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Inside the Minds of Doctoral Students: Investigating Challenges in Theory and Practice

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Abstract

This is a report on a qualitative investigation into the challenges and solutions for Information Systems PhD candidature in Australia by conducting a three-phase research process. Information Systems doctoral theses approved within the past 10 years in Australia were identified in three areas of research, using structured evidence-based search and review methods. This was followed by two focus groups. The first focus group provided a forum where participants engaged and contributed by sharing and reflecting on experiences during their candidature. The data generated was thematically analyzed. The second focus group provided a forum to compare, contrast, and combine findings from the first focus group and the theses review. This was then conceptually organized into a SWOT framework for discussion. The findings imply that there is a need, not only for an inclusive candidature research pathway now provided by most Australian universities, but also an integrated research and personal support pathway. The investigation resulted in defining a conceptual framework of value in Australia and internationally, which acknowledges and bridges the academic-practice gap, offering a considerable step for future PhD candidature investment.

Keywords: PhD candidature, doctoral students, research pathway, information systems, SWOT analysis.

Introduction

Research has identified various challenges faced by PhD candidates during their candidature, especially by first year PhD candidates, overseas students, and non-traditional PhD candidates (Busher, Lewis and Comber, 2014; Naidoo, 2015; Wright & Cochrane, 2000). As attention has been given to identifying the most appropriate research methodology for the investigation the PhD candidate may choose to embark upon (Haksever & Manisali, 2000), there are other challenges PhD candidates may encounter during their candidature. Existing literature has identified challenges such as financial restraints, social isolation, problematic supervisory communication, language barriers, experienced differ-

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ence of educational system, and culture (Harman, 2002; Hockey, 1994; Wright & Cochrane, 2000).

From an academic perspective, selecting an appropriate research methodology involves challenges such as the potential limitations of an adopted methodological approach but also practical difficulties, which may influence the candidate in the choice and conduct of their methodology. Examples of such challenges are: PhD candidate's personal circumstances (Pearson, Cumming, Evans, Macauley, & Ryland, 2011), access to and use of resources (Warburton & Macauley, 2014), or supervisory efficiencies (Buttery, Richter, & Leal Filho, 2005). Perhaps, these challenges provide reasons why 40-50% of PhD candidates do not finish (Gardner, 2008), as many do not fully comprehend the scope of doctoral studies and are not fully aware of the challenges they will face in their programs (Loyd, Harding-DeKam, & Hamilton, 2015).

Whilst various research articles have investigated challenges experienced by PhD candidates, many lack in-depth detail on the methodological or research limitations that emanate as a result of those challenges. Furthermore, it is difficult to pinpoint articles written by PhD candidates, as more commonly they tend to publish articles in conjunction with their supervisory team or colleagues. This makes it difficult to identify the proportion of candidate contribution, their unbiased perception of the limitations of study, and the actual challenges experienced during the conduct of the study. Thus, contributing to the knowledge gap of potential PhD candidates on the challenges they might experience during their candidature. To address this concern, we investigate the challenges PhD students in Australia encounter using two perspectives: challenges as evidenced by the candidates' report in theses (*in theory*); and challenges reported by ongoing candidates (*in practice*).

Based on this reasoning, the authors focus on a review of only PhD theses, which are the sole responsibility of the candidate and should include methodological and research limitations. PhD theses refer to the dissertation involving a doctoral research project written by a candidate for achieving their PhD degree. Higher degree research (HDR) projects refer to research that leads to a doctoral degree award. The fact that many limitations are usually addressed in PhD theses may assist other PhD candidates in similar situations and guide their research choices. However, the challenges presented in PhD theses rarely include practical limitations experienced by the candidate; for example, cultural, political, and personal issues which, one imagines, are fundamental to the success of a PhD candidature. Therefore, this paper investigates Information Systems (IS) PhD candidates' challenges from the perspective of existing literature (theses) and the experiences of current PhD candidates. The research question is: "*what are the real challenges that PhD candidates experience in Australia while investigating IS related topics?*"

To address this question, we investigate the challenges Australian PhD candidates in the IS discipline experience during the research process. The IS discipline was chosen because of its multidisciplinary nature which encourages students to study from all disciplines. Consequently, students who enroll may not have a shared understanding about the *modus operandi* of an IS HDR which may lead to mismatched expectations during their candidature. Therefore, this paper reports on a review of the extant Australian PhD theses completed in the past ten years on IS related topics, focusing on the identified methodological and research limitations. Further, the findings are compared with the challenges four PhD candidates have personally experienced via focus group discussions. The IS related topics are in three specific areas: electronic health (eHealth), electronic peer learning (ePeer Learning), and electronic supply chain management (eSupply Chain Management). These areas were selected because they are aligned with the research focus of IS PhD candidates who volunteered for this study, thus allowing a direct comparison between the literature and their personal experiences.

Therefore, we report on a qualitative investigation into the challenges and solutions for IS PhD candidature in Australia by reviewing relevant doctoral theses and conducting two focus group sessions that facilitated the generation of a SWOT framework. This section is followed by the literature review that provides the theoretical foundations for the paper. The next section presents the method used for conducting: a review of the relevant Australian theses, the focus group discussion, and the SWOT analysis. Following this section is the findings for the theses and the analysis of the focus group discussion. Subsequently, the discussion section integrates the findings from the preceding section into a SWOT analysis framework. This section also provides the limitations and future research before concluding the paper in the final section.

Literature Review

In advocating for improved doctoral candidature experience, a number of researchers have explored the challenges of PhD candidates from diverse perspectives. These challenges include and are not limited to problematic supervisory relationship (Humphrey & Simpson, 2012; Sharip & Ibrahim, 2014; Tress, Tress, & Fry, 2009), financial hardship (Sharip & Ibrahim, 2014), being in a liminal state (*being stuck*) (Kiley, 2009), stress and isolation (Jairam & Kahl Jr, 2012), and time demands (Tress et al., 2009). Added to these challenges are problems related to being an international student such as culture shock and language problems (Harman, 2003a; Skotvoll, 2014).

Whilst most of these challenges are generic to many PhD candidates, there appears to be many more issues that are unique to candidates in Australia due to the implicit assumption of a stereotypical candidate as young, full-time, with few other commitments, commencing after an honors degree, and progressing to academia as an early career researcher after completing a doctorate (Pearson et al., 2011). Williams and Lee (1999) argue the British/Australian model of doctoral training tends to incorporate pedagogical practices of neglect and indifference, which is often traumatic for doctoral students as they are perceived as *independent* scholars. Perhaps this is part of the reasons for low doctoral submission and completion rates in countries where such model of training is incorporated (Booth & Satchell, 1995; Bourke, Holbrook, Lovat, & Farley, 2004).

