Supporting Part-Time Masters Students towards Successful Research Dissertations: A Case Study

Shaun Pather
Geoff Erwin
Corrie Strümpfer

Abstract

Experience at many Higher Education Institutions (HEIs) is that a large percentage of registered Masters students never complete their research dissertation. A number of reasons have been suggested for this. Coursework and dissertation mixed Masters degrees have been introduced in order to attract more Masters students, but the rate of completion is still low. The Faculty of Business Informatics (FBI) at the Cape Peninsula University of Technology (CPUT) has implemented several approaches to part-time Masters students' support, including the most recent one of offering a Structured Study Program (SSP) that is directly supportive of the skills and resources that a Masters student needs to complete a dissertation. This paper reports on various modes of offering Masters degrees, FBI's Masters student history, a survey of FBI's Masters students to assess factors influencing progress with research dissertations and the implementation of SSP.

Key Words

Masters-degree; information technology; post-graduate; higher education; South Africa

Introduction and Background

South Africa emerged from the pre-1994 political dispensation with two distinct types of tertiary educational institutions: Technikon and University. Technikons were created as career-orientated, practical-

content institutions with an emphasis on producing skilled graduates to meet specific needs of the country. Universities provided a broader educational offering with more research-focused outputs. This scenario is currently undergoing rapid transformation, as a result of a number of policy changes in the education arena that have been instituted by the post-apartheid government. The new dispensation for higher education now includes Universities of Technology, Universities and Comprehensive Universities. In 2002, there were 15 Technikons and 21 Universities in South Africa (NWG, 2002). This however was soon to change with announced incorporations and mergers planned for 2004 and 2005 (Ministry of Education, 2003). Major thrusts of this activity are: broadened access to tertiary education, altered relative subsidy values emphasizing Science, Engineering and Technology (SET) and increases in research capacity building and output. One of the mergers resulted in the formation of the Cape Peninsula University of Technology (CPUT), which is the outcome of the merger of Cape Technikon and Peninsula Technikon in January 2005 in the Western Cape Province of South Africa.

Given the imperative for academics to "publish or perish", the Faculty of Business Informatics at CPUT embarked on a process towards increased research activity and research output. This process aligned with CPUT's institutional mission, which was informed by the National Plan for Higher Education (Department of Education, 2001).

The National Plan for Higher Education in South Africa is described as "far-reaching and visionary in its attempt to deal with the transformation of the higher education system as a whole" (Department of Education, 2001: 2). Section 5 of this plan focuses attention on the sustenance and promotion of research in the higher education sector. Several priorities are listed, amongst which it is stated that there is a need "to increase outputs of postgraduates, particularly Masters and doctoral graduates as well as increase research outputs" (Department of Education, 2001: 63). Concern is expressed about the low enrolments in Masters and doctoral programs. It is stated that between

1995 and 1999 there was a "marginal decrease [in postgraduate enrolments in the Technikon sector] from 0.3% to 0.2%" of total student enrolments (Department of Education, 2001: 65).

Given the priorities reflected in the national policy, the Faculty of Business Informatics (FBI) recognised that a major mechanism for improved volumes and quality of research output was to grow the post-graduate program, particularly at Masters level. FBI, for a number of years, had offered a 4th year Bachelor of Technology in Information Technology (BTech IT). However, 4th year graduates were aimed at work-ready status, rather than progression to Masters level. To attract post-graduate Masters students a mixed coursework / dissertation Masters degree program (MTech Information Technology with e-Business specialisation) was designed. The first intake of students for this degree was in July 2002. However, after eighteen months, the first batch of students registered for this program had only completed the coursework and not made noticeable progress towards completion of a research dissertation.

