to questions. On the other hand, data on final thesis grades were based on the average grade given by the thesis examiners in the students' final activity, giving equal weights in written and oral presentation of the master's thesis.

3. Statistical Treatment

To carry out the research undertaking scientifically, after data has been collected, the researcher applied the *linest* of Microsoft Excel. This computes the statistics for a line by using the least squares method and specifically calculates for each point the squared difference between the y-value estimated for that point and its actual y-value.

The regression equation for the line is presented as $y = m_1x_1 + m_2x_2 + \ldots + m_{n-1}x_{n-1} + m_nx_n + b$, where the dependent y-value is a function of the independent x-values. To fully understand the succeeding discussion pertaining to the results of the study, the variables and statistics used in this study are presented in table form below with the corresponding notations and explanations:

Regression table for y (as dependent variable) together with $x_1, x_2, \ldots, x_{n-1}, x_n$ (as independent variables)

variables	x_n	x_{n-1}	…	x_2	x_1	
m_i	m_n	m_{n-1}	…	m_2	m_1	b
se_i	se_n	se_{n-1}	…	se_2	se_1	se_b
r^2; se_y	r^2	se_y	…			
F	F	df	…			
ss_{reg}; ss_{resid}	ss_{reg}	ss_{resid}	…			
t_i	t_n	t_{n-1}	…	t_2	t_1	t_b

where:

m_i The values are coefficients corresponding to each x-value; while b is a constant value which represents the y-intercept of a line.

se_i The standard error values for the coefficients m_i; while se_b is the standard error value for the constant b.

r^2 The coefficient of determination, r^2, is the ratio of regression sum of squares and the total sum of squares. This is used to compare the estimated and actual y-values, and ranges in value from 0 to 1. If it is 1, there is a perfect correlation in the sample, which means that there is no difference between the estimated y-value and the actual y-value. At the other

extreme, if the coefficient of determination is 0, the regression equation is not helpful in predicting a y-value.

se_y The standard error for the y estimate.

F The F statistic or the F-observed value is used to determine whether the observed relationship between the dependent and independent variables occurs by chance; while the df is the degrees of freedom used to find F-critical values in a statistical table.

ss_{reg} The regression sum of squares is the difference between the total sum of squares (the sum of the squared differences between the actual y-values and the average of the y-values) and the residual sum of squares. The smaller the ssresid is, compared with the sstotal, the larger the value of the coefficient of determination, r^2, which is an indicator of how well the equation resulting from the regression analysis explains the relationship among the variables.

ss_{resid} The residual sum of squares is the sum of the squared difference between the y-value estimated for that point and its actual y-value.

t_i The t-test is used to determine whether each slope coefficient is useful in estimating the value of y. The t-observed value is computed as m divided by se. If the absolute value of t is sufficiently high, it can be concluded that the slope coefficient is useful in estimating the value of y.

4. Results and Discussion

The following are the findings of the study after the data have been analyzed using the appropriate statistical treatments. Four regression tables are shown to present the investigation results on the determinants of performance of graduate students in thesis.

4.1. Rating in Research Course as a Determinant of Performance in Thesis

The researcher employed in the computation of regression, the grade of the graduate students in research course as independent variable, and the final thesis grade as dependent variable.

The posted value of $r^2 = 0.01$ reveals a very weak coefficient of determination. It may be noted that if r^2 is 1, it implies a perfect correlation in the sample, which means that there is no difference between the estimated y-value and the actual y- value. At the other extreme, if the coefficient of determination is 0, the regression equation is considered not helpful in predicting a y-value. Thus, the very low value of r^2 revealed that the regression equation $y = 0.17x + 2.68$ is not helpful in predicting a y-value (Table 1).

To determine whether the observed relationship between the grade in research course and the final thesis grade occurred only by chance, the F statistic is computed. Comparing the F observed value of 0.31 with its critical value of 4.08 at 0.05 level of significance disclosed that the relationship took place only by chance.

The t-value of 0.56 as compared to its corresponding tabular value of 2.0181 divulged that the relationship of the two said variables is not significant at 0.05 level. This implies that the slope coefficient of 0.17 is not useful in estimating the value of the dependent variable y. The results further revealed that the students' grade in research course has no direct relationship with their final thesis grade. Thus, there is no reason to consider the said independent variable as a determinant of performance of graduate students in master's thesis.

