Opportunity Costs during PhD Enrolment: An Innovative Information Systems Research Training Programme

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Abstract

Expectations of completing PhDs for job readiness are increasing. Information Systems (IS) PhDs face the additional challenge of appreciating the multidisciplinary and multi-paradigmatic diversity of the discipline, demanding a breadth of knowledge beyond that expected in many other disciplines. Further, PhD students in Australian universities are constrained to a 3+ year enrolment, as compared for example, to the more common 4 and 5 year enrolments in North American universities. These demands require that IS PhD students in Australia be discriminating in their choice of activities during enrolment. With the aim of maximizing the value of the PhD experience, this study explores synergy between research and teaching. More specifically, this research-in-progress (RIP) paper reports a programme design for training PhD students, through involvement as supervisors of coursework Masters students' research projects.

Keywords research training, content analysis, research supervision, methodology, constructivist learning, reflective practice, master-apprentice model, unit of analysis, level of analysis, research design, authentic assessment

1   Introduction

Expectations of completing PhDs for job readiness are increasing. In addition to a strong thesis and promising pipeline of publications, to be maximally marketable PhDs benefit particularly from prior experience of teaching and research funding. Information Systems (IS) PhDs face the further challenge of appreciating the multidisciplinary and multi-paradigmatic diversity of the discipline, demanding a breadth of knowledge of IS research and IS research methods beyond that expected in many other disciplines. In addition, PhD students in Australian universities are constrained to a 3+ year enrolment, as compared for example, to the more common 4 and 5 year enrolments in North American universities.

These demands require that IS PhD students in Australia be discriminating in their choice of activities during enrolment[1]. With the aim of maximizing the value of the PhD experience, this study explores synergy between research and teaching[2]. More specifically, this research-in-progress (RIP) paper reports a descriptive, pilot case study of research training value for PhD students, from involvement as supervisors of coursework Masters students' research projects.

We proceed from the assumption that all activity entails an opportunity cost. When we choose to do one thing, we are implicitly choosing not to do something else of possible value; there is a cost of forsaking the other opportunity. That being said, we further assume that some combinations of activities are more synergistic; the opportunity costs are less and the total value greater, and thus these combinations may be preferred. It is this potential for synergy that we seek to explore in this study.

One might consider that PhD enrolment entails three main activities: (i) learning how to research, (ii) doing the research, and (iii) learning how to be an academic[3]. While (i) and (ii) are integral to (iii), herein by (iii), we refer to other than (i) or (ii). Learning how to be an academic, beyond (i) and (ii), includes such things as teaching experience, university-related administration experience, research funding experience, etc. Note that implicit here is the acceptance by the Academic (and their university) of a larger responsibility for the rounder development of PhD students in line with their career aspirations.

The initiative under study commenced as a small-scale pilot involving a single academic overseeing two PhD-student-supervisors of coursework masters students' projects (ultimately across 3 semesters, and in a later phase of the larger study design involving a 3rd and possibly 4th PhD student). Evidence collection, analysis, interpretation and theorising are ongoing. The pilot, retrospective case study reported herein will be followed by a formal, progressive case study, as well as two further major phases of research (described later in 'Research Design').

While of central importance and interest, this paper does not address strategies for achieving a publications track record early – e.g. thesis by publication. Rather, the focus here is on synergies between research training and teaching experience. Further, by research training we refer more specifically to breadth training; non-core (breadth) research training; research experience beyond that essential for completion of the core research intended.

As an exploratory pilot case study reported in a RIP paper, there is much emphasis on research potential. This paper reports preliminary findings from the pilot case study, prior to analysis of more formal evidence gathered (e.g. team member reflective journals). Emphasis herein is on the evolving study focus, which proved elusive. Such detailed description of front-end conceptualisation of the 'thing of interest' is not common, but is believed by the authors to be warranted and worthy of reporting as example. This emphasis is consistent with the authors all belonging to the 'Research-Systems' research group at Queensland University of Technology (QUT)[4], that research group having particular interest in research training and meta-research, 'an evolving scientific discipline that aims to evaluate and improve research practices' (Ioannidis et al. 2015). Note that a further motivation for the initiative and study was to explore a small-scale 'sandbox' research topic with which to

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[1] It is acknowledged that the relative value of different experiences (and the relative opportunity costs) will vary much for different PhD candidates dependent on such things as their prior experience (What do they already know?), their aspirations (What do they need?), and their capabilities and resources (What can they manage?).