In light of the priorities and concerns expressed in the National Plan for Higher Education (Department of Education, 2001) regarding research, the mission of CPUT, and the slow progress towards dissertation completion within FBI, this paper reports on a study of factors influencing throughput rates in post-graduate programs. The part-time Masters program in the FBI was used as a case study to investigate this issue. The authors reflect on FBI's experiences with this post-graduate offering and present summaries of Masters student surveys. The surveys and focus groups aimed to seek indications of student acceptance and blockages within various aspects of the Masters degree. The authors suggest some possible contributions to the identification of Masters students' difficulties in completion of a research dissertation. The paper concludes with discussion on possible ways to improve throughput rate and to reduce the time lapse between registration and graduation of Masters degree students.

Research Design

The objective of the study was to investigate influential factors contributing to low throughput rates in post-graduate programs, specifically the part-time Masters program in FBI in Information Technology and related areas. In particular, the study aimed to identify factors contributing to progress to completion of the research dissertation.

The principal research question was formulated thus: *"What are the factors contributing to the slow rate of progress towards the completion of the research dissertation at Masters level?"*

The authors conducted a review of secondary data that would inform the study. An intensive literature search in 2004, and then again in March to May 2005, indicated a paucity of literature dealing with the issue of throughput in research-based Masters programs. Several studies have been conducted into post-graduate programs – see for example Barnacle & Usher (2003), Skinner (2003), Dinwoodie (2001), Okazaki-Ward (2001), and Hackette & Gee (1998). However, none of these studies provided any insight or background to issues aligned with the principal research question. For example, the study by Skinner (2003) presents the findings of a study into the learning styles of international postgraduate students. In contrast, the FBI context was the development of student research capacity. Bearing in mind this lack of related literature the authors decided to use the Masters Program within FBI as a case study to gain some insight into the research problem.

Harrison (2002) contends that case study research is about engaging with the complexities of the real world, and making sense of them. Yin (2002) states that as a research strategy the case study approach covers more than data collection and data analysis techniques, and that subunits can add opportunities for broader analysis and increased insights into the problem, calling this approach an embedded case study design.

In this study, one case with three embedded units (each group of students being a unit) was identified, and two types of data collection activities took place.

Firstly, there were two sets of student surveys, to produce quantitative data. A questionnaire was used for the survey to ensure that students (who completed these anonymously) provided candid and honest responses. Questionnaire items were generated by analysing previously completed FBI student/client surveys (of 2002 and 2003). These client satisfaction surveys provided an initial set of items for the questionnaire. Additionally, the Masters programme coordinator, conducted several interviews with other academics involved with the Masters programme. This process assisted in verifying and extending already identified questionnaire items. Finally the questionnaire was subjected to a quality check, by using graduate research assistants in a pilot survey. The final set of questions were organised under the following headings in the questionnaire: Demographics; Students Research background; Progress on the Research Proposal; Barriers to completing the Proposal; Student's understanding of Dissertation Requirements.

Secondly, to gain further understanding of the problem, qualitative data was collected during three focus group sessions with the students. Focus groups are often used to explore a new product or concept, but are also valuable in a research strategy where evaluation of ideas or needs assessment is an objective. The focus group participants can usually grasp the relevant issues quickly, and can respond in an unfettered manner, reacting to each other's comments (Cooper & Schindler, 2003). Cooper & Schindler (2003) also stress that separate focus group interviews should be conducted for different subunits of the population to promote freer discussion and interaction. Further details regarding the implementation of the survey and focus groups are provided under the section "*Conduct of the Study*".

The Case Study Context

Case study research sets out to address the understanding of a phenomenon within its operating context Harrison (2002: 177). In this section the operating context of the case study is outlined in three sections *viz.* 1. Various modes in which Masters degrees are offered; 2. An overview of the FBI Masters program that was the main subject of this case study; and 3. a description of the Structured Study Program (SSP) that forms an integral component of FBI Masters program.

Modes of Offering Masters Degrees

A Masters degree by research dissertation requires the candidate to demonstrate a mastery of the subject area being researched, as well as a comprehensive understanding of the research methodology being used (Remenyi *et al.* 17, 1998). By investigating the post-graduate programs on offer (in 2004) of a number of South African higher education institutions, via each organisation's web-site, the authors identified a number of ways in which Masters programs with a research component are offered. See Table 1 below for a summary of these typical modes of offering Masters degrees, with authors' comments.