The multidisciplinary nature of the IS discipline has often facilitated its classification under science doctorates (Burmeister, 2015), which may have brought about a poor representation of IS doctorates in the literature (Hirschheim & Klein, 2012). Added to the dearth of resources for potential doctoral candidates in the IS discipline to leverage upon, is the evidence of its worst completion rates in Australia (Burmeister, 2015). In an attempt to address this issue, we draw on Kiley (2009), who argues for the concept of *zone of proximal development* as an approach through which a guide is provided by someone who has already engaged in that learning and is prepared to assist a fellow learner or a potential learner. This is based on the proposition by Pilbeam and Denyer (2009) drawn from the homophily theory, that doctoral candidates who share the same structural attributes (studying for the same doctoral qualification) are more likely to be connected and are thus in a good position to offer relevant guidance. Therefore, we do not only consider challenges in *theory* – Australian IS PhD theses – but we also draw on the personal experiences of IS PhD candidates in Australia who have been in the *zone*, thus considering challenges in *practice* as well. The next section presents the methodology of the research.

Method

The research is based on an interpretive research philosophy. As Gibbons (1987) describes, interpretive research aims to understand the intersubjective meanings embedded in social life and to explain why people act the way they do. As the focus of this research was to investigate PhD candidates' reflective experience during their PhD candidature, it was important to consider the reality and our knowledge as social products, which cannot be separated from the social actors who construct and make sense of the reality (Doolin, 1996).

In order to discover PhD candidates' experience in both theory and practice, this research was designed by following the process of three qualitative phases. The first phase was a structured evidence-based review to locate relevant Australian doctoral theses and the following phases were two focus group forums to understand PhD candidates' experience face to face. The design is based on the FMA framework proposed by Checkland and Holwell (1998), which presents the relationship of elements relevant to any piece of research as shown in Figure 1. In the FMA framework, a theoretical framework of ideas (F) is applied through a methodology (M) to investigate a problem of interest in an area of concern/application (A). In this research, the framework of ideas (F) comprises the foundations of current literature concerning PhD candidature and the structured review of relevant doctoral theses. The methodology (M) is a focus group approach carried out in the interpretive paradigm. The area of concern (A) is PhD candidates' challenges and solutions for Information Systems PhD candidature in Australia.

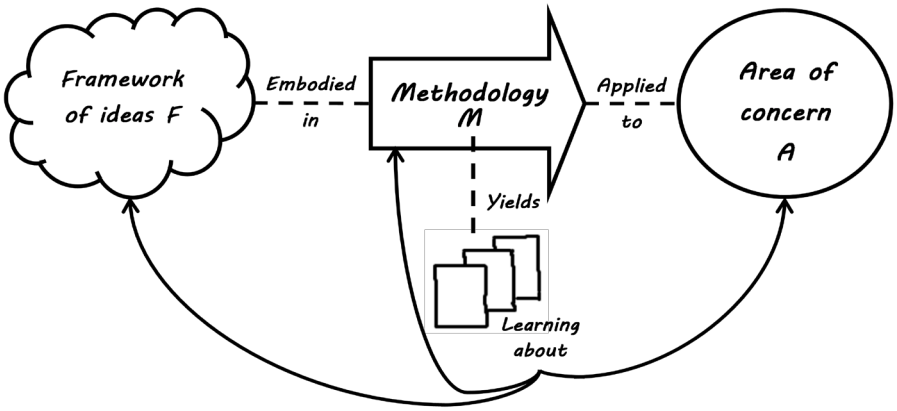

Figure 1. Relationships between the relevant elements of the research (adapted from Checkland and Holwell (1998))

Specifically, Phase 1 of reviewing theses involved the IS-related topics over the past ten years in the areas of eHealth, ePeer Learning and eSupply Chain Management. The electronic search was conducted in the library database Trove. The search process was limited to keywords and titles in thesis and composed of the following related terms: "eHealth" for eHealth, "electronic peer learning" for ePeer Learning, and "electronic supply chain management" for eSupply Chain Management. The theses were limited to those that: (a) focused on IS-related topics; (b) involved research in eHealth, ePeer Learning or eSupply Chain Management; (c) were approved between 2005 and 2015; (d) were in English language; (e) were Australian theses; and (f) where full-text was available online. In Phases 2 and 3, each of the two focus group forums lasted 90 minutes, which was designed to utilize communication between research participants, to understand participants' views and experiences of the topic, and to elicit conflicting and shared views in order to generate data (Kitzinger, 1995). The first focus group discussion (Phase 2) was carried out to generate the themes and the second focus group discussion (Phase 3) was conducted to allocate the themes into a SWOT analysis framework as shown in Figure 2.

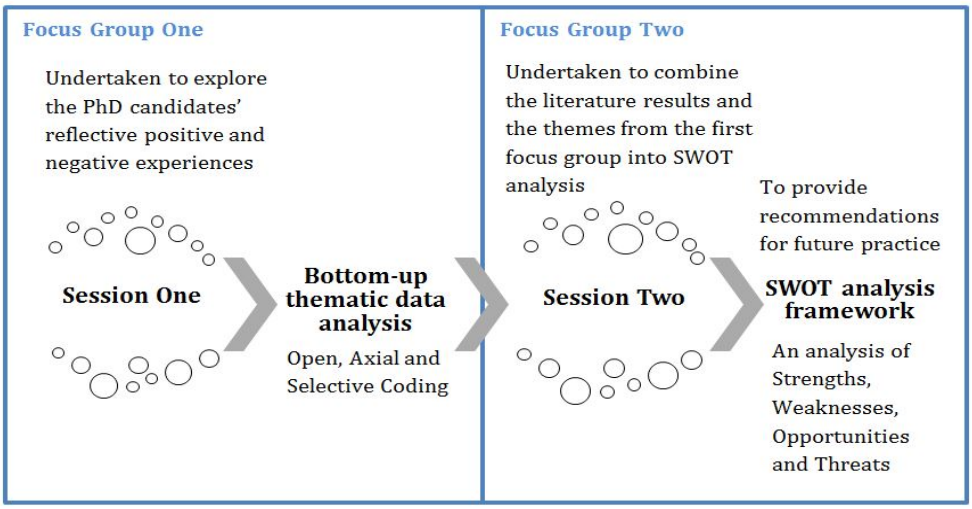

Figure 2. The two focus group discussions

The focus group participants included four current final year PhD candidates in the IS discipline in an Australian university. According to Hensen (2006), Kitzinger (1995), and Rice and Ezzy (1999), four participants are sufficient for a focus group. The participants were recruited during mandatory PhD candidate information sessions held in the university where they volunteered to participate in the focus groups. Due to the context of the investigation and the ethical requirements, the participants were anonymized and labeled as P1-P4 (see Table 1). All materials collected from the focus groups were treated with confidentiality. The research was based on an interpretive paradigm and assessed for rigor using the criteria; credibility, transferability, dependability and confirmability (Lincoln & Guba, 1985). Among the criteria, the relevant interpretive criterion corresponding to generalizability is transferability. Therefore, our findings do not seek to be generalizable as the research focuses only on exploring a particular phenomenon thoroughly. The findings of the research are, however, expected to be transferable as there are similar patterns of behaviors that can be learned.