[2] (Bruce et al, 2014) present another valuable perspective on supervision as teaching

[3] Discussion herein further assumes that the PhD students aspire to careers in Academe, though we recognise that in many universities there is a strong contemporary emphasis on PhD preparedness for 'industry' (thus we do not here mention 'learning how to be a practitioner').

[4] See link http://www.methodsthinking.com/

preliminarily test methodological ideas of the Research-Systems group. Given the work is being undertaken under the Research-Systems umbrella, which emphasizes meta-research, consideration is given to both theoretical and methodological research potential.

The remainder of the paper is structured as follows (Note that as a RIP, and given space constraints, we do not include a separate Literature Review, but rather sparingly cite relevant papers throughout). Next, we describe the evolution of the study's multiple units of analysis, which are foundational to the larger study design. We then describe the larger study design, which is followed by discussion on learnings to date. We conclude with limitations and future research.

2   The Study Units of Analysis (UoA)

As alluded to, the study focus evolved, shifting repeatedly to different units of analysis (things of interest – in case study research, 'the case'). It is observed that the units of analysis are in some sense hierarchically related and embedded, with focus shifting from evaluating the success of (i) each Masters 'Student Project', to (ii) the Masters 'Students Program', to (iii) the PhD Students 'Supervision Program', to (iv) the wider PhD Students 'Research Training Program'. It was the sensed continuing relevance of 'all' of these UoA that prompted us to detail the evolution of our thinking here, and explore methodological implications.

2.1   UoA 1 – The Masters Student Research Project

Description of this UoA required least input from the study team, as much of the design effort here had been put in place by the subject coordinator and their predecessors in the subject design. The main role of the study team (the Academic and two PhD students) at this point was to understand what was in place, which included such standard mechanisms as: course outline, assessment details, Gantt chart and milestones. The focus was in some sense on systematizing each individual Masters student project to achieve efficiency and effectiveness for all concerned (administrators, coordinator, academics, students). A specific aim of the subject is to "*enable* [the masters student] *to conduct a well-defined research project with specific outcomes and deliverables within a precisely defined project plan*" (Appendix I includes an example advertisement for Masters students; Marking criteria document; and Research Systems Unit Synopsis).

2.2   UoA 2 - Masters Students Program

With UoA 2 our view broadened to seek efficiencies and effectiveness 'across' the Masters students' projects for which the focal Academic is responsible (within and across semesters). The focus became the design and evaluation of what is referred to herein as the "Masters Students Research Projects Program" or more simply, the Masters Students Program. The main aim of this Program design was ongoing, focusing on the efficient and effective supervision of coursework masters students and their projects (a continuing succession of Masters students and PhD student supervisors, across multiple semesters into the future). Main mechanisms introduced here were (i) involvement of PhD students as supervisors (under the guidance of the Academic) and (ii) further systematization of projects. Though we do not elaborate these arrangements herein, as example Appendix II depicts possible timing of involvement of a PhD student as Masters student-supervisor across multiple semesters.

Systemisation of projects centred on standardization of research method in order to maximize reusability, and inter-student and cross-project learning. The research method selected was Content Analysis (Krippendorff 2004). The overall program approach has been systematized to the extent possible, to achieve supervision efficiencies, while enabling the masters students to gain competency with content analysis quickly, thereby allowing greater attention to higher value involvement with the content analysis evidence and interpretation, while also ensuring that each student's project has potential to make a unique contribution. The team also held out some hope of research contribution from the Masters students towards the PhD students' research aims (the content analysis projects offered to the masters students align with the PhD student's research[5]). Additionally, the team

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[5] In example, the topic of one PhD student's research was "Business value of IT (BVIT)" and the overarching question of one related content analysis advertised and undertaken by a Masters student was "What are the research methods used in BVIT studies in Information systems and how they are applied?"

explored possible Masters student interest in continuing beyond Masters to higher degree research (HDR)[6].

