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Boundary Spanning Theory: a Case Study of the Professionalisation of ICT Graduates in the Australian Public Service

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Abstract

In this qualitative research-in-progress case study, boundary spanning theories are being used as a conceptual lens to investigate the tensions that arise in the education of ICT graduates as they transition into professionals within the Australian Public Service. Even though these graduates are selected for the ICT Graduate Program from a large pool of applicants and have expert supervision and vigilant mentoring, they seem to face major adjustments to both their personal and working lives as they tackle an educationally challenging postgraduate university course.

The researchers are using theories of boundary spanning to frame phenomena associated with the graduates' experience of the different and potentially competing demands and tensions of workplace and university at the start of their careers. Research findings are expected to provide some critique of boundary spanning theory as well as informing practical improvements to the design and implementation of graduate development programs.

Keywords Boundary spanning theories, work-integrated learning, professionalism.

1 Introduction

In this qualitative research-in-progress case study, theories of boundary spanning are used as conceptual lenses to investigate the tensions that arise in the education of ICT graduates as they transition into professionals within the Australian Public Service (APS). Each year, the APS appoints new ICT graduates to its ranks to build ICT skills and capacity. Even though these graduates are selected from a large pool of applicants and have expert supervision and vigilant mentoring, they appear to face major adjustments to both their personal and working lives as they tackle a challenging postgraduate university course.

The researchers are using boundary spanning concepts to frame the phenomena associated with the graduates' experience of the different and potentially competing demands and tensions of workplace and university at the start of their careers. This theory has been proposed as a means for examining complex situations involving different and potentially conflict domains. The findings from this case study research are expected to inform practical improvements to the design and implementation of graduate development programs such as the ICT Graduate Program (ICTGP) while critiquing boundary spanning in this setting.

Following this introduction, theories of boundary spanning are discussed in Section 2, the case study site is described in Section 3, research questions and contributions are framed in Section 4, the research approach is presented in Section 5, findings to date are discussed in Section 6, and Section 7 is the concluding section.

2 Theoretical Framework

Theories of boundary spanning involve both boundary spanners (such as humans) and boundary objects (such as artefacts). Levina and Vaast (2005) argue that to establish boundary objects-in-use, organisations rely on boundary spanners-in-practice.

Boundary objects include conceptual or physical artefacts. The seminal paper by Star and Griesemer (1989) drew on scientific study in the natural history world, classifying boundary objects as repositories (library or museum), ideal types (diagram or map or atlas), coincident boundaries (maps within which different internal features may be represented), and standardised forms (methods of communications across dispersed work groups).

Gal, Lyytinen and Yoo (2008) claimed that boundary objects facilitate cross-organisational communication and organisational identities, and that changes in boundary objects enable respective changes in cross-organisational communication and organisational identities. Lee (2007, p. 308) advocated that artefacts, through advanced conceptualisation of boundary objects, can be used to "push boundaries rather than merely sailing across them". On the other hand, Kimble, Grenier and Goglio-Primard (2010) viewed boundary objects unfavourably. They criticised the notion of boundary objects as being too mechanistic by ignoring motivational contexts and intergroup politics.

Boundary spanners are defined as individuals or groups who work across organisational boundaries to broker relationships, culture and so forth (Williams 2002). Boundary spanners connect areas within an organisation or with similar networks outside of the organisation (Cross and Parker 2004). One of the difficulties we see for these graduates is the necessity to work across a multiplicity of boundaries, particularly those that separate educational institutions from the workplace, and theory from practice. In this study, we view the ICTGP as a boundary spanning activity which facilitates effective joined-up working by the graduates through coordination and communication across boundaries.

The literature presupposes that the boundaries are known and that the tasks required of boundary spanners are clear (Lamont and Molnár 2002). All the same, the perceptions of a boundary may be more general and may shift in different settings. For example in General Systems Theory a boundary may be dynamic, permeable, malleable, and so on. This research is situated in a context where boundaries may not be so clear and we seek to analyse and define the boundaries across which the graduates are expected to operate and to identify the multiple issues with which they have to deal.