Table 1. Focus group participants

Participant	Gender	Age group	Research area of the PhD candidate	Has scholarship?	Number of supervisors	Supervisors all from one school?
P1	Female	45-55	eHealth	No	2	No
P2	Female	45-55	eLearning	Yes	3	No
P3	Female	25-35	eLearning	No	2	No
P4	Female	25-35	eSupply Chain Management	Yes	2	Yes

The first focus group prompted collaboration among the PhD candidates. The focus group method allowed the researchers to explore a range of ideas and feelings about issues and highlight the differences in perspective between individuals (Rabiee, 2004). As a useful qualitative research tool, the focus group provided an opportunity for the PhD candidates to talk reflectively about both the positive and negative experiences during their PhD candidature, and to voice concerns and expectations (Diambra, McClam, Fuss, Burton, & Fudge, 2009). The focus group discussion

was audio recorded and later transcribed. Data analysis took a bottom-up thematic approach (Maxwell, 1996). The analytical technique, three-phase coding (Creswell, 1998), namely open coding, axial coding, and selective coding, was applied for revealing major themes with extractions of quotations. Three themes emerged – *administration*, *research* and *personal* – with a total of 41 axial codes.

After the group agreed on the sub-themes and themes generated from the first focus group, a second focus group was convened. The findings from the theses review were combined with the thematic analysis into a SWOT analysis by the research participants. It was important to include the research participants, especially during the process of allocating the sub-themes into the SWOT categories, as it helped to generate insights that portray the participants' reflection on their HDR candidature.

SWOT analysis was adopted because it has been commonly recognized as a useful tool for strategic planning and decision making (Helms & Nixon, 2010), specifically in education studies (Dyson, 2004; Hai & Tsou, 2009; Kuiper & Thomas, 2000; Lee, Lo, Leung, & Ko, 2000; Maiteny & Ison, 2000). The focus group discussion allowed us to formulate successful strategies or recommendations, after reviewing the strengths and weaknesses for success or risk factors identified by the PhD candidates, in the light of the threats and opportunities those factors present. In the first instance, the sub-themes were allocated into either the category of Weakness or Threat. After further discussion, the group found each sub-theme could easily be repositioned as a Strength or Opportunity. The following sections will detail, present, and discuss the findings from the theses review and the focus group themes.

Findings

The findings are presented from the perspective of the theses review and the two reflective focus group discussions. As discussed in the method section, this is based on the qualitative three phase research process that was conducted. Phase 1 involves the theses review while Phases 2 and 3 involve the initial and the final reflective focus group discussions.

Findings from the Theses Review

The initial search produced a total of 105 relevant theses. Out of these 105 theses, 27 met the inclusion criteria, including 6 eHealth, 12 ePeer Learning, and 9 eSupply Chain Management. The Appendix presents a summary of the findings of the theses review, focusing on limitations addressed in the thesis. A search of *limitations* was conducted by initially looking for a section for limitations within the table of content. If no limitation section was immediately available, the authors read the methodology and conclusion chapters to identify any discussion of limitations and finally searched for the keyword 'limit*' throughout the thesis.

The Appendix – the results of the theses review – illustrates the common limitations addressed in the theses, which include:

- resource limitations regarding time frame and funding (e.g. survey length and sample size) which limited the scope of what the researcher could explore; and
- limitations on access to sensitive data.

It was interesting to note that, across the theses reviewed, many discussed the limitations of their study from a positive angle, thereby not portraying a true picture of the limitations. Some failed to discuss any limitation of the research; others did not provide any explanation to justify their limitations. For example, Huq (2007) and Watters (2011) stated that the use of a single case study was the limitation of their methodology. Though, using a single case study in itself is not necessarily a limitation, as it depends on the context and philosophical paradigm of the research. The

fact that the limitations in the theses (in *theory*) are not necessarily realistic highlights the need to investigate the actual challenges of Australian IS PhD candidature so as to discover the *real* picture of the difficulties that may plague a PhD (in *practice*).

Findings from Focus Group Discussions

Due to ethical requirements and the context of the investigation, the participants and specific locations have been redacted. It can, however, be revealed that the participants were all in the final year of their PhD candidature, within an IS discipline, in a university in Australia. Analysis of the data produced 18 sub-themes and 3 themes. The themes are: *administration, research,* and *personal*. Based on these themes, the result from the focus group discussion is structured in three sections, one for each theme.

Administration

The theme *administration* refers to the challenges the PhD candidates experienced in relation to the perceived responsibility of the university and university-related resources. This encompasses issues around availability, finance, information, office location, politics, and responsibility. The sub-themes and the associated axial codes are shown in Figure 3.

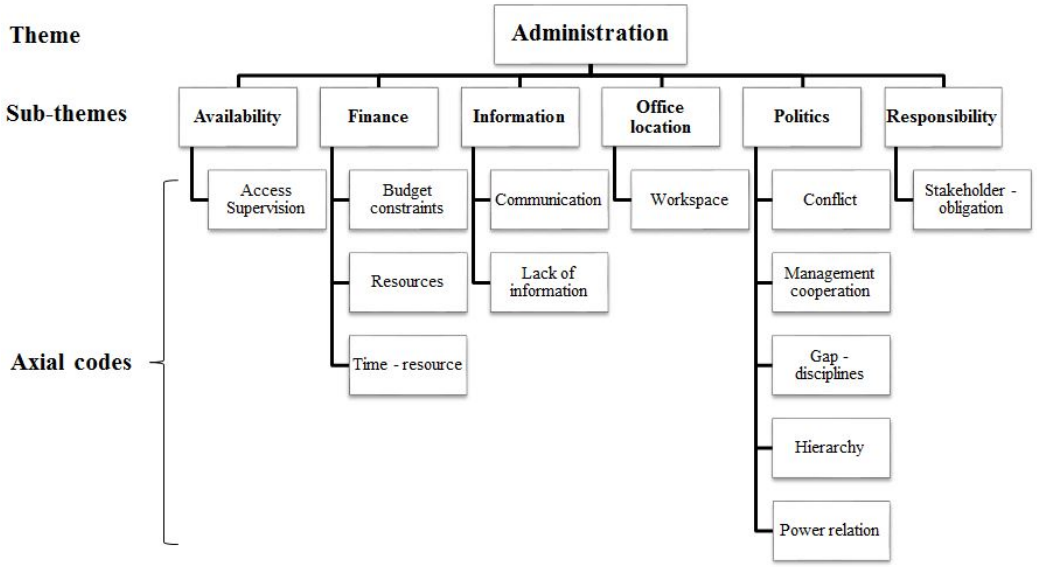

Figure 3. Theme 1 - administration

Availability involves the level of access which the candidates have to their supervisors when considering the teaching, research, administrative roles as well as the personal challenges that supervisors may experience at any time during the supervisee's candidature. This becomes problematic if the supervisor's skillset is indispensable within that supervisory arrangement. Hence, the candidate has to wait till the supervisor becomes available, thus wasting time in some situations. For instance;

> The research paper was delayed for 6 months because my supervisor was too busy with other things. Therefore, the paper was becoming old even before it was sent out for review ... (P4)

Finance is concerned with the budget constraints and monetary resources that are provided by the university and allocated to students for conducting the research investigation associated with PhD

candidature. The problem here relates to the fact that the expectation at the beginning of and/or before the candidature is not usually met during the course of the candidature.

