

Research Papers/Extended Abstracts

A Comparison of Key Characteristics of Undergraduate and SLQF Level 10 Master's Theses: A Case Study in the Faculty of Agriculture, University of Ruhuna

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Abstract

Preparation of a thesis has been included into some undergraduate and postgraduate programmes to develop higher order competencies. A thesis, while being strong on scientific merits, should also be free from errors, well-presented and follow the prescribed guidelines. The objective of this study was to analyse the undergraduate (UG) and Sri Lanka Qualification Framework (SLQF) Level-10 Master (M) theses submitted by the students of the Faculty of Agriculture, University of Ruhuna (FoA) in terms of basic characteristics including page numbers, referencing, tables and figures and the level of adherence to the guidelines. Theses submitted by UG (n=169) and M (n=47) students during 2017-2021 were studied. The sum of the pages in introduction, literature review (LR), methodology and results and discussion (RD) sections of M theses (52.8) was significantly higher than that of an UG theses (37.9). The relative volume of those chapters in UG thesis were 9.1%, 38.1%, 18.2% and 34.5%, respectively while the corresponding values of a M thesis were 8.9%, 38%, 13.1% and 39.7%. The total number of pages in chapters and the whole thesis of some UG and even M theses were unusually less. The mean number of pages in the LR section of a UG thesis (14.5) was significantly lower than the minimum page number stipulated by the FOA thesis preparation guidelines. Compared to the total number of tables+figures in the RD section of UG (16.0) and M (20.8) theses, the number of pages in that chapter of UG (13.1) and M thesis (21.0) were low. The number of non-repeating citations used in the RD section of UG and M theses were as low as 6.0 and 12.5, respectively. As high as 27% and 21% of the UG and M theses respectively, had not cited any reference in the RD section. The percentage of journal-articles in the total number of items in the reference list of a M thesis (63.3%) was lower than that of an UG thesis (71.7%). The number of recent journal citations (within 5 or 10 year years) in M theses were significantly lower than that of UG theses. Incomplete reference lists, non-listing of cited reference and listing of the uncited references were common both in UG and M theses. The study highlights the importance of careful scrutiny of the thesis by the supervisor and educating students about thesis preparation and evaluation criteria.

Keywords: *Evaluation, Master Level, Theses, Undergraduate*

Introduction

The conduct of research and the submission of a thesis are critical components of both undergraduate (UG) and Master (M) programmes. SLQF (2016) prescribes that SLQF Level 10 M programme and UG honours programme of SLQF Level 6 should contain a research component having minimum of 15 and 5 credits, respectively. An UG research should be carried out under the guidance and supervision of a qualification holder of level 10, 11 or 12 and submitted a report/dissertation subject for evaluation. The SLQF Level 10 M research should be conducted under the guidance of a supervisor holding an equivalent or a higher qualification and should make an original academic contribution to a particular discipline. The candidate should submit a dissertation which is evaluated and accepted.

Preparation and the submission of a thesis based on the research conducted is a major component of both UG and M research. Thesis preparation aims at the meeting of a range of higher order skills that substantially contribute to the graduate profile and programme learning outcomes (PLOs) (Hunter et al., 2007). Furthermore, thesis preparation provides an opportunity to learn writing skills accommodated with scientific language, the skills that students are least likely to develop (Lopatto et al., 2004). The final academic performance of a graduate is also greatly influenced by the grade achieved for the research component.

All undergraduate programmes conducted at the Faculty of Agriculture (FoA), University of Ruhuna, namely BSc (Agricultural Resource Management and Technology), BSc (Agribusiness Management) and BSc (Green Technology) are SLQF Level 6 programmes. A range of courses related research methods, statistics, scientific writing and ICT are conducted during the first 7 semesters to assist the students to undertake research and thesis preparation at the 8th semester. Supervisors are provided with common guidelines to evaluate the conduct of research and thesis. Several SLQF Level 10 M programmes are also offered by the FoA while providing plenty of research-supporting supplementary courses.

Evaluation of the thesis is difficult and complex. Reynolds et al. (2009) suggested a 13-point rubric (BioTap) encompassing various aspects including scientific quality, impact, referencing and formatting as mandatory requirements. Though the evaluation of the quality of both UG and postgraduate theses are critically important both from students and institution perspective, the diverse nature of the topics and the higher number of thesis make the task challenging. In this context this study, aims to understand the basic features and formatting, referencing issues of theses submitted by the UG and M students of the FoA.

