What can we Learn From Gender Research? Seven Lessons for Business Research Methods

Eileen Trauth The Pennsylvania State University, University Park, USA

etrauth@ist.psu.edu

Abstract: This paper considers issues, insights and lessons about conducting research in business that are drawn from this author's experiences with gender research in the information technology (IT) field over the past decade. A research program on gender and information technology (IT) is used as the basis for consideration of methodological insights for business research. The purpose in discussing gender research is not so much to focus on the findings of this work. Rather, the purpose is to focus on research issues that have or could arise, the learning from which is transferrable to business research. The reason is that there are similarities between gender research and business research. Both are action oriented in that the research is driven by real issues and practical problems. The research is conducted into the phenomenon in order to inform actions and interventions. This problem-orientation that drives business research also drives gender and IT research. Seven lessons relevant to business research methods are: the effect of data type, the choice of epistemology, the role of theory, building on disparate literature, the influence of researcher standpoint, stakeholder perspective that is privileged, and resolving the rigor vs. relevance conundrum. This review of insights for business research that is drawn from experiences with conducting research on gender and IT makes a case for increased methodological pluralism. Arguably, the degree to which institutions and publication outlets take these issues into account is indicative of their openness to exploring emergent topics. Methodological conservatism might be in order in some areas. But business research, which endeavors to respond to real world problems, needs to have the methodological tools available to respond to them. It must also be responsive to business trends and issues that might bring with them challenges for current methods for conducting research. New economic constraints, issues such as climate change that blur business area boundaries, globalization, social inclusion and innovation are 21st century issues that will encourage the research community to overcome resistance to different ideas, methodologies, epistemologies and theories.

Keywords: critical theory, diversity, epistemology, feminism, gender differences, gender and IT, individual differences theory of gender and information technology, interpretive research, research methods, social inclusion, theory, women and IT workforce

1. Introduction

This paper considers issues and themes about conducting research in business that are drawn from the author's experiences with gender research in the information technology (IT) field over the past decade. A research program on gender and information technology (IT) is used as the basis for consideration of methodological insights for business research. The purpose in discussing gender research is not so much to focus on the findings of this work. Rather, the purpose is to focus on research issues that have or could arise, the learning from which is transferrable to business research. The reason is that there are similarities between gender research and business research. Both are action oriented in that the research is driven by issues and problem. The research is conducted into the phenomenon in order to inform actions and interventions. This problem-orientation that drives business research also drives gender and IT research. In the sections below the gender research program is described. This is followed by a discussion of seven lessons for business research methods that are drawn from this research agenda.

2. Overview of gender research

2.1 The problem

The problem that motivates this research is that women represent half of the population, and, in many societies, half of the labor force, yet are woefully underrepresented in the information technology (IT) field. In view of the economic projections about the continued growth of the IT sector, it is particularly important that all members of society see this as a viable career option. That is, the inclusion of women in the IT sector is a matter of both economic necessity and social justice. There are several answers to the question of why it is important to address the gender imbalance in the IT field (Trauth, Huang, Morgan, Quesenberry and Yeo, 2006).

The first argument for redressing the gender imbalance can be termed the innovation argument. The information economy is also an innovation economy. The reason is that as technology, including information technology, becomes a commodity there is an economic incentive to move its production to the lowest wage economies. Consequently, economies in countries such as the U.S. are focusing their attention on continuous innovation and the development of ever new information products and services as a way to compete in this sector. In such an economy 'talent' or human capital development is what is prized because it is human brainpower and creativity that fuels such innovation. And the 'best brains' can be located in a variety of bodies, not just male. The second argument can be termed the consumer argument. In an information society in which all citizens are engaged in the consumption of information products it is crucial that the varying needs of this diverse consumer base be represented. The air bag story is now given as a classic example of the failure to include diverse perspectives in design considerations. The problem with the automobile air bag is that it was designed with a western man in mind as the generic 'person' without sufficient consideration to the effect of the deployed airbag on someone of a lighter and slighter build than the average western man, with the tradic consequences that have resulted (Smith, 2009). The third argument for gender balance is termed the demographic argument. In much of the western world, demographic changes add urgency to the desire to create a more diverse IT labor force. The impending retirement of the baby boom coupled with projected growth in the IT sector over the next ten years will produce an IT labor force demand that cannot be satisfied by white men alone; yet women typically make up less than 25% of the IT labor force of many countries (Panko 2008). The fourth reason for advocating greater gender balance is a simple economic security argument. As this paper is being written the USA is in the throes of the most severe economic recession in generations. Tens of thousands of workers have lost their jobs; it is predicted to get worse before it gets better. In such circumstances it is incumbent upon individuals to be prepared for economic uncertainties. Thus with the possibility of spouses and partners losing jobs, everyone needs to be prepared to work. And if they are getting lower paying jobs two-income families will become increasingly important. Thus, it seems to make good economic sense that women are able to hold information sector jobs. Finally, there is the equity argument. This argument is that in an open society, all people ought to have equal opportunity to pursue all careers. It is a matter of fairness. But ensuring such equity, however, isn't just a matter of individual choice. It also requires addressing structural barriers that are enacted through cultural norms, societal stereotypes and institutional behaviors.

The business problem of the need for a gender balance in the IT field produces, in turn, a research problem. The problem is that there is insufficient scholarly knowledge of the factors that account for women's under representation in the IT field. Further, there is insufficient theoretical understanding of these factors. What we have, instead, is a situation in which generally well intentioned people identify and theorize factors in an ad hoc fashion. That is, since everyone experiences gender, it is commonly thought that rigorous data-driven interventions are unnecessary. This has contributed to a lack of theoretically-informed interventions to address the gender imbalance.

2.2 Gender and IT research agenda

In response to this need, a research agenda was enacted ten years ago with two goals in mind. One was to explore and better understand how individual, institutional and societal factors operate to discourage women's participation in the IT field. The second goal was to develop an alternative way of theorizing the influence of these factors. This section provides a brief overview of the research agenda with a focus on methodological, epistemological and theoretical considerations.

2.2.1 Methodological and epistemological considerations

The research methodology employed in this research program has involved four forms of data collection: interviews; participant observation; and survey and focus groups. Both quantitative and qualitative data have been collected. Both interpretive and positivist epistemologies have been employed. Two hundred life history interviews were conducted between 2000 and 2006¹ with women in the IT profession in the USA (123), Australia (21), New Zealand (10), and Ireland (46) in order to identify individual responses to socio-cultural factors that inhibit or encourage female participation in the IT professions. These interpretive field studies employed face-to-face, open-ended interviews with female IT practitioners and academics. Strategic, convenience sampling techniques were used to

¹ Twenty-five of the interviews with Irish women were conducted in 1990 before this research program was undertaken. They were part of a larger study of socio-cultural influences on the emerging information economy in Ireland (Trauth, 2000).

facilitate geographical representation of the women in the studies. In the case of the Irish, Australian and New Zealand studies women throughout the country were interviewed. In the case of the American study the geographical representation was limited to three states: Massachusetts (32), North Carolina (30), and Pennsylvania (31). In addition, 31 interviews were carried out throughout the USA with women academics in the IT field. The geographical limitation in the American study was imposed because of the size of the American population in contrast to that of Ireland, Australia and New Zealand. Limiting the geographical representation, thus, facilitated more focused socio-cultural analysis. During interviews that typically lasted 90 minutes, women were asked to talk about their educational backgrounds, work experiences and about family and socio-cultural factors that influenced them to become IT professionals. The women were also asked about factors that have either enhanced or inhibited their participation in the IT sector.

These interviews constitute the bulk of the research conducted as part of this research program. But three additional forms of data have been collected more recently. Participant observation data were collected in 2008 in South Africa with both women and men working in the IT industry. These individuals were students in an intensive Master of IT course that was taught by the author. Finally, a mixed methods study of American university students was undertaken in 2007 and is ongoing. In this study a positivist epistemology is employed in a survey that is investigating the intersectionality of ethnicity, socio-economic class and gender. A subset of the students will also participate in (interpretive) focus groups.

2.2.2 Theoretical considerations

The problem of female under representation in the IT field was theorized using an emergent gender theory that looks to within-gender variation for insights. The *individual differences theory of gender and IT* (Trauth 2002, 2006; Trauth et al., 2004, 2009) considers gender relations in the IT field at two different levels of analysis. The societal level is concerned with the origins and operations of gender group influences. The individual level is concerned with explanations for variation among women with respect to how they respond to gender group influences. This variation is posited as resulting from differences in demographic traits, personalities, and individual and socio-cultural influences. This theory is comprised of three constructs. The *individual identity* construct includes subconstructs such as age, ethnicity, nationality, socio-economic class, parenthood and the aspect of the IT field which one has entered. The *individual influence* construct includes subconstructs such as educational background, personality traits, abilities, mentors, role models, and significant life experiences. Finally, the *environmental influence* construct includes cultural, economic, policy, and societal infrastructure influences. The *individual differences theory of gender and IT* argues that, collectively, these constructs account for the differences among women in the ways they relate to the IT field, and respond to gendered discourses about IT.

The findings from this research reveal pervasive, systemic, yet variable interaction with gender-based influences throughout a woman's education and career. This individual variation has been categorized into differences in: *exposure, experience* and *response* (Trauth and Quesenberry, 2006, 2007). Differential *exposure* - the amount of gender bias which a particular woman actually encounters - varies by such individual factors as her ethnicity, age or parental status, as well as by the geographic region in which she lives. Differential *experience* - a woman's consciousness of bias and the extent to which she notices and internalizes it – is influenced by such individual factors as role models, mentors and significant life experiences, as well as by an individual's personality, abilities, academic prowess, and the culture and economy of a particular geographic region. Differential *response* is affected by such individual factors as the degree of family support a woman receives, her coping mechanisms and her sense of personal agency, as well as by institutional factors such as gender and equality laws and policies of a geographic region as well as the equality climate of institutional settings.

3. What can business research methods learn from gender research?

In this section the issues, insights and lessons learned from gender research are made applicable to business research.

3.1 The effect of data type

The first insight is about the type of data: each has a particular contribution to make to our understanding of issues. Each has its strengths and weaknesses. Quantitative research provides explicit, objective documentation of a phenomenon. It enables wider reach and population

generalizations. Qualitative research, on the other hand, provides "the story behind the statistics." In some senses, it picks up where quantitative research leaves off: from observing and documenting the phenomenon to a nuanced understanding of it. Whereas quantitative research endeavors to generalize to a population, the goal of qualitative research is to generalize to theory (Lee and Baskerville, 2003). Finally, qualitative research opens the door to epistemological variety. It enables not only interpretive but critical research as well. (This is discussed more in Section 3.2.)

In choosing between quantitative and qualitative data, both the strengths and weaknesses need to be taken into account. For example, a disadvantage of quantitative research is that there is not the opportunity for nuanced understanding that is afforded by qualitative research. But a drawback of some qualitative research is its lack of transparency about the method. The reader is often asked to believe without explanation, how the author came to the conclusions she or he did. These strengths and weaknesses have led to methodological bias in some business journals towards exclusive publication of one type of data or the other. Hence, authors wishing to publish in certain journals are made to fit their research to a publisher's methodological constraints rather than allowing the appropriate method to emanate from the nature of the research to be conducted. A related issue is the use of mixed methods. Bias towards one type of data or another will diminish the opportunity to produce rich insights through the use of multiple lenses to view a phenomenon.

3.2 The choice of epistemology

The second insight is about epistemology. Different goals are achieved by different epistemologies. As an illustration, consider the effect of epistemology on gender and IT research. A series of papers considered how the goal, methods and findings of research change along an epistemological continuum (Howcroft and Trauth, 2004; Trauth and Howcroft, 2006; Howcroft and Trauth, 2008). Positivist studies are focused on accurate and replicable documentation leading to valid generalizations about gender and IT. The majority of this research has been directed at documenting *that* there is a gender difference with respect to design, development and use of information systems and technology, or with respect to participation in the IT field. It is difficult to consider how interventions flow out of such findings without discussing the role of theory (taken up in Section 3.3). However, more recently positivist gender research has taken a more sophisticated approach to the phenomenon under study. Examples include Armstrong et al. (2007), Riemenschneider et al (2006), Kuhn and Joshi (2009), Trauth et al. (2010) and Adya and Kaiser (2005).

Interpretive research, on the other hand, is interested in understanding *how* the current status of gender relations has come to occur. Its goal is to understand the social and psychological processes whereby overt and internalized constraints hold women back from equal participation in the IT sector. In shifting from positivist to interpretive research, the goal would change to exploring the ways in which women are influenced by and react to the social shaping of both gender identity and IT. In the interpretive study the focus is on the story of women who "overcame the odds" and how they did so. The results are intended for use in supporting and evaluating interventions directed at women and their societal context. Examples include the work of von Hellens (e.g. von Hellens and Nielsen, 2001) and Quesenberry (e.g. Quesenberry and Trauth, 2008).

Critical research goes one step further by asking *why* gender is constructed as it is and whose interests are being privileged. Hence, it endeavors to expose systems of power that are served by the gender imbalance. The purpose of critical research is to challenge assumptions, identify contradictions and to raise awareness about systems of power. The critical exploration of gender and IT moves beyond articulating key influencing factors affecting women and the within-gender variation in how they overcome them. Its goal is to raise issues of a structural and ideological nature that may frame the experiences that hold women back and serve to reproduce inequality. Examples include the work of Adam (2002), Howcroft (e.g. Trauth and Howcroft, 2006; Howcroft and Trauth, 2004, 2008), Kvasny (e.g. Kvasny 2006) and Richardson (e.g. Adam, Howcroft and Richardson, 2004).

The effect of epistemological choice in business IT research is pointed out in a study on group decision support systems in which two different epistemologies (first positivist and then interpretive) were used to analyze transcripts from a group decision support system discussion (Trauth and Jessup, 2000). What emerged from the analysis were two very different conclusions. The positivist analysis concluded that effective group behavior directed at consensus around alternative solution scenarios had occurred. However, the interpretive analysis revealed a very different picture: the absence of shared consciousness about the issue at hand as well as imbalanced participation by

relevant stakeholders in the decision-making process. As this example shows, a shift in business research from positivist epistemology to interpretive and critical, is a move from the 'safe' research space of objective, quantification of seemingly immutable phenomenon to the 'vulnerable' research space of multiple and subjective understandings of reality. This can be unsettling for some readers and publications that prefer the comfort of numbers. It is even more unsettling for those made uncomfortable by the unstable territory of power, control, resistance and inequality. However, for research that endeavors to address real world questions, interpretive or critical epistemologies may be the most appropriate choice.

3.3 The role of theory

As a relatively new area of investigation research about gender and IT reveals the range of approaches that can be taken to theorizing a phenomenon (Trauth, 2006). The earliest gender work that was published in information systems journals used the narrower definition of theory. That is, theory testing and theory extension work was conducted. However the theories were not those used to explain the phenomenon of gender. Rather, they were theories about technology adoption and use such as the technology acceptance model or the theory of reasoned action. Examples include Venkatesh and Morris (2000), Venkatesh et al. (2000), Gefen and Straub (1997), Webster and Martocchio (1992) and Ahuja and Thatcher (2005). This research can be described as undertheorized with respect to the phenomenon of gender. A second approach taken to theorizing a new topic is to use no theory at all. In the case of gender, this means compiling and representing statistical data regarding the differences between men and women with respect to technology adoption, use or organizational impact. In response to the absence of sufficient theory to explain the phenomenon of the gender imbalance in the IT field, this author is developing *the individual differences theory of gender and IT* as a way of accounting for the observed differences in men's and women's relationships to information technology and the IT field.

Theory can play one of several different roles in a research project. The decision about the role of theory is a function of both the research tradition and the purpose of the research. Gregor (2006) explains that understandings of theory can range from a very narrow definition that limits theory to prediction only, to a more inclusive definition that defines theory as explanation. In between are the issues of causality and generalization. At heart, a theory is an attempt to understand a phenomenon. As such, that understanding can range from a descriptive conceptualization to a systematic statement of rules to be tested towards the production of general principles or causes.

Some business researchers and some business journals limit their definition of the 'acceptable' role of theory to theory testing. This can be limiting, particularly in settings such as gender where the phenomenon is at the early stages of being understood. It can bring a narrowness to investigations with the potential for analytical rigor but real world irrelevance. (This is discussed more in section 3.7.) Taking a broader view, one that emerges from the phenomenon itself, allows for theory to take on a variety of roles that could include: theory testing, theoretically-informed research, theory development or extension, or grounded theory.

3.4 Building on disparate literature

An essential challenge with research that is driven by real-world problems is that the real world doesn't fit neatly into disciplinary categories. Hence, the research is often multidisciplinary and the research literature can be found in many places. In the case of gender and IT research, the literature can be found in the journals and conferences of disciplines such as: women's studies, psychology, education, information systems and computer science. This brings the challenge of keeping up not only with the increasing number of journals in one's own area (such as information systems) but also the relevant literature that is published in journals and conferences in the other fields.

But in doing so, a researcher can encounter another, and potentially more challenging, issue: academic politics. This issue is about what journals, conferences and books are considered to be 'legitimate' in a given discipline. The problem occurs when the definition of legitimate literature is too narrow. This would be manifested by a reward system that recognizes research only when it is published in certain venues or when emerging scholars are taught to look for relevant research only when it appears in certain locations. When this occurs, there is a danger of researchers missing important research, of 'reinventing the wheel' by not sufficiently building upon the full extent of cumulative knowledge.

To address a real-world problem, whether about a gender imbalance or about a business problem, a researcher needs to follow the research – wherever that leads her or him. Hence, the challenge for both gender and business research is to be able to follow the relevant research literature wherever it may be found and to train students for boundaryless literature searching. In this digital age there is little excuse for not thoroughly searching for relevant literature; it would only be the construction of 'legitimacy' that would limit inclusion of potentially relevant research.

3.5 Influence of researcher standpoint

A recent issue that has entered methodological discussions is about researcher reflexivity. Proponents of reflexive or 'confessional' accounts of research (e.g. Kvasny, et al, 2005; Schultze, 2000) argue for greater transparency in presenting methodological details, that includes information about the researcher and how her or his identity characteristics (e.g. gender, ethnicity, nationality), philosophical orientation, disciplinary background, etc. has influenced the research. In the information systems field foundational work on methods such as that of Klein and Myers (1999) has included "the relationship between the researcher and the researched" among the principles for conducting interpretive field studies. Another term that expresses the same methodological stance comes from feminist methodology. Feminist standpoint theory (FST) emphasizes the situated knowledge of marginalized individuals. It provides a systematic approach for theorizing the complexities of lived contexts, experiences and perspectives of women (Haraway, 1988). Harding (2004) describes standpoint theory as "an organic epistemology, methodology, and social theory that can arise whenever oppressed peoples gain public voice. The social order looks different from the perspective of our lives and our struggles" (p. 3).

To illustrate this point, this author will shift to the first person to demonstrate how researcher standpoint can influence the approach to research. First, I have an interdisciplinary PhD in information science not business. Since my education about information problems was interdisciplinary I was educated to look across disciplinary boundaries in the pursuit of knowledge. Hence, an integral part of how I approach research is not so much discipline oriented as topic or problem oriented. Second, the first two decades of my career were spent as a professor in business schools where I was consistently pushing up against disciplinary boundaries and definitions of 'legitimate' research. For example, I conducted research on telecommunications before it was considered to be a 'legitimate' topic in information systems (e.g. Trauth et al, 1983). Third, I had significant international experience prior to conducting gender research. Hence, I brought this culturally-contextual understanding of the different definitions of femininity and masculinity to the way in which I was theorizing gender and IT. Fourth, I had conducted human capital research for 13 years prior to my engagement with gender research. This work was both quantitative (e.g. Lee et al., 1995, Trauth et al., 1993), conducted at the industry and organizational levels of analysis, and gualitative (e.g. Trauth, 2000), conducted at the industry and societal levels of analysis. Because of this research experience I had a deep understanding of issues surrounding IT like skills as well as credibility that enabled me to link gender research, a topic considered to be non mainstream, to a long tradition of human capital research. Finally, I have engaged with the topic of gender and IT as a researcher, teacher and administrator. I have developed and taught courses on diversity and gender. I have conducted and published research on gender. I have had administrative responsibility for the enactment of interventions to address the gender imbalance an IT program of study. Hence, I bring an action and intervention orientation to my gender research.

While transparency about researcher standpoint is commonplace, if not ubiquitous, for interpretive and critical research a case can be made for its inclusion in positivist studies as well. The argument is that an individual's life experiences, biases, interests and identity will shape the assumptions one makes about a phenomenon. This is true even in positivist research. Decisions about what to include and not include in a survey, what theory to use to inform the research, and how the interpretation of findings is conducted all result from human judgments made by a human researcher. Advocates of transparency about researcher standpoint believe that the claim of an 'objective researcher' is a myth.

3.6 The stakeholder perspective that is privileged

In addition to the influence of the researcher's standpoint on the research is the influence of the stakeholder's perspective on the conduct and outcomes of the research. In gender research there are a variety of perspectives that can be taken, a variety of viewpoints that can be emphasized. For example, consider research that is focused on workplace factors influencing the retention of women in

the IT workplace. If a scholarly article is directed at senior executives, it would be strategic in nature, perhaps emphasizing the cost-effectiveness of gender inclusion. The epistemology might be positivist or interpretive. But if it is targeting the female employees themselves, the paper might be about an interpretive investigation of the ways that women cope with such factors as workplace climate, exclusion from networks or the absence of mentors. But it could also be a critical study of institutional barriers to gender equity in the IT workplace. Finally, if gender scholarship is targeting a general audience, then the focus could shift from cost-effectiveness or coping to broader societal themes such as justice or equity.

In the same way, business research has different stakeholders. This is not to say that one perspective is more important than another. Rather, the point is simply that multiple perspectives exist. Whereas there is a tendency to address research results to executives that might not always be the best orientation. But to the extent that a definition of legitimate 'business relevance' is limited to executive perspectives then a narrowness enters the research domain. The determination of legitimate business relevance is the joint action of institutions and publication outlets. Academic institutions, by rewarding executive perspectives, can drive narrowness. On the other hand conference committees and journal editors can also drive narrowness. Doing so has implications for both the approach that is taken to study a phenomenon and how the implications of findings are considered.

3.7 Resolving the rigor vs. relevance conundrum

The final lesson for business research that can be gleaned from its comparison with gender research returns us to the theme that introduced this paper. That is, both areas of research declare themselves to be problem-oriented. For this reason the theoretical vs. applied argument is raised. This dichotomy is often presented as a conundrum: research cannot be practical and at the same time scholarly. It can be methodologically rigorous at the cost of relevance. But if it is highly relevant to real-world problems then it must not be rigorous research. This is a false dichotomy. Rather, what is behind this argument is mistaking the use of *different research methods* for *bad research*. For example, consider a researcher who believes that theory only exists to be tested, that positivism is the only epistemology that exists and that quantitative measurement is the only valid way to conduct research. How does this person react when confronted with research employing interpretive field work, that uses theory only as a sensitizing device, and from which population generalizations cannot be made?

The plain fact is that there is a tremendous need for theoretically-informed interventions in order to properly address real-world problems. Using the gender example, in the absence of a theoretically guided and methodologically rigorous examination of a gender issue, interventions might be developed that reflect counterproductive gender stereotypes and that end up doing more harm than good. Such an ad hoc approach to interventions does not reflect a systematic and thorough theorizing of the problem. In the absence of research rigor to understand a problem the intervention that is developed to address it runs the risk of being irrelevant. Hence, a strong argument can be made that rigor and relevance go hand in hand.

4. Conclusion

This review of insights for business research that is drawn from experiences with conducting research on gender and IT makes a case for increased methodological pluralism. Arguably, the degree to which institutions and publication outlets take these issues into account is indicative of their openness to exploring emergent topics. Methodological conservatism might be in order in some areas. But business research, which endeavors to respond to real world problems, needs to have the methodological tools available to respond to them. It must also be responsive to business trends and issues that might bring with them challenges for current methods for conducting research. New economic constraints, issues such as climate change that blur business area boundaries, globalization, social inclusion and innovation are 21st century issues that will encourage the research community to overcome resistance to different ideas, methodologies, epistemologies and theories.

Acknowledgements

This research has been supported by grants from the National Science Foundation (ITWF #0204246; GSE ##0733747), the Australian Research Council, Science Foundation Ireland, and the Fulbright Foundation (Ireland 1989, Austria 2008).

References

- Adam, A (2002) "Exploring the gender question in critical information systems," Journal of Information Technology, Vol 17, pp. 59–67.
- Adam, A. and Richardson, H. (2001) "A decade of neglect: reflections on gender and IS", New Technology, Work and Employment, Vol 19, No. 3, pp. 222-240.
- Adam, A., Howcroft, D., and Richardson, H. (2004) "A decade of neglect: reflections on gender and IS", New Technology, Work and Employment, Vol 19, No. 3, pp. 222-240.
- Adya, M. and Kaiser, K.M. (2005) "Early determinants of women in the IT workforce: a model of girls' career choices", Information Technology & People, Vol 18, No. 3, pp. 230-259.
- Ahuja, M. and Thathcher, J.B. (2005). "Moving Beyond Intentions and Toward the Theory of Trying: Effects of Work Environment and Gender on Post-adoption Information Technology Use," MIS Quarterly 29(3), 427-459.
- Armstrong, D. J., Riemenschneider, C. K., Reid, M., and Allen, M. (2007) "Advancement, voluntary turnover and women in IT: a cognitive study of work-family conflict", Information and Management, Vol 44, No., 2, pp. 142-153.
- Gefen, D. and Straub, D. (1997) "Gender differences in the perception and use of e-mail: an extension to the technology acceptance model", MIS Quarterly, Vol 21, No. 4, pp. 389-400.
- Gregor, S. (2006) "The nature of theory in information systems", MIS Quarterly, Vol 30, No. 3, pp 611-642. Harding, S. (Ed.) (2004). The Feminist Standpoint Theory Reader, Routledge, New York.
- Haraway, D. (1988) "Situated knowledges: the science question in feminism and the privilege of partial perspective", Feminist Studies, Vol 14, pp. 579-599.
- Howcroft, D. and Trauth, E.M. (2004) "The choice of critical IS research", in Relevant Theory and Informed Practice – Looking Forward from a 20 Year Perspective on IS Research, B. Kaplan, D.P.
- Truex, D. Wastell, A.T. Wood-Harper and J.I.DeGross (Eds.), Kluwer, Academic Publishers, Boston, pp.195-211. Howcroft, D. and Trauth, E.M. (2008) "The implications of a critical agenda in gender and IS research",
 - Information Systems Journal, Vol 18, No. 2, pp. 185-202.
- Klein, H.K. and Myers, M (1999) "A set of principles for conducting and evaluating interpretive field studies in information systems research", MIS Quarterly, Vol 23, No. 1, pp. 67-93.
- Kuhn, K. and Joshi, K.D. (2009) "The reported and revealed importance of job attributes to aspiring information technology: a policy-capturing study of gender differences", The Data Base for Advances in Information Systems, Vol 40, No. 3, pp. 40-60.
- Kvasny, L. (2006) "Let the sisters speak: understanding information technology from the standpoint of the 'other", The Data Base for Advances in Information Systems, Vol 37, No. 4, pp. 13-25.
- Kvasny, L., Greenhill, A. and Trauth, E.M. (2005) "Giving voice to feminist projects in management information systems research", International Journal of Technology and Human Interaction, Vol 1, No. 1, pp. 1-18.
- Kvasny, L., Trauth, E.M. and Morgan, A. (2009) "Power relations in IT education and work: the intersectionality of gender, race and class", Journal of Information, Communication and Ethics in Society, Vol 7, No. 2/3, pp. 96-118.
- Lee, A.S. and Baskerville, R. (2003) "Generalizing generalizability in information systems research", Information Systems Research, Vol 14, No. 3, pp. 221-243.
- Lee, D.M.S., Trauth, E.M., Farwell, D., Kuramoto, L. and Winslow, C. (1995) "Critical skills and knowledge requirements of the IS profession: a joint academic/industry investigation", MIS Quarterly, Vol 19, No. 3, pp. 313-340.
- Morgan, A.J., Quesenberry, J.L. and Trauth, E.M. (2004). "Exploring the Importance of Social Networks in the IT Workforce: Experiences with the 'Boy's Club." *Proceedings of the Americas Conference on Information Systems* (New York, August).
- Panko, R. R. (2008) "IT employment prospects: beyond the dotcom bubble", European Journal of Information Systems, Vol 17, pp. 182- 197.
- Quesenberry, J., Trauth, E.M. and Morgan, A. 2006. "Understanding the 'Mommy Tracks': A Framework for Analyzing Work-Family Issues in the IT Workforce," *Information Resources Management Journal* 19(2), 37-53.
- Quesenberry, J.L. and Trauth, E.M. (2008) "Revisiting career path assumptions: the case of women in the IT workforce" Proceedings of the International Conference on Information Systems (Paris, France, December).
- Quesenberry, J.L. and Trauth, E.M. 2007. "What Do Women Want?: An Investigation of Career Anchors among Women in the IT Workforce," *Proceedings of the ACM SIGMIS Computer Personnel Research Conference* (St. Louis, MO, April), pp. 122-127.
- Riemenschneider, C., Armstrong, D., Allen, M. and Reid, M. (2006) "Barriers facing women in the IT workforce" The Data Base for Advances in Information Systems, Vol 37, No. 4, pp. 58-78.
- Smith, D. (2009) "The imperative of diversity for institutional viability: building capacity for a pluralistic society", Presentation at The Pennsylvania State University (University Park, PA, March 27).
- Schultze, U. (2000) "A confessional account of an ethnography about knowledge work", MIS Quarterly, Vol 24, No. 1, pp. 1-39.
- Trauth, E.M. (2000). The Culture of an Information Economy: Influences and Impacts in the Republic of Ireland. Kluwer Academic Publishers, Dordrecht, The Netherlands.
- Trauth, E.M. (2002) "Odd girl out: an individual differences perspective on women in the IT profession", Information Technology and People, Vol 15, No. 2, pp. 98-118.