> In preparation for my confirmation of candidature, I remember I was told that a certain sum of money was allocated to every candidate to conduct research. Based on that understanding I prepared my research proposal, which includes the budget. And by the way, I believe the research proposal was approved because I passed the confirmation. However, when I needed some of the money for my research activities, I was told the school had no money. (P4)

Information involves the level at which the university communicates with the PhD candidates during the course of their candidature. The lack of information between the university and the student can indeed become detrimental, as the candidate will not know what they do not know.

> In the first year of my PhD, I was not informed in any way, by anyone, that I needed to complete some compulsory introductory units. One month prior to the confirmation of candidature, I received a checklist from the Research Coordinator and that was when I got to know I needed to finish those units before the end of my first year. A consequence of that was my confirmation was delayed for one year. (P3)

Office location refers to the physical situation the candidate finds himself/herself within the university environment, which constitutes a daily workspace for the student. The problem that ensued here concerns the fact that one of the participants was given an individual office space to work in but this led to loneliness, lack of information and isolation, which was detrimental to the survival of the student.

> Hmmm ... in the early days of my PhD, due to the limitation of space in the building where my school is located, my office was located in a different school, a different building. I felt quite isolated at that time when I had the office by myself. That was part of the reasons why I missed some important information about the course of my candidature. (P3)

Politics is concerned with management related issues such as power relations, hierarchy, conflict and issues between and within disciplines. Firstly, the problems within disciplines can be portrayed as an implicit conflict between the technical (*programming and system development-related*) and non-technical (*people and social aspects of the use and application of information technology (IT)*) academics. This occurred in school seminars where candidates with non-technical research topics are blatantly shut down by technical academics because the topic was not technical.

> Hmmm ...what I recall is, when I newly started with my research with a theoretical topic, I got questioned and actually criticized in a school seminar by a technically oriented academic member. Although I explained how this theoretical topic relates to IT and how my research could be an important part of the IT domain, the topic was still criticized by that person only because it did not involve programming or system development. I felt it was criticism for the sake of criticism. (P3)

Responsibility refers to the perceived obligation of each of the stakeholders within the university environment of the candidate. This becomes an issue when responsibilities are not clearly laid out from the university level down to the level of the candidates involved. The scenario in the excerpt below relates to a one-year delay for one of the participant's confirmation of candidature due to lack of information.

> Oh well ... I think it was mostly my responsibility for that mistake because I should have looked up all the information on the website, which I did not do. It was partially my su-

> pervisor's responsibility but he thought I already knew about [compulsory units] therefore, he did not mention it. I will say it was also the School's and the [Research Division's] responsibility. Putting up a single webpage on the website is not a sufficient level of support for information sharing. (P3)

Research

The theme *research* refers to the complexities and choices related to the conduct of investigations throughout the course of the candidature. This consists of the following sub-themes: choice, data, nature of research, participants, research conduct, and risks. The sub-themes and the associated axial codes are shown in Figure 4.

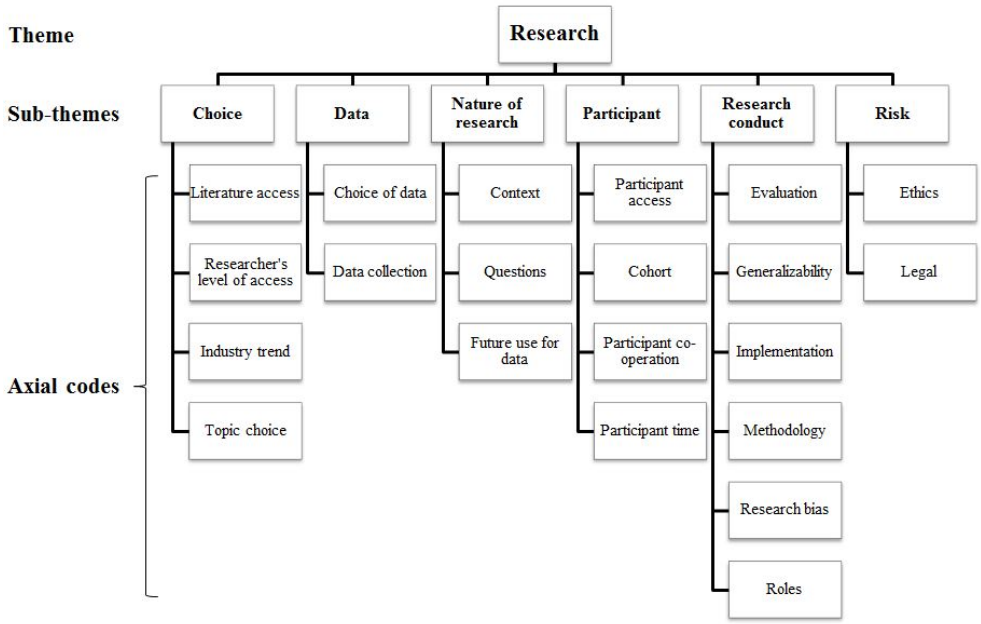

Figure 4. Theme 2 - research

Choice is concerned with issues concerning the choice of the research topic and the impact of industry trends. Some of the participants highlighted the fact that they did not have the choice to choose the research topic they wanted which may have resulted in loss of motivation to complete the study. However, one of the participants stated that the choice of the topic given by the supervisor was based on the industry trend and grant opportunities that became available in the research space.

> Well ... when I think about it now, I was basically tailored towards a substantive area, which I knew nothing about. I remember my supervisor told me about the grant received in that research area but I didn't mind the topic at that time because I felt my research would at least be relevant to the industry and of course funded. Now that I reflect on the journey so far, I wonder what would have happened to me if I didn't find the topic interesting. (P4)

Data involves the decisions made regarding the data collection methods required for the conduct of the research investigation. One issue mentioned here concerns the use of surveys. As the length of surveys has to be limited, the questions posed in surveys have to be limited as well, in order to elicit good responses from respondents. However, this decision is often made at the detriment of the robustness of the research itself, as evidenced by one of the participants.