3 Case Study Site

The Australian Public Service (APS) appoints new ICT graduates to its ranks to build skills and capacity. The case study concerns the ICT Graduate Program (ICTGP) facilitated by the Department of Finance which has about forty new ICT graduates annually (some other APS agencies or departments manage their own ICT graduate programs). The ICTGP is seen as a critical juncture for graduates'

careers in the APS as it provides an opportunity for them to learn about the way in which government operates. Overall, the ICTGP aims to instil a sense of professionalism in ICT recruits, thus equipping them for future leadership roles in the APS. A distinguishing feature of professionalism in the APS is its strong requirement for responsibility and accountability at all levels. The ICTGP addresses this requirement by emphasising evidence-based action as a key attribute of graduates' activity.

ICT graduates are engaged in an educationally challenging, year-long induction program. The ICTGP comprises a university course, the Graduate Certificate in Government Informatics delivered by the University of Canberra, and a range of professional development activities arranged by the Department of Finance (as the ICTGP organising agency), the Australian Public Service Commission, their home agency or department and the Australian Computer Society (ACS). The Graduate Certificate is a single unit which accounts for about twenty percent of a graduate's working week throughout the year, with the rest of their week devoted to agency business as usual ICT work. The course has two components:

Project-based learning: Graduates within an agency form a team to develop, manage and deliver an agency-defined project incorporating technical and organisational elements. The project reinforces and develops graduate knowledge of teamwork and project management and contextualises these within agency development practices. It allows those issues of significance to an agency to be explored in practice, for example, security, systems architecture, local project management and so on.

Work-integrated learning and research-led education: Each month the theory, research and practice literature of a topic is introduced to graduates in face-to-face events supplemented with online material. The topics include Professionalism (including Ethics and Communication), Enterprise Architecture, Information Security, Data Science, etc. For each topic, a graduate uses an online portfolio (e-portfolio) to record their activity in exploring the topic using the following steps:

1. research the general principles, theory, language, best practice and sources of knowledge about the topic;
2. investigate the policies and processes the agency has adopted to address the topic;
3. observe the reality of how 1 and 2 play out in the day-to-day workplace by documenting individual experiences;
4. analyse and critique the alignment of points 1 to 3, producing insights and considering what might be done to improve knowledge and practice;
5. and, in cases requiring action, study the specific case carefully, consider the relevant theories and principles (above), look to alternative possible actions and their likely outcomes then plan action, design, develop, test, execute, follow-up and review.

Most topics iterate and recur as the year progresses, so, by repeatedly following the steps above on each topic, graduates become better practitioners and importantly, more experienced at using a professional, evidence-based approach.

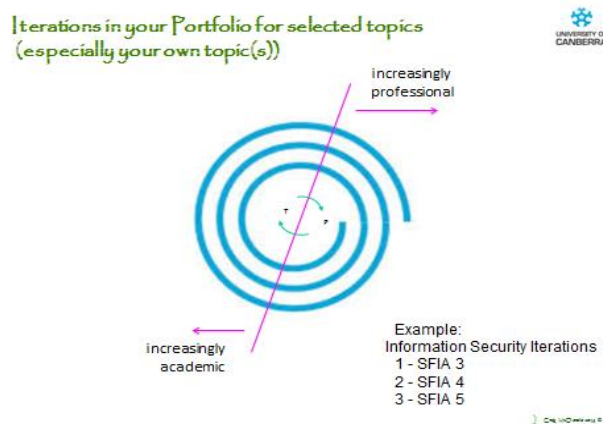


Figure 1 – Portfolio Topic Iteration

Figure 1 shows an example of the process using the topic Information Security. On the first iteration, the graduate comes to grips with security principles, investigates his or her agency's security policies

and observes the practices-in-use. On the next iteration, the graduate may look at a specific security case and come to some conclusion based on additional research. As more iterations are completed, the graduate becomes more expert, possibly being able to meet increasing levels in the Skills Framework for the Information Age (SFIA), used by the ACS and the APS as a means for assessing skill.

Graduates are provided with resources specific to their situation as well as regular encouragement and feedback through workplace supervision and academic mentoring. It is apparent that during their first year in the APS, ICT graduates are required to undergo a considerable amount of training whilst also facing increasing responsibilities. Concurrent to undertaking the ICTGP, graduates face mounting commitments to their immediate workplace and colleagues. In addition, for many graduates, this is their first paid job, their first experience of living away from home, and their first time living in Canberra, thus adding to the pressures they face. In this study, the researchers intend to investigate the issues faced by ICT graduates as they navigate and span workplace domains.