Trauth, E.M. (2006) "Theorizing gender and information technology research," in Encyclopedia of Gender and Information Technology. E.M. Trauth (Ed.), Idea Group Publishing, Hershey, PA, pp. 1154-1159.

Trauth, E.M., Farwell, D. and Lee, D. (1993) "The IS expectation gap: industry expectations versus academic preparation", MIS Quarterly, Vol 17, No. 3, pp. 293-307.

- Trauth, E.M. and Howcroft, D. (2006) "Critical empirical research in IS: an example of gender and IT", Information Technology and People, Vol 19, No. 3, pp. 272-292.
- Trauth, E.M., Huang, H., Morgan, A., Quesenberry, J. and Yeo, B.J.K. (2006) "Investigating the existence and value of diversity in the global IT workforce: an analytical framework," in IT Workers: Human Capital Issues in a Knowledge-Based Environment. F. Niederman and T. Ferratt (Eds.), Information Age Publishing, Hershey, PA, pp. 331-360.
- Trauth, E.M. and Jessup, L. (2000). "Understanding computer-mediated discussions: positivist and interpretive analyses of group support system use", MIS Quarterly, Vol 24, No. 1, pp. 43-79.
- Trauth, E.M., Joshi, K.D., Kvasny, L., Chong, J., Kulturel, S. and Mahar, J. (2010) "Millennials and masculinity: a shifting tide of gender typing of ICT?" Proceedings of the 16th Americas Conference on Information Systems (Lima, Peru, August).
- Trauth, E.M. and Quesenberry, J. (2006) "Are women an underserved community in the information technology profession?" Proceedings of the International Conference on Information Systems (Milwaukee, WI, December).
- Trauth, E.M. and Quesenberry, J.L. (2007) "Gender and the information technology workforce: issues of theory and practice," in Managing IT Professionals in the Internet Age. P. Yoong and S. Huff (Eds.) Idea Group Publishing, Hershey, PA, pp. 18-36.
- Trauth, E.M., Quesenberry, J.L. and Huang, H. (2009) "Retaining women in the U.S. IT workforce: theorizing the influence of organizational factors", European Journal of Information Systems, Vol 18, pp. 476-497.
- Trauth, E.M., Quesenberry, J.L. and Morgan, A.J. (2004) "Understanding the under representation of women in IT: toward a theory of individual differences", Proceedings of the ACM SIGMIS Computer Personnel Research Conference (Tucson, AZ, April), pp. 114-119.
- Trauth, E.M., Trauth, D.M., and Huffman, J.L. (1983) "Impact of deregulation on marketplace diversity in the USA", Telecommunications Policy, Vol 7, No. 2, pp. 111-120.
- Venkatesh, V. and Morris, M. (2000) "Why don't men ever stop to ask for directions? gender, social influence, and their role in technology acceptance and usage behavior", MIS Quarterly, Vol 24, No. 1, pp. 115-139.
- Venkatesh, V., Morris, M.G. and Ackerman, P.L. (2000) "A longitudinal field investigation of gender differences in individual technology adoption decision making processes", Organizational Behavior and Human Decision Processes, Vol 83, No. 1, pp. 33-60.
- von Hellens, L.A. and Nielsen, S. (2001) "Australian women in IT", Communications of the ACM, Vol 44, No. 7, pp. 46-52.
- Webster, J and Martocchio, J. (1992) "Microcomputer playfulness: development of a measure with workplace implications", MIS Quarterly, Vol 16, No. 2, pp. 201-226.

Evidence Analysis Using CAQDAS: Insights From a Qualitative Researcher

Marian Carcary University of Limerick, Ireland

marian.carcary@ul.ie

Abstract: In data analysis the qualitative researcher seeks to produce a convincing explanation of the phenomena under investigation. Data analysis is an iterative process and requires reflection and interpretation on the researcher's part on several levels. Interpretation suggests that there are no clear rules and that the researcher's judgment, intuition and ability to highlight issues play an important part in the process. As a result, the issue as to how to analyse qualitative evidence is an area often poorly understood by researchers new to the interpretivist paradigm. The complexity of the data analysis process is increased due to the volume of evidence collected as part of a qualitative research study. The role of Computer Aided Qualitative Data Analysis Software (CAQDAS) in supporting this data analysis process is examined in this paper. It explores how CAQDAS can be used in facilitating the management of an extensive qualitative evidence base. CAQDAS enables researchers to manage qualitative data that would prove onerous through manual "pen and paper" methods. The paper examines the author's use of the CAQDAS package N-vivo in managing approximately 400 pages of single spaced interview transcripts resultant from a study on the evaluation of a new student ICT administrative system implementation in the Irish Institute of Technology (IoT) sector. This was an extensive empirical research study conducted across several case study sites and involved 49 informants and multiple sources of case study evidence. The objective was to develop a coherent cross-case primary narrative of the system's implementation from the evidence collected, reduce this to a set of key findings and ultimately develop a theoretical conjecture that provided fresh insights into the ICT investment evaluation process. The N-vivo package served primarily as a support tool in managing the interview transcripts; in reflecting on the emerging themes; and in interpreting the body of evidence. It facilitated the identification of key points, the coding of key concepts that emerged from the body of evidence, and comparison between these concepts. It supported the later reclassification of concepts into a series of categories and sub categories; this helped to organise related concepts in relation to the overall research and facilitated greater understanding of the body of evidence. It supported the creation of memos to clarify emerging concepts and the categorisation of interview material to facilitate cross-case analysis. Further, it facilitated analysis through for example relationship and model exploration. These features of N-vivo played a vital role in producing a series of narrative accounts and ultimately the distillation of a new theoretical conjecture.

Keywords: qualitative data analysis, CAQDAS, N-vivo, coding, categorisation, memos, interpretivist research, research audit trail

1. Introduction

Qualitative data analysis is a complex process, particularly when large volumes of research evidence is gathered and when the researcher is new to the interpretivist paradigm. The iterative nature of analysis and the importance of researcher reflection, interpretation, judgement and intuition mean that there are no clear rules to follow. Nonetheless, when gualitative analysis is conducted in a transparent manner, and when the logic of the researcher's interpretations can be traced, the interpretivist paradigm often leads to more interesting research findings. The interpretivist paradigm is the one followed throughout this research paper. The empirical research study referred to was centred on the field of ICT evaluation and the evaluation of a new Student MIS in a number of Irish IoTs. Some of the IoTs requested to remain anonymous within the final report and hence are referred to as Site One, Site Two etc throughout this paper. The interpretivist paradigm offered the opportunity to develop an in-depth understanding of the ICT system's impact, as it facilitated the capture of contextual depth and detailed, nuanced descriptions. It emphasises qualitative research methods, which are flexible, context sensitive and largely concerned with understanding complex issues. In the past, many researchers relied on pen, paper and highlighters when analysing their gualitative evidence. However, over the past 20 years, CAQDAS packages have evolved and grown in functionality to support the qualitative analysis process. Following a discussion of the interpretivist paradigm and qualitative research methods, this paper explores the value of CAQDAS in supporting analysis of the evidence gathered for the Student MIS project.

2. The interpretivist paradigm discussed

Interpretivist research is sometimes described as non-positivist, post-positive or qualitative. The researcher is not perceived as being entirely objective; rather he/she is a part of the research process (Rowland, 2005). According to Walsham (2006: 321):-

"we are biased by our own background, knowledge and prejudices to see things in certain ways and not others".

Further, Wheatley (2006) stated:-

"we inhabit a world that is always subjective ... Our world is impossible to pin down, constantly and infinitely more interesting than we ever imagined".

The interpretivist stance is holistic and considers numerous variables including the context of the study (Klein and Myers, 1999). Context is regarded critical. As outlined by Clarkson (2004):

"people cannot be understood outside of the context of their ongoing relationships with other people or separate from their interconnectedness with the world".

Hence, this approach aims to grasp the diversity of subjects' experiences (Kvale, 1996).

Interpretivism recognises the difficulty in making research value-free and objective. In terms of this view, a single objective reality does not exist. The social world does not lend itself to being understood by physical-law-like rules (Snape and Spencer, 2003). Multiple realities need to be considered. These include an external reality, which is what actually occurred in the physical world, and internal realities, which are subjective and unique to each individual (Bannister, 2005). Because each situation is different, the researcher needs to delve below the surface of its details to understand the reality. Bannister (2005) suggested that reality is examined through a series of mental processes or filters. These may include perceptual, contextual, linguistic, memory, sequence, personality, agenda, methodological, selection and temporal lenses. Being aware of these filters allows the researcher to understand the evidence supplied by the informant. The meaning derived by the researcher is a function of the circumstances, the people involved and the broad interrelationships in the situations being researched (Saunders et al, 2007; Veal, 2005). Walsham (2006: 325) maintained that:

"the researcher's best tool for analysis is his or her own mind, supplemented by the minds of others when work and ideas are exposed to them".

Unlike the positivist stance, physical-law-like generalisations are not the end product. Rather understanding through detailed descriptions is sought by answering questions such as "*what*?", "*why*?" and "*how*?"

3. Qualitative research methods

The interpretivist paradigm emphasises qualitative research methods which are flexible and context sensitive (Mason, 2002). In qualitative research, words and pictures as opposed to numbers are used to describe situations. According to Van Maanen (1983: 9) its methods include:-

"an array of interpretive techniques which seek to describe, decode, translate, and otherwise come to terms with the meaning, not the frequency, of certain more or less naturally occurring phenomena in the social world".

Hence, it is largely concerned with understanding complex issues (Mason, 2002). In qualitative research, the researcher is actively involved and attempts to understand and explain social phenomena in order to solve what Mason (2002:18) calls "*the intellectual puzzle*". It relies on logical inference (Hinton et al, 2003) and is sensitive to the human situation as it involves dialogue with informants (Kvale, 1996). In general, the researcher collects large quantities of detailed evidence. Thus, qualitative research may achieve depth and breadth (Blaxter et al, 2006; Snape and Spencer, 2003; Veal, 2005). Further, qualitative methods are useful when the researcher focuses on the dynamics of the process and requires a deeper understanding of behaviour and the meaning and context of complex phenomena (Alvesson and Sköldberg, 2009; Snape and Spencer, 2003). It is the most appropriate approach for studying a wide range of social dimensions, while maintaining contextual focus (Mason, 2002).

Conducting qualitative research requires considerable reflection on the researcher's part, and the ability to make a critical assessment of informants' comments. It involves debating the reasons for adopting a course of action, challenging ones own assumptions and recognising how decisions shape the research study. Mason (2002) provided the following guidelines for the qualitative researcher:

- The research should be conducted systematically and rigorously;
- It should be strategic, flexible and contextual;

- The researcher is accountable for its quality and claims;
- He/She should engage in critical scrutiny or active reflexivity;
- He/She should produce convincing arguments.

Qualitative data collection approaches include for example participant observation, observation, documentary analysis, discourse analysis, conversation analysis, biographical methods, case studies, interviews and focus group discussions (Ritchie, 2003). The choice of method is influenced by the nature of the research problem, the researcher's theoretical lens or philosophical assumptions, the researcher's skills and academic politics (Trauth, 2001).

4. The research study and the research methodology

The qualitative research evidence discussed in this paper was collected for a research study in the field of ICT evaluation. The study sought to better understand the ICT evaluation process through evaluating the impact of a large-scale standard student MIS implementation in the Irish IoTs. Interpretivism has grown in importance in IS research in the past decade (Walsham, 2006) and was the predominant philosophical position for this study. The study's research methodology is outlined in *Figure 1*. The case study was the selected research method and was based on data collected from five sources – organisational websites, project documentation, newspaper articles, independent reports and semi-structured interviews. The case study is a key tactic in interpretive ICT research (McBride and Fidler, 2003; Walsham, 2004). It was employed in 36% of research designs studied by Chen and Hirschheim (2004) and was defined by Yin (2009) as:

"an empirical inquiry that investigates a contemporary phenomenon within its real life context, when the boundaries between the phenomenon and the context are not clearly evident, and in which multiple sources of evidence are used".

The case study is appropriate in situations where a single explanation cannot provide a complete account of the research topic. It is suitable for achieving in-depth, holistic knowledge of broad, complex phenomena and in understanding interactive processes, relationships, political issues and influence tactics within specific contexts (Lewis, 2003; Marshall and Rossman, 1999).



Figure 1: Research methodology

Case studies were conducted within five IoTs. Purposive sampling as opposed to probabilistic sampling was used in case site selection, as this sampling strategy helps ensure that key research themes are addressed and that diversity in each category is explored. The five case sites were

selected due to their diversity in a number of respects. They participated in different implementation waves, were geographically dispersed and differed in their student population sizes and academic programme offerings. The most valuable source of case study evidence was semi-structured interviews.

The interview enables depth, nuance and complexity in data to be captured (Mason, 2002) and is generative in that new knowledge may be uncovered (Legard et al, 2003). Its popularity is linked to its ability to obtain a range of informant views and to communicate multiple perspectives on a phenomenon (Johnson, 2002). It provides an undiluted focus on the informant and offers opportunity for clarification and greater understanding through use of follow-up questions (Legard et al, 2003; Ritchie, 2003). According to Kvale (1996: 1), the interview helps to:-

"understand the world from the subject's point of view, to unfold the meaning of people's experiences, to uncover their lived world prior to scientific explanations".

Interviews involve a dual aspect – personal interrelations between the interviewer and informant, and the knowledge, meaning and understanding that results from their dialogue and interaction. In general, the interview takes place in an interpersonal context which is influenced by power, emotion and the interpersonal process. Hence, in interpreting statements made by informants, the researcher always needs to bear in mind the context in which the interview took place (Ellis and Berger, 2002). As stated by Warren (2002: 98):

"in the social interaction of the qualitative interview, the perspectives of the interviewer and the respondent dance together for the moment but also extend outward in social space and backward and forward in time".

As a result, the interview needs to be considered in terms of biographical, contextual, historical and institutional elements, rather than as a set of discreet questions and responses detached from the interviewer and informant (Fontana, 2002). The nature of interviews is that they may develop or change a person's understanding of phenomena and new subject dimensions may emerge during the process.

Within the IoTs, 49 semi-structured interviews were carried out between 30 November 2005 and 24 May 2006 with senior management personnel, MIS team personnel and system end users. The selected informants were closely involved in the ICT project and had in-depth knowledge of the subject area. The approach I adopted corresponded to what Kvale (1996) termed the "*traveller metaphor*" of interview research. In this approach, the interview process is regarded as the creation of stories; the meaning of informants' stories is uncovered through the researcher's interpretations and these are shaped by the researcher into new convincing narratives of the evidence collected. Hence, the goal was not to extract specific details from individual informants; rather it was to explore questions such as *how*? and *why*?. Each interview lasted between 60 and 90 minutes, was recorded with the informants' permission and was later transcribed. The supporting documentation was valuable in corroborating the evidence collected in the semi-structured interviews. It provided a means of triangulation in that it supplied specific details, and helped to augment and substantiate the interview data.

5. Qualitative data analysis

The challenge for many qualitative researchers lies in analysing the body of evidence gathered. In data analysis the qualitative researcher seeks to produce a convincing explanation of the phenomena, based on a holistic interpretation of the social understandings captured in the empirical data. The difficulty lies in the fact that the researcher is:

"faced with a bank of qualitative data [and] has very few guidelines for protection against self delusion, let alone the presentation of unreliable or invalid conclusions to scientific or policy making audiences" (Miles and Huberman, 1994).

Kvale (1996: 32) suggested that:

"precision in description and stringency in meaning interpretation correspond in qualitative interviews to exactness in quantitative measurements".

Further, Miles and Huberman (1994) stated that:

"the strengths of qualitative data rest very centrally on the competence with which their analysis is carried out".

Data analysis is an iterative process and requires what Alvesson and Sköldberg (2009) termed *"reflexive interpretation"*. This is a need for reflection and interpretation on several levels. Reflection requires thinking about the research and as outlined by Alvesson and Sköldberg (2009), it involves examining how:

"the theoretical, cultural and political context of individual and intellectual involvement affects interaction with whatever is being researched".

Interpretation takes place on four levels:

- Interaction with the empirical material;
- Interpretation of underlying meanings;
- Critical interpretation;
- Reflection on text production and language use.

Interpretation suggests that there are no clear rules and that the researcher's judgment, intuition and ability to highlight issues play an important part in the process. Reflexivity is a key requirement for ensuring rigor in qualitative studies (Long and Johnson, 2000). It helps ensure that the researcher considers his/her own values and beliefs, while analysing the evidence collected and acknowledges that his/her actions will impact the context and meaning of the issue being investigated.

6. Exploring CAQDAS – how can computers help?

Computers have played an extensive role in research projects for many years, for example in facilitating interview transcription, in documenting results, and in writing research reports and findings. However, from a data analysis perspective, greater emphasis is placed on the role of computers in analysing quantitative evidence, through use of software such as the Statistical Package for the Social Sciences (SPSS). Many interpretivist researchers are unsure as to how Computer Aided Qualitative Data Analysis Software (CAQDAS) can support the analysis of their qualitative evidence, despite the fact that several books have been dedicated to the topic since the 1990's. Arguments are made by researchers both for and against their merits. Nonetheless, the number of CAQDAS tools available on the market has grown considerably since its first emergence over 20 years ago. Examples of popular tools include N-vivo, N6, HyperResearch, Atlas.ti, MAXqda, Qualrus and many more.

Lewins and Silver (2009) suggest that CAQDAS packages generally encompass some or all of the following tools:

- Content searching tools
- Linking tools
- Coding tools
- Query tools
- Writing and annotation tools
- Mapping or networking tools

The software supports the creation of an efficient data management system whereby large volumes of unstructured evidence can be systematically organised. According to Wickham and Woods (2005)

"an efficient and well-structured data management system is critical to tracking, accessing, and documenting the data available and the analyses applied to it".

This data management system helps the researcher in transforming their research evidence into the final research report in a systematic manner as opposed to "*a disorganised stumble through a mass of data, full of 'insightful' observations of a mainly anecdotal nature*" (Silverman, 2004). CAQDAS can also enhance the transparency of the analysis process: through effective documentation of the researcher's thoughts and interpretations, the logic of the researcher's conclusions can be traced (Wickham and Woods, 2005). It also provides for more rapid and rigorous qualitative data analysis (Rambaree, 2007).

The sophistication of CAQDAS packages have increased considerably over the years; all now have facilities greater than simple code and retrieve functionality. CAQDAS represents an alternative tool to the pen/paper/highlighter/scissors approach previously relied upon. Modern CAQDAS packages

support the administrative mechanics of data analysis, thereby saving time and freeing the researcher from manual, clerical tasks. Activities such as data coding and re-coding; categorising concepts into higher order categories; developing memos of ideas as they emerge, enabling the "write up" of the research to commence early on; annotating pieces of data; creating models; exploring different insights and associations within the data; searching themes; and testing relationships between issues, concepts and themes are easily facilitated. Some CAQDAS also supports work with non-textual data such as pictures, video and audio. CAQDAS enables the researcher to build more easily on his/her existing analysis, through for example adding a new code, or combining codes to create a new category, while still maintaining the "organisational system's integrity" (Seror, 2005). Further, the researcher can easily jump between various levels of analysis, for example from a concept, back to the original interview transcripts to explore that concept in context, to a memo exploring the researcher's thoughts on the development of the concept, and so on. This increases the researcher's closeness with the data and ultimately supports development of new theory. In the words of Fielding and Lee (1998: 10):

"Of course, one can build theory with paper and pencil, or while in the bath or walking down the street. What the software does is to facilitate and enhance theoretical development, usually by treating codes applied to text segments as building blocks for the production of a set of interrelated conceptual categories...Use of the appropriate software tools allows the analyst to go beyond using codes simply to label or point to relevant themes in the data. Instead, codes become theoretical categories, emerging out of the data, but linked in possibly complex, but theoretically relevant ways.

Hence, as stated by Richards (2002: 267), CAQDAS enables a researcher to do "more with data" as a result of "a range of techniques and tools that were impossible, unknown or too time-consuming before computers entered the field". However, it is important to note that the software does not do the analysis. The responsibility for deciding on the codes, for the categorisation of concepts etc remains with the researcher. However, it enables the researcher to concentrate his or her energy on the conceptual work of analysis and on reflection and interpretation on the evidence base. As stated by Gill Ereaut, Director of Linguistic Landscapes, UK:

"the fact that computers don't think is not a limitation at all; in fact, it leaves the researcher doing what they most want to do - the thinking."

7. N-vivo discussed

N-vivo (version 7) was the CAQDAS used in this study's data analysis. This package is developed by QSR International, a leading developer of qualitative analysis software, whose products are used by more than 400,000 individuals in over 150 countries. This section provides a brief overview of some features of this tool prior to examining how it supported analysis of the research evidence.

N-vivo's project pad is focused around Documents and Nodes. It supports the direct importing of documents in text only or rich text formats (.rtf). The researcher has full editing rights on all documents, enabling annotations to be added to any point in a document, and links from textual documents to external files can be inserted. It also offers a number of versatile linking devices such as databites, doclinks and nodelinks which increase integration between documents, coded data and memos, which can be created as blank documents and linked to relevant documents or nodes. For example, N-vivo's external databites folder facilitates the storing of large files that the researcher may need to refer to, thereby enabling him/her to maintain contextual richness. N-vivo's coding structure may be un-hierarchical (as represented by its free node structure) or hierarchical (as represented by its tree node structure). The free node feature enables the researcher to code data under a new theme without the need to decide immediately where it fits in relation to the overall hierarchical structure or taxonomy of tree nodes. Unrelated concepts may later be categorised into categories and sub categories facilitating structural organisation of the data. Further, coding stripes in the document margins, offer a high level view of how documents have been coded, visually highlighting which data has been categorised at specific topics.

All data coded under a single node can be retrieved by browsing the node, which takes all coded sections from their original positions and presents them together in one window. The researcher can easily return from this window to the original document to view the concept in context. Various attributes can be assigned at both a document and node level enabling certain characteristics of the data to be defined. The data can be interrogated in various ways, for example qualitative cross tabulations or matrix searches displays search results in frequency table format; its assay tool

provides a high level view of the presence or absence of certain codes, attributes etc in a document or document set; while its modelling tool enables insights and theories linked to the data to be presented in a visual format.

8. Using N-vivo in the student MIS research project

The following sections provide examples of how N-vivo supported the analysis of the student MIS project research evidence.

8.1 Concept creation and management through N-vivo

The N-vivo software package served primarily as a support tool in managing the 387 pages (230,663 words) of single spaced interview transcripts; in reflecting on the emerging themes; and in interpreting the body of evidence. The initial step in using N-vivo involved importing all 49 interview transcripts from Microsoft Word in rich text format. Each transcript was examined to identify key ideas, words or points raised by informants. The concepts that emerged were coded in one of two ways, i.e. using *in-vivo codes* or *in vitro codes*. The terms *in-vivo* and *in-vitro* codes were derived by Strauss (1987) and were explained by Alvesson and Sköldberg (2009). *In-vivo* codes are those that emerge directly from the informants' interview transcripts, in other words they are terms stated by the informants themselves. On the other hand, *in vitro* codes are terms the researcher creates to encapsulate a concept discussed by an informant. Ritchie et al (2003: 221) compared the importance of this coding process to a building's foundation:

"If that foundation is ill-conceived or incomplete, then at best it could jeopardise the integrity of the construction, or at worst bring the whole structure crashing to the ground".

Initially the concepts appeared unrelated and they were coded in N-vivo's *free node* structure (*Figure* 2). This *free node* structure is commonly used for holding nodes early in the coding process, when new ideas do not appear to have clear logical relationships with other nodes. Examples of initial unrelated nodes in the student MIS project included the perceived change required in organisational culture, the issue of integration with other systems, the return on investment potential, the project timescale, and the learning process required for system operationalisation.



Figure 2: N-vivo's free node structure

As coding progressed, it became apparent that many concepts were related. These were reclassified into a series of categories and sub-categories in N-vivo's hierarchical *tree structure*. This organised related concepts in relation to the overall research and facilitated greater understanding of the body of evidence through examining the key themes. *Figure 3* provides an example of this. Here, the various problems experienced in systems operationalisation, such as a lack of support, a lack of training, problems or glitches in the system's functionality and the issue of staff movement to other functional areas, are grouped under the "*current problems*" tree node. Additional high level categorisations used throughout the project included for example, legacy systems, system implementation, server hosting, human change issues, system start-up problems, system benefits, project evaluation, and system functionality. Many categories were further decomposed, for example the sub categories "functionality *exploitation*" and "functionality requirements met" were further branches from the "system functionality" tree node.



Figure 3: Category creation through N-vivo's tree structure

8.2 Memo creation and development

Memos were created during data analysis to clarify emerging concepts. These were standalone documents; however through N-vivo's *DocLink* and *Nodelink* facilities, these memos were related to relevant documents or nodes. *Figure 4* shows a memo outlining the nature of system commissioning problems; through the Nodelink facility this was linked to the "*Problems at System Start-up*" tree node. The memo feature also enables the researcher's thoughts and reflections on the evidence to be recorded and is therefore a key tool for reflexivity. Memos recorded included not just notes on emerging concepts, but also memo's on the researcher's reflections and experiences, and observations made concerning the context and constraints in which research participants provided information. It therefore aids more conceptual and theoretical thinking about the data.

8.3 Defining document attributes

To facilitate cross-case analysis, various document attributes were defined in N-vivo's *attribute* facility. The documents were categorised according to case-study site, implementation wave and informant type. *Figure 5* shows the creation of the case study "site" attribute while *Figure 6* highlights attribute

values (site 1, site 2, site 3 etc) being created. The relevant values were then assigned to the project documents, thereby enabling a filtering of evidence related to a particular institution, informant etc.