The findings may be associated with the work of Wong and Wong (2010) where two for every five participants they interviewed in their study acknowledged the facilitating theme of general preparation in research and writing. The general preparation in their study is referred to as having related job experiences, writing courses, reading literature, completing required courses, selecting a suitable supervisor, and recruiting committed participants. On the other hand, their interview results divulged that three for every five participants affirmed that lack of understanding of the thesis writing process was hindering. The matter of assertion specifically included the lack of knowledge in the research topic, the thesis process, research methodology, and supervisor selection (Wong and Wong, 2010).

Evident from the findings of Wong and Wong that there were more students who believed that lack of understanding of the thesis writing process was disadvantage, rather than those few who thought that completing the required courses was advantage. The results of the present study, actually supports the said observations. It may be noted in this study that students' grade in the research course, which requires only the research proposal as students' output, has not been established to estimate the performance in the final thesis. Lack of understanding the whole thesis writing process, from its conceptualization to presentation of final output, was considered disadvantage by many in the previous study.

Moreover, Han (2014) found out that a considerable number of students out of the 414 sample respondents have problems in the selection and report of topics, writing of each part and debating in the whole process of graduation thesis.

The findings of Han may be considered as one of the reasons why no direct relationship was found in the students' grades in research course and master's thesis. It may be recalled from the previous discussion that only research proposal was required from the graduate students to present during their course of study in research. Most of the graduate students have no hands-on experience in the undertakings after the research proposal has been conceptualized. These concerns include the preparation of the essential parts of the master's thesis, namely, the presentation of results, conclusions and recommendations. This observation further supports the statement of Han who believed that writing each part and debating in the whole process of the master's thesis are considered problems of most of the graduate students.

4.2. Rating in Thesis Manuscript as a Determinant of Performance in Thesis

Many graduate students experienced difficulty in writing the master's thesis mainly because they are not sure of its rules and requirements, or may be some are not certain of its writing procedure and essential use (Yang, 2006).

In master's thesis, writing skills and reading comprehension seemed to be one of the many attributes that need to be taken into consideration by most of the graduate students. Kaur (2009) believed that the ability of speaking and writing well in English among the graduate students is daunting in the region of educational system where English is used as a second language.

To investigate this concern scientifically, the researcher in this study, computed for the regression considering the students' ratings in thesis manuscript as independent variables and the final thesis grade as dependent variable. The independent variables reflected on concerning writing are the grades in thesis manuscript in terms of: (1) content, (2) organization, and (3) style and mechanics.

The reflected value of $r^2 = 0.92$ which is near 1, posted a very strong coefficient of determination, which means that there is almost no difference between the estimated and actual y-values. Thus, it may be stated that the regression equation $y = 0.69x_1 + 0.07x_2 + 0.23x_3 + 0.17$ is functional in predicting the final thesis grade (Table 2).

To test whether the observed relationship between the grade in thesis manuscript and the final thesis grade happened only by chance, the F statistic is computed. With the F critical value of 2.85 compared to the observed value of 142.39, reveals that the relationship of the said variables occurred not only by possibility.

The t-observed values for the style and mechanic (3.39) and content (6.83) when compared to its critical value of 2.0181 explained a direct strong relationship of the dependent and independent variables as reflected by their constant coefficients of 0.23 and 0.69, respectively. The coefficient 0.07 for the organization, on the other hand, is considered not valuable in estimating the final thesis grade.

This finding may be compared to the work of Burns (2000) where, in the former, many factors were identified that could contribute to the pressures of undertaking and coping with the requirements of postgraduate work. According to Burns, this includes lack of writing skills using appropriate language, reading, and comprehending academic texts in a critical manner. Other attributes, like lack of knowledge in research skills that includes information linkages in sentences' formation or redundancy facts in writing construction, according to Burns, may also affect postgraduate thesis achievements.

4.3. Rating in Oral Defense as a Determinant of Performance in Thesis

Thesis examiners evaluated the graduate students during the oral presentation of paper based on how they performed in terms of: (1) mastery of content, (2) research skills, (3) open-mindedness, (4) effective visuals, and (5) response to questions. Ratings in the final thesis (dependent variable, y) and oral defense (independent variables, x_1-x_5) were considered in the computation of the regression below.