Content Analysis was chosen for its value as an early effort with any novice researcher's foray in a new research direction[7]; it is a readily accessible research approach that can yield practical, tangible, pragmatic outcomes that can have clear value to practice. At the same time, the approach can be highly rigorous, nuanced, and challenging, potentially yielding a credible contribution to knowledge. To a large extent, the ease or difficulty of the approach and its practical versus knowledge contribution intent are a function of the questions being asked of the literature being content analysed. It is suggested that when undertaken as a novice, questions should be more descriptive, evidence from the literature sources is more readily discernible, and its codification is more mechanical involving relatively lesser expert judgement; such judgement often demands greater experience and insight.

Having identified content analysis as the standard research approach, two main vehicles of further systemisation were (i) design of a standard content analysis protocol (Appendix III), and (ii) the design of a 6-hour training module on content analysis (Appendix IV), offered through an existing subject 'Advanced Research Topics', to which relevant coursework masters students were invited. Much further could be said here on the detailed design of this Program and its evaluation, but with the continuing shift in focal unit of analysis, this detail has now been backgrounded and is out of scope of this paper.

As early motivation for reflection on the Program design, and given we thought the Program sufficiently unique and novel (and a prospect 'sandbox'), we resolved to formally study the Program (see "Research Design") and draft this report, the main question of interest being 'How efficient and effective is the Program?' With this research question, several alternative research designs were considered, including single case study (Yin 2013; Eisenhardt 1989), longitudinal case study (Yin 2013), multiple case study (Yin 2013), embedded case study, action research (Susman et al, 1978; Reason et al, 2001), evaluation research (Pawson et al 1997) and action design research (Sein et al. 2011).

While all of these alternatives were of interest and suggestive of promise, and the ongoing reflection practically valuable in design and evolutionary refinement of the Program (and relevant explanatory theory did begin to surface), the attention of the study team was shifting. Whether of more direct interest and value to the PhD students, or because it was something close to the research interests of the Academic; attention inexorably shifted to the PhD student experience. A main benefit deriving from the initiative, the magnitude of which was anticipated but initially under-valued, is PhD student personal development from assuming the role of supervisor.

2.3   UoA 3 - PhD Students Research Supervision Training Program

Discussion at weekly meetings of the team (the Academic and PhDs) gradually shifted away from the Program to centre more on discussion of the supervision experience of the PhDs. The unit of analysis became the supervision training program and the overarching research question became "How effective is the Program at developing PhD student supervision capabilities?" The main mechanism of supervision training was PhD student direct experience as a supervisor, under the oversight and guidance of the Academic. At periodic meetings of the Academic, PhDs and Masters student (usually one Masters student at a time), the Academic would assume the role of supervisor, seeking to demonstrate their approach [a master-apprentice model (Lave 1982) involving the education of both the student and teacher].

2.4   UoA 4 - PhD Students Research Training Programme[8]

While supervision experience is acknowledged to be centrally valuable for the PhDs (as future supervisors and as insight into their own student-supervisor relationship), further reflection revealed a larger, and in total more valuable PhD student experience, thereby encouraging conception of a yet broader research training 'Programme' that spans that larger experience. It is this larger 'research

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[6] One Masters Student's coursework content analysis project yielded a conference paper submission co-authored with the PhD student, potentially qualifying the Masters student as 1st-class Honours equivalent at Large University, thereby improving their eligibility for an HDR scholarship.

[7] All PhD students under direction of the Academic undertake early content analysis training and conduct an early content analysis of literature in the area of their research thereby 'certifying' them to supervise a Masters student.

[8] We here adopt the British spelling of 'programme' to differentiate the final, larger UoA.