4 Research Aims and Contributions

Using the notions of boundary spanning theory and the case study site described above, the researchers have derived preliminary research questions to focus the study on how the theory plays out in this case study, and what we can learn from the case study using the theory. The preliminary research questions are:

1. What insights does examining the ICTGP bring to Boundary theory? For example, what constitutes a boundary? What are the attributes of these boundaries and the domains behind them?
2. What issues do the various ICT graduates face and how does boundary theory account for them? How do graduates span the multiple boundaries to address the issues they face?
3. What actions can be taken as a result of research questions 1 and 2 and does boundary theory provide a means of identifying the likely outcomes of those actions?

The ICTGP is designed to provide ICT graduates with the skills and knowledge to operate effectively as ICT professionals in the APS and to develop into future managers and leaders. This research will benefit the APS through providing information on the educational and mentoring support and graduates qualities required to optimise the graduates' effectiveness to their agency. The findings of this study can be used to inform improvements to the design and implementation of graduate professional development programs beyond those of the Graduate Certificate in the ICTGP.

This research has several contributions to make. Firstly, it will benefit the academic community since it will enable analysis into different organisational domains, including what and where they are, the boundaries they are situated within, the attributes and the challenges associated with navigating multiple domains. This aspect of boundary spanning is under-researched especially in the environment of ICT in the APS.

Secondly, this research will benefit graduates through providing them with the opportunity to explore their perceptions, expectations, fears and doubts regarding their experiences as a graduate and their career in the APS more broadly. Subsequent cohorts will benefit from putative changes to the course as a result of the findings of this research.

Finally, there will be benefits for the APS and the agencies participating in the ICTGP. These organisations will be provided with a report on broad themes, workforce diversity being one, that are emerging from the research. The report will contain only aggregated data, not individual accounts and will outline key challenges faced by participants. The report will be provided to the Department of Finance (as the ICTGP coordinating agency) which will decide whether to disseminate it further.

5 Research Approach

This research is using a qualitative case study approach focussing on the ICTGP, with emphasis on the Graduate Certificate in Government Informatics. This approach is warranted as the research phenomena is the ICT graduates' experiences, and this needs to be examined in situ with an understanding of the critical contextual factors, social processes and dynamics (Yin 2013). Qualitative case studies typically combine data collection methods such as observations, document analysis, interviews and questionnaires and use triangulation of data sources to ensure confidence in the rigor of the research process. This research project follows that typical pattern.

5.1 Observations

Participant observations of current ICT graduates are taking place at University-arranged events, in meetings and at agency site visits by UC academics as researchers. Site visits are mentoring activities undertaken by the appointed academic of each small team of graduates. Sometimes the agency's graduate coordinator and/or graduate supervisor participate in the site visits. Due to conflicts of interest from academics as educators in the Graduate Certificate for the current cohort, no specific research questions are asked and no data collected although observations of the graduates, as they think and speak naturally about their experiences, may inform future questions. As observers, academics are in a position to interpret boundary spanning events and see boundary objects in context.

5.2 Document Analysis

Document analysis complements observations, interviews and questionnaires. Key documents are the graduates' e-portfolios written in critical style and submitted as assessments to UC academics during their Graduate Certificate studies. At the time of writing, e-portfolios of the 2015 cohort are being analysed through the conceptual lenses of boundary theories in an effort to identify key informants. Reflective writing of workplace activities by students is fitting, using tools such as personal journals and presentations (Pavlovich 2007). Critical reflection is even more desirable to encourage students to recognise strengths and weaknesses of their work, to apply educational theory to workplace practices, and to ascertain future learning needs (Jackson 2014, p. 3).

Finally, other documents deemed to be relevant to the research may be obtained from the departmental graduate program coordinators for analysis. These include the UC Graduate Certificate course convenor's evaluation report which has been prepared at year's end according to APS criteria.