Data reveals a regression equation of $y = 0.26x_1 + 0.17x_2 + 0.31x_3 + 0.11x_4 + 0.01x_5 + 0.28$. The observed $r^2 = 0.94$ which is close to 1, posted a very strong coefficient of determination, which may be observed similar to the findings when regression was earlier computed employing grades in

thesis manuscript as independent variable. The regression suggests that the equation of y has likewise established its purpose in predicting the students' final thesis grade (Table 3).

Since the F computed value, 116.23, is found to be higher to its critical value of 2.47, it can be stated that the observed relationship between the grades in oral defense and final thesis grade took place not by chance.

The t-computed values (t_i) as compared to the critical value of 2.0181 explained that students' grades in terms of mastery of content (x_1), research skills (x_2), and open-mindedness (x_3) with t values posted at 3.55, 2.03, and 4.13 are said to be significant, respectively. On the other hand, students' grades in terms of effective visuals (x_4) and response to questions (x_5), with t-values registered at 1.31 and 0.13, respectively, were considered insignificant.

This finding is similar to the observation of Mushoriwa and Nyakutse (2014) when they discovered that one of the problematic areas for many of the participants in their study was deciding on the best way to present data because facing the oral presentation panel was challenging for their respondents.

Data from their interviews revealed that many of the participants wished they had been coached on how to defend their thesis. They said that their respondents lacked confidence because they did not have knowledge regarding the defense process. The researchers recommended, after their investigation, that students should be given a lot of thesis defense practice sessions before they finally defend their theses to the panel of examiners to mitigate the fear and nervousness (Mushoriwa and Nyakutse, 2014).

4.4. Ratings in Research Course, Thesis Manuscript, and Oral Defense as Determinants of Performance in Thesis

Finally, a regression is computed considering the final thesis grade as dependent variable as against ratings in research course (x_1), thesis manuscript (x_2-x_4), and oral defense (x_5-x_9), collectively as independent variables. The findings revealed a regression equation of $y = 0.25x_2 + 0.15x_3 + 0.10x_4 + 0.10x_5 + 0.10x_6 + 0.10x_7 + 0.10x_8 + 0.10x_9$ and posting a perfect relationship among the variables (Table 4).

The F value of 1.4E+31 as compared to its tabular value of 2.18 affirmed that the observed relationship between the dependent and independent variables occurred not by chance.

It may be noted that all the dependent variables except grades in research course posted values of t that are sufficiently high. It can also further be observed that all the t computed values are evidently high compared to its corresponding critical value of 2.0181; thus, the slope coefficients of the dependent variables except for grades in research course have established their use in predicting the students' final thesis grade.

Likewise, Ngozi and Kayode (2014) revealed in their study that, jointly, the variables pertaining to supervision schedule, students' interest and predisposition towards research work, student's skill in conduct of research and availability of needed research support are major

attributive variables to delay in thesis completion. In their study, the researchers recommended that the students should be properly trained in research methods as well as enforced to show profound interest towards their research work (Ngozi, 2014).

The results of the present study finally disclosed that all the independent variables, except grades in the research course, when taken singly and collectively, consistently served as efficient variables in estimating the students' final thesis grade which is evident from selected Filipino graduate students considered in this research.

5. Conclusions

Based on the results presented in this study, the following conclusions are drawn:

1. The students' grade in research course, when taken individually and jointly with other independent variables through regression, has consistently not established to be a determinant of students' performance in thesis.

2. The students' grade in thesis manuscript, when taken singly and collectively with other independent variables through regression, has constantly recognized to be a determinant of performance in thesis. The students' grades in writing the thesis manuscript, particularly in terms of content, style and mechanics are said to be functional in estimating the final thesis grade, except in the writing conduct in terms of organization.

3. The students' grade in oral defense, similar to the findings in thesis manuscript, when taken alone and together with other independent variables through regression, has known to be a determinant of performance in thesis. The students' grades in oral defense in terms of the mastery of content, research skills, and open-mindedness are considered supportive in predicting the final thesis grade; except for the criteria that pertains to effective visuals and response to questions.

6. Recommendations

In the light of the salient findings and conclusions, the following recommendations are hereby offered:

1. The graduate students should engage themselves in various academic undertakings that will them develop their research skill, oral presentation ability, and writing facility in order for them to be able to produce a genuine scholarly thesis work.