Mode of offering	Pros	Cons
1. Research only with supervisor as the major support / mentor structure: Match a student with an appropriate study leader, and student works alone	Part-time student works at own pace, and fits the study in with work and personal schedule	Student needs extreme dedication and perseverance to succeed. No peer-group support. Low success rate

Mode of offering	Pros	Cons
2. Coursework & Research mix: Student registers for a series of courses (contributing various % to final mark), which must be completed successfully before a dissertation can be submitted.	Student has a peer group support environment; Student is enriched by being exposed systematically to new knowledge in the field. Student has many deadlines and targets.	Student sees Masters degree as a series of taught courses with focused outputs, and expects the completion of the research dissertation to have the same style. CPUT experience indicates that the transition from taught courses to dissertation is very difficult.
3. Research only, but progress to dissertation is supported by a Structured Study Program (SSP) with research milestones supervised by a team of academics.	See discussion below.	See discussion below.

Table 1: Typical modes of offering Masters Degrees

Cape Peninsula University of Technology Masters Degree Program

Efforts by the Faculty of Business Informatics (FBI) to increase research output and foster the beginnings of a culture of research amongst staff have been reported on previously (Pather & Erwin 2002; Pather & Erwin 2003). FBI academic focus emphasised post-graduate programs. Historically, there has been very low throughput from the Bachelor of Technology degree (4 years) to the Masters degree. FBI designed and implemented a Masters Degree in Information Technology with specialisation in e-Business using several approaches. Table 2 below shows registration figures, and the progress of students as at mid-2004.

Date of first registration	Mode of offering (See Table 1 above)	No. Of students first registered	Currently Registered	Drop-out rate	Student Progress
July 2002	2	17	9	47%	▪ All 3 course-work modules completed. ▪ Only one research proposal for dissertation submitted for consideration by April 2004.
Jan 2003	2	15	11	27%	▪ Students are completing the last of 3 coursework modules. ▪ Only two research proposals for dissertation submitted for consideration by April 2004. ▪ However, research proposal now included as a compulsory output for the 3rd module by **ALL** students.
Jan 2004	3	13	12	7%	▪ Four months into the program, and all students are actively completing a research paper. This serves as a topic discovery exercise. ▪ All students are beginning to identify research problems for the dissertation. Preliminary work towards the proposal has commenced.

Table 2: Summary of Student Progress on Masters programs The Masters Degree by Research Only: Supported by a Structured Study Program (SSP)

The Masters Degree spans approximately twenty-four months. The objectives of the SSP are twofold:

- To expose the student to current e-Business topics, trends and issues so that he/she is enabled as a conversant and versatile practitioner in the field; and,

- To prepare the student to undertake a sound research project that culminates in a Masters Dissertation.

The phrase "course-work" was intentionally avoided to describe any activities during the SSP as a way to dissociate the student from the (teaching) paradigm of knowledge transfer and examinations. No credit-earning examinations occur during SSP. The student is supported throughout the dissertation process, with published milestones (each one semester approximately). See Fig. 1 below.

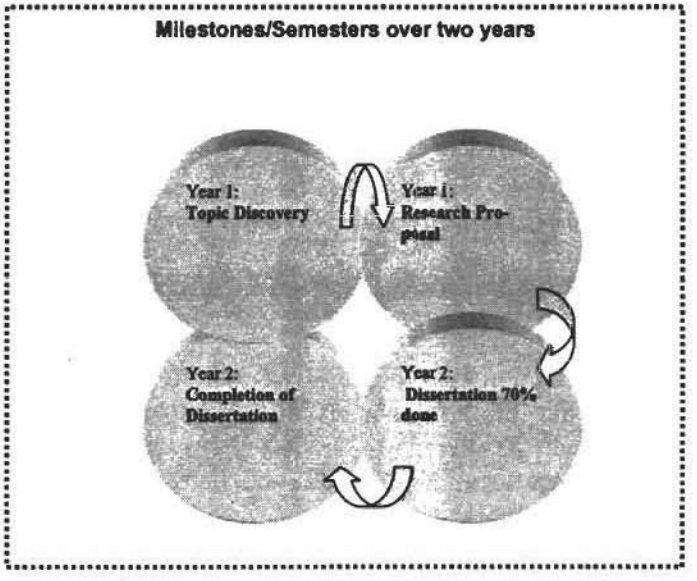

Fig 1: Milestones/Semesters in the Structured Study Program (SSP)