training Programme' (henceforth referred to simply as the 'Programme') that is the primary focus of (and is the current main unit of analysis of) the larger study, the overarching research question now being "How effective is the Programme at developing PhD student career-relevant capabilities? [9]"
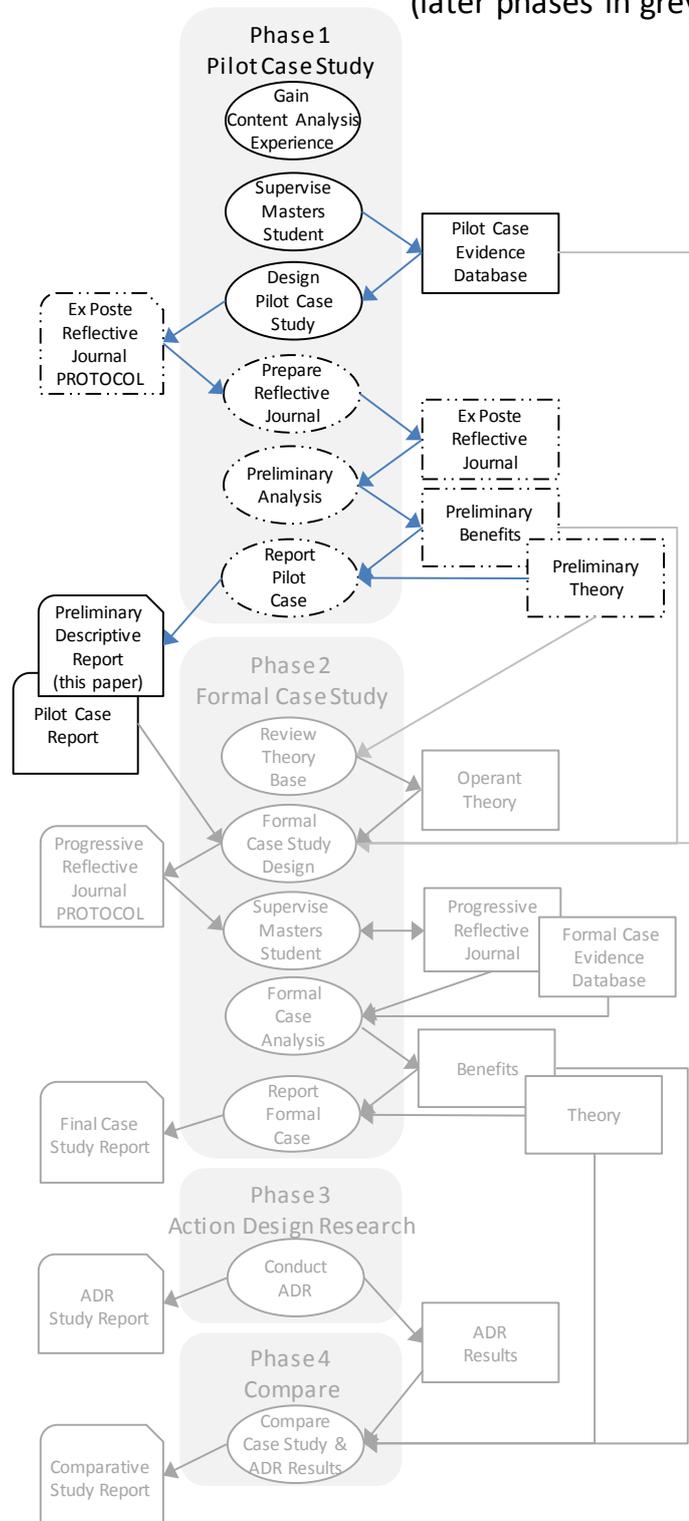
The research training Programme essentially encompassed all experiences of the PhD students that derived from their involvement with the Masters students[10]. Given the systemization and standardization achieved, PhD student time spent with the Masters students was contained, with other main investments of their time being - interactions between themselves and with the Academic. Thus, the experience of the PhDs can be described in terms of their interactions with: (i) the Masters student(s), (ii) each other, and (iii) the Academic. The PhD students' reflective journal (Ortlipp 2008) protocol (mentioned in 'Research Design') has been designed around this structure. A useful cross-reference for reflection is - these three key relationships, with the four units of analysis discerned above. With emphasis on 'research training' of the PhD students (acknowledging that the Academic too has learned much, and we hope also the Masters students), the question asked of each cell in such a matrix, is a derivative of the overarching research question of the pilot case study, namely 'How beneficial have these interactions (Masters, Peer, Academic) in relation to this level (Project, Program, Supervision Program, Research Training Programme) been [for the PhD], and in what ways?'