> ... I told you I had to shorten my survey because of the respondents and because of the money to be spent on panels. So, my supervisor said I should put the comprehensive survey in the appendix to let my examiner know that I did the work. (P4)

Another interesting issue relates to the use of emails, which is a low cost data collection method but does not assure participants of the confidentiality of their responses.

> After my first round of interviews, I sent each participant a follow-up email, asking for specific stories according to the aspects I am investigating. These stories were quite political and often involved the attitude towards their superiors. Out of 14 emails, I only got 2 people responding and willing to have a second interview. One participant replied and said she was not comfortable answering those sensitive questions especially in the written form. However, the 2 follow-up interviews turned out to be most interesting and valuable. So I think, although it was disappointing that I got a low response with the follow-up emails, it was quite worth doing. (P3)

Nature of research refers to issues related to the sensitivity of the research investigation, which tends to influence the decisions made about the conduct of the research. More specifically, this deals with the context of the research investigation and the actual research questions. One of the issues raised here refers to how the context of the research investigation can indeed limit the interest of potential research participants.

> ... on that occasion, I rang many firms to see if I could interview them about the problem that occurred with their products, but nobody wanted to talk to me about the areas where they failed in their operational processes. It doesn't portray them well, as you can imagine ... (P4)

Participant is concerned with matters related to access to, the cohort of, the time of and the level of cooperation of the participants. One of the most interesting issues discussed here concerns the difficulty one of our participants experienced when trying to contact respondents.

> ... you know my research participants are students in a university. So, I was unable to distribute an online survey directly to online participants because of the ethical requirements. So it was difficult for me to encourage the students to voluntarily participate in the study which led to a very low response rate. (P2)

Research conduct involves issues related to the roles, methodology, implementation, generalizability, research bias, implementation and evaluation concerning a research investigation. One of the issues here relates to the assumptions that are made by the university when accepting a PhD candidate, in terms of the expectation of information systems literacy.

> Well … I would say for example; subject area sensitivity and as a researcher or professional the access level to the information I required. eLiteracy and access to online services is also a concern for, not only research participants but the presumption that the candidate is eLiterate and has access and appropriate funding to support services beyond the university confines to progress their research all of which may influence the generalizability and validity of the research don't you think? (P1)

Risk is concerned with the ethical and legal considerations that are related to the conduct of a research investigation. It was revealed that ethical considerations could indeed influence cross-cultural studies. The context of the investigation may require the researchers to acquire ethical approval from the countries involved, which influences the time spent on the research. This is problematic for PhD candidates as the time allotted for their research investigation is quite limited.

> I could not conduct the study in [my university in my country] because I had to do 2 ethics applications and the one in [my university in my country] had many processes and levels of approval which it had to go through before I now apply for the one in Australia. So, due to my research timeline, I had to modify my research to focus on Australia alone because of the shorter ethics approval process. (P2)

Personal

The theme *personal* involves issues related to the PhD candidates' lives throughout the course of their candidature. This consists of the following sub-themes: culture, geography, isolation, uniqueness, and work-life balance as shown in Figure 5.

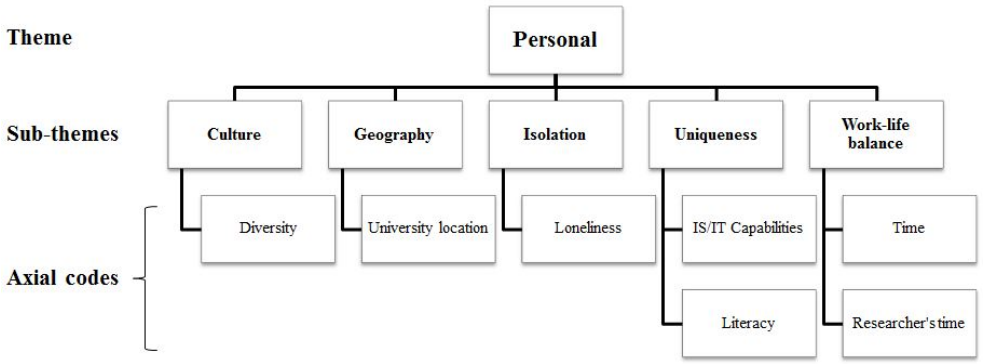

Figure 5. Theme 3 - personal

Culture is concerned with the extent to which diversity is accommodated within a university environment. Whilst the participants acknowledged the full acceptance and understanding of candidates that hail from all communities within Australia, they however had issues as international candidates. One of the issues relates to culture shock and the difficulty in understanding the stern style of communication of some of the supervisors.

> ... my first 6 months in Australia and in this [university] was stressful because I just did not understand the communication style of my supervisor. I took all the comments emotionally because nobody had ever talked to me like that before so it was hard for me to take those comments objectively. But when I understood that supervisor about 1 year later, then I started considering [the supervisor] as a blessing, rather than a curse. (P4)

Geography concerns the considerations related to the location of the university with reference to the location of one's immediate family members who are close enough to influence the candidate's studies. The excerpt below shows how one of the participants failed to critically consider the impact of the geographical location of the university where the study would be undertaken.

> ... because I got a scholarship here I didn't have a choice. And you know how difficult it is to get a job in a remote area, so my partner has to stay on the mainland where he got a job.... If I have to choose between going for a conference and going to see my partner, I will certainly choose my partner ... It's quite difficult for me. (P4)

Isolation involves the problems that may arise due to the loneliness of the journey towards a doctorate degree, which has the tendency to lead to lack of vital information. This may however be reduced through communication and networking, which is sometimes facilitated by the activities provided by the university or even the provision of a shared office space for PhD candidates within a discipline.

> ... if I was in a shared space with other colleagues, I'm pretty sure I wouldn't have missed the information about the compulsory units in the first year of my candidature. (P3)

Uniqueness refers to the level of IT literacy, which is usually expected of any PhD candidate in a university environment regardless of the background the candidate possesses.

> … yes we are all unique and as such our individual journey to complete our PhD is unique, as it should be. But I think in the beginning, we have mentioned the isolation of offices and separation from family etc., there was also the fear of inadequate information and typing skills and ability. I don't think to this date anyone has provided a solution to this question … I still worry about it, maybe I will reflect on it in my thesis. (P1)

Work-life balance is concerned with the extent to which a PhD candidate invests time into the study at the expense of living a good quality lifestyle (in whichever way good quality is defined by individual candidates).

> … to me work life balance is incredibly important and difficult, I have a very supportive husband and his cooking skills have improved a lot. Since commencing my candidature I have had a new grandchild in [location], I have only visited [location] twice [in 3 years] and my Mother has died in [location]…. I would love to be able to "step off" my candidature, and I know I can, but personally I have made a commitment to myself to see this through … I think I could do better with this work-life balance thing … (P1)

In summary, this sub-section has presented the results of the findings from the focus group discussion. The analysis of the data has produced 18 sub-themes and 3 themes. The themes presented here are: administration, research and personal. The findings presented in this section will be discussed and interpreted in the next section.