5.3 Interviews

Participants will be identified through adopting the purposive sampling technique. Purposive sampling has been defined as a "non-probability sampling method in which the researcher selects participants based on personal judgement about which ones will be most informative" (Polit and Beck 2008, p. 763). Key participants are the ICT graduates who will be selected based on their thoughtful reflective writings during the previous year. Agency supervisors of these participants may also be selected to participate, as well as agency graduate program coordinators, APS career development support (CDSO) team members, the Department of Finance, and UC academics, all of whom mentor and support the ICT graduates. These supervisors and mentors are expected to provide an alternative view from that of the graduates. Following the identification of graduates, the research team will obtain contact details from the Graduate Certificate course convenor.

The research team has UC Ethics Committee clearance and is following the guidelines of the National Statement on Ethical Conduct on Human Research (Australian Government 2015). All participants will be provided with a research consent package (the participation information sheet and consent form) to gain their informed consent before any data from, or concerning, them is collected. The research team will email potential participants inviting them to participate in the study, and will attach the study consent package for information. This document outlines the background into the study, its aims and what participation will entail. It also provides information regarding data storage and assurances regarding participant privacy and anonymity. If the individual agrees to participate in the study, a member of the research team will follow up with a phone call and email to confirm and ascertain availability for an interview.

Initially during 2016, around twenty ICT graduates from the previous year's cohort (identified from analysis of their e-portfolios) and some supervisors and mentors will be invited to undertake one-on-one in-depth semi-structured interviews at a location near to, but not necessarily in their agency at a pre-arranged time. The same participants may be invited to follow-up interviews in 2017 and 2018 to determine the apparent influence of the ICTGP on career advancement. With the agreement of each participant, interviews will be audio-recorded for detailed and accurate transcription and analysis purposes. The interviews will last thirty minutes to one hour. Then in 2017, about twenty graduates from the 2016 cohort will be interviewed.

In the interviews, each participant will be asked about their experiences as a graduate, the different domains they operate within and any challenges associated with working across these domains. In addition, they will be asked how they navigate these domains and the knowledge, skills and support they think they need to do so professionally. Please see Appendix 1. Professionals need to learn how to work in and manage complex situations that encompass uncertainty, instability, uniqueness, and value

conflicts. Professional attributes include demonstrating integrity and maturity when dealing with others and, at the highest level, acting in a way that encompasses leadership and emotional intelligence (Litchfield, Nettleton and Taylor 2008).

In the interviews with supervisors and mentors, questions will be similar to those asked of the graduates with the possible addition of questions associated with their roles. The interviews are designed to enable the research team to explore perceptions regarding the development of ICT graduates in the Australian Public Service.

5.4 Questionnaires

Interviews of the ICT graduates will be accompanied by a non-compulsory survey-style questionnaire with demographic questions such as gender and age, whether English is their first language, tertiary qualification, tertiary institution where their undergraduate award was attained, prior work experience, location before coming to Canberra, and relocation anxieties. The purpose of these questions is to make sense of the qualitative interview data related to gender, age, experience and cultural diversity of the ICT graduates.

6 Preliminary Findings

To date, findings are preliminary, based solely on observations of 2016 ICT graduate interactions with mentors and supervisors and limited document analysis of e-portfolios from the 2015 cohort of graduates. The data analysis was concerned with the concepts of boundaries and domains and the insights garnered in response to the three research questions. These concepts and insights will be further explored in interviews and questionnaires to address the issues faced by the ICT graduates and the likely outcomes from spanning (or not spanning) boundaries of domains.

Tentative boundaries, and the domains behind them, are identified as follows:

Theory/Practice Boundary: While Kurt Lewin (1951) may well have said “that there is nothing so practical as a good theory”, observation suggests that graduates coming into the course retain the view that ‘academic’ means an abstract thing of no practical value. The course attempts to span this boundary by having graduates look for instances where particular theories play out in practice, and, conversely, by analysing situations to see what theories might account for them. Does this approach cast a different light on the nature of theory, broadening it to include ‘good practice’ and clear well-grounded concepts?

Undergraduate/Postgraduate boundary: The Australian Qualifications Framework spells out differences between level 7 and 8/9 courses. Are these differences ones of discontinuity or just more of the same? What influences do previous educational experiences of the graduates have on their capacity to handle the course?