Implementation tactics of the SSP were:

- The first section of SSP is academic writing in a series of workshops, readings, analysis of research articles, and systematic exploration of the contents of an issue/topic.
- Each workshop/seminar facilitator issues projects/assignments (all compulsory) and a student is moved through the stages of writing a

paper with reviews along the way and papers as outputs/milestones. A compulsory paper (suitable for a conference or first phase towards a journal submission) is required at the end of the first semester.

- Students are paired with a study leader within the first five months, as the SSP proceeds. Topic discovery for dissertation starts within 4-6 weeks after first registration. A list of topics that the Masters student must master is issued to every student. This is like a shopping list in a supermarket. The benefit of this method is that most of the workshops/seminars can occur in any order any time. For each topic (such as Cyber Law, Web server implementation ++) there is a reading list (mix of compulsory, recommended and interesting) with suitable warnings re: academic sources only.

Conduct of the Study

To gain insight to the research problem viz. what are the factors influencing the perceived slow rate of progress towards the research dissertation, a case study research design (as described in the Research Design section of this paper) was chosen.

In the first phase of data collection, currently registered Masters students were surveyed from the three intakes of Masters students registered during and after July 2002 (refer to Table 1 above) up to January 2004. A questionnaire was used for the survey. The first two groups of students were surveyed in November 2003 and May 2004. The new intake of students in 2004 was also surveyed. Together this made up the survey of the three case study subunits. The surveys aimed to identify factors that contributed to slow progress onto and during the research dissertation.

Following on the surveys, focus group sessions were conducted with each of the three case study subunits in May 2004. These sessions were held with the 2003 and the 2004 intake of students to elicit data regarding their expectations of the Masters degree. In an effort to convene these sessions with an unbiased facilitator, a very new member of

the Masters program staff, who had no previous interactions with the students, facilitated the discussions. The choice of the facilitator was made in order to ensure that students were more open and frank during the focus group sessions.

Results of the Survey

Of the 27 students, 18 took part in the 2004 survey. Five students were from the 2002 intake; five from the 2003 intake and eight were from the 2004 intake. Five out of the total of 18 students reported that they had no research methodology course in their previous studies.

Year of Intake↑↑	2002	2003	2004
Prior	4	5	4
No Prior	1	0	4

Table 3: Prior Research Methodology Course

Eight of the thirteen students that attended previous research methodology courses completed these courses more than two years (the gap) before their Masters registration.

Year of 1st registration↑↑ Gap□	2002	2003	2004	Total No. of students
<1yr			1	1
1 to 2yr		2		2
2 to 3yr	2	2	1	5
3 to 5yr	1			1
5 to 9yr		1	1	2

Table 4: Gap since attendance at Research Methods courses prior to Masters degree registration

Progress on the Research Proposal

Table 5 shows student progress in commencing the research proposal.

At what stage is your research dissertation currently?	Year of Intake	Not started yet	Have a broad idea of the topic but have not started	Have a good idea of the topic and a clear research problem is identified	Have commenced working on the research proposal	Research proposal is completed
	2002	0	1	0	4	0
	2003	0	1	1	3	0
	2004	2	6	0	0	0
	Total	**2**	**8**	**1**	**7**	

Table 5: Progress towards completion of dissertation

Barriers to Completion of the Research Proposal

Table 6 shows the statements regarding perceived barriers towards completion of the research proposal completed by the student respondents, using a five-point Likert scale.