Methodology

In this study, the thesis submitted by UG (n=169) and M level (n=47) students during 2017-2021 to the Library, FoA, University of Ruhuna were studied. The undergraduate research component was a 6-credit engagement. The master students followed coursework and two-year research programmes of SLQF L 10. The credit value of the research component was between 25 - 30.

The number of pages and the number of tables and figures in introduction, literature review, results and discussion were recorded. The intext citations and the reference list were also studied to determine the total number of citations in different sections, the types of references and the year of the references cited.

The references cited were categorised as; journals, books, web resources, conference proceedings, reports, monographs, PhD Dissertations, MSc Dissertations and M. Phil Dissertation. Data were summarised using descriptive statistics. Mann-Whitney U test was employed to analyse the data using SPSS version 23.

Results and Discussion

The characteristics of a typical UG and M level theses are presented in Table 1. A typical UG thesis contained 3.5 page introduction (9.1%), 14.5 page literature review (38.1%), 6.9 page methodology (18.2%) and 13.1 page results and discussion section (34.5%). The corresponding values of a M thesis were 4.7 (8.9%), 20.1 (38%), 6.9 (13.1%) and 21. 0 (39.7%) Though definite levels have not been established, it is generally accepted that the percentage volume of the introduction, literature review, methodology and results and discussion and conclusion sections of a thesis should be within the range of 10-15%, 20-30%, 10-20%, 30-40% and 5%-10% (Open AI 2024). Both UG and M theses had relatively smaller introduction chapters at the expense of more voluminous literature review. Relative contributions of other two characters were within the accepted norms.

The sum of the pages in those chapters of a M theses (52.8) was significantly higher than that of an UG theses (37.9). Except for the materials and methods chapter, the number of pages in the other chapters of a M thesis were significantly higher than that of an UG thesis. However, as indicated by the minimum number of pages, some UG and even M theses contained an unusually less number of pages in chapters and in the whole thesis. For example, the minimum number of pages in the RD section of an UG and M thesis were as low as 3 and 4, respectively. Furthermore, the mean number of pages in the literature review section of a UG thesis (14.5) was significantly lower than the stipulated minimum page number of 20 in FoA UG thesis evaluation guidelines. Though minimum page limits have not been given, it is worthwhile to check whether short methodology sections, particularly in M

theses and unusually short results and discussion chapters in both UG and M theses are proportionate to the assigned credit values and the time devoted and adequately contribute to meeting the intended learning outcomes.

The number of tables+figures in the results and discussion section of a M theses were significantly higher than UG theses. UG thesis evaluation guidelines also require the results and discussion section should contain at least 5 tables+figures. Though, mean number tables+figures met that requirement, it should be noted that some UG and theses even M theses had only 2 tables+figures. Compared to the total number of tables+figures in the R and D section (16.0 and 20.8 for UG and M), the number of pages in that chapter (13.1 and 21.0 for UG and M) was found to be low. The number of non-repeating citations used in the R and D section of UG (6.0) and M (12.5) theses were also low. Alarming, the R and D section of some UG and even M theses had not cited a single reference. These findings indicate that both UG and M students have given more emphasis on presenting results using tables and figures with less emphasis on interpreting and discussing.

Table 1: A comparison of the features of an undergraduate and Masters (SLQF L 10) thesis of the Faculty of Agriculture, University of Ruhuna.

Features	UG	Master`s level	UG	Master`s level	Mann-Whitney U Test P value
	Mean(range)	Mean(range)	Median	Median	
Introduction					
No of Pages	3.47 (1-12)	4.68 (2-18)	3.00	4.00	0.005
No of Tables	0.08 (0-3)	0.43 (0-4)	0.00	0.00	0.006
No of Figures	0.25 (0-5)	0.31 (0-4)	0.00	0.00	0.663
No of Tables + Figures	0.33 (0-7)	0.75 (0-8)	0.00	0.00	0.141
No of citations	10.04(0-51)	12.70 (0-56)	9.00	10.50	0.190
Non-repeating citations	8.23 (0-46)	9.77 (0-37)	7.00	9.00	0.431
Literature review					
No of Pages	14.48(2-35)	20.18 (6-39)	14.00	18.50	0.000
No of Table	1.22 (0-8)	3.45(0-20)	1.00	2.50	0.000
No of Figures	1.92 (0-15)	2.25(0-10)	1.00	1.00	0.777
No of Tables + Figures	3.15 (0.-16)	5.71 (0-26)	2.00	4.00	0.007
No of citations	59.33 (4-209)	65.47 (2-210)	52.00	48.50	0.884
Non-repeating citations	37.92 (4-157)	43.50 (2-173)	34.00	36.50	0.873
Materials and Methods					
No of Pages	6.91 (1-21)	6.93 (1-24)	6.00	6.00	0.181
No of Tables	1.40 (0-8)	1.29 (0-5)	1.00	1.00	0.780