Profession/Employee or Trade Boundary: The attributes of a professional can be seen as different from those of an employee or tradesperson. The professional takes responsibility for evidence-based action in new situations while the tradesperson follows rules and standards. Observation suggests most graduates coming into the course have been trained as academic tradespeople who demand rules and standards to respond to rather than taking initiative and seeking the knowledge they need to professionally address the situations they find themselves in.

University/Workplace Boundary: An over-the-top characterisation would see the APS workplace as one of task allocation, performance reviews, plans and schedules, nine-day fortnights, separation of work from personal and social life etc, while the traditional university is one of the exploration of ideas, freedom of thought and discussion, engagement in university life, then the final exam. In reality, today’s university units are characterised by strict curricula, objective-driven content, explicit tasks, assessment criteria and rubrics that could as well be APS work. Can the Graduate Certificate in Government Informatics course make modest attempts to redress the trend? It has some hallmarks of a more traditional university, for example, graduate-led assessment criteria as they need to determine the quality attributes of their own work and no grades (pass/fail).

Boundary between Agencies: Over a dozen agencies are involved in the course, all with different missions and cultures. Can the ICTGP be a mechanism for facilitating communication across social groups and collective sense-making among graduates?

ICT/General Public Service Work: The ICT domain within APS agencies has always been rather separate from the rest of the agency (Ogbonna and Harris 2007), yet in most cases graduates work on projects with line management from ‘business’ areas. The boundary between these two

domains is spanned through systems artefacts, modified processes and individuals capable in both. How can a course engender this capability?

Open/Secure Boundary: The security requirements of the APS means that in some cases graduates needs to be very careful about what perceptions they allow to cross the border from the restricted internal agency environment to the open academic environment.

Tentative boundary spanners: A finding of the research is the casting of academics engaged with the course as boundary spanners. As such, different skills are required of them than those needed in a normal university course. A clear understanding of the domain of public service workplace attitudes and mores is required as well as a clear understanding of the nature of theoretical and research domains. Both of these understandings have to be contextualised in a wide range of different forms of ICT used across different agencies from some of the oldest legacy systems to experimental technologies. And further needs to be contextualised in the aims of the course itself, specifically graduate autonomy and leadership. There is a sense in which the graduates are being educated to be boundary spanners themselves.

Tentative boundary objects: The assessment tasks and course material of the Graduate Certificate may be considered boundary objects-in-use. It is these that embody the design principles of the course.

7 Conclusion

The findings are showing how theories of boundary spanning can provide a coherent lens for analysing a complex situation in a way that raises further questions and suggests new areas for course design. Findings that arise are expected to influence the future design of the Graduate Certificate and provide greater knowledge of theories of boundary spanning. The research is entering its interview and questionnaire stage from which much more detail and, hopefully, new insights will emerge.

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Appendix 1

Interview Protocol: ICT Graduates

The interviews are designed to enable the research team to explore perceptions regarding the development of ICT graduates in the Australian Public Service. Six main topics will guide general conversation in a semi-structured approach.

<p>Please tell us about your experience as an ICT graduate on the ICT Graduate Program</p>

<p>Objective: to establish the participants' experience with the ICT Graduate Program (ICTGP) and to identify potential patterns regarding perceptions of the program.</p>
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<p>How does the ICTGP enable or impede your development as an ICT professional in the APS?</p>

<p>Objective: to obtain graduates' perceptions regarding the effect of the ICTGP on their professional development.</p>

<p>What are the various contexts you are required to operate in and how does this play out on a weekly basis for you?</p>
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<p>Objective: to establish the different domains (APS, agency, workplace, graduate team, ACS, UC etc) graduates operate within, the demands of these domains, and the extent to which they complement and/or conflict with one another.</p>

<p>Consider specific examples of problems you have encountered. What issues did you face when working across these different contexts?</p>

<p>Objective: to obtain graduates' perceptions regarding the issues they face when navigating diverse domains.</p>
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<p>What knowledge, skill or support do you need to be able to navigate/work across these different contexts?</p>

<p>Objective: to identify key elements that are considered important for enabling graduates to span the various domains.</p>
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<p>What changes would you make to the ICT Graduate Program if you could?</p>

<p>Objective: to elicit perceptions of possible changes to the program.</p>

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