Discussion

This section does not only discuss the findings but also compares the challenges in theory with those identified in practice. In line with existing literature, our findings reveal that, for HDR students to confidently complete their PhD candidature, they require holistic support not only for academic challenges but also for practical limitations (Buttery et al., 2005; Haksever & Manisali, 2000; Son & Park, 2014; Warburton & Macauley, 2014; Wright & Cochrane, 2000). The university, faculty, school, supervisors or self may provide this. Through a dual-perspective, we report on the HDR student limitations found in the literature (i.e. the review of doctoral theses) and discuss the identified practical challenges (i.e. the preliminary focus group) based on a final reflective HDR student focus group. Thus, we have offered the opportunity for reflection and comparison to *real* HDR student experiences. Having considered the literature, which provides insights into the challenges of PhD candidates *in theory*, we take the reader one step further, by providing rich insights as to how these challenges unfold *in practice*.

Based on the data and summary comparisons presented, it is evident that there are numerous similarities in the literature reviewed and the focus group findings. An example is a similarity between resource limitations (*theses review findings*) and limited access to sensitive data (*focus group findings*). However, the similarities are only obvious in two of the themes (administration and research) that are generated from the focus group, thus validating the argument (see introduction section) that PhD theses rarely include practical limitations experienced by the candidates. To provide a broad perspective on the findings, we no longer make any reference to eHealth, eSupply Chain Management or ePeer Learning as sub-disciplines of the IS discipline. Instead, we choose to focus on building a conceptual framework for higher degree researchers providing the opportunity for aspiring and new PhD candidates to learn from *real* peer practical experience, as this is the aim of this paper.

The findings from the literature present an arguably transferable set of academic limitations, which may guide future researchers. However, the focus group deflects from a purely academic discussion, reflecting and discussing personal and administrative obstacles, which may be interpreted as *real* limitations. The discussion integrates the results for the literature review and the three themes that emerged from the focus group analysis into a SWOT analysis framework, which provides recommendations for future practice. The SWOT analysis findings during our second focus group discussion provided an opportunity for reflection. Those challenges that were first identified as a Threat or Weakness by the PhD candidates were resolved to become an Opportunity or Strength as shown in Figure 6. As a result, this discussion is structured in three sections, the focus group themes: *administration, research*, and *personal*.

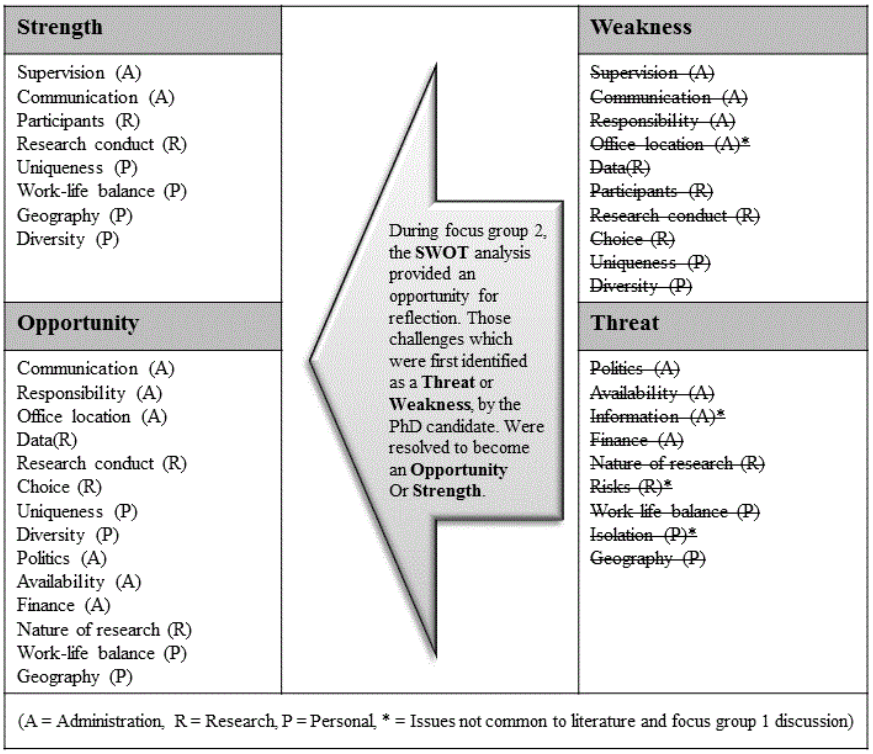

Figure 6. The SWOT analysis conducted during the second focus group discussion

Administration

Analysis of limitations of the theses reviewed provides some evidence of administrative concern, categorized as resource limitations; this is seen throughout the 28 theses reviewed. However, when the PhD candidates were offered the opportunity, in this case via a focus group, to voice and have their concerns reflected formally via a research paper, the sub-themes of availability, finance, information, office location, politics, and responsibility clearly emerged. The sub-themes are not improbable from the existing literature as Harman (2003b) argues that, despite the efforts of Australian universities to enhance academic support, administrative support, and infrastructure, it is not clear if academic departments have adjusted to the increased numbers and diversity of PhD candidates enrolled.

Research

The theses review presents the expected limitation results in terms of access to data (Jones, 2011) and the nature of the methodological approach (Huq, 2007; Watters, 2011). These may all be considered as, part of or, obstacles to be aware of during the HDR student candidature. Reviewing

the comments provided by the focus group provides an alternative lens. The qualitative aspect of the focus group allowed for the inclusion of explanation and expansion of verbalized limitation terms. The focus group sub-themes (choice of data, nature of research, participants, research conduct, and risks) could all be aligned to the generic terms identified in the literature review. However, it was interesting to note that challenges related to acquiring the skill and level of sophistication required to conduct a thorough and critical literature review have not been identified in our findings, whereas Boote and Beile (2005) argue a dissertation should not just consist of mere summaries of the existing literature, commonly found in theses. Perhaps this is because PhD candidates may not be equipped with the skills to assess the quality of their work objectively. This suggests that research-related limitations should not only be viewed by the HDR student but also by seasoned examiners and experienced supervisors. The findings in this paper only come from research-related challenges from the HDR student perspective.

Personal

Analysis of limitations of the theses reviewed made no reference to the personal impact on and responsibility of an HDR student. Although, when reviewing the theses, it was commonly found that the impact and responsibility of completing an HDR project can be clearly garnered from the acknowledgment section of each thesis. The focus group provided for in-depth discussions that produced the sub-themes of culture, geography, isolation, uniqueness, and work-life balance. Although the impact of the themes of *research* and *administration* may be addressed with insight, change in the delivery of human resources, increased skill, and greater provision of resources. The theme of *personal* may take greater consideration and change in attitudes, which acknowledges and understands diversity, not only from a policy stance but also from the *real* personal perspective. Owler (2010) and Pearson et al. (2011) discuss this, arguing that PhD candidates bring varying goals, expectations, history, and responsibilities to their candidature which influences the student's experience.