🖹 Nature of System Start-up Problems - Document Browser
Browser Document Edit View Format Links Coding
Nature of System Start-up 💌 🛐 🚯 🔡 🚂 🄌 🎟 💧 🐰 🖿 💼
Normal 💽 Times New Roman 💌 12 💌 Black 💌 B 🖍 🖳 🚞 🚊 🗮
The problems listed under the "Problems at System Start-Up" tree node appear to be interconnected and influence each other in various ways. For example, from the data, it can be clearly traced that the US orientation of the system was a contributory factor in many end-users failing to embrace system changeover. Other factors in this reluctance to change were: the lack of stakeholder involvement throughout the MIS project the comfort with the previous legacy systems the need to alter long established work practices the lack of knowledge and familiarity with the new MIS at the time of system start-up.
In-Vivo In-Vivo In-Vivo In-Vivo In-Vivo
Section: 0 Paragraph: 5 Coding:

Figure 4: Memo creation in N-vivo

Create/Edit Document Attributes		Create/Edit Document Attributes		
Attribute Value		Attribute Value		
Attributes:	 Create new Attribute Edit selected Attribute Type the new attribute name: Site Description: Attribute referring to the five case study sites investigated 	Values for : Case Site Unassigned Unknown Not Applicable Site 1 Site 2	Create new value Edit selected value Site 3 Delete selected value and replace all its occurrences by: V	
Apply	Value type: String	<	C Set selected value as default Replace all occurrences of the current default value by the new one Current default value: Unassigned	
	Close		Close	

Figure 5: Defining Attributes

Figure 6: Defining Attribute Values

8.4 Interrogating the data example 1 - cross case tabulation of key issues

The various attributes defined later facilitated cross-case analysis by enabling data to be examined according to different variables. N-vivo's *Matrix Intersection* facility was the most useful application of this, whereby particular text characteristics could be cross tabulated with others. For example, *Figure* 7 shows various system benefits categorised according to the case study site in which they were experienced.

Boolean Search		X				
Operator: Matrix Intersection	•					
Find text referenced by each o	of these items	Clear Items				
Choose Nodes	🍐 (14 19 1) Effects of in 🖕 (14 19 26) Functionali					
Choose Text Patterns	 (14 19 6) Volume & n (14 19 20) 5 					
pairwise with each of these items						
Choose Nodes	🛃 Case Site = Site 1					
Choose Attribute Values	Case Site = Site 2					
Choose Text Patterns	Case Site = Site 3	v				
Return: All matrix no	odes as a set	•				
Name: /Search Re	esults/Matrix Intersection	Choose				
	ОК	Cancel				

Figure 7: Matrix intersection boolean search

Matrix - (10 36) /Search Results/Matrix Intersection 2								
File Matrix Selection								
Display: Number of documents coded 💽 Show Statistics								
Row Header:								
Column Header:								
Matrix Table	1: Case Site = Site 1	2: Case Site = Site 2	3: Case Site = Site 3	4: Case Site = Site 4	5: Case Site = Site 5			
1:(14 19 1) Effects of integration	8	9	6	0	4			
2:(14 19 26) Functionality related benefits	2	4	2	7	3			
3:(14 19 6) Volume & nature of data	4	5	2	2	4			
4:(14 19 20) End reporting	5	2	4	4	0			
5:(14 19 10) Improved data access1	2	2	5	2	0			
6:(14 19 3) Support related benefit	2	3	1	2	2			
7:(14 19 15) Job related benefits	1	1	3	2	1			
8:(14 19 4) Improved quality procedures	0	1	3	2	0			
9:(14 19 18) Improved structure	1	1	2	0	2			
10:(14 19 31) Management related benefits	2	2	1	0	0			
11:(14 19 37) Staff empowerment benefits	1	0	2	1	1			

Figure 8: Matrix intersection search results

This exercise resulted in a comparative analysis of the nature and frequency of benefits realised in the five IoTs (*Figure 8*). From this we can see for example that the beneficial effects of integration were widely experienced in Site One and Site Two, but failed to be experienced in Site Four, thereby prompting further investigation into the reasons behind this. This enabled exploration of benefit variances between sites and provided a further way to interrogate the data in producing a holistic primary narrative.

8.5 Interrogating the data example 2 – the model explorer tool

The explore model tool facilitates the creation of models. Nodes, documents, attributes, sets etc can easily be dropped on the model template, model layers can be explored, and links between items established. These illustrations of the relations within the data can be readily exported to the final project report. *Figure 9* shows an example of the application of N-vivo's model explorer tool. This model visually depicts a number of the nodes coded, reflecting the key problems and benefits experienced from system implementation, and the various interconnections, as inferred by informants statements, that exist between these issues. For example, the fact that the MIS was an "Americanised System" contributed to the "System Usability" problem, resulting in an "Increased Workload" and "Slowed Performance" for system users. Similarly, the benefit of "System Integration" was the catalyst in the realisation of improved data standards and data access, improved quality procedures, and job and management related benefits.





9. From N-vivo to new theory

The ability to interrogate the data in various ways and to create memo's on the researcher's interpretations in N-vivo were important initial steps in working towards new theory. The key concepts and categories identified through N-vivo coding were initially synthesised into a cross-case primary narrative of the Student MIS project. The use of narratives was key; they are a form of knowledge and communication (Czarniawska, 2004) as complex situations can be better understood in story format. The narrative plays a central role in social life as according to Roland Barthes (1977) (quoted by Czarniawska (2004: 1)), the:-

"narrative is present in every age, in every place, in every society; it begins with the very history of mankind, and there nowhere is nor has been a people without narrative...narrative is international, transhistorical, transcultural: it is simply there like life itself".

They assist in developing a meaningful whole from a series of scattered events (Alvesson and Sköldberg, 2009). Openness to different interpretations is important in order to gain a fuller understanding of the situation (Czarniawska, 2004). Phenomena can be placed in context and key relationships explored (Remenyi, 2005). Hence narratives are a useful means to understand and make sense of interview material. They enable the researcher to shape various interview stories into a coherent account of the key themes (Kvale, 1996). The processes involved in producing this detailed description from the body of evidence are shown in *Figure 10*. The procedures followed in identifying and coding key concepts in N-vivo suggest that the story produced closely relates to the actual events as perceived by informants. This increases the potential for the research having direct theoretical implications.





Figure 10: Development of primary narrative

Progression to the higher-order narrative involved significant reflection on the empirical evidence and the primary narrative. A higher order narrative was defined by Remenyi et al (1998: 126) as:

"a description which both captures the essential aspects of the information represented in the primary narrative but provides a more parsimonious conceptual framework in which the ideas, concepts and relationships have been defined".

Reflection on the primary narrative involved considering three questions: "what does the text say?" "why does the text say what it does?", and "what is my understanding of what is taking place?". This approach was useful in providing a conceptual separation of three ways of examining the primary narrative and in expanding my interpretation over a series of stages. Through this process the primary narrative was reduced to the principal findings or key themes, and the nature of relationships was interpreted. This process involved both creativity and flexibility (*Figure 11*). Diagrammatic representation was important in understanding the phenomenon's diversity and in exploring relationships and complex processes.

Re-trawling the higher order narrative, to establish relationships between the findings and the extent to which they influenced each other, was the basis for developing the theoretical conjecture. The theoretical conjecture reflected a distillation of the knowledge acquired through data analysis. Its development and refinement were based on iterative reflection. Further, the in-depth analysis process suggests that it was a convincing approximation of the truth (Bannister et al, 2006).



Figure 11: Development of higher order narrative

10. Conclusions – what are the implications of using CAQDAS for the qualitative researcher?

This paper has provided insights from a qualitative researcher's perspective on the value of the N-vivo IT package in supporting evidence analysis for the large scale student MIS research project. Distilling a new theory from hundreds of pages of empirical research evidence is a considerable challenge. CAQDAS plays an important role in this analysis process through supporting the systematic organisation of unstructured evidence and in helping the researcher to develop a detailed understanding of the data.

For interpretivist researchers, the principal issues in ensuring high quality research are consistency and integrity in the study's design. Qualitative researchers emphasise the importance of reflection on the body of evidence, the ability to make critical assessments of informants' statements, and the importance of producing convincing arguments and explanations (Mason, 2002). CAQDAS software facilitates this by supporting efficient management, reflexivity and interrogation of a large body of evidence. CAQDAS functionality is now far greater than simple code and retrieve processes, and offers the researcher various tools to interrogate the data, experiment with various interpretations, and keep notes on his/her insights and the logic of his/her interpretations. Essentially, CAQDAS enables the researcher's analysis and write-up of research findings to begin early on, as the researcher's closeness to the data is increased.

In terms of evaluating the research output, use of CAQDAS may also improve a research project's internal validity (Lewis and Ritchie, 2003). Internal validation is enhanced by adopting a constant comparative method; CAQDAS facilitates this by supporting a researcher's iterative reflection on the body of evidence in light of concepts previously coded, the coding of new pieces of data in relation to the boundaries of these codes or the creation of new nodes. Mason (2002) also emphasises the importance of the qualitative researcher demonstrating the validity of his/her interpretations, which is contingent on the approaches taken in data analysis and the transparency of the researcher's interpretations. In this respect, CAQDAS facilitates the transparency of the analysis process, through the documenting of key interpretations in memos and the use of direct quotations to support those interpretations. From the point of view of the reliability construct, qualitative researchers are concerned with demonstrating that the researcher has not invented or misrepresented data or been careless in data recording or analysis and provides transparency on the interpretations recorded in memos that lead to the research findings; these memos facilitate checking through the researcher's interpretations and enable a tracing through the research logic.

The above highlights the value of CAQDAS in supporting evidence analysis. In the final research output it is useful to document the role/value of CAQDAS in a comprehensive research audit trail. This is particularly true for researchers new to the interpretivist paradigm. An audit trail enables a researcher to reflect on how a study unfolded, and enables a reader to follow each stage of the process and trace through the research logic; it may be intellectual or physical in nature (Carcary,

2009). In an intellectual audit trail, where the researcher reflects on how his/her thinking evolved throughout the research process, the role of CAQDAS in supporting iterative interpretation of and interaction with the evidence should be explained. In a physical audit trail, which documents all stages of the research process and reflects key methodology decisions, the role of CAQDAS in managing and analysing the empirical evidence should be documented. This activity provides clear justification and evidence of why and how CAQDAS was used in supporting evidence analysis in a research study.

This paper has largely reflected on CAQDAS in a positive light; its value greatly aids the analysis of large evidence volumes. However, despite the sophistication of CAQDAS tools, it is important not to over emphasise the power of the technology through assuming that it will do the analysis itself. CAQDAS is merely a support tool, but when used effectively it enables the researcher to concentrate his or her energy on the conceptual work of analysis.

11. Avenues of further research

N-vivo is only one such CAQDAS package. An avenue of possible further research involves conducting a comparative analysis of the features of other qualitative analysis tools such as N6, HyperResearch, Atlas.ti, MAXqda, and Qualrus. This would help to increase researcher awareness of the software available, identify the strengths and limitations of the various tools and enable researchers to select the software best suited to their needs. For this study, only interview material was imported to N-vivo software. A further study may report the value and drawbacks of the software in supporting analysis of various evidence types, such as emails, published reports, and pictures.

References

Alvesson, M. and Sköldberg, K. (2009). *Reflexive methodology – new vistas for qualitative research*, (2nd edn). Sage Publications, London.

- Bannister, F. (2005). Through a glass darkly: fact and filtration in the interpretation of evidence. *Electronic Journal* of Business Research Methods, **3**, (1), 11-24.
- Bannister, F., Griffiths, P. and Remenyi, D. (2006). Theory building through case study analysis. In (Ed. D. Remenyi) *Proceedings of the 5th European Conference on Research Methodology for Business and Management Studies*, pp. 39-50. Trinity College Dublin, Ireland, 17th-18th July, Academic Conferences, Reading.

Blaxter, L., Hughes, C. and Tight, M. (2006). *How to research*, (3rd edn). Open University Press, Buckingham.

- Carcary, M (2009). "The Research Audit Trial Enhancing Trustworthiness in Qualitative Inquiry", *Electronic Journal of Business Research Methods*, 7(1), p11-24.
- Chen, W. and Hirschheim, R. (2004). A paradigmatic and methodological examination of Information Systems research from 1991 to 2001. *Information Systems Journal*, **14**, 197-235.
- Clarkson, G. (2004). Gestalt counseling in action, (3rd edn). Sage Publications, London.
- Czarniawska, B. (2004). Narratives in social science research introducing qualitative methods, Sage Publications, Thousand Oaks, London.
- Ellis, C. and Berger, L. (2002). Their story/my story/our story: including the researcher's experience in interview research. In *Handbook of interview research: context and method,* (ed. J.A. Gubrium and J.A. Holstein), pp. 849-876. Sage Publications, London.
- Ereaut, G. (2010) "What is Qualitative Research?" available from http://www.qsrinternational.com/what-isqualitative-research.aspx. (22 February 2010).
- Fielding, N and Lee, R (1998). Computer Analysis and Qualitative Research, Sage.
- Fontana, A. (2002). Postmodern trends in interviewing. In *Handbook of interview research: context and method,* (ed. J.A. Gubrium and J.A. Holstein), pp. 161-176. Sage Publications, London.
- Hinton, M., Mieczkowska, S. and Barnes, D. (2003). A framework for evaluating e-business investments in terms of business process performance. In (Ed. E. Berghout and D. Remenyi), *Proceedings of the 10th European Conference on Information Technology Evaluation*, pp. 317-326. Madrid, Spain, 25th-26th September, MCIL, Reading.
- Johnson, J.M. (2002). In-depth interviewing. In *Handbook of interview research: context and method,* (ed. J.A. Gubrium and J.A. Holstein), pp. 103-120. Sage Publications, London.
- Legard, R., Keegan, J. and Ward, K. (2003). In-depth interviews. In *Qualitative research practice a guide for social science students and researchers,* (ed. J. Ritchie and J. Lewis), pp. 138-169. Sage Publications, London.
- Lewins, A. and Silver, C. (2009) Choosing a CAQDAS Package: A working paper. CAQDAS Networking Project, available from Internet http://cue.berkeley.edu/qdaarticle.pdf (13th January 2009)
- Lewis, J. (2003). Design issues. In *Qualitative research practice a guide for social science students and researchers*, (ed. J. Ritchie and J. Lewis), pp. 47-76. Sage Publications, London.
- Long T. and Johnson M. (2000) 'Rigour, reliability and validity research'. *Clinical Effectiveness in Nursing*, Vol. 4, No.1, pp.30–37.

- Klein, H.Z. and Myers, M.D. (1999). A set of principles for conducting and evaluating interpretive field studies in Information Systems. *MIS Quarterly*, **23**, (1), 67-94.
- Kvale, S. (1996). *InterViews an introduction to qualitative research interviewing*, Sage Publications, Thousand Oaks, London.
- Marshall, C. and Rossman, G. (1999). *Designing qualitative research*, Sage Publications, Thousand Oaks, California.

Mason, J. (2002). *Qualitative researching*, (2nd edn). Sage Publications, London.

- McBride, N. and Fidler, C. (2003). An interpretive approach to justification of investment in Executive Information Systems. *Electronic Journal of Information Systems Evaluation*, **6**, (1).
- Miles, M. B. and Huberman, A. M. (1994). *Qualitative data analysis,* (2^{rid} edn), Sage Publications, Thousand Oaks, CA.
- Rambaree, K. (2007). Bringing Rigor in Qualitative Social Research: The Use of a CAQDAS, UoM Research Journal, 13. Available from http://www.uom.ac.mu/provcrci/ResearchJournal/ Vol13Special/Papers/A2.pdf
- Remenyi, D. (2005). Tell me a story a way to knowledge. *Electronic Journal of Business Research Methods*, **3**, (2), 133-140.
- Remenyi, D., Williams, B., Money, A. and Swartz, E. (1998). *Doing research in business and management an introduction to process and method,* Sage Publications, London.
- Richards, L. (2002). Qualitative computing—a methods revolution? *International Journal of Social Research Methodology*, **5**,(3), 236–276.
- Ritchie, J. (2003). The applications of qualitative methods to social research. In *Qualitative research practice a guide for social science students and researchers* (ed. J. Ritchie and J. Lewis), pp. 24-46. Sage Publications, London.
- Ritchie, J., Spenser, L. and O'Connor, W. (2003). Carrying out qualitative analysis. In *Qualitative research* practice a guide for social science students and researchers (ed. J. Ritchie and J. Lewis), pp. 219-262. Sage Publications, London.
- Rowlands, B.H. (2005). Grounded in practice: using interpretive research to build theory. *Electronic Journal of Business Research Methods*, **3**, (1), 81-92.
- Saunders, M., Lewis, P. and Thornhill, A. (2007). *Research methods for business students*, (4th edn). Prentice Hall, Harlow.
- Seror, J. (2005). Computers and Qualitative Data Analysis: Paper, Pens, and Highlighters vs. Screen, Mouse, and Keyboard, *Tesol Quarterly*, **39**, (2), 321-329.
- Silverman, D. (2004). Interpreting qualitative data: Methods for analysing talk, text, and interaction. London: Sage Publications.
- Snape, D. and Spencer, L. (2003). The foundations of qualitative research. In *Qualitative research practice a guide for social science students and researchers*, (ed. J. Ritchie and J. Lewis), pp. 1-23. Sage Publications, London.
- Strauss, A. (1987). Qualitative analysis for social scientists, Cambridge University Press, New York.

Veal, A.J. (2005). Business research methods: a managerial approach, (2nd edn). Pearson Education, Sydney.

Trauth, E.M. (2001). Qualitative research in IS: issues and trends, Idea Publishing, Hershey, PA.

Van Maanen, J. (1983). Qualitative methodology, Sage Publications, Beverly Hills, CA.

Walsham, G. (2004). Development, global futures and IS research: a polemic. *Journal of Strategic Information Systems*, **14**, 5-15.

Walsham, G. (2006). Doing interpretive research. European Journal of Information Systems, 15, 320-330.

- Warren, C.A.B. (2002). Qualitative interviewing. In *Handbook of interview research: context and method,* (ed. J.A. Gubrium and J.A. Holstein), pp. 83-102. Sage Publications, London.
- Wheatley, M.J. (2006). *Leadership and the new science: Discovering order in a chaotic world.* (3rd edn). Berret Koehler, San Francisco.

Wickham, M. and Woods, M. (2005). Reflecting on the Strategic Use of CAQDAS to Manage and Report on the Qualitative Research Process. *The Qualitative Report.* **10**, (4), 687-702.

Yin, R. (2009). Case study research: design and methods, (4th edn). Sage Publications, Thousand Oaks, CA.

Uncovering Hidden Meanings, Values and Insights Through Photos

Maria Ryan and Madeleine Ogilvie Edith Cowan University, Perth, Australia

m.ryan@ecu.edu.au m.ogilvie@ecu.edu.au

Abstract: Photographs have been used as a means of data capture for many years. Their use in recording observable phenomenon in anthropology is well documented. They also provide a valuable tool for researchers from other disciplines. This paper explores the use of photographs in qualitative business research. It demonstrates how the use of photographs can enrich the business research process through a range of techniques such as photo-elicitation, autodriving, projective prompts and phenomenological interviews. Drawing from a selection of the researchers' past studies, a comparative review of the use of photographs and the benefits they bring to the data capture process is examined. These studies range from an analysis of visible face makeup, place attachment in a rural community using farmers and town respondents and international students' perceptions of home. The photographs capture the outside image of what a respondent is sensing and experiencing inwardly, providing a prompt for the respondent to drive the interview with their own words, language and values. In all instances photographs were found to augment the quality and richness of the data captured and provide an extra depth of analysis that otherwise may not have been discovered. In addition, the paper highlights the dynamics involved in the process of using visual data capture methods. The photographs were used for respondents to engage in a free sorting task which is useful in uncovering respondents' values and meanings when asked to explain choices made between their photographs. This is of particular use in difficult to articulate situations like face makeup self perceptions and personal attachment to the environment. Our findings suggest that photographs are an increasingly important tool to use in business research and that they enhance the breadth and insight of the qualitative research process. The procedures and value gained using photographs are outlined along with a discussion on the benefits and disadvantages of this process.

Keywords: photoelicitation, qualitative research, autodriving, projective prompts, interviews

1. Introduction

This paper explores the use of photographs (photos) in business research methods and highlights how they have enriched the research process in each instance. Photographs have been used as a means of data capture for many years. Their use in recording observable phenomenon in anthropology is well documented and the benefits derived from their use means they also provide a valuable tool for researchers from other disciplines (Stanczak 2007). Indeed, photographs have been used as visual projective techniques in a variety of disciplines, including marketing (Soley 2006), tourism (Jenkins 1999) and education (Kaplan and Howes 2004; Loeffler 2005). Consumer researchers have used photographs to investigate attachment to 'favourite things' (Wallendorf and Arnould 1988), 'Thanksgiving rituals' (Wallendorf and Arnould 1991) and 'home and interior design' (Firth 1995). Firth's (1995) study used respondent generated photographs to examine place attachment. In this case, the results of a free-sorting task were analysed by the Repertory Grid Technique (Kelly 1963), which is useful in uncovering respondents' values and meanings when asked to explain choices made between objects (e.g. photographs), particularly in difficult to articulate situations. The technique has been used to explore perceived value and value that was latent in direct question interviews (Gutman 1991, Zeithaml 1988). Consequently, this technique has been used in two of the three studies discussed in this paper.

To explore the benefits and disadvantages offered by photographs used in research, three diverse studies are reviewed, including an analysis of visible face makeup; a study on place attachment in a rural community using farmers and town respondents; and finally, a study into international students' perceptions of the home environment. Each study is outlined, followed by a discussion of the common benefits and problems associated with Photoelicitation techniques.

2. Study 1: Analysis of visible face makeup

The purpose of this study was to gain insights into why women wear make-up. It explored how visible face-make-up affects the way women consume appearance in everyday life, how they feel about themselves, and the role make-up played in their perception and image of self. It utilised a phenomenological methodology to explore this everyday behaviour.

ISSN 1477-7029 Reference this paper as: ©Academic Conferences Ltd

Ryan, M and Ogilvie, M. "Uncovering Hidden Meanings, Values and Insights Through Photos" *The Electronic Journal of Business Research Methods Volume 9 Issue 1 2011 (pp 25-34), available online at www.ejbrm.com*

Adopting this methodology, the study used a combination of qualitative techniques including observation, in-depth interviews and photoelicitation as an auto-driver. In line with existential phenomenological principle, the study used these techniques to explore the symbolic nature of face makeup and the emotional dimension that it represents to women. By including photoelicitation, it was possible to explore this emotional dimension further and gain a clearer interpretation of the experiences and dialogue that was captured in the data.

In this study respondents were provided with a disposable camera and asked to take 4 (four) photographs of themselves with an emphasis on face and shoulder shots during the following different consumer behaviour activities:

- A night out or special occasion.
- Work or normal daily activity throughout the week.
- Relaxing at home on day off.
- Shopping (Groceries).

In addition, they were all asked to take 4 (four) photos, or find a newspaper/magazine clipping of someone, who they perceived to be 'different' from themselves and someone they considered to be similar or the same as themselves. The purpose of this was so that attributes of self-identity could be further explored through understanding these differences and similarities (Woodward 1997). This facilitated the repertory grid technique ensuring a range of the photographs could be sorted.

The camera was then returned to the researcher who developed the photos and set up a time with the respondent for an in-depth interview to discuss them. Interviews were conducted with participants in a setting that was convenient and conducive for candid and open exchange. The interviews were forty-five minutes to three hours in duration with an average time of one and a half hours per interview. There were 31 female participants.

Within the interviews, the photographs were then used as a prompt to guide the conversation as well as to draw out key information from the respondent as they endeavoured to interpret the image (Harper 1998; Heisley and Levy 1991; Ryan and Ogilvie 2001). Using this technique the following key issues were addressed during the interview:

- A definition of the photographed events.
- The difference in make-up routines for each event and the reasons for those differences.
- The respondent's feelings, attitudes and perceptions for each of the occasions and reasons why they felt like that.
- The emotions respondents remembered feeling at the time of each picture.
- Documentation of individuals' make-up histories and how they had changed over time
- The motivations behind the make-up for each occasion. Were there any underlying reasons for their choice of facial adornment? What guided their decisions?
- To identify which look they liked the best/least and reasons why?
- To explore the rationale for respondents choice in people perceived as different to and the same as themselves.
- To establish what make-up signified to the individual.

Respondents were also shown a series of eight photographs of different forms of facial make-up with their responses to these plates documented. Included in these photographs were extremes of beauty and cultural difference, from the perfect model face to an extreme gothic representation. The eight photos were used as a projective technique to elicit respondents' reactions to different make-up outcomes. The main purpose of this extra stimulus was to confirm if the participants' impressions of themselves were congruent with how they perceive others (Richins, 1991; Woodward, 1997) and to understand their intentions to consume or reject these specific facial appearances.

The rationale and benefits from using this type of methodology coupled with photoelicitation was that phenomenological principles explore the essence of a specific phenomenon of interest and its experience on the senses. Central to the phenomenological approach is that there is a core meaning that is mutually understood through the experience of the phenomenon (Patton, 1990). Thompson,

Locander and Pollio (1990) argue that existential phenomenological study comprises of three important categories. These include "intentionality", "emergent dialogue", and the "hermeneutic circle" (p 347), and these three elements provide the base for this form of methodology in this study.

In the phenomenological process, *'intentionality'* contends that "lived experience may not always honour standard conceptual boundaries and, therefore, must be understood relative to the specific life-world from which it emerges" (p 347). Photographs coupled with the participants rich descriptions of what they were wearing, why and what was transpiring at the time, provided a rich snapshot of events that made interpretation of participants' 'lived experiences' clearer.

Existential phenomenology also uses rich, descriptively focused interviews where questions are guided by the participants' responses. Dialogue should be non-judgmental in nature (Colaizzi 1978, Kvale 1983, Polkinghorne 1989) and through the process of '*emergent dialogue*' understanding is gained (Thompson et al., 1990). In this instance by allowing respondents to drive their own interviews using their own photographs to reveal what was important to them and the rationale for their behaviours.

The third category, 'hermeneutic *endeavour*' is where constant evaluation and re-evaluation of the data is conducted. Each part of the narrative was examined alone and then, as a whole, with interpretations being continuously revised as more information becomes available. It is a back and forth process from which commonalties appear (Bleicher 1980, Ricoeur 1976). These commonalities are then grouped or bracketed to become themes. Within this three phase process, the use of photographs in this study, added to understanding each of the phases of the phenomenological process in more detail providing richer clarity of participants intended meanings.

During the in-depth interview, respondents' feelings, attitudes, perceptions and experiences about make-up were explored using the 'focussed' interview format (Sampson 1996). To draw out these feelings from participants, a combination of projective techniques and laddering in the form of the Kelly Repertory Grid technique (identifying how any two of three stimuli are similar but different from the third stimulus) was used (Kelly 1963, Zaltman and Coulter 1995). Respondents were asked to identify from their set of photos the image they perceived as being different to the others, and the shots they would group as the same. They were also asked which of the photos they liked the most, and which the least, as well as discussing the rationale for their choices.

In addition, a description of each participant's make-up history was documented with reasons for change explored. Feelings and emotions about wearing facial make-up and facial adornment were also discussed and the signification of the medium extrapolated from the data gathered.

Findings from this research indicate that the reasons why women wear makeup are multi faceted and influenced by a variety of stimuli; however, the most compelling reason that emerges is women's desire to conform to a societal appearance code. The code is strong in moulding and guiding facial appearance in every day encounters and the benefits derived from adhering to this code are numerous. It seems that by conforming to the code the individual increases their chance of acceptance and success within their respective community.