No of Figures	3.79 (0-73)	2.06 (0-15)	2.00	1.00	0.039
No of Tables + Figures	5.20 (0-73)	3.35 (0-16)	3.00	2.00	0.034
No of citations	2.32 (0-22)	3.58(0-24)	1.00	1.00	0.265
Non-repeating citations	1.79 (0-14)	2.54(0-14)	1.00	1.00	0.203
Results and Discussion					
No of pages	13.10 (3-40)	20.97(4-47)	11.00	20.00	0.000
No of Tables	4.24 (0-31)	9.37(0-42)	2.00	6.00	0.000
No of Figures	11.72 (0-155)	11.47(0-51)	9.00	10.00	0.783
No of Tables + Figures	16.00 (2-155)	20.85(2-57)	13.00	18.50	0.007
No of citations	8.22 (0-80)	17.50(0-71)	5.00	13.50	0.000
Non-repeating citations	6.04(0-50)	12.54(0-48)	4.00	8.50	0.003
Whole Thesis					
No of pages	37.98 (13-76)	52.79 (29-88)	37.0	50.50	0.000
No of Tables	6.99 (0-34)	14.56 (1-42)	5.5	13.50	0.000
No of Figures	17.69 (0-241)	16.10 (0-54)	14.00	14.00	0.71
No of Tables + Figures	24.68 (6-241)	30.67 (5-72)	21.00	29.50	0.002
Reference list					
Total references	41.81(10-176)	58.25(12-233)	35.00	46.50	0.063
Journals	29.95(2-119)	36.91(0-172)	25.00	22.50	0.892
Monographs	0.01(0-1)	0.00(0-0)	0.00	0.00	0.352
Websites	2.34(0-33)	2.85(0-18)	1.00	2.00	0.080
Books	2.46(0-19)	5.31(0-22)	1.00	3.50	0.000
Symposia etc	1.36(0-8)	2.54(0-16)	1.00	1.50	0.020
Master thesis	0.13(0-40)	0.41(0-6)	0.00	0.00	0.106
MPhil thesis	0.01(0-1)	0.00(0-0)	0.00	0.00	0.352
Doctoral thesis	0.20(0-3)	0.35(0-4)	0.00	0.00	0.269
Reports	4.99(0-30)	9.66(1-29)	4.00	7.00	0.000
Journals last 5 yrs	8.35(0-41)	4.14(0-20)	6.00	3.00	0.000
Journals last 10 yrs	15.25(0-53)	11.54(0-70)	13.00	9.00	0.002

Except in the introduction and literature review section of the PG theses, figures were more frequent in other chapters of both UG and M theses. M theses contained a significantly higher number of tables+figures (30.6) than UG theses (24.6). Both UG and M theses, tables and figures were more abundant in the R and D section. Interestingly, though maximum values have not been given, some UG thesis had as high as 241 tables+figures.

All UG and M theses had cited and listed at least some references. As expected, the reference list M theses contained significantly more references than the UG thesis. Surprisingly, of the total number of items listed in the reference list, journals accounted for 71.7% in UG theses, compared to 63.3% in M thesis. Meanwhile, percentages of books and reports in the reference list of M theses (9.1% and 16.6%) were higher than that in UG theses (5.7% and 11.9%). The number of recent journal citations (within 5- or 10-year) in M theses were significantly lower in M theses than in UG theses. FoA guidelines for thesis evaluation recommends that of the total items cited, 30% should be within the last ten years. Having 36.5% of citations in the last ten years, UG theses met this minimum standard. However, the percentage of recent citations (last ten years) in M theses was only 19.7%. Incomplete reference lists, non-listing of cited reference and listing of the uncited references were common both in UG and M theses.

Mudalige et al. (2018) showed that undergraduates of all three degree programmes at the FoA obtained a significantly higher semester grade point average for research component than that in other semesters. Moreover, almost 50 % of the students had achieved A+ or A while another 30 % had achieved A- for their research project. Weaknesses that the current study identified in UG theses highlight the importance of more careful attention on educating students about thesis preparation, evaluation criteria and, assessing the UG thesis by the supervisors.

Conclusion

Findings of this analysis raise the concerns about the standards of both UG and SLQF level 10 Masters theses. In terms of many aspects, huge variation was detected. Both UG and M theses were found to pay more emphasis on presenting results than interpreting and discussing them supported by recent literature. Attention of both students and supervisors in preparation and assessing the thesis are needed to improve the standards of both UG and Master level theses.

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