It is noted that the shifts in UoA did not occur as a result of conscious consideration of potentially interesting and important higher level dynamics (though we do see potential value from a multilevel theory lens here). Rather, there was a general sense that each lower level activity (project, program, ...) was influential in some larger sense, the implicit question posed being 'How is this activity influential more broadly?'

3 The Larger Study Research Design

Figure 1 depicts the overall study design, with later phases (beyond what has been commenced and is reported in this RIP) in

Figure 1 – Study Design
(later phases in grey)

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grey. Note that the pilot case study is only partially complete, with ongoing activities depicted with broken lines. The larger research study is being conducted over 3 consecutive semesters, each semester entailing a main phase of the study, followed by a comparison phase: (i) pilot (retrospective) case study (this paper), (ii) formal (progressive) case study, (iii) action design research, and (iv) comparison.

Phase 1: Pilot Case Study - The first semester primarily entailed the conduct of the pilot case study intended to yield a more detailed formal case study design and preliminary evidence collection instruments. It also yielded preliminary and mainly descriptive case study evidence, which is reported herein, pointing to possibly relevant theory. A main and unanticipated effort was with identification of the study unit of analysis as elaborated earlier.

The primary unit of analysis of the pilot case study (and formal case study) is the research training Programme, thus there is a single case[11] [12]. The overarching research question in the pilot case is: How effective has the research training Programme been for the PhDs, and in what ways? The study is at this stage somewhat exploratory and descriptive.

A main vehicle of evidence collection in the Pilot (and in subsequent phases) is a reflective journal (Yeatman 1995). Though in future, PhD students involved in the Programme will maintain their journals on a progressive basis, i.e. following each major milestone and meeting, in the Pilot; the journals were only introduced subsequently to completion of two rounds of Masters students' supervision, thus they were completed retrospectively. The initial Reflective Journal Protocol was designed with such retrospection in mind, and will be adapted for ongoing, future, progressive use, to be completed by each PhD student separately.

While a draft pilot case study protocol exists and the PhD students have prepared retrospective reflective journals, and in some sense through regular meetings and extensive discussion the PhD student experiences have been analysed, this process is yet in train; formal reporting of that evidence would be premature. That being said, this paper constitutes a preliminary such report; the scope of which has been constrained to a focus on the evolution of the study design. In addition, though observations herein will have been influenced by the reflective logs, more influential have been the informal discussions and meetings between the Academic and PhDs.

Phase 2: Formal Case Study - We briefly describe the subsequent Phases of the study. Phase 2 formally repeats the initial case study, this time commencing with a detailed review of the theory base, informed by prospective theory identified in the pilot. Unlike the pilot, evidence collection is more progressive and real-time, the revised, progressive reflective journal protocol being informed by the pilot case protocol, the pilot case evidence base, the pilot case report, and operant theory identified in Stage 1 of Phase 2. Research questions remain much the same as in Phase 1, but with stronger emphasis on theory.

Phase 3: Action Design Research - In Phase 3, a new PhD student is introduced to again be involved in Masters student supervision; but this time, rather than a case study lens, they bring to the study and review of the Programme, a new perspective. We return here to an action design science research perspective. The systemisation of the Masters students' research method can be considered action design research, given the aims of devising mechanisms or artefacts of value to the ongoing programme. These artefacts include such things as timelines, cross-reference tables, frameworks, protocols (many of which are represented by the Appendices I, II and III) and this paper itself. The Programme itself is a designed artefact. The merit in conceiving [research] methods as designed artefacts has been argued previously (e.g. March and Smith 1995; Venable and Baskerville 2012). The overarching research question here is 'What value is there from adopting a design science research lens in further evolving and evaluating the research training Programme?'

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[11] Given the PhD students and Academic in some sense have a 'new' experience of the Programme each semester, and the Programme evolves, there is some justification for considering the combined Pilot and Formal cases a multiple case study. We felt though that the emphasis in each is quite different, with the first emphasizing instruments and description, and the 2nd emphasizing theory. It is for the same reasons that we do not consider the execution logic a longitudinal case study. Given the unit-of-analysis of the Pilot case is the same as the Formal case, it is not an embedded case study (the former is not embedded in the latter – see (Yin, 2013)).

[12] The main single case has embedded within it (for both the Pilot and Formal executions) two sub-case studies for which the unit of analysis is the Masters student projects. While valuable, detailed analysis of the embedded cases is outside the scope (and size) of this paper.