2. The graduate faculty handling the research course should provide students a model that will demonstrate expectations in the whole thesis process and that will guide the students in determining the appropriate level of detail and tone needed in the revision of their paper.

3. The thesis adviser and reader should encourage and motivate the students to engage with their own ideas, give them an opportunity to ensure they are on track, and provide formative feedback, keeping comments focused on higher-order concerns.

4. The thesis committee members should take into consideration a creation of detailed rubrics or re-examination of the thesis evaluation criteria, both for oral and written presentation, to ensure a consistent standard and make the evaluation of the masters' thesis transparent.

5. The curriculum planners should consider the integration of scholarly activities in the masters' curriculum that will develop the graduate students' needed skills in research and will likewise give opportunity to students to apply the theory they have learned into practice.

6. The school administrators should offer workshops and other similar academic undertakings that can provide graduate student-participants with tips and techniques that will help them present their research effectively and confidently, and get feedback as well from the experts in a supportive environment.

7. The future researchers should consider the integration of other dependent and independent variables that could possibly affect the students' performance in the postgraduate work, not only in the master's level, but also in the doctorate level of various discipline.

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Statistical Tables

Table 1

Regression Table for Final Thesis Grade (dependent variable, y) and Research Course Grade (independent variable, x)

variables	x research	b constant
m_i	0.17	2.68
se_i	0.31	0.43
r^2; se_y	0.01	0.47
F	0.31	41
ss_{reg}; ss_{resid}	0.07	9.23
t_i	0.56	

Regression equation: $y = 0.17x + 2.68$

Table 2

Regression Table for Final Thesis Grade (dependent variable, y) and Thesis Manuscript Grade (independent variable, x_1-x_3)

variables	x_3 style and mechanics	x_2 organi-zation	x_1 content	b constant value
m_i	0.23	0.07	0.69	0.17
se_i	0.07	0.10	0.10	0.13
r^2; se_y	0.92	0.14		
F	142.39*	39		
ss_{reg}; ss_{resid}	8.52	0.78		
t_i	3.39*	0.67	6.83*	

* *significant*

Regression equation: $y = 0.69x_1 + 0.07x_2 + 0.23x_3 + 0.17$

Table 3

Regression Table for Final Thesis Grade (dependent variable, y) and Oral Defense Grade (independent variables, x_1-x_5)

variables	x_5 response to questions	x_4 effective visuals	x_3 open-mindedness	x_2 research skills	x_1 mastery of content	b constant value
m_i	0.01	0.11	0.31	0.17	0.26	0.28
se_i	0.08	0.08	0.08	0.08	0.07	0.11
r^2; se_y	0.94	0.12				
F	116.23*	37.00				
ss_{reg}; ss_{resid}	8.74	0.56				
t_i	0.13	1.31	4.13*	2.03*	3.55*	2.48*

** significant*

Regression equation: $y = 0.26x_1 + 0.17x_2 + 0.31x_3 + 0.11x_4 + 0.01x_5 + 0.28$

Table 4

Regression Table for Final Thesis Grade (dependent variable, y) with Grades in Research Course (x_1), Thesis Manuscript (x_2-x_4), and Oral Defense (x_5-x_9)

variables	x_9 response to questions	x_8 effective visuals	x_7 open-minded-ness	x_6 research skills	x_5 mastery of content	x_4 style and mechanics	x_3 organi-zation	x_2 content	x_1 research	b constant value
m_i	0.10	0.10	0.10	0.10	0.10	0.10	0.15	0.25	0.00	0.00
se_i	1.8E-16	1.8E-16	1.9E-16	2.1E-16	1.8E-16	1.4E-16	2.3E-16	2.5E-16	2.0E-16	3.5E-16
r^2; se_y	1.00	0.00								
F	1.4E+31*	33								
ss_{reg}; ss_{resid}	9.29	0.00								
t_i	5.6E+14*	5.5E+14*	5.3E+14*	4.9E+14*	5.6E+14*	7.1E+14*	6.6E+14*	9.8E+14*	0	1.6E-01

** significant*

Regression equation:

$$y = 0.25x_2 + 0.15x_3 + 0.10x_4 + 0.10x_5 + 0.10x_6 + 0.10x_7 + 0.10x_8 + 0.10x_9$$