In this study individuals perceived that the face was an intricate communication tool, and the make-up upon it a complex sign of one's status, level of conformity and overall standing within the community. It is evident that this silent language of the 'sign' is learned through experience and in this way becomes accepted as a meaningful symbol within the society's culture.

3. Study 2: Place attachment in rural town

This study explored the impact that place attachment had on a range of economic and social consumption decisions made by residents of a rural town in Australia. The study was an attempt to provide an understanding of how rural residents (both 'town people' and 'farmers') related to their locality and how this relationship affected their consumption behaviour.

Place attachment has been noted in the literature as a complex construct and researchers have noted the need to further understand its impact on consumption situations (Kleine and Baker 2004, Milligan 1998, Williams, Patterson, Roggenbuck and Watson 1992). While the construct has been used to understand attachment with recreational sites and tourist destinations (Kaltenborn 1997, Milligan

1998, Moore and Graefe 1994, Warzecha and Lime 2001, Williams and Patterson 1999), place attachment has had limited applications that have focussed on home location environments, particularly in a rural town context.

Given the need to maintain the human, economic and social capital of towns in rural districts across Australia (Cocklin and Alston 2003), research on residents' attachment to their town and its subsequent impact on consumption choices is timely and appropriate. It can provide opportunities for local retailers to understand consumers' motivations and, by using this knowledge, develop loyalty among local residents. Therefore, this study was designed to provide insights into the way that local demand can be developed, providing a practical contribution to solving some of the sustainability issues that are of concern in many regional areas of Australia.

The first phase of the research was an exploratory, qualitative design. The purpose was to:

- Explore concepts of place attachment
- Determine language that was suitable for the questionnaire that was to be used in the quantitative phase
- Develop some of the hypotheses that were to be examined in the quantitative phase of the research.

Qualitative research and, specifically, the face-to-face interview, provided an appropriate environment in which to explore the emotional and symbolic dimensions of place attachment, adding a depth and richness to our understanding. There was a need to understand the 'essence' or 'spirit of place' (Kruger 1996, Milligan 1998, Relph 1976). This 'essence' can be manifested as the emotional aspect of place attachment, and as such, was better captured in a personal interview setting. Further, a review of the literature found no construct or framework for place attachment that was replicable within the present study. Consequently, the in-depth personal interview technique was chosen to develop an understanding of place attachment and its impact on consumption.

Hull IV (1992) used photo-elicitation to examine suburban residents' perceptions of the image created by the physical features depicted in an array of photographs of scenes from their neighbourhood. He found place attachment was higher when there was a good fit between the perceived image from the photograph and a respondent's own self-image. It was evident that photographs were helpful in place studies. Indeed, photo-elicitation was felt to be ideal for the present study as it could uncover the feelings and emotions that lie behind a visual scene, revealing (in this case) residents' image of their town, and how this image was influenced by the physical aspects of the town and surroundings.

Thirty in-depth face-to-face interviews were conducted. Each interview lasted between one and oneand-a-half hours and was audio taped and transcribed. Respondents were chosen at random from the town's electoral register. Respondents were initially sent a disposable camera and a letter outlining the study requirements. They were asked to take photographs of places, people and things that were important to them in their lives. Subsequent in-depth interviews discussed the respondents' meanings, sentiments and stories behind the chosen photographs. The interview structure followed the 'focussed' interview format (Sampson 1996) that had a general question outline to guide the interview, but allowed the flexibility to adapt and probe within each interview situation.

Respondents were prompted beyond the photographs by asking them to talk about other places that were important to them that were not shown in the set of photographs. In addition, respondents were asked "What would you miss most if you left your home town?" This question was included to create the setting of 'loss' that often leads people to realise the relationship that exists between them and a place (Dixon and Durreheim 2000).

Ensuring the validity of in-depth interview findings required the use of a number of measures. The interviews were all conducted in a similar setting and, therefore, differences introduced by different settings were minimised. The nature of place attachment is that each person has different specific 'places' that are important to them and, therefore, comparisons were made at a broad level across the interviews. Generalisations from the interviews were also based at a broad level, with each aspect referred back to existing literature for reference to existing themes and constructs. Construct validity was addressed by referring emerging themes and constructs back to the literature and asking some interviewees (five) to review the summaries (Strauss and Corbin 1990, Yin 1989).

A total of 537 photographs were provided by respondents, with an average of 16 photographs for each respondent, acting as auto-drivers during the interview. The photographs were categorised according to groupings derived from a content analysis of the respondent-generated photographs and previous literature (Hull IV 1992, Kaltenborn 1997, Korpela 1989). The photographs were classified within broad categories with the following categories being represented most strongly:

- Natural and built environments
- Family and friends
- Farm environments.

Other photograph categories included:

- Significant events: such as the Town's Spring Festival, occurring at the time of the study
- **Possessions and collectibles**: less common than given to expect as a result of previous research (Belk 1998; Ellis 1985; Wallendorf and Arnould 1988).
- **Photographs** of cars, taken predominantly by male respondents, and pets rounded out the categories.

In determining the main themes from the research, the narratives generated from discussions with the photographs were analysed as a primary source of data. Comments such as "But I couldn't take a picture of them because they were at work" [F, under 40, T] or "They were too shy to have their photo taken" [M, under 40, T] were expressed by some respondents. In these cases, respondents were encouraged to talk about the person (or place) missing from their photo collection. How each respondent reacted to the experience of taking photographs was an important aspect of the interview process.

Pictures of the home, the town hospital (often because it was a place of work and held strong selfidentity and social memories) and various town buildings symbolised respondents attachment to the built environment of their town. Public facilities were a consistent feature in respondents' photographs, with the recreation centre, medical suites, senior citizens centre and schools being sources of pride, companionship, work and self-identity, as well as symbols of safety and town well-being. Often these facilities were the setting for social gatherings and subsequently held fond memories of friendship, enjoyment and social bonding. This was also evident within the natural environs of the town, including picnic areas and parks.

The social fabric of the town was evident across many of the photo collections. The positive lifestyle qualities of the town were evident, with safety, peace and quiet and an intense sense of community spirit underlying the stories derived from a range of photographs. Childhood memories and family gatherings created a nostalgic feel, with respondents creating their stories around photographs of the picnic areas, memorial park and churches.

There were many comments on the quality of life in the town, which were not captured in the photographs but came as a result of describing the activities and images within the photos. The following quote is an example of these feelings and one that was not specific to a particular photo but to an overall feeling that emerged from the discussion of the feelings and sentiments behind the photos.

I think it is just the peace and quiet. The fact that to go and do my grocery shopping isn't an ordeal like it might be in the city. You don't have to fight for parking and crowds and you can just get in and get it done. I think a lot of it is just the open space not being crowded in and just the peace and the quietness. (F, 40s)

Respondents were asked to choose their three most important photographs and describe how they felt when they looked at them. This technique was adopted from Hull IV et al.'s (1994) research and revealed similar emotional responses to Hull IV et al.'s (1994) classification. Feelings of peace, calm, nostalgia, uniqueness, freedom and safety were evident in the responses, with the emotional link between place and person being evident. The interviews emphasised the attachment process in three ways, namely:

- Attachment to a contextual setting allowing some activity to take place (place dependence)
- The place becoming an extension of oneself with it being "incorporated into one's concept of self" (Krupat 1983: 343)

• The care and maintenance of the place for long-term life of the place (Steel 2000)

4. Study 3: Students perception of home

Overseas students have access to a number of learning opportunities available by virtue of a highly competitive tertiary education market system. Despite the increasing trend for remote, online-based learning programs, many students elect to travel outside their home country to experience the cultural difference of studying abroad. The benefit is symbiotic, with crucial university funding being attracted by increased numbers of overseas students seeking an enriched studying experience.

The focus of this research was the on-campus learning experience received by ex-patriot students studying in Australia and Singapore. How these students adapted to the different physical, social and emotional environments when studying overseas was examined. It concentrated on students' consumption of the 'home' phenomena through an experiential and sensory approach demonstrating the influence of the senses in the adaptation process.

The international tertiary education market is fiercely competitive. The United States is the world's main provider of education for overseas students, followed by the United Kingdom, Australia, France, Germany, and Canada (Marginson 2007). Student evaluation of higher education has been debated at length within the literature (Clouder 1998, McKenzie, Sheely and Trigwell 1998, Wachtel 1998) and is one of the most extensively researched areas in education (Wilson 1998). Studies have also been conducted that explore reasons why students seek tertiary education (Floyd and Gordon 1998, Thornburg 1997); factors that influence their choice of destination (Mazzarol and Soutar 2002) and success factors for universities marketing themselves internationally (Mazzarol 1998, Marginson 2002). If Australia is to improve its market share it must understand the key differentiating offerings which may not solely involve academic factors. To be effective in communicating to prospective students by using their language and perceptions of Australia, the need to find research methods that uncover these perceptions in meaningful ways is required. Photoelicitation and autodriving interviews is one technique that offers such insight and understanding. As Marginson (2007:32) noted ..."Australia needs to understand the positive influence and importance of freedom, natural landscapes, space, beaches and climate to the overall decision-making process of overseas students."

In-depth interviews were conducted with twenty-two students using photoelicitation as an auto-driver. Overseas students who were going back to their home country for the inter-semester break were approached to participate in the study. Students were given disposable cameras and asked to take photos of important places, people and things that represented home to them in their own country as well as their country of study (Australia or Singapore). The follow-up interviews were audiotaped and transcribed resulting in an extremely rich data set which was analysed and coded for emerging trends.

The twenty-two students generated a total of 286 photographs. These photographs were grouped and coded by the researchers resulting in a number of emerging themes. Students volunteered for this study so a bias toward overseas students that had relocated successfully was an anticipated result. When recounting their experiences, all students referred to the positive influence of their senses (sight, smell, touch, hearing and taste) on their experiences, making those experiences more memorable and real. In some instances awareness of this sensory influence helped bridge the gap between their home and country of study.

Recreational site research identified the substitutability of one site with another as an aspect of recreational place choice (Wyman 1985). This phenomenon was evident in this study's results. Some other mix of environments in the new country became the overseas student's substitute 'home'. This substitutability was reflected in students' pictures and dialogue of places, people and objects (Ryan and Ogilvie, 2001). Dispersed throughout the discussions was the consistent reference to sensory stimuli used to emphasis feelings and the importance of the experience to the student. Almost every interview reported some reference to one or more of the senses in the dialogue of recounting experiences and special memories.

Not surprisingly, visual scenery was a common point of reflection when students were talking about their home and special places. Overseas students in Australia referred to the beauty of isolated beaches:

"The scenery in Australia is, well, something that definitely means home to me here, they remind me of the sea at home, yet they are different.. I'm not used to the beaches looking like that, with open views.... There is nothing like that in Scotland",

along with open spaces, red dirt and green fields. Specific attractions of 'home' were kept as a sacred memory and not substituted:

"This is a beautiful photo.... Its autumn or late summer.. that part of the year the sky gets this really weird light like you can see the orange light.....It just happens sometimes then we all run out of our houses and just look at it because it is magnificent.....that's just the beauty of Norway."

Photographs provided the most common visual stimuli for students. They were a possession that was easily transported as a memory store, providing a sense of the past and help secure their identity

"I like to look at my photographs if and when I have past timeSince I was young every time my parents said I was leaving my house the first thing I would grab all my photos because other things will be gone but photographs are a memory that I want to have with me forever".

Students feel safe and secure in a foreign country when they feel 'at home' with their new environment. The environment can serve to stabilise the self-concept and thus assist in the overall positive experience for overseas students (Hormuth 1990). This research emphasised the importance of the senses when overseas students relate to their home country and their overseas study country. As the senses are so vital in providing the input for the experience of the 'home' phenomenon, their use in promoting the other (non academic) benefits of studying in Australia could be considered to give an affective, emotional and realistic account of what Australian life has to offer. Adaptation to the new environment is essential for the student to have a positive experience from the learning process. A vital part of this adaptation is experienced through the senses. The photoelicitation technique facilitated the uncovering of this dimension in students adaption process due to its ability to assist in the autodriving interview process in uncovering feelings, emotions and enhanced insights.

5. Discussion

Photographs motivate respondents to respond to visual prompts with more descriptive and insightful comments than they do without such visual aids (Carlsson 2001, Heisley and Levy 1991, Heisley, McGrath and Sherry 1991, Hull IV 1992, Loeffler 2005, Samuels 2004). The photograph captures the outside image of what a respondent is sensing and experiencing inwardly, providing a prompt for the respondent to drive the interview with their own words, language and values. As Collier and Collier (1986: 125) suggest, *"[photo] representation of critical area[s] of the informant's life can trigger emotional revelations otherwise withheld, can release psychological explosions and powerful statements of values."*

Photographs in the three studies described in this paper were developed and used as visual elicitation with respondents during in-depth interviews. "Autodriving" is the term used when an interview is 'driven' by the respondent on seeing and hearing their own behaviour (Heisley and Levy 1991). Autodriving has been described by McCracken (1988) as assisting respondents to 'manufacture distance' from their own personal feelings. Through this technique respondents can "see familiar data in unfamiliar ways" (McCracken 1988, p.24). Similar to this technique the visual elicitation allows the respondent to drive the interview as they seek to interpret their photographs and explain them. This was particularly evident in the interviews with younger respondents in study 3. The younger age group are more difficult to engage in descriptive conversation, being inclined to give monosyllabic responses (Grant 2006) yet given their own photos as drivers they could delve into the setting and open up their own responses with more depth than would possibly occur without the photo prompts.

In some cases the camera did not represent the image that the respondent had hoped for or perceived. Whilst in studies two and three this required the respondent to explain in more descriptive terms the scene they wanted depicted, one respondent (in study one) was prepared to blame the camera for the misrepresentation *"Well looking at them I don't see that there is any difference, so whether that is the fault of the camera or whatever. ...although if I looked in the mirror and not the photographs I would see differently." (f, 53) This difference provided a rich source of data on perceived image and self identity. In this study the photos taken represented an iconic image of the 'self' and judged as a good or bad photo based on its alignment with the respondents perceived self image.*

The descriptions of the three studies highlight the depth and richness of the data obtained from the photoelicitation process. There were, however, a number of limitations with the technique. At times the process of taking the actual photos was itself a limitation of the technique. The photos required respondents to travel (study 2 and 3) and take photos that were time consuming. In some cases (in study 2) the respondents had the camera for several weeks before taking their photos. This was especially evident with the farmers in the survey. The time factor was also important for respondents in study 1 who did not always have a special event to attend and would hold onto the camera for prolonged periods until such an occasion arose. In some cases six months elapsed before cameras were returned and interviews completed. Consequently, there is potential for this time lapse to influence fashion trends and hence the data collected from respondents who moved with these trends. Some respondents found the process invasive (most evident in study 1). Respondents from study one were at times self-conscious about taking, discussing and having close up photographs of their face and all its intricacies scrutinised. Indeed one respondent noted: "I studied photography at university, ..., it was always a good excuse because you are in front, you know, you have got the camera no one else is taking photos of you, cause I really hate having my photo taken. I don't have high thoughts of the way I look or anything like that you know." (f. 34).

The photograph process also involved ethical considerations. Due to the sensitive nature of taking facial photographs (study 1) all respondents were asked to sign a consent form acknowledging that, whilst no names would be used, they may be recognised by their photograph in future publications. A similar procedure was employed in the other two studies.

Therefore our findings suggest that the use of photographs to enhance the research process is particularly worthwhile in situations when greater depth of clarity of the respondents meaning is needed, when the demographic being interviewed is slow or limited in their responses and also for enhancing phenomenological analysis. Furthermore, one of the main ways to increase the credibility and trustworthiness of qualitative research is through the use of triangulation. Photo-elicitation provides one method of collecting data and therefore a good source of validation or triangulation that can add to the validity process. Consequently, to our mind, the benefits and richness of the data captured by using photos in the research process far outweigh any disadvantages.

References

Belk, R. W. (1988) Possessions and the Extended Self. Journal of Consumer Research, 15(2): 139-168.

Bleicher, J. (1980) Contemporary Hermenuetics, London: Routledge Kegan Paul.

- Carlsson, B. (2001) Depicting Experiences. Scandinavian Journal of Educational Research, 45(2): 125-143.
- Clouder, L., (1998). Getting the 'Right Answers': Student Evaluation as a Reflection of Intellectual Development? *Teaching in Higher Education*. **3**(2) 185-192.
- Cocklin, C. and Alston, A. (Eds.) (2003) Community Sustainability in Rural Australian Communities: A Question of Capital. *Academy of the Social Sciences in Australia.* Wagga Wagga.
- Cocklin, C. and Dibden, J. (Eds.) (2005) *Sustainability and Change in Rural Australia.* UNSW Press: Sydney Colaizzi, P. F. (1978) "Psychological Research as the Phenomenon Views It" in *Existential-Phenomenolgical*
- Alternatives for Psychology. R. Valle and M. King (eds.), New York: Oxford University Press Collier, J. and Collier, M. (1986) Visual Anthropology: Photography as a Research Method. Albuquerque: University of New Mexico Press. p 125.
- Creswell, J. W. (1994) Research Design: Qualitative, Quantitative and Mixed Methods Approaches, Sage Publications: Thousand Oaks, CA.
- Ellis, L. (1985) On the Rudiments of Possessions and Property. Social Science Information, 24(1): 113-143.
- Firth, K. J. (1995) Examining the Relationship between Place Attachment and Personality. *PhD Dissertation*. University of Guelph, Canada.
- Floyd, C. J., and Gordon, M. E., (1998). What Skills are Most Important? A Comparison of Employer, Student, and Staff Perceptions. *Journal of Marketing Education*. **20** (2): 103-109
- Grant, I. (2006). Creative Approaches to New Media Research. Young Consumers, 7 (3): 51.
- Gutman, J. (1991) Exploring the Nature of Linkages Between Consequences and Values. *Journal of Business Research*, **22**: 143-148.
- Harper, D. (1998) An argument for visual sociology. In J. Presser (Ed.), *Image-based research: A sourcebook for qualitative researchers* (pp24-41). London: Palmer Press.
- Heisley, D. D. and Levy, S. J. (1991) Autodriving: A Photoelicitation Technique. *Journal of Consumer Research,* **18**(December): 257-272.
- Heisley, D. D., McGrath, M. A. and Sherry Jr, J. F. (1991) To Everything There is a Season: A Photoessay of a Farmers' Market. *Journal of American Culture*, **14**(3): 53-80.
- Hormuth, Stefan E., (1990) The Ecology of the Self. Cambridge: Cambridge University Press.
- Hull IV, R. B. (1992) Image Congruity, Place Attachment and Community Design. *The Journal of Architectural and Planning Research*, **9**(3): 181-192.

- Hull IV, R. B., Lam, M. and Vigo, G. (1994) Place-identity: Symbols of Self in the Urban Fabric. Landscape and Urban Planning, **28**(2-3): 109-120.
- Jenkins, O. H. (1999) Understanding and Measuring Tourist Destination Images. *International Journal of Tourism Research*, **1**(1): 1-15.
- Kaltenborn, B. P. (1997) Nature of Place Attachment: A Study Among Recreation Homeowners in Southern Norway. *Leisure Sciences*, **19**(3): 175-189.
- Kaplan, I. and Howes, A. (2004) Seeing through Different Eyes: Exploring the Value of Participative Research Using Images in Schools. *Cambridge Journal of Education*, **34**(2): 143-155.
- Kelly, G. A. (1963) A Theory of Personality: The Psychology of Personal Constructs, Norton: New York. Kleine, S. S. and Baker, S. M. (2004) An Integrative Review of Material Possession Attachment. Academy of
- Marketing Science Review, 2004(1): 1-35. Korpela, K. M. (1989) Plan-Identity as a Product of Environmental Self-regulation. Journal of Environmental
- Korpela, K. M. (1989) Plan-Identity as a Product of Environmental Self-regulation. *Journal of Environmental Psychology,* **9**(3): 241-256.
- Kruger, L. E. (1996) Understanding Place as a Cultural System: Implications of Theory and Method, University of Washington: Published PhD.
- Kvale, S. (1983). "The Qualitative Research Interview: A Phenomenological and Hermeneutical Mode of Understanding", Journal of Phenomenological Psychology, 14, Fall, 171-196
- Loeffler, T. A. (2005) Looking Deeply In: Using Photo-Elicitation to Explore the Meanings of Outdoor Education Experiences. *The Journal of Experiential Education*, **27**(3): 343-346.
- Marginson, Simon, 2002. The Phenomenal Rise of International Degrees Down Under: Lucrative Lessons for U.S. Institutions? Change 43(3), 34-43.
- Marginson, S. (2007). Global position and position taking: The case of Australia. *Journal of Studies in International Education*, **11** (1) 5-32
- Mazzarol, T. (1998). Critical success factors for international education marketing. International Journal of Education Management, **12** (4) 163-175
- Mazzarol, T. & Soutar, G. N. (2002). "Push-pull" factors influencing international student destination choice. International Journal of Education Management, **16** (2) 82-90
- McCracken, G. (1988) The Long Interview. Newbury Park, CA: Sage.
- McKenzie, J.; Sheely, S. and Trigwell, K., (1998). Drawing on Experience: An Holistic Approach to Student Evaluation of Courses. Assessment and Evaluation in Higher Education. **23** (2) 153-163.
- Milligan, M. J. (1998) Interactional Past and Potential: The Social Construction of Place Attachment. Symbolic Interaction, 21: 1-33.
- Moore, R. L. and Graefe, A. R. (1994 Attachments) to Recreation Settings: The Case of Rail-Trail Users. *Leisure Sciences*, **16**(1): 17-31
- Ogilvie, M. and Ryan, M. M. (2000) Visual Student Evaluation: The Unspoken Words. Paper presented at the *Proceedings of the CSUE Conference*, Sept. 2000. pp 152-160.
- Patton, M. Q. (1990) Qualitative evaluation and research methods. California: Sage Publications Inc.
- Polkinghorne, D. E. (1989) Phenomenological research meets existential-phenomenological perspectives in *Psychology* R. and S. Halling (eds.), New York: Plenum, 41-62.
- Relph, E. (1976) Place and Placelessness, Pion Ltd: London.
- Richins, M. (1991) Social comparison and the idealized images of advertising.
- Journal of Consumer Research. 18(1): 71-83.
- Ricoeur, P. (1976) Interpretation Theory. Fort Worth: Texas University Press
- Ryan, Maria M., and Ogilvie, Madeleine, 2001. Examining the Effects of Environmental Interchangability with
- Overseas Students: A Cross Cultural Comparison. Journal of Marketing and Logistics. **13**(3), 63-74. Sampson, E. E. (1988) The Debate of Individualism: Indigenous Psychologies of the Individual and their Roles in
 - Personal and Societal Functioning. American Psychologist, **43**: 15-22.
- Sampson, P. M. (1996) Theorizing the interview. *British Journal of Sociology*, **47**(June), 295-314 Samuels, J. (2004) Breaking the Ethnographer's Fames: Reflections on the Use of Photo-elicitation in
- Understanding Sri Lankan Monastic Culture. The American Behavioural Scientist, 47(12): 1528-1540.
- Stanczak, G.C. (2007) Visual research methods: image, society, and representation, Sage Publications: California.
- Strauss, A. and Corbin, J. (1990) Basics of Qualitative Research, Sage Publications: California.
- Thornburg, L., (1997). Employers and Graduates Size Each Other Up. HR Magazine. **42** (5): 76-79 Thompson, C. J., Locander, W. B., Pollio, H. R. (1990) The lived meaning of free choice: an existential-
- phenomenological description of everyday consumer experiences of contemporary married women. *Journal of Consumer Research* **17** (3):346-361
- Wachtel, H. K., (1998). Student Evaluation of College Teaching Effectiveness: A Brief Review. Assessment and Evaluation in Higher Education. **23** (2) 191-211.
- Wallendorf, M. and Arnould, E. J. (1988) My Favourite Things: A Cross-cultural Inquiry into Object Attachment, Possessiveness, and Social Linkage. *Journal of Consumer Research*, **14**: 531-547.
- Wallendorf, M. and Arnould, E. J. (1991) We Gather Together Consumption rituals of Thanksgiving Day. *Journal of Consumer Research*, **18**(1): 13-31.
- Warzecha, C. A. and Lime, D. W. (2001) Place Attachment in Canyonlands National Park: Visitors' Assessment of Setting Attributes on the Colorado and Green Rivers. *Journal of Park and Recreation Administration*, **19**(1): 59-78.

Williams, Daniel R., Patterson, Michael E., Roggenbuck, Joseph W., Watson, Alan E., 1992. Beyond the Commodity Metaphor: Examining Emotional and Symbolic Attachment to Place. *Leisure Sciences.* 14(1), 29-46.

Woodward, K. (1997). Concepts of identity and difference. *Identity and Difference*, Ed. Woodward K. pp59-61. London, Sage Publications Inc.

Yin, R. K. (1989) *Case Study Research: Design and Methods, Sage Publications;* Newbury park, California. Zaltman, G. & Coulter, R. H. (1995). Seeing the voice of the customer: Metaphor

based research. Journal of Advertising Research, 35(4), 35-51.

Zeithaml, V. A. (1988) Consumer, Perceptions of Price, Quality and Value: A Means-End Model and Synthesis of Evidence. *Journal of Marketing*, **52**(3): 2-22.

A Strategy for Delayed Research Method Selection: Deciding Between Grounded Theory and Phenomenology

Sebastian Reiter, Glenn Stewart and Christine Bruce Queensland University of Technology, Brisbane, Australia

<u>sebastian.reiter@qut.edu.au</u> <u>g.stewart@qut.edu.au</u> <u>c.bruce@qut.edu.au</u>

Abstract: This paper presents a strategy for delayed research method selection in a qualitative interpretivist research. An exemplary case details how explorative interviews were designed and conducted in accordance with a paradigm prior to deciding whether to adopt grounded theory or phenomenology for data analysis. The focus here is to determine the most appropriate research strategy in this case the methodological framing to conduct research and represent findings, both of which are detailed. Research addressing current management issues requires both a flexible framework and the capability to consider the research problem from various angles, to derive tangible results for academia with immediate application to business demands. Researchers, and in particular novices, often struggle to decide on an appropriate research method suitable to address their research problem. This often applies to interpretative qualitative research where it is not always immediately clear which is the most appropriate method to use, as the research objectives shift and crystallize over time. This paper uses an exemplary case to reveal how the strategy for delayed research method selection contributes to deciding whether to adopt grounded theory or phenomenology in the initial phase of a PhD research project. In this case, semi-structured interviews were used for data generation framed in an interpretivist approach, situated in a business context. Research questions for this study were thoroughly defined and carefully framed in accordance with the research paradigm's principles, while at the same time ensuring that the requirements of both potential research methods were met. The grounded theory and phenomenology methods were compared and contrasted to determine their suitability and whether they meet the research objectives based on a pilot study. The strategy proposed in this paper is an alternative to the more 'traditional' approach, which initially selects the methodological formulation, followed by data generation. In conclusion, the suggested strategy for delayed research method selection intends to help researchers identify and apply the most appropriate method to their research. This strategy is based on explorations of data generation and analysis in order to derive faithful results from the data generated.

Keywords: research method selection, qualitative research, grounded theory, phenomenology

1. Introduction

ISSN 1477-7029

Research methods are *'traditionally'* chosen prior to data generation based on the nature, aims and goals of the research project. However the *'traditional'* process of a research method selection may limit flexibility in revising or changing the selected research method at a later stage. This can lead to potential implications, such as shortcomings in the research design and hence results of the study. In addition recent studies often fail to detail the process of research method selection while being excellent in describing them. They rather critique the methods conventionally applied and emphasize on the negative aspects instead of proposing alternatives or innovative solutions.