Phase 4: Methodology Comparison - Finally, in Phase 4, results of Phases 2 and 3 are compared. This phase of the study is more methodological, aiming to understand the relative merits of a case study versus action design research lens in the study context.

4 Discussion

While it is acknowledged that the experience of the study team's shifts to new units of analysis is not uncommon, it is further noted that the tendency when these shifts occur is to lose sight of the prior UoA, thereby disregarding their potential embeddedness and hierarchical relations. By formally considering the possibility that prior (and subsequent) UoA are related (a possible multilevel perspective), a richer theoretical understanding may become possible. Further, such a perspective brings language to discussion and thinking on these relations, which otherwise can be muddled and conflated. In this paper, though we have more carefully considered the existence of UoA and we believe all UoA will continue to influence our thinking as the larger study progresses (we have not disregarded them), much deeper consideration of how they might be theoretically related is yet required.

As mentioned, one motivation for the initiative was to explore a 'sandbox' research subject with which to preliminarily test methodological ideas of the Research-Systems group. On reflection, it is felt the Programme has proved highly valuable as a means of considering both alternative focal problems of interest, as well as alternative research designs and their relative merit. Typically PhD students are preoccupied with their own research, normally addressing a problem and context with which they have limited direct prior experience. With the 'sandbox' Programme described herein, the students are working together on a project in which they all have a common vested interest; something to which they are close, and increasingly intimate. Anecdotally, it is sensed that value derives from there being a 'team' of PhD students with a common cause; engendering a sense of comradery/collegiality amongst the PhD students, and with their supervisor. More pragmatic and perhaps more tangible benefits to the PhD students have been their learnings regarding content analysis, and with regards reflective journals, both versatile foundational skills regardless of their primary research direction or methodology.

Though the pilot case study is largely descriptive, influenced by these early experiences and by early attention to the potentially relevant literature, several possibly valuable theoretical lenses have been identified. The first stage of the Formal Case Study Phase will entail careful revisiting of the theory base with these early experiences and theory prospects in mind. As further example (we earlier suggested possible value from the master-apprentice model (Lave 1982)) of a possibly useful theory lens, Stiggins (1987:34) describes how 'authentic assessment' as "Performance assessments (Gerow et al. 2014) call upon the examinee to demonstrate specific skills and competencies, that is, to apply the skills and knowledge they have mastered." Though the PhD students are not formally 'assessed' on their learning from involvement in the Research Training Programme; they are required, in their interaction with the Masters students, to apply and demonstrate (to the Masters student, the subject coordinator, each other, the Academic, and themselves) their knowledge of research design and supervision. Further, more careful consideration of the value of the PhD experience as a form of authentic assessment has merit.

It became apparent when crafting the PhD Student Reflective Journal Protocol, and particularly the section "Your Own Experience of Supervision", that PhD students would benefit much from advancing formal training in supervision. While the Programme experience was that these PhD students, without exception, were professional and capable as supervisors, giving good values to the Masters students, advancing formal insights into the supervision role would enable them to better benefit from their experience of supervision, by encouraging more nuanced reflections, insights and learnings. It is thus recommended that Large University introduces formal supervision training designed for PhD students, with the PhD students' development as priority (value to the Masters students being a by-product).

5 Conclusion

5.1 Limitations

As a research-in-progress paper, the main limitation faced in crafting this report has been the project is not yet complete (is actually at an early stage). A limitation of the pilot case study is the involvement of only 2 PhD students. Being a descriptive and somewhat exploratory 'pilot' only cursory attention has thus far been given to theory. A further limitation of the pilot case study is its partial completion, with analysis of retrospective journals yet in progress. This is felt to be less a limitation of discussion herein

on units of analysis and the evolving research design, but more a limitation of discussion on benefits of the Programme (to be explored further in the larger design).