Drawing upon the findings of Lahenius (2012), we provided a forum for peer self-supervision and it was interesting to see skills from within the group emerge. This enabled those obstacles, which, in the first instance, were presented as a *Weakness* or *Threat* to ultimately become a *Strength* or *Opportunity*. As a group, the perceived limitations of the *real* PhD candidature were proved to be a pathway to developing an awareness of what is required of a *real* PhD candidature. The candidature not only consists of learning to become a competent researcher within an academic forum but must equip the candidate with real confidence to deliver transferable academic and human resource skills throughout their career (Platow, 2012). The literature reviewed and the focus groups both demonstrated limitations to research opportunity that can be overcome with the inclusion of increased awareness regarding the need for a high-level communication and diversity skills (Pearson et al., 2011).

The findings demonstrate there is a need not only for an inclusive candidature research pathway, now provided by most universities in Australia, but an integrated *research* and *personal* support pathway. The findings *in theory* confirmed the common limitations that PhD candidates have already known and many researchers experience. However, the challenges, often not mentioned in academic papers or PhD theses, are those things we sought to discover. Reviewing the literature and providing a forum for peer in-depth discussion has offered the opportunity for the authors to develop a conceptual framework shown in Figure 7, which acknowledges and bridges the academic-practice gap offering a considerable step for future PhD candidature investment.

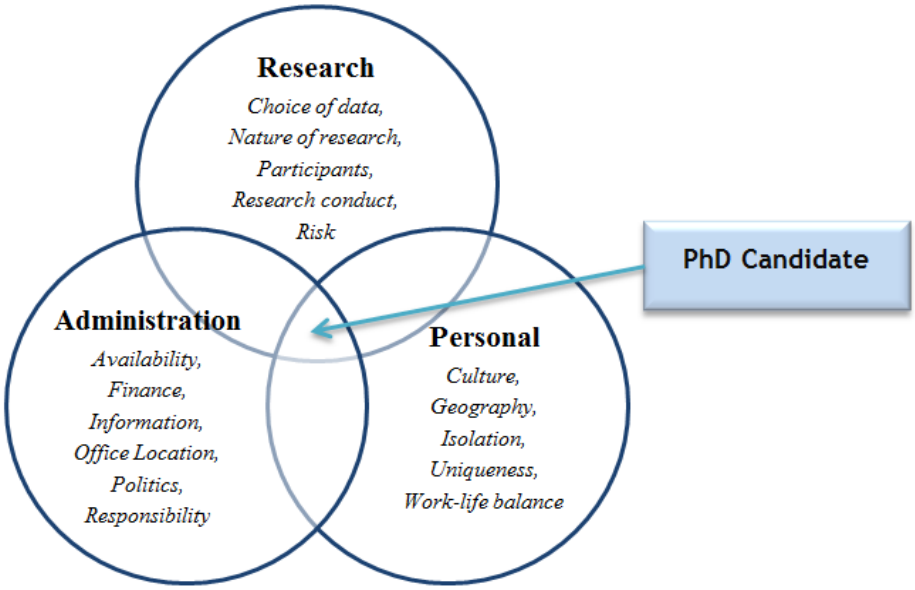

Figure 7. Conceptual framework – understanding a *real* PhD candidature

Therefore, the authors argue that a PhD candidate is embedded within the three themes (administration, research and personal) and has the ability to recognize the strengths and opportunities in each of the *potential challenges* as a pre-requisite for successful candidature. The participants in this study latterly understood that the PhD experience relies on the candidate's epistemological views about their candidature, suggesting that it is advisable to be proactive and to be optimistic. This framework provides conceptual guidance based on the SWOT analysis for early researchers as the aim was not to provide *prescriptive solutions*. It is anticipated that this guidance may be helpful to the readers in understanding, interpreting and transferring the knowledge to their own situation.

Limitations

In the preparation of this paper, the authors identified potential limitations and potential discussion regarding bias; we argue the limitations only provide an opportunity for further research. For instance, future research could engage cohorts at an international level, compare and contrast different gender or cultural views, and/or compare different disciplines and administrations. We further acknowledge the study focuses on doctoral studies in Australia in only three information systems areas: eHealth, ePeer Learning and eSupply Chain Management. To compare the challenges in theory with practice, our findings from the review were drawn only from HDR theses. We believe it is the sole responsibility of the candidate to provide a true reflection of the challenges in their PhD candidature. Only theses available on Trove, accessible by the university library, were obtained.

The focus group was conducted with four female voluntary participants. This may be regarded as a limitation; however, Kitzinger (1995), Rice and Ezzy (1999) and Hansen (2006) argue four participants are sufficient for a focus group, whilst Ferreira (2003) and Seagram, Gould, and Pyke (1998) argue female PhD candidates have a higher attrition rate, which makes the contribution of this paper valuable. In addition, we recognize future study design may benefit by following other population models; for example, the use of a mixed methodological approach, and adding a quantitative demographic component that includes a survey of HDR scholars supplemented by views and interpretations of some of the cases. Having diverse cultures and nations attempt to reproduce

this research will also be beneficial. Understanding variances in administration and institutional policy may be considered as well.

We regard this investigation as touching upon what we identified as a huge gap between *theory* and *practice*. Whatever the methodological approach or cohort applied, future questions to be asked are: "why does this gap exist?" and "why do researchers fail to mention the *other* challenges in their theses?"

Conclusion

The authors have presented results from an investigation providing substantial insights for IS PhD candidates, supervisors and Australian universities. The defined conceptual framework may offer a bridge between the academic and practice gap that offers a considerable step for future PhD candidature investment. The implication of the investigation should not only be interpreted within the discipline of Information Systems. The knowledge may be transferred, as it provides a broad overview of what should be expected during an HDR candidature, thus giving an opportunity to aspiring and current PhD candidates to prepare adequately early in their career.

The preparation for PhD candidature can be categorized. In terms of the research, potential candidates should be empowered with insights into the need to be proactive academically and administratively. This ensures swift progress toward their proposed study. In terms of psychological readiness, potential candidates, the supervisors, administrative staff, and other PhD candidates need a better understanding of the importance of cordial relationships, cooperation, and consideration.