Such shortcomings, paired with the need for rigorous and relevant research to address the needs of various stakeholders, suggests more attention be paid towards the research methods selection. In addition, multiple stakeholders such as academia, practitioners, and industry partners increase the complexity of research demands, objectives and expected results. Furthermore, practitioners and industry partners tend to look for tangible results that can be easily transferred and applied to practice. Thus, academia must not be neglected in striving for rigor and relevance (Robey and Markus 1998) Rigorous research in particular, can be achieved not only through carefully selecting and applying the research method but also detailing its execution.

Research method selection is dependent on the circumstances and objectives of the research rather than deriving from philosophy (how we think about it) or methodology (how we study it) (Hammersley 1999:80). Selecting the most appropriate research method must be driven by the research question and current body of knowledge in the area researched (Wynekoop and Russo 1997) as well as the data accessible to the researcher. Unfortunately, researchers are often confronted with an overwhelming number of research methods and regularly struggle to decide on the most suitable one.

©Academic Conferences Ltd

Reference this paper as: Reiter, S, Stewart, G and Bruce, C. "A Strategy for Delayed Research Method Selection: Deciding Between Grounded Theory and Phenomenology" *The Electronic Journal of Business Research Methods Volume 9 Issue 1* 2011 (pp 35-46), available online at www.ejbrm.com

35

Their selection is often based on assumptions about the expected results, influenced by their previous experiences or the supervisory team in the case of PhD or research students. This applies particularly to interpretative qualitative research, where it is not always immediately clear what is the most suitable research method to use as the research objectives shift and crystallize over time. Positivist research on the other side for example often does not have this issue and is usually more controlled and straightforward.

Given the multiple research methods available, choosing the most appropriate research method is not an easy task. Even when limited to qualitative interpretative methods, there are still numerous options (Miles and Hubermann 1994) to be considered. Basically each possible research method has advantages and disadvantages (Benbasat, Goldstein and Mead 1987) which need to be taken into account. Other than the knowledge and background of the researcher, the influence of the research team and the capability of human information processing can be a limitation as well. According to von Wright (1979) the human short term memory is restricted to 5 +/- 2 observational units which limits our taxonomy. On the other hand, Tesch (1990) refers to 27 qualitative research methods These might be perceived in different ways by different people in the same manner as different disciplines favor different types of methods as well as the use of different vocabulary for qualitative research. This reason further highlights the need for a strategy to select the most appropriate research method.

Mason (2002:26) suggests the creation of an overview of potential research methods and data sources in the initial research stage including the ones which might be rejected. She further highlighted that by generating data and analysing data paired with the experience gained by researcher throughout this process the research most appropriate method could be selected. In this study a strategy for delayed research method selection will be firstly detailed followed by describing the application of an exemplary case. The paper there after concludes with a discussion and outlook to future research.

2. Strategy for delayed research method selection

The strategy for delayed research method selection aims to help in the process of selecting the most appropriate research method related to the problem and stakeholder's interests, in order to derive faithful results. Attention is thereby paid firstly to the research setting and research question, secondly on the mode of data generation and lastly the most suitable research method to be selected based on the data generation and data pre-analysis (pilot study). The difference to the *'traditional'* research method selection is in the sequence, and consideration of the before mentioned aspects.

2.1 Research setting

Prior to applying the strategy for delayed research method selection, the research context as well as the purpose and expected representation of research findings have to be clearly articulated and defined. This includes fundamental considerations encompassing the current state of art in the field of investigation, related literature, background, experience and knowledge of the researcher. The research purpose explains the research objectives and if existing requirements of the research project sponsor or partner are applicable. Further the intended unit of analysis being for example an individual, organization, artefact or specific circumstance need to be clearly defined and stated. The ability to access and generate useable data is a key consideration to the research method selection. An additional element is the evaluation of the generated data in terms of its composition in quality as well as quantity. Special attention has to be paid thereby to sampling, which needs to be thoroughly aligned with the research paradigm requirements. Consequently available data has to be clearly evaluated prior to pre-selecting an appropriate research method.

2.2 Research question

The definition of research questions is the most important step when undertaking any research (Yin 2003:7) as they give direction to the research method applied. In order to delay the research method selection, research questions are suggested to be kept as broad as possible and as detailed as necessary. Concurrently, the research questions need to be aligned with the research paradigm and requirements of the later pre-selected research methods. An exploratory approach to examine and narrow down the research objective is therefore appropriate. This requires an open-mind while framing the research question. At the same time, the researcher is required to familiarize with potential research methods and build awareness of their requirements. Hence the guiding research questions initially remains on a high level.
2.3 Mode of data generation

Multiple data sources are suggested to be used rather than only one source to capture the contextual complexity of the area under investigation. Yin (2003:86) suggested the convergence of the 'Six sources of Evidence' namely documentation, archival record, interviews, direct observation, participant-observation and physical artifacts. Besides the dominant mode of data generation, other sources should be considered to capture the contextual complexity. Triangulation of data sources and different modes of generation thereby enable the researcher to observe the object of investigation from different angles (Neuman 1997:151). The interview technique (Kvale 1996; Patton 2002) is commonly used in gualitative studies. Interviewing is often seen as synonymous to gualitative inquiries, while having similar constructions irrespective of the methodological position (Wimpenny and Gass 2000). However the form and format of the interview conduct varies dependent on the research paradigm and to the selected research method. There are significant differences in design, conduct, role of the researcher, formulation of questions and analysis, depending on the research method. These need to be carefully considered as even slight deviations might impact the research results. Most important factor in the mode of data generation is the availability and the access of appropriate data. These two factors can determine a research program especially as qualitative research is dependent on rich and faithful data form the sources available. The focus of gualitative researcher is thereby not to 'simple' find data in a collectable state, instead the focus is on how to generate data from the chosen data sources (Mason 2002).

2.4 Pre-selection of research methods

"Qualitative research is characteristically exploratory, fluid and flexible, data-driven and context sensitive" (Mason 2002:24). By considering the research setting, research question and mode of data generation, two to three research methods should be pre-selected for the pilot study. A comprehensive overview of qualitative research methods is given by Tesch (1990) or Miles and Hubermann (1994). When comparing the pre-selected potential research methods, special attention is paid to the expected results, the mode and conduct of data generation as well as requirements for data analysis. Following to the pre-selection of research methods, a pilot data generation and pre-analysis is conducted to test their suitability and alignment.

2.5 Data generation

Data generation is initially conducted with a meaningful pilot sample (n=3-5). A certain degree of formalization is suggested, including procedures such as a detailed protocol outlining the steps (Howard-Grenville) and data gathered (what) during the interviews or on-site visits. *"In each case, you will need to ask yourself whether you have generated data of appropriate order, from the relevant range of sources, and with adequate coverage, to fashion the kind of argument you desire"* (Mason 2002:174). Throughout data generation the researcher is encouraged to revisit the requirements of all pre-selected research methods in order to ensure they are strictly followed. In the case of any deviation the conduct of data generation has to be stopped and adjusted. This phase ensures that the set of requirements determined by the pre-selected methods regarding the data quality and quantity is met.

2.6 Data pre-analysis

The data pre-analysis phase concentrates on applying each of the pre-selected research methods to the data sample from the pilot study, to compare the results and their representation with the research objectives. This stage is to pilot and confirm the suitability and appropriateness of collected data as well as to ensure that the requirements of pre-selected research methods are met. This includes: Are the questions phrased according to the research methods principles? Are the collected data suitable for further analysis? Any misalignment would lead to either a de-selection of the method or an unusable data sample.

2.7 Delayed selection of the research method

After the generated data is revisited and its quality checked and analyzed, results are carefully compared with the prerequisites and requirements of the pre-selected research methods. The focus is thereby to evaluate which of the pre-selected research methods is most appropriate for the data analysis and subsequently the conduct of the study. Next the quality and quantity of the generated data is evaluated. Derived research findings are assessed against the expected quality and

representation. In addition, emerging themes and priori results can be reported at the same time. The final stage of the strategy for delayed research method selection is to select the most appropriate and suitable research method. This process differs from the *'traditional'* approach where in contrast the formulation of research questions and consideration of the research setting is followed by determining the research method prior to data generation and analysis. In the following Figure 1 illustrates the process of the strategy for delayed research method selection.



Figure 1: Process of strategy for delayed research method selection

3. Case

This section details an exemplary case of a qualitative study following the interpretive tradition (Klein and Myers 1999) and reveals how the strategy for delayed research method selection assists in

deciding on the most appropriate and suitable research method in the initial phase of a PhD research project.

3.1 Research setting

The exemplified research project is situated in a business context aiming to derive a narrative framework or a set of propositions applicable to both academia and practitioners. An exploratory investigation aims thereby to discover theory of cultural effects and their interaction on global projects. More specifically, it is aimed to first understand the complex construct under investigation, being global projects. Second is to explain occurring cultural effects and its interactions on global projects whereby the unit of analysis being the global project. In the first stage, the area under investigation is determined and narrowed down. A high-level preliminary literature review is conducted across both academic and practitioner sources to identify knowledge gaps and current challenges as well as the needs expressed by the research and practitioner community. The literature review aimed to firstly to better understand the field of investigation and secondly revise and define the research objectives and guiding research questions. The chief investigator (first author) acknowledges his biases of domain knowledge in the area under investigation given his substantive professional working experience working with multinational organizations on global projects. At the same time he was a novice researcher when embarking this research program, guided by his supervisory team (co-authors) and learning's from coursework on qualitative research methods.

3.2 Research question

Research questions for this study were initially kept broad to accommodate the requirements of both potential research methods. An exploratory approach was chosen to examine the occurring effects and their interaction in global projects. This required flexibility and an open-mind to frame the research questions. By comparing qualitative research techniques, the researcher became more aware of the requirements of inductive qualitative interpretative research methods such as the need not to be biased by existing theories and research. Hence the guiding research question remained at a high level, such as: *What are the cultural effects experienced by senior management practitioners working on global projects?*

3.3 Mode of data generation

Semi-structured interviews were chosen for data generation, due to the explorative nature of the study and excellent access to interviewees. Interviewees were selected based on their expertise and background of working on global projects to ensure that they represent the targeted interviewees group (Leedy and Ormrod 2005:147). Access to data in form of multiple individuals in senior leadership positions working for various multinationals or professional service firms was given and exceeded initial expectations of the research team. Priority while selecting interviewees was set on quality, having only a few but therefore more powerful interviewees rather than quantity.

3.4 Pre-selection of grounded theory and phenomenology

Research method selection is crucial, "qualitative research designs invariable need to allow for flexibility, and for decision-making to take place as the research process proceeds." (Mason 2002:45). Independent of the research outlet being a peer-reviewed conference or journal the rigor in the execution of research has to be shown. In particular doctoral research asks for a rigorous, stringent and clear process from the research problem identification over the description of the research setting, research questions, data generation and research method selection as well as the execution and presentation of findings. For the conduct of this study and guiding through the PhD research questions and research setting given they are both inductive and their initial steps are almost identical. These characteristics allowed a pilot study and delay of the definite research method selection. For this study both methods were interpreted as interpretative qualitative research aiming to discover theory (Grounded theory) respectively meaning of lived experiences (Phenomenology). A third method considered initially being ethnography was neglected in the early stage as no multinational organization running a global project was accessible to the research team for full-time observation and interview purposes.

Grounded theory evolved in the 1960's with 'The discovery of grounded theory: Strategies for qualitative research' (Glaser and Strauss 1967). It is "an inductive theory discovery methodology that

allows the researcher to develop a theoretical account of the general features of the topic, while simultaneously grounding the account in empirical observation of data" (Martin and Turner 1986:141). In grounded theory, theory emerges from the data in a natural setting; it is "a logically consistent set of data collection [generation] and analysis procedures aimed to develop theory" (Charmaz 2001:245). "Phenomenological research is the study of essences" (van Manen 1997:10). Phenomenology is concerned about experiences in human life; "We can only know what we experience" (Husserl, 1913). Phenomenology emphasizes on understanding the experience of people involved, whereby the research methods are the methods of philosophy (Wilson 2002). Phenomenology also stresses the nature of human experience and the meaning that people are attached to their experiences. In other words, phenomenology is about the experience of others.

The mode of data generation and design of interview questions is fairly similar for both research methods in the early stage, with the core issue being the generation of rich and faithful data. The objectives for data analysis are different, even though marginal in the initial phase. Grounded theory aims to enquire and state how actors interpret reality, rather than testing hypotheses (Suddaby 2006) and is thereby more attentive to how theory emerges from subjective experiences. Phenomenology on the other side is more concerned about the individual's experience (Suddaby 2006; Patton 2002:104). Both methods are commonly seen as appropriate for management studies (Ehrich 2005; Fendt and Sachs 2008). Table 1 below gives an indication of criteria against which grounded theory and phenomenology in this study were compared. However the criteria may heavily depend on the research setting and pre-selected research methods and potentially need to be modified for other studies.

What	Grounded Theory	Phenomenology			
Research question	"What theory emerges from systematic comparative analysis is grounded in fieldwork so as to explain what has been and is observed?" (Patton 2002:133).	"What is the meaning, structure, and essence of the lived experience of this phenomenon for this person or group of people?" (Patton 2002:132).			
Representation of findings	Theory about (Morse and Richards 2002:36).	In-depth reflective description of the (experience) (Morse and Richards 2002:36).			
Data generation	Interviews, observing social interactions by listening to what informants say about themselves and others. The selection of participants and other data sources is a function of emerging hypotheses, the sample size a function of theoretical completeness (Baker, Wuest and Stern 1992).	In-depth, unstructured lengthy interviews which are more similar to a conversation rather than a typical interview talking the interviewee and listening the researcher (Leedy and Ormrod 2005:139). The interviewee and the researcher often work together during the interview <i>"arrive at the heart of the matter"</i> (Tesch 1990:147).			
Data analysis	Prescribed and systematic method of coding the data into categories and identifying interrelationships; continual interweaving of data generation and data analysis; construction of a theory from categories and interrelationships (Leedy and Ormrod 2005:144).	Search for <i>'meaning of units'</i> that reflect various aspects of the experience; integration of the meaning units into a <i>'typical'</i> experience (Leedy and Ormrod 2005:144).			
Literature review	Not extensive literature review prior to the study 'only' after theory is emerging form the data. But grounded theory is no excuse to ignore literature (Suddaby 2006).	Review of professional and research literature to prepare for the study. The focus is thereby prior relevant studies; distinguishes their design, methodologies, and findings (Moustakes 1994:111).			
Background of the researcher	Experience in the field can be an advantage, however it has to be distinguished between knowledge and influencing an interviewee through knowledge during data generation (Fendt and Sachs 2008).	The researcher can have personal experience in the phenomenon of investigation, while broadening his own understanding by the experience of others the researcher can than generalize from a insider perspective <i>'what something is like'</i> (Leedy and Ormrod 2005;139).			

3.5 Interview conduct

Semi-structured interviews are for both grounded theory and phenomenology the most common mode of data generation. Interview questions therefore were carefully phrased according to their requirements. The early stage of interviewing is fairly similar for both pre-selected methods by phrasing questions such as *'Please describe your experience* ... ' in order to unfold the field of inquiry. In continuance phenomenological interviewing tends to be dialogical, rather than observational, the meaning of lived experience is a result of co-creation between the researcher and the researched (Wimpenny and Gass 2000). In difference to grounded theory, where the first instance of interviewing aims to recount the interviewee's experience (Glaser and Strauss 1967:75-76), while subsequent interviews during theoretical sampling will be more focused and tailored to the emerging theory. No matter what stage of research both methods of phenomenology and grounded theory require interviewee.

Pilot interviews (4) were conducted, in-person and via telephone. Special emphasis was firstly put on not biasing the interviewee. The researcher's role is thereby seen as 'distant expert' (Glaser 1992) or 'co-producer' (Charmaz 1995) for grounded theory, while for phenomenology the researcher is supposed to suspend any preconceived notions as well as personal experiences called 'bracketing' (van Manen 1997:175). Secondly, when conducting interviews, attention was paid to changes through rewording and re-sequencing of questions during the interview as this can lead to problems when comparing responses (Patton 2002:349). Interview questions were carefully phrased, such as: 'Please describe effects related to culture you experienced while working on global projects?'

3.6 Pre-analysis of interviews

The utmost important criteria for any research is the means of data analysis. In this case as both methods are of inductive qualitative nature, categories will emerge from data (Morse and Richards 2002:134). Grounded theory is thereby more attentive to how theory can emerge from subjective experiences, while phenomenology is more concerned about the individual's experience (Suddaby 2006).

In the first step, interview summaries were written immediately after each interview (Yin 2003:76; Miles and Hubermann 1994), while audio recordings were verbatim transcribed and analysed in sequence. Following to this, the interviews were analysed prior to conducting the next interview. This allowed the incorporation of findings, adjustments of questions e.g. if questions were not understood in consecutive interviews. The cycle of data generations and analysis was in-line with grounded theory, in other words each interview was analysed before the following was conducted. This approach seemed be appropriate in the given research setting being explorative, while allowing to adjust direction throughout research conduct.

The data generated was in the first pass analysed by 'open coding' following grounded theory, where the researcher finds as many categories as possible by labelling the text of each interview as defined by Glaser (1992:38). A second pass through the data was undertaken in accordance to phenomenology approach by searching for the 'meaning of units' reflecting various aspects of the interviewees experience (Leedy and Ormrod 2005:144). To 'bracket' own experience and knowledge is thereby crucial, in order to understand the data collected, such as experience of the participants (Patton 2002:485). Bracketing was achieved by writing down all related experiences of the researcher prior to conducting the interview. Thus, the researcher can enter the interview without presupposition as they were put aside to ensure that the 'true' phenomenon was revealed (Morse and Richards 2002:47). This allowed segregating between the researcher's experience, which is beneficial for understanding the research context and the emerging findings from the data generated.

Table 2 compares grounded theory and phenomenology regarding: When does abstraction occur? Where does abstraction occur? How is abstraction done? and What is the goal of abstraction?

Next to the methodological questions the findings gained from the pre-analysis of the generated data help to further understand the research setting and its context. Emerging findings reported to and verified by both amongst scholars and in the practitioner community yield to be insightful. In addition the researcher familiarized himself with both phenomenological and grounded theory data analysis its principles and limitations.

Abstraction	Grounded Theory	Phenomenology				
When	Abstraction is from the data but can be informed by previously derived theories.	Not until one has the data: Previous ideas and knowledge are bracketed.				
Where	Categories derived from data (observation or line-by-line analysis of text); constant comparison with other situations or settings.	Themes and meanings in accounts, texts.				
How	Theoretical sensitivity; seeking concepts and their dimensions; open coding, dimensionalizing, memo writing, diagramming.	Deep immersion, focus, thorough reading.				
What	To identify a core category and theory grounded in the data.	To describe the essence of a phenomenon.				

Table 2: Abstraction of	f grounded theory	and phenomenology	adopted from Morse	& Richards (2002)
-------------------------	-------------------	-------------------	--------------------	-------------------

3.7 Delayed selection of grounded theory as appropriate research method

The strategy for delayed research method selection helped in particular during the process of data generation and data pre-analysis of the pilot study to decide on the most appropriate and suitable research method. Grounded theory thereby crystallized to be the more suitable research method for this PhD research project. The reasons for choosing grounded theory over phenomenology are discussed in the following.

Data generation showed that interviewees provided additional direct and indirect data next to the data gathered through semi-structured interviews, the main source of data. This included project documentations or reports (direct) or references (indirect) provided by the interviewee, as well as documents and information retrieved by researching the organization, project, and the interviewee (indirect). This appeared to benefit the grounded theory method, which infers from listening, observations, readings or ones past experiences (Baker, Wuest and Stern 1992). In other words everything is data to the grounded theorist (Stern, Allen and Moxley 1982), allowing the flexibility of utilizing different data sources. Phenomenology on the other hand concentrates on having interviewees, which experienced the effects and their interactions on global projects as only legitimate source of data (Baker, Wuest and Stern 1992). The strength of grounded theory is the combination of the depth of inquiry and the unimpaired interplay of theoretical and empirical data (Gibson, Gregory and Robinson 2005). Even though we were aware of these differences between grounded theory and phenomenology prior embarking this study, we did not anticipate such support and openness of the interviewee's in answering the questions posed in the first instance.

The sampling further suggested applying the grounded theory method, given that almost all carefully selected interviewees agreed to participate, having 38 interviewees to date. Multiple interviewees even recommended colleagues with a similar background and experience to the research team for this study providing a small pool of quality data sources. This supported the argument *"The selection of participants and other data sources is, therefore, a function of emerging hypotheses and the sample size, a function of theoretical completeness"* (Baker, Wuest and Stern 1992). This is in contrast to the phenomenology method where the sample size is kept on purpose small. Moreover the requirement of phenomenology joint collaboration and repeated interviews over time appeared to be not feasible due to time and access limitations. Limitations in time occurred because not all interviewees could commit to further interviews and interviewees identified were predominantly independent individuals rather than groups. This development couldn't be predicted as the initial planning was to conduct two to three in-depth longitudinal case studies in an organizational setting.

During the data pre-analysis of the pilot study two more aspects underlined the decision to choose grounded theory over phenomenology. Firstly the circumstance that grounded theory provides clear guidelines for both the conduct of the research and interpretation of the results is very helpful for a novice researcher (Fendt and Sachs 2008; Charmaz 2001). Despite the experience and seniority of two supervisors with both methods, the clear guidelines of grounded theory were more appealing and compatible than the vague defined instructions of phenomenology to the chief investigator and PhD candidate. In fact grounded theory does not rely on descriptive accounts compared to phenomenology and it is more flexible (Fendt and Sachs 2008). Secondly, the approach of constant

comparison, development of emerging themes followed by purposeful data generation for theoretical sampling as suggested by grounded theory.

Looking for specific data, for specific purposes appeared to be more promising to derive faithful results. "Theoretical sampling is the process of data collection [generation] for generating theory whereby the analyst jointly collects, codes, and analyses his data and decides what data to collect next and where to find them in order to develop his theory as it emerges" (Glaser 1978:36). In addition this is aligned with the overall research setting and the available pool of data sources, having numerous 'significant' individuals (interviewees) sharing their experiences of managing and working on global projects.

Results depicted during the pre-analysis of the pilot study exploring the effects and its interaction on global projects refined the research direction, while at the same time research objectives were further detailed. These results suggested on building up the emerging themes and further detail and verify them in proceeding interviewees till theoretical saturation is reached. The alignment between the findings of the data pre-analysis, a 'theory about ..' and the emerging research objective a theory of effects impacting global projects, suggested to apply grounded theory over phenomenology to this study. Grounded theory aims to answer the 'what' questions in the explorative theory development phase and the 'how' questions in the theory refinement phase (Morse and Richards 2002:36).

The 'delayed' decision on the most appropriate and suitable research method helped by taking considerations into account as highlighted above, which evolved during the study and were not anticipated prior to commencing the study. Consequently it would not have been possible to consider them by applying the 'traditional' approach of research method selection. In the same way the research objective further developed and the scope crystallized throughout the pilot study conduct, while simultaneously deriving first results for discussion and retrieving feedback.

A combination of phenomenology and grounded theory as suggested by Annells (2006) or Wilson and Hutchinson (1991) was considered. However limitations in terms of time and resources raised constraints of feasibility. In addition a multi-method approach would not ensure a higher accuracy and relevance of results.

In summary the strategy for delayed research method selection helped firstly to gain a profound understanding of grounded theory and phenomenology, their characteristics and applications prior to deciding on one method. "You will need to ensure that your methods of the data generation, and your research practice in general, enable you to adopt the appropriate forms of data analysis here." (Mason 2002:178). Unlike the 'traditional' approach, requirements of the study were taken into account and addressed by selecting grounded theory as the most appropriate research method. Secondly conducting a pilot study, including data generation and data pre-analysis provided insight to quality, representation and relevance of priori results. Trailing both research methods proves to be beneficial by experiencing the data generation and getting a feeling for the data, prospective results as well as the research setting. Moreover it allows to better argue and justify the selected research method given the gained experience with both in particular its suitability or unsuitability to this data set, respectively. Lastly the researcher gained time and flexibility to refine and further reduce the research scope as well as address stakeholder's requirements more appropriately without being limited by a pre-defined research method. In comparison to the 'traditional' approach, the proposed strategy for delayed research method selection allowed the researcher to get familiar with the research method at the same time as conducting the pilot study. The pilot study thereby allowed testing of the pre-selected research methods upon their appropriateness, while deriving the first results.

3.8 Associated benefits and further notes

The chief investigator was untrained in conducting interviews from an academic perspective while in his professional background he had deep experience coping with individuals and organizations in and from multiple and diverse cultural settings. Throughout the interview conduct he acquired further domain knowledge which was build up to improve his skills in interviewing such as how to interact with the interviewee or the different modes of interview conduct e.g. in-person, telephone or video and its appropriateness. These reasons are in-line with experience described in literature (e.g. Myers and Newman 2007). It could be argued that a more precise preparation and introduction to qualitative data generation would have been appropriate as described by the examples of Mason (2002). Howsoever

the benefits of generating data and gaining experience in qualitative interviewing outweigh even when there was a risk in generating data not useable for analysis. In addition generating data helped to better understand the field and gain subject matter expertise.

The utilization of computer-assisted qualitative data analysis software (CAQDAS) in this case the NVivo8 software provided invaluable assistance to capture, safe and compare data in comparison to the 'old-fashioned' and manual way of cards and post-its or multiple spreadsheets. This is due to the fact that both methods of phenomenology and grounded theory can be easily compared and contrasted. In addition, CAQDAS also allows multiple coders' ensuring intercoder reliability, which is another benefit. A potential imitation to be taken into account is the time required to familiarize with the CAQDAS package but this is also the case for manual approach.

4. Discussion of delayed research method selection

Time and delivery of results as well as rigor and relevance remain to be the core factors for research projects driven by stakeholders, supervisors and the engaged business. *"Ultimately, what you do must depend upon the way you have framed your research questions, the philosophical and methodological posture which they encapsulate, the way you have designed your project to support these, and the realities of the research process that you have pursued"* (Mason 2002:203). In contrast to the urgency of project completion, patience helps researchers to derive rigorous and potential relevant results in research. The proposed strategy for delayed research methods followed by data generation and pre-analysis of the pilot study, before subsequently selecting the most appropriate research method. This accommodates in particular the circumstances that research questions and objectives developed over time might even change in the initial phase of research projects. On the other hand the research setting solidifies and demands evolved during the conduct of a pilot study. At the same time, more rapid development of suitable questions and the engagement with the research partners, maintains their interest and commitment to the study.

Advantages of the proposed strategy for delayed research method selection are numerous. It guides the researcher, while the researcher at the same time explores capabilities of various research methods and their limitations during the research method pre-selection and the pilot study. In addition the strategy for delayed research method selection discloses unforeseen prospects for data analysis. Moreover even though not directly related to the research objective the strategy for delayed research method selection provides a continuous training for the researcher of comparing and contrasting various research methods, their application, limitations, obstacles and presentation of results. This is in comparison to the 'traditional' approach of a stringent and inflexible plan for execution, which might need to be revised later during the research conduct. Furthermore it allows adaptation to requirements by taking the collected data into account as well as unforeseen circumstances such as opposing findings evolving during the data analysis.

5. Conclusion

This paper suggests a strategy for delayed research method selection that intends to support researcher to identify and apply the most appropriate method for data analysis. The objective is thereby to derive faithful and relevant results from the data collected in a rigorous, repeatable and traceable manner. A reported case study shows this exemplary, although admittedly very brief. The strategy for delayed research method selection is suggested to be applied when choosing between similar research methods rather than opposing ones. It is anticipated that novice research, especially PhD, or research students in their initial stage, which often do not have a solid knowledge and background experience in multiple research methods as well as their selection will benefit from applying this strategy. Moreover this strategy is open-minded and not biased by any particular research methods based on previous experiences.