Only five statements' responses showed a clear aggregation towards either the top or bottom end of the scale viz. statements 5, 6, 7, 8 & 9 (shaded). Out of the 18 students eight indicated that not being able to decide on an appropriate research problem was relevant as a barrier. In addition to this, four of the five students from the 2002 intake indicated this as a relevant barrier. Five out of the eighteen students rated "lack of guidance" as a barrier for completing the proposal. Five more students rated "lack of guidance" as having had medium relevance. Of these five, two were from the first intake in 2002.

Nine of the eighteen students rated an inadequate understanding of research methodology as a barrier to completing the proposal for a dissertation. Three of these were from the 2002 intake.

Research Barrier	Student response
1. Not being able to decide on an appropriate research problem.	No clear response; spread across the scale
2. Finding a study leader.	No clear response; spread across the scale
Research Barrier	**Student response**
3. Pressure at my workplace.	No clear response; spread across the scale
4. Lack of guidance.	No clear response; spread across the scale
5. Inadequate writing skills.	Not relevant
6. Access to academic literature.	Not relevant
7. Pressure in my personal-life (e.g. family, children, etc.)	Not relevant
8. Lack of personal motivation to complete the degree.	Not relevant
9. Poor time management.	Not relevant
10. Inadequate understanding of research methodology.	No clear response; spread across the scale

Table 6: Barriers to completion of the Research Proposal (Shaded statements indicate statements for which summarised aggregate responses were clearly positioned on the scale)

Students' Understanding of Dissertation Requirements

In the section on the Dissertation two students indicated that they did not clearly understand the purpose of doing a dissertation. One of these was from the 2002 intake of students.

Significant majorities of respondents expressed understanding of the Masters structure, dissertation protocol and the role of Masters academic coordinator, study leader, academic staff and student in progressing the e-dissertation. 72% felt they would complete the dissertation in an 'acceptable timeframe', and all respondents estimated they would finish their Masters dissertation (not necessarily graduate) within 30 months of starting the Masters degree.

Focus Group Sessions: Students' Expectations from the Masters Degree

Detailed field notes were compiled during the focus group sessions, which were help separately with the different intakes of students. The session notes were analysed using the technique of open coding (Strauss & Corbin, 1998: 119-120.) Some of the pertinent issues that were evident after analysing the session notes are:

- The 2003 intake of master's students expected more management, as well as practical-oriented course work, whereas the group of students from the 2004 intake expected to do course work, instead of a SSP.
- Both groups expected more focus on technology.
- Students from the 2004 intake indicated also that they expected more presentations by e-commerce/e-business experts.
- Only one student from both groups mentioned enhanced research skills as an expectation.

Discussion of Survey and Focus Groups

Statistical treatment is necessarily limited due to the relatively small number of respondents. The aim in conducting both the survey and the focus group session was to determine factors influencing the slow rate of progress towards the research dissertation. From the analysis of the data presented in the previous two sections, we were able to make the following observations:

- Under one-third of the students had no prior formal exposure to research methodology even though all had four year degrees.
- More than half of the students who did undertake formal instruction in research methodology, did so between three and nine years ago.
- The authors statistically processed student data (see Table 7 and Table 8) to see if there were any significant differences:
  i. between the groups of students who had no formal instruction and those who did; and

ii. between those who had formal research methodology instruction within the last two years, and those who had formal instruction a longer time ago.

No statistically significant difference was found between these groups of students.

- Tables 7 and 8 on the next page show calculations done by the statistical software program SPSS for Windows; Cross-tabulations and Chi-Square.

Three of the eight cells in Table 7 have expected counts less than 1. The expected cell counts of about 1, or less than 1, in Table 7 would only be permissible if about 80% of the cells had expected values of above 5 (Cochran, 1954). Therefore, the chi-square probability value of 0.057 in the Asymp. Sig. column of Table 8 is inaccurate, which means that there is no statistically significant difference between the groups of students who had previous formal Research Methodology instruction and those who did not, in responding to the given statement.