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Appendix

The results of the theses review

Research Area	Thesis	Method	Limitations of Method	Limitations of Research
eHealth	(Jones, 2011)	A single-case qualitative longitudinal process study	1) Data vary in their temporal embeddedness 2) Process data tend to be eclectic.	1) Limited access to sensitive data 2) Resource limitations 3) Meeting – reporting cycle were absent.
	(Perrot, 2012)	Nunamaker et al.'s (1990) systems development research methodology	1) Framework does not provide an alternative for the entire MDA stack 2) Framework does provide a workflow and activity diagram replacement 3) The gathering of contextual information is not part of the thesis.	1) This work assumes that all defined context information is available at the depth required 2) A quantitative method has limited explanatory power 3) There is little information about how students learned and how instruction worked.
	(Ahmad, 2013)	A positivism research utilizing different data mining processes	1) Equally important issues like privacy and security are not included 2) Working with large number of features and attributes in the dataset, led to limited accuracy, precision and specificity 3) Ethical, legal, and social limitations on data collection and distribution limit researchers and industries when utilizing human data.	As per methodological limitations.
	(Chen, 2014)	The research model and methodology based on a comprehensive software engineering approach	1) Supporting the operations on resource-limited devices 2) Time for processing each state is limited.	As per methodological limitations
	(Wong, 2011)	A qualitative case study	1) Research was based on one department in one hospital 2) Participants were only interviewed once 3) The focus was medical practitioners within the Department of General Internal Medicine 4) Ethical constraints, only allowed the researcher to observe the clinical handover sessions, conducted away from the clinical practice area 5) Lack of generalizability is one major limitation associated with case study research 6) The nature of qualitative research is such that both the researcher and the participants can introduce research bias.	1) Participants had a maximum of one hour available to attend the focus groups 2) Researcher had to limit the number of questions for discussion 3) A limited budget was available for the design and development of the electronic tool 4) No standards available to guide practice for clinical handover.
	(Sulaiman, 2010)	The system development research method	Method and methodology difficult to define	Used only plain text for the investigation

Research Area	Thesis	Method	Limitations of Method	Limitations of Research
ePeer Learning	(Endicott, 2011)	Qualitative method: semi-structured interview (individual teachers); focus groups (whole network groups); documentary evidence (artifacts of network-based professional learning); and research diary (field notes from participant observation)	Restricted cohort of specialist language teachers.	The authenticity of the case narratives was perhaps affected by the changes of people, places or events that would identify the participants, either directly or indirectly.
	(Ruth, 2004)	Mixed methods: Case study with content analysis (of online conversation) & survey. These were drawn from four email discussion lists.	Survey had a limited data collection period and a restricted group of participants. Also, data collection occurred during only one year – time constraints.	Unspecified
	(Simeon, 2005)	Qualitative method: semi-structured interview, participant observation, artifacts (initial planning flow charts, course outlines), and researchers' journal	Limited to two case studies that each case consisted of an Instructional designer (ID) working with one or more lecturers.	Limited ICT skills of participating lecturers.
	(Dawson, 2007)	Mixed methods: quantitative method – online survey, student online communication interactions and social network analyses; and qualitative method – content analyses of the discussion forum transcripts and student interviews.	The limitations were associated with the population size investigated and the lack of scalability of the adopted methods.	Unspecified
	(Gerbic, 2006)	Qualitative method: interview, online discussions, and paper-based course documents and information from online site.	1) The difficulty in identifying reliable and valid units of text during content analysis 2) Lack of suitable recording tool; thus leading to poor quality of interview 3) Unresponsiveness of some students during interviews.	The structure of the investigated courses limited the boundaries of the research.

Research Area	Thesis	Method	Limitations of Method	Limitations of Research
	(Calway, 2005)	Mixed methods: Qualitative method - Folio methodology (unobtrusive research). Also, reflective interviews with staff. Quantitative - web-site page (webCT) of a completed learning skills questionnaire.	A limitation of the data analysis was the difficulty in verifying the questionnaire responses with the students who completed the learning skills inventory.	Unspecified
	(Huang, 2013)	Mixed methods (with an embedded case study): qualitative (observations and focus groups) and quantitative (questionnaire).	Limited number of participants	Only the students' perceptions were investigated.
	(Dawson, 2010)	Qualitative method with multiple-case study methodology (semi-structured interviews).	The model's initial selection criteria were limited to participants being current supervisors or Supplemental Instruction Leaders (SILs) with mentors.	Unspecified
	(Lander, 2013)	Mixed methods: discourse analysis on qualitative data was supplemented by quantitative data concerning interaction patterns.	Unspecified	Unspecified
	(Piriyasilpa, 2009)	Qualitative method: online discussion postings	Unspecified	The study was limited in terms of having small groups of participants, not investigating areas in Systemic Functional Linguistics (SFL), and teacher interaction had not been investigated
	(Khoo, 2012)	Mixed methods: quantitative (questionnaires) and qualitative (focus groups, interviews, observation and document analysis).	Unspecified	The number of participants in the research study was relatively small.
	(Stehlik, 2014)	Mixed methods: Questionnaire, Observational techniques, personal interviews, and focus groups. Moreover, System development and usability evaluation were included.	Unspecified	1) Only one General Practitioner (GP) was recruited in initial interviews, therefore the data collected was limited 2) Feedback from practices indicated that lack of remuneration for their time (GP) was the primary reason for lack of participation. Therefore, limited resources influenced research participation.

Research Area	Thesis	Method	Limitations of Method	Limitations of Research
eSupply Chain Management	(Nasir, 2010)	Mixed method research methodology (Interviews & Survey)	Compromise due to requirements of the structural equation model and the length of questionnaire.	Small geographic coverage due to limited fund.
	(Bidar, 2011)	A quantitative approach (survey)	Survey length constraints limits sampled items	Responses from single respondents leading to possible response bias or social desirability bias.
	(Coelho, 2006)	Survey based on interviews and direct observation	1) Bias by the observer 2) Selection of important facts decided by the observer	Unspecified
	(Huang, 2010)	Mixed methods. Surveys, interviews.	1) Measurement items' ambiguity 2) Bias in the questionnaire 3) Limitations of self-reported measures.	1) Limited sampling due to lack of resources 2) Economic downturn during cross-sectional data collection.
	(Huq, 2007)	An exploratory case study framework, with methods from decision theory, game theory, fuzzy logic and simulation for analysis	The use of a single case study	1) Limited timeframe impacted the collected data 2) Scenario utilized does not represent business reality in the real world.
	(Watters, 2011)	Interviews, document reviews, system analysis and design	The use of a single case study	The absence of any statistical conclusions since the study only conducted a single case study
	(Pupunwiwat, 2012)	Design and development	Unspecified	Unspecified
	(Arunthari, 2005)	Postal Survey, Interviews, observations.	1) Low response rate in postal survey 2) Findings of the qualitative study is not generalizable, as study is limited to certain location and context.	Unspecified
	(Preradovic, 2010)	Design and development	Unspecified	Unspecified

Biographies

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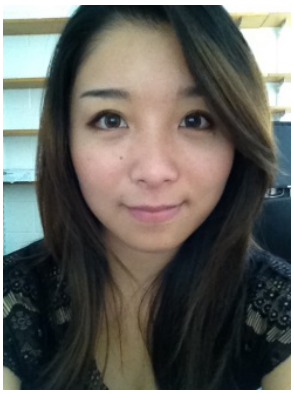

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