Philosophical positions are not detailed in this paper, however these will be taken into account in forthcoming work. In the same manner the selection of multiple research methods for data analysis and their potential combination of multiple paradigms (e.g. Lewis and Grimes 1999) will be considered in future work. The proposed strategy of delayed research method selection is expected to benefit multifaceted large scale research projects in their initial phase where different aspects need to be taken into account, or research which is combined differently on purpose to frame questions for later

analysis with multiple methods. Furthermore the proposed and innovative strategy is expected to be applicable to interdisciplinary sector across multiple applications in various fields of research.

References

- Annells, M. (2006) 'Triangulation of qualitative approaches: hermeneutical phenomenolgy and grounded theory', *Journal of Advanced Nursing*, Vol. 56, No. 1, pp. 55-61.
- Baker, C., Wuest, J. and Stern, P.N. (1992) 'Method slurring: the grounded theory / phenomenology example', *Journal of Advanced Nursing*, Vol. 17, pp. 1335-1360.
- Benbasat, I., Goldstein, D.K. and Mead, M. (1987) 'The Case Research Strategy in Studies of Information Systems', *MIS Quarterly*, Vol. 11, No. 3, pp. 369-388.
- Charmaz, K. (1995) 'Grounded Theory', in *Re-thinking methods in psychology*, eds Smith, J., Harre, R. and Langenhove, L., Sage Publications, London, UK, pp. 27-49.
- Charmaz, K. (2001) 'Grounded theory in the 21st century: Applications for advancing social justice studies', in *The American Tradition in Qualitative Research*, vol. 2, eds Denzin, N.K. and Lincoln, Y., Sage, London, pp. 244-285.
- Ehrich, L.C. (2005) 'Revisiting phenomenology: Its potential for management research', *Proceedings Challenges* or organisations in global markets, British Academy of Management Conference.
- Fendt, J. and Sachs, W. (2008) 'Grounded Theory in Management Research', Organizational Research Methods, Vol. 11, No. 33, pp. 430-455.
- Gibson, B., Gregory, J. and Robinson, P.G. (2005) 'The intersection between systems theory and grounded theory: The emergence of the grounded systems observer', *Qualitative Sociology Review*, Vol. 1, No. 2.
- Glaser, B.G. (1978) *Theoretical Sensitivity: Advances in the methodology of grounded theory*, Sociology Press, Mill Valley, CA, US.
- Glaser, B.G. (1992) *Emergence vs. Forcing: Basics of Grounded Theory Analysis*, Sociology Press, Mill Valley, CA, US.
- Glaser, B.G. and Strauss, A. (1967) *The discovery of grounded theory: Strategies for qualitative research*, Aldine Publishing Company, New York, US.
- Hammersley, M. (1999) 'Deconstruction the Qualitative-Quantitative Divide', in *Qualitative Research*, vol. 1, eds Brymann, A. and Burgess, R., Sage Publications, London, UK, pp. 70-83.
- Howard-Grenville, J.A. (2005) 'The persistence of flexible organizational routines: The role of agency and organizational context', *Organization Science*, Vol. 16, No. 6, p. 618.
- Klein, H.K. and Myers, M.D. (1999) A Set of Principles for Conducting and Evaluating Interpretive field Studies in Information Systems', *MIS Quarterly*, Vol. 23, No. 1, pp. 67-94.
- Kvale, S. (1996) InterViews: A introduction to qualitative research interviewing, Sage Publications, Thousand Oaks, CA, US.
- Leedy, P.D. and Ormrod, J.E. (2005) *Practical Research: Planning and Design*, 8th edn, Pearson Merrill Prentice Hall, Upper Saddle River, NJ, US.
- Lewis, M.W. and Grimes, A.J. (1999) 'Metatriangulation: Building theory from multiple paradigms', Academy of Management Review, Vol. 24, No. 4, pp. 672-690.
- Martin, P.Y. and Turner, B.A. (1986) 'Grounded Theory and Organizational Research', *The Journal of Applied Behavioural Science*, Vol. 22, No. 2, pp. 141-157.
- Mason, J. (2002) Qualitative researching, Sage Publications Ltd, Thousand Oaks, CA.
- Miles, M.B. and Hubermann, M.A. (1994) *Qualitative data analysis: an expanded sourcebook*, 2nd edn, Sage Publications, Thousand Oaks, CA, US.
- Morse, J.M. and Richards, L. (2002) *Readme first for a user's guide to qualitative research*, Sage Publications, Thousand Oaks, CA, US.
- Moustakes, C. (1994) Phenomenological Research Methods, Sage Publications, Thousand Oaks, CA, US.
- Myers, M.D. and Newman, M. (2007) 'The qualitative interview in IS research: Examining the craft', *Information and Organization*, Vol. 17, No. 1, pp. 2-26.
- Neuman, W.L. (1997) *Social Research Methods: Qualitative and Quanititative Approaches*, 3rd edn, Allyn & Bacon, Needham Heights, MA, US.
- Patton, M.Q. (2002) *Qualitative research and evaluation methods*, 3rd edn, Sage Publications, Thousand Oaks, CA, US.
- Robey, D. and Markus, M.L. (1998) 'Beyond rigor and relevance: producing consumable research about information systems', *Information Resources Management Journal*, Vol. 11, No. 1, pp. 7-15.
- Stern, P.N., Allen, L. and Moxley, P. (1982) 'The nurses as a grounded theorist history, processes, and uses', *Review Journal of Philosophy and Social Science*, Vol. 7, pp. 200-215.
- Suddaby, R. (2006) 'From the editors: What grounded theory is not', *Academy of Management Journal*, Vol. 49, No. 4, pp. 633-642.
- Tesch, R. (1990) Qualitative research: Analysis types and software tools, Falmer, New York, NY, US.
- Van Manen, M. (1997) Researching lived experience: Human science for an actin sensitive pedagogy, The Althouse Press, London, UK.
- Von Wright, J. (1979) 'On the limitations of human information processing (Ihmisen tiedonkasittelykyvyn rajoituksia)', *Academia Scientiarum Fennica, Vuosikirja Year Book*, pp. 163-171.
- Wilson, H.S. and Hutchinson, S.A. (1991) 'Triangulation of Qualitative Methods: Heideggerian Hermeneutics and Grounded Theory', *Qualitative Health Research*, Vol. 1, No. 2, pp. 263-276.

Electronic Journal of Business Research Methods Volume 9 Issue 1 2011

Wilson, T.D. (2002) 'Alfred Schulz, Phenomenology and Research Methododlogy for Information Behaviour Research', in Fourth International Conference on Information Seeking in Context, Lisbon, Portugal.

Wimpenny, P. and Gass, J. (2000) 'Interviewing in phenomenology and grounded theory: is there a difference?', *Journal of Advanced Nursing*, Vol. 31, No. 6, pp. 1485-1492.
 Wynekoop, J.L. and Russo, N.L. (1997) 'Studying Systems Development Methodologies: An Examination of Research Methods', *Information Systems Journal*, Vol. 7, No. 1, pp. 47-66.
 Vin B. (2002) Cone Study: Descents: Descents and Methods. 2014. In Context, Elsbord, Political Context, Elsbord, Political Context, Elsbord, Political Context, Political Context, Elsbord, Political Context, Elsbord, Political Context, Elsbord, Political Context, Political Context, Elsbord, Political Context, Political Context,

Yin, R.K. (2003) Case Study Research: Design and Methods, 3rd edn, Sage Publications, Thousand Oaks, CA, ÙS.

Counting on an Iterative Process: Initial Lessons from the Research Assessment Exercise 2008

Deborah Knowles and Elisabeth Michielsens Westminster Business School, University of Westminster, London, UK

d.s.knowles@wmin.ac.uk michiee@wmin.ac.uk

Abstract: The aim of this paper is to present the early stages of a critical analysis of the Research Assessment Exercise (RAE) 2008 which is intended to generate a model that can be of practical use in the Research Excellence Framework 2013. By drilling down into the research outputs available on the RAE 2008 website we intend to compare the context and methodologies used in more and less successful submissions. We show how an on-going study may generate results that are useful in progressing towards both discovering answers to the Research Questions and refining of the methods used. '. The results of the RAE 2008 in the field of Business and Management may have been disappointing for a number of institutions. However, the feedback in the form of the RAE ratings is difficult to use in making improvements to performance. This paper uses Westminster Business School (WBS) a post-1992 business school, as an example, and focuses on the Research Output aspect of the RAE ratings. It shows how a comparison of a sample of submitted outputs from this business school and those of two more successful institutions is a relevant exercise which reveals some useful areas for improvement and is worth re-focusing to provide more constructive feedback. Following a precursory literature review which sets the scene of differing but often not-quite-understood statuses of the qualitative and quantitative paradigms, initial findings suggest that the RAE outputs submitted by these three business schools vary substantially in terms of indicators of prestige and features such as topic area, journal rankings and citations; indicators of resources and professional network such as number of different topics, authors and location of authors; and indicators of methodology and method. The analysis takes into account the requirements of the 2013 Research Excellence Framework (REF) in order to progress. In this way the results of the RAE may be used to assist in institutional preparations for the REF.

Keywords: RAE 2008, REF 2013, research methods, qualitative, quantitative, research outcomes, iterative process

1. Introduction

We may 'all know the Research Assessment Exercise (RAE), but it is far from true that we all 'love' it (Oppenheim, 1996). The RAE 2008 was intended to create a ranking of institutions according to quality of research activity as a basis for the determination of research grants from the HE funding bodies (RAE, undated). The results in the field of Business and Management Studies may have been disappointing for a number of institutions.

The ratings themselves form a type of feedback, especially by ranking the institutions in comparison with each other. However, this feedback is difficult to use in making improvements to performance as there is no indication as to the direction of renewed effort.

The ratings in the areas of Research Outputs, Research Environment, and Esteem Indicators graded business schools according to published criteria requiring 'originality, significance and rigour' at 'world-leading' (4*), 'internationally excellent' (3*), 'recognized internationally' (2*) and recognized nationally' (1*) levels (Ghobadian, 2009; RAE, undated; Seale, 1999).

'Originality' requires the innovation or distinctiveness of: the methodological approach, the datasets used, the research questions posed and the underlying theoretical framework.

'Significance' includes the insight and scope of coverage of the work, the impact on the discipline in the UK or internationally, the extent to which it has opened up new areas of research and current or potential impact on policy and practice.

'Rigour' involves the contextualisation of the work, the strength, appropriateness and intellectual coherence and the extent to which the research outcomes are supported (Ghobadian, 2009).

This on-going study 'drills down' into material available on the RAE 2008 website in order critically to evaluate the salient features of the more successful business schools. We intend to generate a model that can be of practical use in the RAE's successor, the Research Excellence Framework (REF)

ISSN 1477-7029 Reference this paper as:

©Academic Conferences Ltd

Knowles, D and Michielsens, E. "Counting on an Iterative Process: Initial Lessons from the Research Assessment Exercise 2008" *The Electronic Journal of Business Research Methods Volume 9 Issue 1 2011 (pp 47-56), available online at www.ejbrm.com*

Electronic Journal of Business Research Methods Volume 9 Issue 1 2011

2013. This is an area that has received little attention in the academic literature on Research Methods in Business and Management; however, it is important to investigate and analyse the peer evaluation of scholarly endeavours. For this paper we have focussed on the outputs of the research from the perspective of research methodology: the paradigms which seem to be in opposition and the methods employed. We demonstrate the iterative character of our project in terms of the theoretical base and also the sample chosen.

Assessing the quality of research publications is clearly a contentious activity; even the search for judgement criteria is seen as 'controversial' (Seale, 1999). The problem is magnified by the existence of the two seemingly monolithic paradigms. The positivist approach, as we know, favours quantitative methods which are able to 'prove' results by counting responses (often large numbers of them) and performing mathematical feats to demonstrate correlations; the newer interpretivist, or phenomenological, qualitative tradition, on the other hand, prefers to delve behind the figures (often very few of them, even a sample of one only) to discover the reasoning behind behaviours and attitudes.

The battle over what constitutes the best research wages on a field where the definition of 'best' is not agreed. An extreme personal experience illustrates this contest in unusually concrete terms. One of the writers of this paper witnessed a scene at an international conference (not the ECRM) three years ago in which a keynote speaker giving an address on qualitative methods was booed and shouted down by a group (manifestly identifying themselves as) of quantitative researchers.

This paper continues with the following structure. After reviewing the literature in the field of quality in Research Methods and discussing the method for this study, it will use Westminster Business School, a post-1992 institution, as an example, and focus on the Research Output aspect of the RAE ratings. It will use material available on the RAE website to begin to analyse submitted outputs from this business school and those of a comparator (post-1992) institution which was more successful in the RAE and a very successful business school, in order to discover the characteristics of papers submitted by those who were more successful in the RAE 2008 and the differences between theirs and those of WBS. The analysis will take into account the requirements of the 2013 REF in order to progress. In this way the results of the RAE 2008 may be used to assist in institutional preparations for the REF.

2. Literature review

The valuing of research from the two traditions must begin with an agreement on what constitutes good quality research and how this 'good quality' may be termed. The research methods lexicon is stretched in several directions at once as Leech (2007) advocates 'scientific' research as a measure of quality although she is critical of an environment in which grant awarding bodies prefer quantitative studies over qualitative, offering the former 'money, prestige and distinction'. Seale (1999), however, regards 'quantitative' and 'scientific' as synonymous. Since the sciences in which quantitative methods originated are often regarded as the producers of objective 'truth' and the 'crowning achievements of Western Civilization' (Carey, 1989:99, cited by Denzin and Lincoln, 1998:7), qualitative researchers may well feel, as Leech (2007) says, 'left out'. Leech refers to the emotion felt by qualitative researchers saying that (contrary to the experience described above) they are the ones who exhibit anger and use 'unnecessarily provocative language'.

Both qualitative and quantitative methodologies receive criticism. Quantitative methods are said to be 'too narrow and limiting' (Cavanagh and Reynolds, 2005) as well as a long list of derogatory epithets including 'oppressive', 'arrogant', dull-minded' and 'so-called evidence-based' quoted by Smagorinsky (2007). While 'in a world where numbers talk', qualitative research is said to lack reliability and to deal in anecdotalism (Silverman, 2006). Seale (1999) considers the contrast between the two paradigms as 'overdrawn' and promoted by qualitative researchers concerned to 'emphasise difference'. As we have seen, however, it is not only qualitative researchers who want to promote their own cause.

Validity and reliability are generally considered to be features of creditable research. However, whilst these are accepted as 'important criteria' in quantitative research (Bryman and Bell, 2007:410), they are less easily achieved in qualitative research. This difference is explained as quantitative researchers are able to agree on what constitutes validity and reliability whereas qualitative researchers have faced challenges in reaching consensus. They are apparently keen to convince research funding bodies of the value of their work whilst at the same time valuing 'creativity ' and 'a

freedom of spirit' <u>and</u> distancing themselves from the positivist tradition (Seale, 1999:467). The multiplicity of approaches in qualitative research makes it more difficult to communicate its value to external bodies and to new researchers, and makes it harder to define criteria for assessment. For Lawler (1999) the over-riding elements of a good quality study are its usefulness for practice and its contribution to theory-appropriate knowledge. The REF will use the criterion of social and economic impact related to policy generation. This revised direction is contested; mainly it must be said by academics in fields other than Business and Management (see e.g. Newman, 2010); researchers within this field may be more able than most to address the requirement to inform policy.

Norris and Oppenheim (2003) confirmed previous research in finding a high correlation between results in the RAE 2001 and citation impact. This may, however, be a spurious and iniquitous measure as Oppenheim himself had noted seven years earlier that previous research may be cited for a number of often contradictory reasons, including 'to criticise' it. An incorrect or contentious publication, in that case, probably has an equal or even better chance of citation as one that has otherwise all the features of good quality research. Some cited works, which Oppenheim (1996:156) terms 'false drops' may not even be related to a subject. The majority of works are never cited, others (10-30% according to Oppenheim) are cited only by their own authors. On the other hand, authors of classic works (such as Einstein and Alzheimer) are rarely cited as they reach Oppenheim's Nirvana of 'citation oblivion' (Oppenheim, 1996:158). Oppenheim's caveats notwithstanding, the REF 2013 will use bibliometrics (citation impact) as one of its criteria (HEFCE, 2009). Cassell et al (2003; 2006) suggest that both quality of research and a bias in the external research community are important in this argument. Their research confirms weaknesses in qualitative research methods training as well as problems with the perception and assessment of qualitative research by key players in the research domain such as journal editors and funding bodies. They argue for "contingent criteria to assess the value of different qualitative contributions by appropriate assessments". At the moment, quantitative data is seen as inherently more reliable and objective. Lee et al (2006) also conclude from findings from the 2001 RAE for Finance and Accounting that the RAE encourages quantitative research at the expense of qualitative research.

In some disciplines the discussion of assessment criteria is more prominent than others: for health and medical research for instance Daly et al (2007) propose a hierarchy of evidence to assess qualitative research. These criteria are "based on the central methodological task of the qualitative researcher: defining a theoretical framework for the study, specifying a sampling process, describing the methods of data collection and analysis, and drawing research conclusions". However, the hierarchy proposed which goes from a single case study at the lowest level to descriptive studies, to conceptual studies, to 'generalisable studies in which sampling is focused by theory and the literature, extended as a result of analysis to capture diversity of experience.' at the top, may still be judging based on the more traditional quantitative criteria. However, not all are convinced that determining a unified set of assessment criteria for qualitative research is possible and would give a solution (see e.g. Dixon-Woods et al, 2007).:

3. Research questions

This stage of the study addresses the following questions in order to compare research outputs according to 'originality, significance and rigour' (ABS, undated):

- How do the outputs of WBS submitted to the RAE 2008 Unit of Assessment (UoA) 36, Business and Management Studies differ from those of higher ranked business schools in terms of methodology, research techniques employed and subject matter?
- How do these RAE outputs of WBS differ from those of higher ranking business schools in terms of journal rating and citation impact?
- How do these RAE outputs of WBS differ from those of higher ranking business schools in terms of authorship?

4. Method

As the outputs submitted for the RAE exercise are accessible through the RAE website, we are able to read them to assess differences between them. To improve understanding of what kind of research and outputs WBS should be aiming at producing for the REF 2013 to raise its rating over that achieved in 2008, a sample of its own outputs in the Unit of Assessment 36 - Business and Management Studies - is compared in this first wave of the analysis with samples of those of two

other UK business schools. The selection criteria used for the institutions were that one of the business schools should be, like WBS, a post-1992 institution and above WBS in the rankings and the other should be at the top of the rankings. The rationale for this method is that both low-level and high-level improvements may be identified. One limitation of this method, which we fully recognise, is that although all the outputs are provided there is no way of knowing exactly at which level any individual publication was judged. Therefore we are aggregating features of the outputs of each university in order to form a view of overall tendencies. For this paper we compare outputs from London Business School (LBS), the top business school in research output ranking, Westminster Business School (WBS), which is ranked near the bottom of the top 35% of the rankings and Kingston University, which is ranked in the middle between LBS and WBS and is also the top-ranking post-1992 business school. Below (Table 1) is the list of universities ranked within the first 35% by research outcomes in the Business and Management field. A second limitation of the method, which will be addressed as the study progresses, is that in drilling down into the data available on LBS, it becomes apparent that this institution is less appropriate as a comparator for WBS - even as an aspirational one - as its output topic areas, interests and priorities are vastly different from those of WBS. Nonetheless, for the current paper, we continue with the analysis using the LBS data in order to demonstrate the iterative process of the study.

The sample of outputs has been compiled 'randomly' by downloading them in the alphabetical order of the target author at each institution. The samples consist of 50 of the 90 outputs submitted by WBS, 51 of the 310 outputs submitted by LBS and 27 of the 81 submitted by Kingston University. Universities were ranked by GPA in terms of research outputs between 1 and 4, using percentages published at each RAE star level (we did not include 'unclassified'). That is to say, a university with the following profile: papers at 4* (40%), 3* (30%), 2*(20%) and 1* (10%) will have an GPA (grade point average) of (4x0.40)+(3x0.30)+(2x0.20)+(0.10)=3. A GPA of 4 would indicate a perfect score of exclusively 4* submitted work.

London Business School	3.19	University of Birmingham	2.64	Heriot-Watt University	2.35
Imperial College London	3.09	Aston University	2.61	University of Brighton	2.35
University of Oxford	2.84	University of Leicester	2.6	University of Hertfordshire	2.35
University of Cambridge	2.83	University of York	2.59	Open University	2.32
London School of Economics and Political Science	2.81	University of Manchester	2.57	De Montfort University	2.31
King's College London	2.8	City University, London	2.54	University of Ulster	2.31
Cardiff University	2.8	University of Reading	2.53	University of Glasgow	2.31
Cranfield University	2.78	Kingston University	2.53	Manchester Metropolitan University	2.31
University of Bath	2.77	Queen's University Belfast	2.52	School of Oriental and African Studies	2.31
University of Leeds	2.76	University of Bradford	2.5	Middlesex University	2.3
University of Warwick	2.74	University of Liverpool	2.49	University of Bristol	2.27
University of Exeter	2.73	University of Surrey	2.48	University of the West of England, Bristol	2.21
Lancaster University	2.72	University of Southampton	2.48	Nottingham Trent University	2.19
University of St Andrews	2.7	University of Newcastle upon Tyne	2.48	Robert Gordon University	2.18
Royal Holloway, University of London	2.7	University of Kent	2.47	Glasgow Caledonian University	2.17
University of Strathclyde	2.68	University of Aberdeen	2.45	University of Westminster	2.17
Queen Mary, University of London	2.68	Swansea University	2.45	Oxford Brookes University	2.13
University of Durham	2.67	Birkbeck College	2.43	Brunel University	2.12
Loughborough University	2.66	Keele University	2.41	University of Plymouth	2.12
University of Sheffield	2.66	University of East Anglia	2.36	University of Stirling	2.12
University of Nottingham	2.64	University of Edinburgh	2.36	University of Hull	2.09
-				-	

 Table 1: GPA research outputs RAE 2008 for the top 35% in unit of assessment 36, business and management studies

Source: RAE 2008

5. Presentation and discussion of interim findings

The preliminary findings indicate that the submissions of LBS, Kingston and WBS vary dramatically on indicators of prestige, subject, resources and professional network, method and methodology. We will discuss these in the sub-sections below.

5.1 Indicators of prestige and subject

As indicators of prestige we have included the currently available 2010 ABS journal ranking of the sample of submitted papers (Table 2) and the number of citations (seen via the Google Scholar search engine in February 2010) (Table 3) for each submission. Table 2 shows that 73% of the LBS sample were published in 4* journals, compared to only 26% and 8% in the other two institutions: most of WBS's and Kingston's publications were in 3* and 2* journals. These are findings that we can intuitively expect; they show that the RAE judgments and the ABS ratings are in line with each other.

	WBS	Kingston	LBS
4 star	8%	26%	73%
3 star	38%	41%	14%
2 star	36%	26%	4%
1 star	6%	7%	0%
No information/rating	12%	4%	10%
Total	100%	100%	100%
absolute numbers:	50	27	51

Table 2: ABS star rating of submitted papers (in percentage)

Source: RAE 2008

The number of citations also varies considerably. While the WBS and Kingston samples have few or no outputs which are cited more than 50 times by other publications, a considerable percentage (43%) of LBS's sample publications are cited at this level. This might especially impact on the quality criteria of *originality* and *significance*.

Table 3	: Citation	impact per	⁻ submitted	output	(in percentage)
		mpace poi	000111111000	output	

	WBS	Kingston	LBS
10 or fewer citations	70%	51%	13%
11-25	14%	19%	30%
26-50	12%	30%	13%
51-100	4%	0%	10%
101-250	0%	0%	13%
251-500	0%	0%	8%
more than 500	0%	0%	3%
no info	0%	0%	10%
Total	100%	100%	100%
Absolute numbers:	50	27	51

Source: RAE 2008

The prestige and citations might link with the topic area of the publications, as the number of 4^* and 3^* journals differs significantly per subject area. In Table 4 below we give an overview of the number of 4^* and 3^* journals per ABS subject area.

Looking at 4* journals only, economics has 17 journals ranked 4*, while finance has four. In 3* economics has 48 journals listed, with finance having 25. Other disciplines have far fewer journals listed in these categories: in Operational Research for instance only one journal is ranked 4* and there are no 4* journals listed at all in Business Law. However, we cannot assume that fewer 4* journals make it more difficult to publish at that level. It is relative, and will also depend on the size of the global research community working in that area.

5.2 Indicators of resources and professional network

As indicators of resources available we have included the percentage of papers submitted in one subject area, the number of authors per submitted paper, and if the authors are from the same university.

Table 4 shows the topic area for the sampled papers. The topic areas are taken from the ABS subject list. The papers in the LBS sample are firmly focused around two main themes: Economics and Finance, with OrganiZation Studies at second level. Only 8% of these submissions are classified as 'other' i.e. in an ABS topic where it was the only submission in the whole sample. The submissions in both the WBS and the Kingston samples on the other hand are more varied, with the most submissions outside finance and economics: their profiles focus on HRM and social science (WBS) and organisation and operational research areas (Kingston). Nearly 1 in 5 Kingston submissions are in the 'other' category meaning the only submission under a subject area, whereas WBS, like LBS, has only 8% of the outputs in 'other' areas. WBS has a number of areas of study (Business Law, Ethics, Information Management and Public Sector) in which there is only one submitting author, whereas LBS and Kingston have almost none of these.

Table	4:	Number	of 4	4* a	and	3*	journals	per	subject	area	(absolute	number)	+	Subject	area	of
		submitted	d pap	pers	s by	uni	versity (p	erce	entage)							

	Total number of 4* journals by subject	Total number of 3* journals by subject			
AREA	(ABS)	(ABS)	WBS	Kingston	LBS
	, , , , , , , , , , , , , , , , , , ,				
(ABS areas)			percentage	percentage	percentage
Accounting	5 journals	14 journals	0%	0%	2%
Business Ethics	0 journals	3 journals	4%	0%	0%
Business Law	1 journal	5 journals	6%	0%	0.5%
Economics	17 journals	48 journals	10%	7%	22%
Enterprise and SME	2 journals	4 journals	2%	4%	0%
Finance	4 journals	25 journals	2%	0%	33%
General management	7 journals	9 journals	2%	4%	6%
HRM-Employment	6 journals	9 journals	18%	7%	0%
Info Management	4 journals	24 journals	4%	0%	0%
Marketing	6 journals	12 journals	4%	0%	4%
Operational	1 journal	21 journals	10%	19%	2%
Org & Mgt science	5 journals	15 journals	0%	0%	4%
Organization Studies	6 journals	4 journals	2%	15%	10%
Public Sector	3 journals	10 journals	4%	0%	0%
Social Science	18 journals	25 journals	14%	0%	0%
Other	Diverse number	Diverse numbers	8%	19%	8%
Not on list			8%	0 %	8%
Total			100%	100%	100%
Absolute numbers:			50	27	51

Sources: ABS, 2010; RAE, 2008

An intriguing issue seen here is that LBS's very successful subject areas of Economics and Finance are the fields of study of two separate RAE Units of Assessment: UoA 34 Economics and Econometrics (in which Kingston submitted, but LBS and WBS did not) and UoA 35 Accounting and Finance (in which none of these three business schools submitted) (RAE, undated). It is here that LBS parts company with WBS and Kingston in terms of its suitability as a comparator.

We argue that the concentration of subject areas can be seen as an indicator of support and resources and might indicate the existence of a subject specific research community which can support and peer-review publications. An institutional research profile which consists of a wide diversity of subject areas seems to suggest that researchers there might lack subject-informed support and professional critique as part of their professional development.