Through close, early involvement in Programme design, reflective discussions throughout, and ultimately, the retrospective reflective journals, the PhDs and academic have gained many insights. Unpacking those insights from the four main units of analysis is complex. To what extent future PhDs involved in the Programme will benefit similarly is unclear, as they will not have similar involvement in Programme design. That being said, the Programme will evolve and new PhDs may become involved in ongoing delivery of the Content Analysis training module. Though the 3rd PhD (the Design Science Research guy) will be involved in a further extension of this study, beyond them, further PhD students participating in the Programme will not be involved in the reflection entailed in this or the follow on papers, production.

5.2 Future Research

Given this is a RIP, the main further research possible (and intended) is described in 'The Larger Study Research Design'. In considering to which of the conference tracks we should direct the paper, we felt the larger work aligns in varying degrees with fully 5 topics listed in the "IS Education, Training and Learning Technologies" track. We believe the Programme represents an "Innovative learning approach" (and pedagogy, e.g., transformational, active, blended, and hybrid learning). We believe it represents "Inter and multi-disciplinary approaches to IS (HDR) education". Given supervision is a key activity in the work of academics, we feel involving PhDs in real supervision, real work in research practice represents innovative "Work integrated learning". We believe the Programme addresses a key "Pedagogical issue and challenge in IS (HDR) education", namely getting PhDs to be reflective learners and practitioners. Further, we believe the Programme is an example of innovative "Design of learning environments, artefacts, activities, assessments, and evaluation instruments." This potential from the study setting is only broached in this RIP, offering potential for focusing and going deeper into one or more of these areas in the later phases (or beyond).

Ultimately, the current paper is somewhat methodological, having emphasis on the evolution of the study units of analysis. Given this orientation, not surprisingly, several methodological questions of interest, worthy of pursuit, are suggested. In giving consideration to mechanisms of design and outputs associated with the various units of analysis, we experienced some confusion due to conflating research design with project planning. We believe there are interesting and important questions worthy of attention here in pulling these apart – e.g. what is the relationship between a research design and a project plan? Do they overlap? How do they align?

Given difficulties experienced early on with choosing between case study, multiple case study, embedded case study, longitudinal case study, action research, evaluation research and action design science, we suggest valuable methodological comparison across these approaches is warranted, in attention to questions like – How are they similar? How different? How complementary? What are their relative strengths and weaknesses? When is one preferred, and why? (A focus solely on the alternative case study designs too would be of value). A third PhD student, thus far only peripherally involved, is currently undertaking a content analysis as part of their thesis effort, thereby becoming 'certified' to supervise a coursework Masters student next year. This PhD student's research has a Design Science Research emphasis, and more specifically is exploring the merit of conceiving research methods and research designs as designed artefacts (see e.g. (Venable and Baskerville 2012)). They will drive Phase 3 and possibly Phase 4 of the larger study, conceiving the Programme as a designed artefact and adopt an Action Design Research (ADR) lens. Sub-artefacts of the Programme might include various of the appendices to this paper, including the generic content analysis protocol, the Programme Lifecycle, and role Descriptions.

Though the main study depicted in figure 1 will continue to seek understanding of theoretical value from the research training programme, a splinter study deriving from the pilot case and its inherent emphasis on conceptualisation and clarity around units of analysis, suggest value from further focused effort in that direction.

The shift in unit of analysis from Project, to Projects Program, to Supervision Training Program, to Research Training Programme, may suggest merit from adopting a multilevel theory lens; more specifically considering whether any important collective construct at the Research Training Programme level is formed by any operant construct at a lower level (e.g. see (Zhang and Gable 2017)). Though methodological guidelines tend to be silent on how to conduct qualitative research from a multilevel perspective, Lapointe and Rivard's (2005) analysis demonstrated how multilevel theorizing could be carried out in a qualitative design. Thus, the potential here is two-fold: (i) further inform our

understanding of research training and PhD student development, and (ii) devise prescriptive methodological guidance for multilevel theorizing in qualitative research.

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Appendices
Due to length, the several appendices are uploaded to a Dropbox public folder: https://www.dropbox.com/sh/46o5pmpnn8uhk1s/AACLzijLT6xGzSMgtf2a5ASha?dl=0

- Appendix I – Example advertisement document; Marking criteria document; Research Systems Unit Synopsis;
- Appendix II – Timeline of PhD student supervision of Masters students across enrolment;
- Appendix III – Masters Student Content analysis protocol;
- Appendix IV - Content analysis module Info.

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