The current structure of the MTech programme supports my development towards completion of the research dissertation							
			Strongly Agree	Agree	No Opinion	Disagree	Total
ResMethn	No	Count	0	3	0	2	5
		Expected Count	0.8	2.8	0.8	0.6	5.0
	Yes	Count	3	7	3	0	13
		Expected Count	2.2	7.2	2.2	1.4	13.0
Total		Count	3	10	3	2	18
		Expected Count	3.0	10.0	3.0	2.0	18.0

Table 7: Crosstabulation of Previous formal Research Methodology instruction vs. the perception of "The current structure of the MTech program supports my development towards completion of the research dissertation"

	Value	df	Asymp. Sig 2-sided)
Pearson Chi-Square	7.532 [a]	3	0.057
Likelihood Ratio	9.053	3	0.029
Linear-by-Linear association	2.997	1	0.083
N of Valid Cases	18		

[a] 7 cells (87.5%) have expected count less than 5. The minimum expected count is 0.56

Table 8: Chi-Square tests

The progress of students on the SSP as opposed to formalised coursework was examined. None of the students registered in 2002 and 2003 had completed their research proposals (even after being exposed to the formalised coursework for between 18 and 24 months). Yet, at least six of the students registered for the SSP in 2004 had a broad idea of a research topic. This indicates that formalised coursework was a barrier to (some) students completing their dissertations.

- No major surprises were apparent in the responses to the barriers to completing the research proposal. Only five out of the ten statements yielded some indication of relevance or irrelevance. From the responses of the longest-registered group of students (registered in 2002) to the question of whether an "inadequate understanding of research methodology" was a barrier or not, the responses were distributed evenly across the five point scale. This indicates that this group of students, even after being exposed to 18 months of course work, still do not have a uniform view of the value or importance of research.
- The lack of understanding of the longest-registered group of students with regards to the dissertation was highlighted. Not all of the students indicated that they had a clear understanding of what was required to complete the dissertation. One student in this group indicated that s/he did not clearly understand the purpose of doing the dissertation. This suggests that a formalised coursework program was a barrier to students gaining a proper understanding of the nature and scope of the dissertation.
- From the focus group sessions it is apparent that for all groups, expectations of the Masters program and the actual design of the program were mismatched. It was expected by most students that the Masters program would be a deeper (than fourth year) level of exposure to Information Technology concepts. None of the students (including those in the SSP) had any expectations that one of the principal outcomes of the program was to provide them with a solid foundation on which to conduct applied business research.

Limitation

The response rate to the survey was 67% (18 out of 27 responses). This response rate is considered excellent in general survey situations. However, a small number of respondents prevent rigorous statistical

treatment such as making inferences from cross-tabulation or finding correlations in the data.

Future Work

The students registered on the FBI Masters program via the SSP will continue to be closely monitored and evaluated in order to establish the success of this mode of offering and to publish results. Collection of data from other Faculties and institutions may provide guidelines for the design of Masters degrees.

Conclusion

The objective of the study was to determine factors influencing the slow rate of progress towards research dissertation, and to examine the possible impact on Masters success by introducing the SSP. It was not possible from the collected data to make any significant comparison between various modes of offering research Masters degrees. However, some interesting observations were made from the survey.

Students' exposure to research methodology needs to be carefully examined - especially where students had studied in institutions other than the registering institution for the Masters degree. Some anecdotal evidence does present itself in terms of students in the SSP being more research oriented, in a shorter time frame than those students on the course-work program. However, it is still too early to tell if the student registered under the SSP mode of delivery will be more successful that this first group of students.

Finally, a large number of the Masters students expected (or preferred) a more coursework-oriented degree with IT knowledge transfer. This could be an indication that there is a dwindling demand for research-only Masters degrees. However, it is incumbent on academics at tertiary institutes to focus on degrees with research focus towards meeting national research output targets, as well as to create a more fertile ground for Doctoral studies.

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Authors' Contact Details

Shaun Pather (pathers@cput.ac.za)
Geoff Erwin (erwing@cput.ac.za)
Corrie Strümpfer (strumpferc@cput.ac.za)

Faculty of Business Informatics
Cape Peninsula University of Technology, Cape Town, South Africa