The same argument applies to the number of authors (Table 5). Submissions by two or three authors from the same institution suggest a research community centring on similar themes, which can provide support and critique. It might also indicate the size of the project: larger and longer research briefs are more likely to be taken on by teams, resulting in joint publications. Sole- authored papers might indicate less support in and/or outside one's own institution, sole researchers working on smaller studies in a vacuum. We intend to investigate this further.

The universities under discussion here vary on this indicator: the sample of the successful LBS scarcely includes any sole-authored papers, while this type comprises nearly one in three of WBS's sample. This would substantiate our argument of lack of support through joint authorship. The universities also vary on the indicator of whether the authors were at the same university (Table 6). LBS's co-authors mostly come from different institutions, suggesting that they are part of a national or international professional network which can provide support and resources (use of datasets, partnerships in funded research for instance). The two other institutions' researchers demonstrate fewer indications of a professional network outside their own institution.

	WBS	Kingston	LBS
1 author	30%	19%	6%
2 authors	34%	44%	65%
3 authors	26%	44%	24%
4 or more authors	10%	4%	8%
Total	100%	100%	100%
Absolute numbers:	50	27	51

Table 5: Number of authors per output (percentage)

Source: RAE 2008

Table 6: Are the joint authors from the same university? (percentage)

	WBS	Kingston	LBS
yes	50%	48%	11%
no	38%	44%	68%
do not know	12%	7%	21%
Total	100%	100%	100%
Absolute numbers:	50	27	51

Source: RAE 2008

5.3 Indicators of methodology and method

In Table 7, we give an overview of the methodology of the sample of submitted papers. The methodology will be linked to the subject area of the submissions: we assume that finance and economics will have a larger proportion of quantitative methodology associated.

What the preliminary Table shows us is that methodology for the RAE 2008 does seem to 'count' at first glance: as this sample shows an extremely high prevalence of quantitative articles from LBS: 82%. (As we have seen, this university's sample includes 55% in the finance and economics fields.) This goes down to one in two submissions for Kingston and just over one in three submissions for WBS. Tellingly, LBS has no qualitative focused papers in our sample; other submissions were mixed in methodology (both qualitative and quantitative) but with the quantitative element the main focus of the submitted paper.

The submissions in the Kingston and (especially) WBS samples are much more diverse; indicating that variety for this exercise might not be a good thing at all. Several of the papers did not really classify as a quantitative or qualitative methodology, but were instead more an overview of 'state of the art' knowledge in a field (Literature focus) or another type of narrative focusing less overtly on the literature and more on discussion.

	WBS	Kingston	LBS
quantitative	58%	52%	82%
qualitative	12%	33%	0%
mixed	6%	4%	18%
Literature focus	12%	7%	0%
narrative	8%	4%	0%
no info	4%	0%	0%
Total	100%	100%	100%
Absolute numbers:	50	27	17

Table 7: Main methodology of outputs (percentages)

Source: RAE 2008

The information on sources of data indicates whether the sampled outputs are based on primary, secondary data or theory based work (Table 8). Primary data research is very popular in the Kingston sample, whereas the WBS sample includes work based on primary and secondary data to an equal extent. There is an interesting prevalence of theory based work at LBS: more than one in three articles in our sample.

Table 9 illustrates the research techniques used; it shows the importance of theory-based quantitative papers in the LBS sample. Theory based work is the focus of the 4* journals in finance and economics, empirical work comes in second place. Kingston and WBS have a completely different research methods profile. No theoretical work is seen in these samples. Qualitative techniques such as interviews, focus groups (reported under qualitative mixed) and case studies are the most common techniques used. At WBS, the survey technique forms the basis of half the papers in the sample, either through secondary or primary analysis. In the WBS and Kingston samples the literature review or narrative features; quantitative research is present, but to a much smaller extent than in LBS.

Table 8: Sources of data in outputs (percentage)

	WBS	Kingston	LBS
primary data	40%	63%	19%
secondary data	42%	26%	25%
no data	16%	11%	38%
do not know	2%	0%	18%
Total	100%	100%	100%
Absolute numbers:	50	27	51

Source: RAE 2008

	14/20		1.50
	WBS	Kingston	LBS
case study - interviews	0%	35%	0%
case study- mixed qualitative methods	0%	4%	0%
	WBS	Kingston	LBS
Interviews only	4%	4%	0%
survey and interviews	10%	12%	0%
survey	12%	0%	0%
mixed qualitative	4%	8%	0%
mixed quantitative	4%	4%	25%
quantitative: secondary data	36%	0%	0%
quantitative: empirical	0%	19%	0%
quantitative: theory based	0%	0%	42%
narrative-literature review	16%	12%	8%
experiment	6%	0%	8%
mixed quantitative and qualitative	4%	0%	17%
no info	4%	4%	0%
Total	100%	100%	100%
absolute numbers	50	26	12

Tabla		a a rah t	h - i - · · - ·			(noreceters	`
I able	9. Res	earchite	echnique	s usea in	oulpuls	(percentage)

Source: RAE 2008

6. Preliminary conclusions

Preliminary findings suggest that the RAE outputs sampled from the three business schools vary substantially in terms of topic area, indicators of prestige such as journal rankings and citations; indicators of resources and professional networks such as authorship; and indicators of methodology and method. The outputs of the most successful institution are more linked to the subjects of economics and finance with little activity in other areas. They are typically written by more than one author and focus on quantitative methodology, either empirically or theory based.

What does that mean for WBS and the next REF 2013? As these findings are preliminary, WBS needs to proceed with caution in acting on them at present. However, it is already becoming clear that they need to consider more traditional methods, especially within the quantitative paradigm. This may mean that subject areas that do not usually identify with quantitative techniques may need to try them, perhaps after focused training. The inclusion of bibliometrics (citation impact) is already established for the REF. WBS scored very low on this aspect in 2008. Its researchers will need to focus on the need to produce outputs that are not only of high quality but also of the necessary relevance to their peers.

This paper traces an early stage in literature review, sample selection and analysis which reveals both the relevance of the study and the need to re-focus with regard to the sample and the data emphasis. The literature review will also be increased in scope to include the discussion of methodology within the broader issues of academic research practice. Analysis is still to be done on linking the areas explored: for example, are the outputs with most authors also the most sophisticated in terms of methods and findings and are they the most highly cited?

In seeking recommendations leading to an improvement in WBS's performance in the REF, it is clear that although we have gained some insight into the differences between this institution's RAE 2008 outputs and those of better performing business schools, the future development of the project should focus more strongly on the comparability of institutions' subject areas in order to increase the relevance of differences in research methodologies.

Acknowledgements

We are grateful to the twenty or so delegates at the 9th European Conference on Research Methodology for Business and Management Studies who attended our presentation on the last afternoon of the event for their insightful comments.

References

- ABS (2009) Journal Ratings, available at http://www.the-abs.org.uk/files//abs_web_subject.pdf, [last viewed 28.02.2010].
- Bryman, A. and Bell, E. (2007) Business Research Methods (2nd Edition), Oxford, Oxford University Press.
- Cassell, C., Symon, G. and Johnson, P. (2003), "Benchmarking Qualitative Research Methods in Management", ESRC-funded project H333250006.
- Cassell, C., Symon, G., Buehring, A. and Johnson, P. (2006), "The Role and Status of Qualitative Methods in Management Research: an Empirical Account", *Management Decision*, Vol. 44 No. 2, pp. 290-303.
- Cavanagh, R. and Reynolds, P. (2005) 'Ensuring Quality of Method in Quantitative Educational Research', Paper presented at the Australian Association for Research in Education 2005, Focus Conference, Cairns.
- Collingridge, DS, Gantt, E E (2008) <u>The Quality of Qualitative research</u>, *American Journal of Medical Quality*, Vol. 23, No. 5, 389-395.
- Daly, J, Willis, K, Small, R, Green, J, Welch, N, Kealy, M and Hughes, E (2007) 'A Hierarchy of Evidence for Assessing Qualitative Health Research', *Journal of Clinical Epidemiology, Vol 60*
- Dixon-Woods, M, Booth, A and Sutton, *A.J. (2007)* 'Synthesizing Qualitative Research: a Review of Published Reports' Qualitative Research, vol. 7(3) 375–422, SAGE Publications
- Ghobadian, A (2009) RAE 2008 Lessons for Individuals the unit of Assessment, Presentation at Westminster Business School, 04.11.2009.

HEFCE (2009) Research – REF – Bibliometrics, last updated 23.09.2009, available at: http://www.hefce.ac.uk/research/ref/Biblio/

- Lawler III, E.E. (1999) 'Challenging Traditional Research Assumptions' In Lawler III, E.E., Morman Jr, A.M., Mohrman, S., Ledford Jr, G.E., Cummings, T.G. and Associates (1999) *Doing Research that is Useful for Theory and Practice*, Oxford, Lexington, pp. 1-17.
- Lee, B (2006) The "Qualitative Inquiry in the Business and Management Field" symposium at the Second International Congress of Qualitative Inquiry, *Qualitative Research in Organizations and Management: An International Journal*, vol 1, issue 2

Leech, N. (2007) 'Research and the "Inner Circle": The Need to Set Aside Counterproductive Language', *Educational Researcher*, Vol. 36, No. 4, pp. 200-2.

Newman, M. (2010) 'Delay of up to two years planned to get to grips with impact measure', *Times Higher Education*, 14.01.2010, available at

http://www.timeshighereducation.co.uk/story.asp?sectioncode=26&storycode=409991&c=2 [last viewed 28.02.2010].

- Norris, M. and Oppenheim, C. (2003) 'Citation Counts and the Research Assessment Exercise V: Archaeology and the 2001 RAE', *Journal of Documentation*, Vol. 59, No. 6. pp. 709-30.
- Oppenheim, C. (1996) 'Do Citations Count? Citation Indexing and the Research Assessment Exercise', Paper presented at the 19th Annual UKSG Conference, Keele, April 1996.
- Pratt, M.G. (2008) Qualitative Research in Top-Tier North American Journals Fitting Oval Pegs Into Round Holes: Tensions in Evaluating and Publishing, *Organizational Research Methods* 2008; 11; 481
- RAE (undated) http://www.rae.ac.uk [last viewed 28.02.2010]
- Seale, C. (1999) 'Quality in Qualitative Research', *Qualitative Enquiry*, 5, pp 465-478. Silverman, (2006) 'What is Qualitative research?' available at URL: http://www.uk.sagepub.com/upm
 - data/11254_Silverman_02_pdf , [last viewed 25.02.2010]
- Smagorinsky, P. (2007) 'A Thick Description of Thick Description', *Educational Researcher*, Vol. 36, No. 4, pp. 199-200.

The use of the Case Study Method in Theory Testing: The Example of Steel eMarketplaces

Jessica Claudia Iacono, Ann Brown and Clive Holtham Cass Business School, London, UK

J.C.lacono@city.ac.uk A.P.Brown@city.ac.uk C.W.Holtham@city.ac.uk

Abstract: Many of the research questions of interest to IS academics and practitioners concern the success or failure of change initiatives involving the introduction of new systems and practices, when the phenomenon interacts with the context, and the focus is on organisational rather than technical issues. These are exactly the types of research questions for which a case study method is well suited. This paper assesses the use of the case study method to test hypotheses and build theory while investigating the phenomenon of steel e-marketplaces. The paper draws upon the lead author's experience when working on her doctoral thesis '*Factors Affecting the Viability of Electronic Marketplaces: an Empirical Investigation into International Steel Trading*'. Although the case research strategy has mostly been utilised for exploration and hypothesis generation, the case method is appropriate to all phases of research. In this study the research objectives were identified as theory description and theory testing, and the case strategy was used to describe and test the hypotheses. The lead author undertakes a cross-case analysis of multiple IT-powered initiatives in order to develop theoretical propositions to be tested through subsequent research. This paper discusses how issues and concerns inherent in this method were dealt with, and assesses the quality of the findings.

Keywords: case study research, positivist research, building theory from case studies

1. Introduction

Many of the research questions of interest to IS academics and practitioners concern the success or failure of change initiatives involving the introduction of new systems and practices, when the Information System interacts with the people using it, and the focus is on organisational rather than technical issues. These are exactly the types of research questions for which a case study method is well suited.

For Yin (1994) 'A case study is an empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident.'. In the case study attention is paid to contextual conditions, the focus is on contemporary events, and the experience of the actors is important.

The case study method is flexible, producing diverse research outcomes (Darke et al, 1998), and supporting all types of philosophical paradigms. Case studies can be exploratory, descriptive or explanatory (Yin, 1994). They can be used to generate and/or test theory within the positivist paradigm (Eisenhardt, 1989; Lee, 1989; Lee and Baskerville, 2003). They can be intrinsic, instrumental (providing insight into an issue or situation of concern) or collective - based on more than one site (Stake, 2000). They can be used to provide a rich description of social phenomena, generating knowledge of the particular within the interpretivist paradigm (Walsham, 1993; Macpherson et al, 2000).

This paper draws upon the lead author's experience of using the case study method when working on her doctoral thesis '*Factors Affecting the Viability of Electronic Marketplaces: an Empirical Investigation into International Steel Trading*'. The research project is set against the background of the steel trading industry, in which the steel is bought and sold globally, and has to be transported physically. The phenomenon being investigated is the failed attempts between 1998 and 2000 at establishing electronic marketplaces to handle this trade. Economic theory and academic research predicted that electronic marketplaces would displace traditional intermediaries, the steel trading companies. These predictions failed to materialise. Hence, the research project initially focused on the questions - Why did these marketplaces fail? Under what conditions might they work? It later evolved into the revision of the existing theory and the testing of a revised theory. This paper reports on how the case method was used to build and test theory. The aim of the paper is to discuss how issues and concerns inherent in this method were dealt with, and to assess the quality of the findings.

ISSN 1477-7029

©Academic Conferences Ltd

Reference this paper as: Iacono, J, C, Brown, A and Holtham, C. "The use of the Case Study Method in Theory Testing: The Example of Steel eMarketplaces" *The Electronic Journal of Business Research Methods Volume 9 Issue 1 2011 (pp 57-65), available online at www.ejbrm.com* The next section explains the rationale behind the choice of the method. Section three discusses how the case method can be used to test hypotheses and build theory within the positivist paradigm. The following section introduces the research project and discusses the research design, the data collection techniques, the data exposition and analysis. Section five evaluates the research process and the quality of the results.

2. Rationale behind the choice of the case method

Economic theory and academic research predicted that the advent of electronic marketplaces would revolutionise current business practice and lead to the disintermediation of the middleman (the Electronic Market Hypothesis – 'EMH'). The lead author's doctoral thesis looked for evidence in support of the EMH in the steel industry, where it was also predicted that electronic markets would replace the middleman, the steel trading companies. Many trading platforms sprang up between 1998 and 2000; however, none prospered. The research started with an in depth case of one failed attempt at launching an electronic marketplace (pilot case), and added more cases investigating different approaches to the same business problem.

The cases presented in the study conform to Yin's definition. They all investigate a contemporary phenomenon in a real-life setting, and the focus is on organisational and managerial (rather than technical) issues (Myers, 2003). These are precisely the issues identified as best suited to case study research. The experiences of the agents are critical, and intelligible only within the social and cultural context of the industry. No manipulation of variables is possible (or necessary), and there is still little cumulative knowledge in IS (Benbasat et al., 1987; Benbasat and Zmud, 1999).

Following Benbasat et al. (1987, p. 372), the lead author asked the following questions to decide on the suitability of the case strategy (the answers are provided in parenthesis):

- 'Can the phenomenon of interest be studied outside its natural setting?' (No)
- 'Must the study focus on contemporary events?' (Yes)
- 'Is control or manipulation of subjects or events necessary?' (or possible...? No; Benbasat et al., 1987)
- 'Does the phenomenon of interest enjoy an established theoretical base?' (No, as no cumulative knowledge in IS; Benbasat and Zmud, 1999).

The case study is the most common qualitative method used in information systems (Myers, 2003). Qualitative methods, such as ethnography, action research, case study research, were developed in the social sciences, and were deemed to be more appropriate to the study of social and cultural phenomena than the quantitative methods of the physical sciences, such as survey methods, laboratory experiments, mathematical modelling. Qualitative methods are concerned with the meaning, not the frequency, of phenomena. The rationale for conducting qualitative analysis is that, given the human capacity to talk, the object of understanding a phenomenon from the point of view of the actors is largely lost when textual data are quantified.

The use made of the case method in this study is that discussed by Eisenhardt (1989) and Lee (1989) – the cases are used to revise and extend an existing theory from practice, and then move on to the testing stage. Thus, the philosophical perspective adopted in this study is positivist. Positivism posits that reality is external and objective, and objectivity is both possible and desirable. Positivist research aims to produce universal laws through the application of the scientific method of the physical sciences (Lee and Baskerville, 2003) and to increase the predictive understanding of the phenomenon under investigation (Orlikowski and Baroudi, 1991). This was also the aim of the research – to revise the EMH and test the revised model.

3. The use of the case study method in building and testing theory

This section discusses the problems and challenges of case research for building and testing theory. It outlines a number of ways to evaluate the quality of the research findings.

Case study research is difficult and presents the researcher with unique challenges (Yin, 1994; Dubē and Parē, 2003; Darke et al, 1998). Case studies are most commonly qualitative, and this places a heavy emphasis on the individual contribution and choices of the researcher. The researcher seeks an in-depth understanding of the interaction between phenomenon and context. S/he may collect data on many variables; the challenge is to identify those variables of significance to the phenomenon

under investigation (Benbasat et al, 1987; Remenyi & Williams, 1995). Hence the importance of methodological rigour to increase the robustness of the argument and the reliability of the findings. Key decisions for the researcher include the range and type of data to be collected, the selection and number of case sites and the type of analysis to be carried out.

Eisenhardt (1989) describes the process of building theories from case study research. The process starts with the initial definition of the research question. The '*a priori*' identification of variables ('*constructs*') from the extant literature guides the research process. Tentative themes emerging from the fieldwork are compared and contrasted with the literature. The idea is to systematically compare and contrast theory and data, iterating towards a theory that accurately reflects the data. The comparison of emergent themes and theories with the literature is crucial, given the limited number of cases which can be studied.

Building theories from case studies relies on theoretical (as opposed to statistical) sampling. Given the limited number of cases which can be studied, it is important to select critical, extreme, revelatory cases, in which the phenomenon is '*transparently observable*' (Pettigrew, 1988, cited in Eisenhardt, 1989). Inevitably an element of subjectivity is involved in non-random sampling. A multiple case design allows the findings to be replicated across cases; hence, the evidence from multiple cases is perceived as more compelling. A multiple-case design is appropriate when the purpose of the investigation is theory description, theory building or theory testing. The factors dictating the choice of the research design, whether single or multiple case, will guide the choice of site.

Within the positivist paradigm the case study can be viewed as an experiment. While it is not a randomised experiment, the logic in relation to generalisability is the same, and the investigator expects the same outcome from either the experiment or the case, provided that all the variables of interest are replicated. Cases may be selected for literal replication, for which the investigator expects similar outcomes, or for their differences with respect to the variables of interest, and for these the investigator expects contradictory outcomes (theoretical replication). Either way the reliability of the findings is enormously amplified when both types of cases form part of the research design.

There is now a de facto standard for evaluating case study research within the positivist tradition (Benbasat et al., 1987; Lee, 1989; Eisenhardt, 1989; Yin, 1994). This tradition acknowledges the importance of the three criteria of validity (internal for causality, external for generalisability), reliability, and replication. Dubē and Parē (2003) use these ideas to develop a framework for evaluating positivist case study research in information systems (Dubē and Parē's framework is referred to later in this paper).

The case study relies on multiple sources of evidence and multiple data collection methods. Each source has advantages and disadvantages and all complement each other, so that it is recommended that multiple sources of evidence be used and triangulated (Yin, 1994, p. 92). Triangulation enhances both validity and reliability. Within-case and cross-case analysis, cross-case pattern-matching and tying the emergent theory with the literature enhance internal and external validity. Internal validity is concerned with the issue of causality - do the factors claimed to drive the observed outcomes actually cause them or are they themselves caused by other factors? External validity refers to the generalisation of the findings beyond the case. Case studies are generalisable to theoretical propositions (analytical generalization) rather than populations, as the case study does not represent a 'sample', and the researcher's objective is to generalise theories rather than list frequencies. Reliability demonstrates that the procedure can be replicated with the same results, and is dealt with by making as many steps as explicit as possible, and clearly displaying the evidence, so that the process can be audited. The idea is to analyse the evidence objectively, eliminate alternative interpretations, and produce a compelling case. Data exposition and analysis rely heavily on 'the integrative powers of the researcher' (Benbasat et al., 1987, p. 374) and it is incumbent upon the researcher to present the evidence, establish cause and effect and argue persuasively. The reader should be able to follow the derivation of any evidence from the initial research question to the conclusions of the study, as this chain of evidence will improve the reliability of the findings (Yin, 1994).

Lee (1989) discusses four problems resulting from applying the natural science model to MIS case research. These are:

- Making controlled observations in a real-world setting. As no manipulation of variables is possible in natural settings, the researcher has to capitalise on naturally occurring variations in the variables.
- Making controlled deductions. Markus (1983) deals with the problem by making verbally expressed predictions based on different verbally expressed theories.
- Achieving replicability from real-world settings which rely on observations which are unique and non-replicable.
- Generalisability how to extend and apply the finding from one case to other settings, given that the phenomena observed are unique and non-replicable.

The use of the case study method in building and testing theory has been extensively discussed and analysed in MIS literature. A consensus has formed that MIS research need not be quantitative in order to be regarded as scientific, and there is now an established methodology for conducting case study research within the positivist paradigm.

4. The research project

This section introduces the research project and discusses the research design and process.

The research project looked for evidence in support of the EMH in the steel industry, where it was also predicted that the advent of electronic marketplaces would lead to the disintermediation of the middlemen, the steel trading companies. The study focuses on the global physical Business-to-Business ('B2B') spot steel trading market. Spot market is defined as business which is not under (short or long-term) contract. The study is concerned with physical trade (not 'paper' trade = derivatives), and the material (if) bought 'virtually' has to be transported 'physically'.

An electronic marketplace allows its users to identify and select potential partners and conclude business online. Opinions differ whether an electronic marketplace needs to support all three functions of identification, selection and execution to qualify as an electronic marketplace. Suffice it to say here that electronic marketplaces vary considerably in the range of functions they provide; this is sometimes referred to as 'the scope of the electronic market' i.e. the range of functionalities/ancillary services offered, the degree of automation and geographical coverage. Many electronic marketplaces launched between 1998 and 2000 were merely 'quote engines', providing little more than aggregation/match-making. E-Steel and MetalSite were the first to announce plans to broaden their geographical reach and service offering. These plans never came to fruition. One by one the steel electronic marketplaces launched during the 'dot.com bubble' became inactive or were forced to change their business models and strategic focus.

4.1 The research design

In April 2000 the lead author became involved in a feasibility study for the development of an electronic marketplace targeted to serve the intercontinental steel trading market. This study stimulated the intellectual curiosity of the lead author; hence, the research project began with data rather than theory (Lampel, 2004). As a participant observer the lead author had unlimited access to relevant information throughout the duration of the project. She continued to work in the steel trading industry during the project; hence, the decisions made with respect to the case selection and research design flowed from her immediate working experience and access to industry professionals.

The research process started with the formulation of the research question. A review of the extant literature suggested a number of variables which might affect the viability of electronic marketplaces. The lead author organised the motifs which emerged in various papers in a coherent argument and tentative conceptual framework (the Model). She formulated the working hypotheses, and, based on the working hypotheses, made verbally expressed predictions to be tested in the fieldwork. Thus, the fieldwork features all the variables tentatively identified as determinants of e-marketplace viability. The Model is tested and refined through the fieldwork and recommended for further testing in other industry settings.

The study features multiple cases and multiple levels of analysis within a single case (firm vs. industry; prime vs. secondary market) and attention is paid to the relevant context; hence, each case has an embedded design. The author discusses the product characteristics and the structure of the

industry, and the trade laws and business practices governing it, and introduces the viewpoint of buyers, sellers and traders.

The selection of cases relies on theoretical sampling. The cases were chosen from a larger sample because of their characteristics, and the variables of interest are clearly observable. The cases are selected for literal and/or theoretical replication, because of the intrinsic similarities and/or differences between them. The deciding factor, however, is accessibility. In this sense, the selection of cases is partly opportunistic, and allows the lead author to rely on participant observation (Lee, 1989; Yin, 1994).

The final research design features seven cases. The experience of other electronic marketplaces is incorporated by reference in this study. The seven cases are presented in Table 1.

The first three cases investigate the prime market for steel products, in which the steel is made to order and to the specifications of the particular buyer. Cases four to seven investigate the secondary market for steel products, in which commodity items are typically offered on an 'as is' and 'where is' basis.

Good research design is an iterative, not a linear process (Lampel, 2004). The initial research design featured two cases, both representing attempts at launching an electronic marketplace allowing onestop shopping in the prime market. Later it seemed appropriate to add a descriptive case at the beginning, which would serve as an introduction and provide the reader with an understanding of the dynamics of international steel trading. Thus, the research design was enhanced to feature three cases, all set against the background of the prime steel market.

Market	Case No.	Purpose of Case
	Case 1	Description
The prime market	Case 2	Theory-testing
	Case 3	Theory-testing
	Case 4	Description
The secondary market	Case 5	Description
	Case 6	Theory-testing
	Case 7	Theory-testing

 Table 1: The seven cases

The three cases are conceptually distinct and stand-alone, yet related. Whereas case one constitutes a reflection upon the business dynamics and processes of international steel trading, case two tests the hypothesis and also represents a meta-evaluation of the feasibility study in which the lead author had participated. Case three also tests the hypotheses, and the investigator expects a similar outcome (literal replication). The remainder of the fieldwork is concerned with the secondary market for steel products. The researcher can test the hypotheses in a different setting (the secondary market), and expect a contradictory outcome (theoretical replication). Two cases were chosen to introduce/describe the secondary market, the characteristics of transacted items, the role of the services of two electronic marketplaces to dispose of reject parcels. She gained valuable insight into the workings of online auctions. The two electronic marketplaces became the subject of the last two cases.

4.2 Data collection

In this study multiple sources of evidence are utilised and triangulated. These include: company files, business plans, financials, published reports by management consultants, magazine and newspaper articles, slide-shows, emails etc. The lead author had informal exchanges with colleagues, senior executives of electronic marketplaces, journalists and logistics services providers mostly during the normal course of business. Hence, data were often collected in a non-systematic manner though informal personal communications. No formal interviews were conducted. The choice of data collection methods reflects the preference of the lead author for unobtrusive techniques, and a concern to minimise disruption and maintain a low profile. Inevitably this raises the issue of

methodological rigour (e.g. none of the interviews were recorded; there are no transcripts). Field notes were taken, and revisited as soon as possible after the event to ensure accuracy, and filed electronically. Emerging issues were analysed and, where appropriate, further explored by telephone, email or instant messaging at the first opportunity. All contributors were informed of the scope of the study, and emerging themes were discussed with them. The prevailing data collection technique is participant observation (Myers, 1999); above all this thesis draws upon the experiences of the lead author in the industry.

4.3 Data analysis

In qualitative research data collection and analysis, interpretation and reporting are often carried on in parallel, and the results of one activity can alter the direction of the others. In this study the findings from the fieldwork are analysed through pattern-matching, within the case and across cases. Emerging themes are compared and contrasted with the literature and with the working hypotheses and predictions. Multiple theories are triangulated, alternative explanations are considered and the appropriate adjustments are made to the Model. The study features a sample of vignettes of practice, from real life situations, and photographs, to illustrate concepts and corroborate the argument. There is a checklist at end of each case to summarise the findings and monitor progress. The reader is able to follow the researcher's argument, but ultimately form his/her own opinion.

5. Evaluation of the study and research process

This section aims to assess the level of methodological rigour in the research process and its adherence to the criteria of good practice for positivist case study research in IS. Dubē and Parē (2003) propose a framework for evaluating positivist case study research in information systems. Tables 2 and 3 assess the quality of the research design and data collection and analysis against Dubē and Parē 's criteria. They show that the research process adhered to good practice and generally met the criteria of validity, reliability and replicability.

Attributes of good practice: Research Design [criteria]	The seven cases
Clear research question [validity]	The research question has been formulated at the beginning of the study: 'What are the factors affecting the viability of electronic marketplaces?'
A priory specification of constructs and clean theoretical slate [validity]	The study has identified ' <i>a priori</i> ' a set of variables (' <i>constructs</i> ') to guide the research process.
Theory of interest, predictions from theory and rival theories [internal validity]	The theory of interest: EMH. The study introduces and discusses alternative theories. It tentatively identifies the determinants of e-marketplace viability and organises them in a conceptual framework (the Model). It formulates working hypotheses and predictions. The findings from the fieldwork are compared and contrasted with the literature and with the working hypotheses and predictions. Adjustments are made to the Model, which is recommended for further research and testing.
Multiple-case design [validity]	The study utilises a multiple (seven) case design.
Nature of single case design [internal validity] Replication logic in multiple case design	The cases follow a replication logic (literal and theoretical replication).
Unit of analysis [validity]	The study features multiple levels of analysis within a single case (firm vs. industry; prime vs. secondary market).
Pilot case	Case Two is utilised as pilot case.
Context of case study [reliability and validity]	The cases are set against the background of the steel industry; and attention is paid to the relevant context. The author discusses the external environment, the reality of the marketplace, the characteristics of the product, the business practice and the interpersonal relations.
Team based research [reliability]	N/A
Different roles for multiple investigators [reliability]	ΝΙΔ

 Table 2: Evaluation of the case work – research design (based on Dubē and Parē, 2003)

Attributes of good practice:	The seven cases
Data Collection	
Elucidation of data collection process [reliability, replication, validity]	The data collection process is discussed in some detail. The findings from each case are recorded in a checklist to enable the reader to follow the development of the argument and monitor progress.
Multiple data collection methods; Mix of qualitative and quantitative methods [reliability]	The data collected are mainly qualitative. The study relies on multiple sources of evidence and data collection techniques and these are shown in a table at the beginning of the fieldwork.
Triangulation [reliability]	The study utilises triangulation of data sources and of theories.
Case study protocol and case study database [reliability, replication]	The case study database and organisation of the material are discussed in some detail in the study before introducing the fieldwork.
Data Analysis	
Elucidation of analysis process [reliability]	Data collection and analysis have been carried out in parallel. Care has been taken to document the process, substantiate statements, and clearly display the evidence.
Attributes of good practice:	The seven cases
Field notes, coding, data displays [replication; external validity]	Data have mostly been collected informally during the normal course of business. The selection of cases is partly opportunistic, allowing the researcher to utilise participant observation. Field notes have been taken and filed electronically. The study features a sample of vignettes of practice and photographs, to illustrate concepts and substantiate statements.
Logical chain of evidence [internal validity]	The evidence is presented in a readable and accessible manner; the reader is able to follow the argument, but ultimately form his/her own opinion.
Empirical testing & Time series analysis [internal validity]	The research objectives have been discussed and stated at the beginning of the study as theory description and theory testing.
Cross case comparisons [internal validity]	Within-case and cross-case analysis and pattern- matching are utilised in the study.
Use of natural controls [internal validity]	The researcher has utilised naturally occurring variations in the variables.
Quotes [reliability]	All cases quote extensively from the academic literature and business press, industry sources and company files.
Project reviews [reliability]	Emerging themes were discussed with informants. As a doctoral thesis, the project was reviewed by supervisors and internal and external examiners.
Comparison with literature [validity]	Emerging themes from the fieldwork have been constantly referred to, and compared and contrasted with the literature.

Table 3: Evaluation of the case work – data collection and analysis (based on Dubē and Parē, 2003)

This study also conforms to Lee (1989). The four problems discussed in Lee (1989) are dealt with as follows (Table 4):

Table 4: Evaluation of the case work – applicability of the natural science model to MIS case research (based on Lee, 1989)

Problem	Solution
Making controlled	The lead author relies on natural controls to make controlled observations, by
observations	testing, for example, the same theory in different settings (e.g. prime vs. secondary
	market – the product attributes are different).
Making controlled	She makes controlled deductions based on verbally expressed predictions.
deductions	
Replicability	The multiple case design allows the findings to be replicated across cases.
Generalisability	The resulting theory (the refined Model) is not industry specific, and can be
-	generalized to other industry settings subject to successive testing.

5.1 Quality of findings

Based on the foregoing, the refined Model is robust and can assist in identifying those purchasing situations which are promising for B2B electronic marketplaces; the characteristics for successful e-marketplaces are shown in sufficient detail for it to be used for further research in other industry settings. The parameters identified are generalisable to other industry settings and not steel specific.

In this study the starting point was a well-established theory, which the researcher's experience showed did not work. Subsequent case research clarified the objective factors which were needed to make it work. The robustness of the findings is due at least in part to the good fit of the positivist paradigm and research method with the scope of the enquiry. The academic work is enriched by the experience of the practitioner and the reliability of the findings is increased by the credibility of the researcher as an industry insider.

5.2 Lessons learnt

Research popular among steel industry practitioners between 1998 and 2000 predicting greater market governance was mainly quantitative. Predictions were said to be conservative, as one piece of steel could in principle be bought and sold over the internet several times. These studies failed to consider the highly dynamic, supply chain-intensive and relationship-filled trading environment. The industry knowledge is largely tacit, the level of personal involvement in the buying/selling process is high, and firms make decisions based on factors other than price alone. There is an argument here which supports qualitative vs. quantitative methods and '*inquiry from the inside*' in management research, since the experiences of the actors are critical and intelligible only within the social and cultural context of the particular industry. The choice of the case method allows the writer to capitalise on unparalleled access to data and sites through participant observation. Here participant observation arises from an ongoing working situation. The mode of enquiry, therefore, fits the topic of the investigation and the investigator's skills and circumstances.

5.3 Limitations

lacono et al. (2009) elaborate on case study research and the role of the researcher as a participant observer. The strength of this method is the in-depth and first-hand insight into a real world setting which the investigator acquires; one weakness is the potential lack of objectivity. The research project draws upon the lead author's experiences and the experiences of others in the industry; data have sometimes been collected in a non-systematic manner though informal personal communications during the course of business. Concerns over confidentiality have at times also prevented the writer from disclosing data of a sensitive nature, which might have further illustrated concepts and corroborated arguments.

In this study the lead author has attempted to present the evidence in an unbiased and clear manner. In the research project concerns over subjectivity and/or lack of rigour were dealt with by acknowledging the dual role of the investigator as an industry practitioner and researcher; distinguishing as appropriate facts from personal reflections, alternating between inside and outside enquiry, and documenting and substantiating statements and let the facts speak for themselves.

6. Conclusions

This paper has discussed the use of the case study method to build and test theory, and how issues and concerns arising from utilising this method were dealt with in the lead author's doctoral thesis.

The robustness of the findings is due to the nature of the phenomenon, which fits comfortably within the positivist paradigm, and the appropriateness of the case method, which is particularly suited to the study of information systems in organizations, and permits the collection of rich qualitative data through participant observation. This paper has shown that it is possible to produce rigorous qualitative research which complies with the standards of positivist research and meets the criteria of validity, reliability and replicability of the natural sciences.

References

Benbasat I, Goldstein D and Mead M (1987) 'The Case Research Strategy in Studies of Information Systems' *MIS Quarterly* Vol. 11, pp. 369-386.

- Benbasat, I. and Zmud, R (1999) 'Empirical Research in Information Systems: The Practice of Relevance' in *MIS Quarterly*, Vol. 23, No. 1, pp. 3-16.
- Darke P, Shanks G and Broadbent M (1998) 'Successfully completing case study research: combining rigour, relevance and pragmatism' *Information Systems Journal* 8, pp. 273-289.
- Dubé, Line; Paré, Guy. (2003) 'Rigor in Information Systems Positivist Case Research: Current Practices, Trends, and Recommendations' *MIS Quarterly*, Vol. 27 Issue 4, p. 597.
- Eisenhardt K (1989) 'Building Theories from Case Study Research' *Academy of Management Review* Vol.14, No 4, pp. 532-550.
- Iacono J, Brown A and Holtham C, (2009) 'Research Methods A Case Example of Participant Observation' Proceedings of the 8th European Conference in Research Methods for Business and Management (ECRM).
- Lampel, J. (2004) 'A Note on Research Design' Working Paper, City University, Cass Business School.
- Lee A (1989) 'A Scientific Methodology for MIS Case Studies' MIS Quarterly Vol. 13, Issue 1, pp. 33-50.
- Lee A and Baskerville R (2003) 'Generalizing Generalizability in Information Systems Research' Information Systems Research Vol. 14, No. 3.
- Macpherson I, Brooker R and Ainsworth P (2000) ' Case study in the contemporary world of research: using notions of purpose, place, process and products to develop some principles for practice' *International Journal of Social Research Methodology* Vol. 3, Issue 1.
- Markus L (1983) ' Power, Politics and MIS implementation' *Communications of the ACM* Vol. 28, No 6, p. 430-444.
- Myers, M.D. (2003) 'Qualitative Research in Information Systems' in *MISQ Discovery*, at www.qual.auckland.ac.nz.
- Orlokowski W J and Baroudi JJ (1991) "Studying Information Technology in Organizations: Research Approaches and Assumptions", *Information Systems Research* (2) 1991, pp. 1-28.
- Remenyi D and Williams B (1995) 'Some aspects of methodology for research in information systems' *Journal of Information Technology* 10, pp. 191-201.
- Stake Robert (2000) 'Case Studies' Ch.16 of Denzin and Lincoln (ed) Handbook of Qualitative Research 2nd edition, Sage.
- Walsham G (1993) 'Interpreting Information Systems in Organizations' Wiley Series on IS
- Yin R (1994, 2003) 'Case Study Research Design and Methods' second and third edition Applied Social Research Methods Series, Volume 5, Sage Publications.

Research Methodology by Numbers – a teaching tool

Graham Trevor Myers Durban University of Technology, South Africa

graham@dut.ac.za

Abstract: Research Methodology is a daunting subject for those who have to negotiate its vastness for the first time. Often the knowledge they gain is not coherent and lacks foundation. In this paper a structured system of incremental assignments given to students allows them to experience research by "doing" rather than learning vast amounts of theory. This model allows all students to grasp the process of research by doing a quantitative proposal and pilot study in seven steps. The result is the completion of a first research project which eventually culminates in a publishable paper at internal university level. From this universal foundation every discipline may expand and hone the skills learnt by students by examining the epistemology and ontology of the specific discipline. It also allows students from different disciplines to comprehend and discuss the research of other disciplines and foster inter-disciplinary research. The model has been developed for Universities of Technology in South Africa over a period of 13 years. It started off as a very theoretical set of lectures which covered as many quantitative and qualitative methodologies as could be taught, but this left students rather bewildered. The simplification of the system to cover just one quantitative method, using the relationship between two variable, or constructs, taught through assignments, self chosen mentors and an e-mail communication system has had remarkable success with high completion rates and high marks from students in large classes. Rubrics have been the main form of assessments and the final products of a proposal and pilot study, and a publishable paper have been of exceptionally high and uniform in standard.

Keywords: research methodology, teaching quantitative research, research in large classes, marking rubrics, research mentors

1. General introduction or background

Research Methodology became a feature of Universities of Technology (UoT's) in South Africa in the mid 1990's with the introduction of the Bachelors degree in Technology. Every student had pass this course. In the faculty of Commerce the first six students were subjected to this course through a process of lectures only. A local text was prescribed and the introduction of the course started with the difference between quantitative and qualitative studies and the ideas of modernism and post modernism and all the theory that the lecturer thought a good course should have. The only text that existed in South Africa at the time was not the most comprehensible. Since then many more have been authored which are easier to follow.

The results were poor as there was too much to remember and no context within which to place their knowledge.

Thus, a process was started to turn this subject around. The existing texts were of little help, and so it was that like Ball and Pelco (2006) from the College of William and Mary, a process of discovery was initiated to create students interest in the subject and allow them to benefit more from the experience. At the end students had to be able "to do", and what better way, than to learn by doing. Enjoyment was also a factor that needed to be considered so as to assist in the development of the higher degrees in the university because the university depended on these students returning for study further.

The intermittent years have seen an annual revision of the notes and assignments in the course handout, which has now swollen to some 120 pages, with requirements for each assignment specified and the marking rubric presented so that the students, or their peers or mentors, can assess progress before the work is submitted. In this manner the number of facilitators becomes endless, to the advantage of the student.

2. The developmental years

The number of students who chose this Research Methodology course increased rapidly to the point where the Faculty of Commerce had some 1000 students at this level after the normalization of the political situation in South Africa. This "massification" of education led to its own problems. There was not enough time to spend with every individual for correcting and marking their work. Some of the classes were also offered through "block release" in which the lecturer met with the students for a week as they flew in from their home countries and then returned with a set of assignments laid out to

facilitate completion of the work. The full-time classes increased as access to higher education permeated to all, but the number of facilitators did not increase proportionately.

A process of emailing of assignments began, and the load of correcting and advising was spread to persons in the student's community who could assist. Each student had to find in the community three people who could mentor him or her. The first of these was someone who had studied Research Methodology or had a Masters degree, to assist with the methodology sections. The second was a Mathematics teacher in the local high school to help with the numbers, graphs and elementary statistics and the third an English teacher who would give guidance on the layout and expression.

Initially, both quantitative and qualitative methods were made compulsory for students who had to choose from this plethora of "incomprehensible" methods, one method that suited their particular problem statement. This was unsuccessful as there was no underlying understanding of the process of research which had been masked in the search for "being correct" and "inclusive". Different teachers of the Research Methodology course also had vastly different ideas of what constituted a Research Method. There were those who taught an almost pure course in statistics and those who taught only phenomenological methods. There were also those who had a higher degree but knew little of the research process as it did not form part of their coursework or they mimicked the methodology of their supervisor. From this developed a method of teaching students (and staff) a series of steps to tackle an initial project which would take them to the point that they understood the process of solving a problem in commerce (or any other field) and be able to check it on the way, so that a poorly constructed problem statement did not scuttle everything every step of the way. Most of the students had come through a high school system that had emphasized the sciences and mathematics so a quantitative methodology was emphasized with choices within this framework.

3. The basic model

The model has settled down after 13 years of practice, to contain seven steps towards producing two major pieces of work which allow the student to develop skills in Research. After this every faculty or department must put in place a second Research Methodology course that will take the student through the specific methods that are required in that discipline at post-graduate level. This has not materialized as yet but should follow.

The steps are outlined in the diagram below and follow the chapters that will be written in the proposal and pilot study. Every one of these steps has sub-sections, which guide the student to the point that he can successfully solve any management problem. (Cooper and Schindler 2006:56)

Every step results in a piece of work being submitted via e-mail so that there is a record of it on both computers, as well as a date reference, and it is marked according to the prescribed rubric for the year. This is done because students lose the electronic copies and do not keep hard copies. The work would have been checked firstly by one of the three mentors chosen by the student in his or her community or one of his peers, depending on the situation. This also allowed for the development of an academic network of persons who could work together and enhance their own research skills. Some of the students worked in situations where the skills were freely available and they had only to submit after step 3 so that the lecturer had control over the work before data was collected. The final pilot study also had to be submitted and the report returned before the publishable paper was written.

The general framework consists of seven steps (Figure 1), each of which is highly structured with notes and explanations so that a student does not lose focus by being bombarded with too much unstructured information. The sections in the notes also refer the student to relevant chapters in the Research Methodology texts. He also has access to past students' work. These are physical copies but when internet bandwidth and expertise allow, these will be available electronically.

Every step has an attached rubric and a set of instructions on how the assignment for that chapter should be executed. This rubric is in the form of a spreadsheet and complies with the points that are required in that department or field of study. Once the work has been submitted the lecturer will mark it and keep a copy, while emailing the report to the student. This serves as feed-back and as this course is one of continuous assessment, the student has the option to resubmit if the mark is a fail.



Figure 1: Research by numbers general framework

4. Step 1: Introduction

The introduction is the first chapter of the student's report. Traditionally the stumbling block has been to find a topic. Much discussion has to take place in class on this and it has been found that topical issues around campus or in the community are more likely to be accepted and understood than topics within the discipline. Attempts have been made to provide lists of researchable topics in the discipline but these are very seldom used. Most full-time students prefer to do something that is unrelated to their field of study so that they are not embarrassed by missing major sections of the theory. They also prefer to conduct surveys rather than observational studies or experimentation. Most of their investigations revolve around social issues and often indigenous knowledge.

Students who are in full-time employment prefer to relate their research to their work and are thus more adventurous in tackling other methods of research. Those in engineering and the brewing institutions have tended to conduct experiments which are work-related.

The verbalization of a management problem often is the stumbling point for students. This is a topic in its own right. There is an entire process of discussion that must take please between what is put forward as a management problem, and what materialises as the research problem. One management problem can lead to a number of possible research problems.

Many of the students do not link two constructs (Welman, Kruger and Mitchell 2007:21) together but rather come up with huge topics like global warming, or HIV infection. One has then to create for them a sentence something like this:-

"I want to know if ((IV)) affects ((DV)) in/on (Limitation)."

(Where IV refers to an Independent Variable, DV refers to a dependent Variable)

This usually allows them eventually to come up with some relationship to investigate. With some students, however, one has to provide them with a topic as they are insecure about their choice of topic, even though the lecturer covers all types of diverse topics to make them understand that the development of knowledge does not usually come from thinking within the norms they have been exposed to previously.

The questions in Figure 2 below set out the steps that students are expected to follow. As with all chapters there is an Assignment Instruction which sets out the exact requirements. There is a corresponding chapter in the Study Guide (Lecture notes) which directs them to various texts for further reading. It also gives the skeleton outline of the chapter to be written and what should be covered in each section. Numbering is used in this section and cumulative indenting of subsections is practised. All work is double spaced and in the third person passive tense. In later assignments various other styles of reporting must be covered. When work has been done, the past tense is used.

The most effective tool to fast track this process is a red pen. A line through this chapter for just one student, with the word "Re-do" suddenly changes the attitude of the entire class to the seriousness of the topic. They read what they should be doing and start to measure their work against the rubric to ensure that the instructions are being followed. A pass of at least 80% should be the standard. Work that does not meet the standard results in problems in the future chapters and research.



Figure 2: Questions and steps required for construction of chapter 1

Much of the work in Figure 2 is self explanatory, to those who are engaged in this pursuit of teaching Research Methodology. The limit for this paper does not permit the inclusion of the course notes but every department in a university should be able to construct these from the available texts. It would

also be wise for staff engaged in this pursuit to devise their own generic course to incorporate what their university would require.

The Durban University of Technology, originally the Durban Institute of Technology at its inception when Technikon Natal was merged with M.L. Sultan Technikon, constructed such a syllabus over a period of 3 months with the consultative input of every interested person in the relevant faculties. This core syllabus still stands as part of the study guide. It included all the sections that are presented in this paper.

Step 2: Literature review

The second chapter to be written takes the student into the literature of the constructs he or she has designed or identified in the first step. The chapter is linked to the previous chapter through a brief introduction summarising the previous chapter and then the student searches the variables that they have identified. It is impressed upon students that each chapter should be able to stand alone, linking it to the previous and following chapter. This is emphasized in Figure 3.

Some of these steps in the model depict the decisions which will impact on future chapters. The decisions made in step 1 will influence step 2 and so on.



Figure 3: Questions and steps required for construction of the literature review in chapter 2

The number of sources is kept to a minimum of 5 per variable so that the student is not delayed or swamped by vast numbers of references as the course is completed in a 15 week semester. They are also marked on having at least one source from a text, one from the internet and one from a journal. The use of knowledge bases is often problematic for some students as they either use only the internet, or the library, but very seldom both. Journals are often disregarded completely.

This encourages them to search widely and pick only those sources which cover the concept broadly without getting bogged down in too many references.

From these references they are encouraged to determine the five major characteristics of this construct as these will be used to devise the questions in the data capturing tool in step 4.

It is at this point that library staff is brought into the process to assist students and the writing styles which they have been taught in their first year courses are used. Computer skills which they were also taught in their first year have to be revised because the programs used are now obsolete and the students at the time did not consider what they learnt to be of long term importance.

5. Step 3: Methodology

Once the student has examined the literature which underpins his work he has to revisit the questions he asked in the first step and in chapter 1. These must be summarized at the outset in chapter 3 and refined if necessary.

Step 1: Introduction
Step 2: Literature
Step 3: Methodology
Copy the conclusion from step 2 = Intro 3;
Summarize Step 1;
Define the Population;
Define who will not be included;
Choose a method of sampling;
Explain the details including advantages & disadvantages;
What methodology will be used;
Explain the details of what and when;
Choose the data collection tool; $(\rightarrow 4)$
Explain the details; $(\rightarrow 4)$
Choose the analysis tools to be used; $(\rightarrow 5)$
Explain the details; $(\rightarrow 5)$
Give a time line and budget;
Use a conclusion to link to step 5;
Have research and mathematics mentors check;
Submit for lecturer approval
Step 4: Data Capturing Tool
Step 5: Analysis
Step 6: Pilot Study
Step 7: A Publishable Paper

Figure 4: Questions and steps required for construction of the research methodology in chapter 3

There is quite a comprehensive set of methodologies that can be chosen, but more emphasis is placed on a survey method for on-campus students. This tends to develop observational skills as well. Each discipline will find their students emphasize certain methods. Students of horticulture tend to choose some form of experimentation while other commerce students may choose a survey method.

Education students are inclined to choose observation and in-depth interviews. Engineering students I have found tend to do some form of data analysis.

Sampling techniques and data analysis are covered in the lectures at this stage because students have to select how they will gather their data and then analyze it. Validity and reliability are discussed and if time and facilities permit then a course in SPSS (a statistical analysis package) is provided. In the back of the text book that is prescribed is a disk with a free statistical package which a number of students use because the text explains it in some 10 pages. Those who work for large conglomerates have access to very powerful tools in such programs as SAP, as well as operators to analyse and draw their data for them.

Figure 4 sets out the points that should be covered. The rubric should have the same points in it as the model and usually totals 20 marks.

Some of the points in this rubric are not in the "step 3" instruction as they appear in a different place in the notes prepared for 2009. This rubric is presented in Figure 6.

6. Step 4: Data capturing instrument

From step 2 the questions that need to be asked materialize. The variables that have been written about had to emphasize the five major points, and it is these that comprise the questions. The Symbol 2 and arrow in figure 5 indicates this.



Step 7: Publishable Paper

Figure 5: Questions and steps required for construction of the data collection tool

The data capturing tool has to integrate with the methodology and the type of question has to comply with the measurement scale which is dependent on the statistics that are to be used in the analysis. Upon completion it has to be submitted for marking and sanction by the lecturer. The ethical considerations that each university has in place should be carefully considered here as well as the culture within which the research is being done. No data is to be collected without sanction.
7. Step 5: Analysis

The analysis section has caused the greatest amount of soul searching in the development of this course and requires a separate paper. Statisticians are inclined to teach many unrelated methods to students without even telling them what they are trying to find. It became necessary to find something that allowed the non-mathematical student to interpret the data and have some idea of what is going on in their research. The solution was found in some wisdom whose origin is no longer in memory, but it came in the form of "Presenting the data". Saunders, Lewis and Thornhill (2000:337) mention Turkey's (1977) exploratory data analysis approach and using this and ideas from many years of teaching mathematics, a system was devised which was called Primary analysis and the Secondary analysis.

		Assignment 3			
Name :				Final Mark:	
Student No:					
			Mark	Max	Actual
Assignment 3 / Chapter 3		Research Method		20	0
3.1		INTRODUCTION		3	
	3.1.1	Have the salient points of the study been given?	0.5		
	3.1.2	Торіс	0.5		
	3.1.3	Problem Statement	0.5		
	3.1.4	Hypothesis	0.5		
	3.1.5	Independent Variable	0.5		
	3.1.6	Dependent Variable	0.5		
3.2		POPULATION		4	
	3.2.1	Has the population been defined?	1		
	3.2.2	Is it clear to you who forms the population and who does not?	1		
	3.2.3	Are the people/items excluded being identified?	1		
	3.2.4	Will the student be able to get access to this population?	1		
3.3		SAMPLING METHOD		6	
	3.3.1	Is it clear how the sample will be chosen?	1		
	3.3.2	Has the student tried to overcome bias in sampling?	1		
	3.3.3	Are the actual details of the procedure given?	1		
	3.3.4	Are the instructions clear enough for another person to repeat?	1		
	3.3.5	Are adv. and disadvantages of this sampling method given?	2		
3.4		TYPE OF RESEARCH STUDY		3	
	3.4.1	Is the methodology appropriate to the study?	2		
	3.4.2	Has it been explained in enough detail for another to execute?	1		
3.5		DATA GATHERING AND ANALYSIS		4	
	3.5.1	Has the method of gathering data been discussed?	2		
	3.5.2	Has the method of analyzing the data been discussed?	2		
Comments					
				<u> </u>	

Figure 6: Rubric for assignment 3

In Primary analysis the student is required to present every question/measure in the form of a table and then a graph and then in language to express what is determined or discovered. This allows an overall perception of what happened and can be compared to what is expected to happen. After this the student does the same thing but compares variables. The table now becomes a cross tabulation and the graph has comparative columns or lines. The program used by the student in presenting his work has a package which produces graphs and he/she is required to experiment with all of these and to use as many types of graphs and tables as possible to represent the data. Of course the rubric will examine the effectiveness of the choice. All rubrics are on a spreadsheet and automatically total and score the assignment.

Once this "presentation of the data" has been done then descriptive statistics are given and examined by the student, using the package he/she is willing to work with or that is available in the organization or text book. The results are examined within the findings of the previous section and this is a paper in its own right. Box plots and stem and leaf diagrams are encouraged, which many text books do not explain but in every discipline there are diagrams which assist central tendency and dispersion calculations.

Inferential statistics are limited in this course to chi square, correlations and perhaps the student –t test. As some of them will be going into fields of study that need other interpretation these should be covered in that specific Research Methodology Course in the Masters programme.

Deductive and inductive reasoning is also emphasized in this section, as is triangulation, hoping that the same results will be reflected in all three methods of data analysis.



Figure 7: Questions and steps required for data analysis in chapter 4

Each one of these assignments leads to the production of another chapter in the proposal and pilot study. The student at this level should now have the idea of research being a process of solving a problem in a scientific manner.

8. Step 6: Pilot study

The final proposal and pilot study now comes together. A final chapter is put in place which emphasizes the circular flow of research. The student needs to show some form of self-criticism and growth towards maturity where they can not only take advice from others but also become self-critical. This is probably one of the most important points to inform your acceptance of the student for further study.

The notes on this section are rather detailed and examples of what the university requires such as declarations, indexes, cover pages must be emphasised. Once this has been checked then it is finalized in a leather bound cover. If the mentors charged for their services they do not receive a copy. If they did not charge, in the spirit of true academic development of knowledge, they are given a copy in which their contribution is acknowledged.

Step 1: Introduction	
Step 2: Literature	
Step 3: Methodology	
Step 4: Data Capturing Too	bl
Step 5: Analysis	
Step 6: Pilot Study	
	Five paragraph summary of all up to now;
	Repeat summary of results from step 5;
	What went wrong?
	What you will do differently next time?
	What should be done to extend this study?;
	Add cover page, Dedications, Thanks, and Declarations;
	Construct Abstract (3 paragraphs -100 to 250 words);
	Prepare Indexes and Bibliography;
	Add Appendixes (Table of raw data & codes);
	Submit to Research Meth mentor - sign;
	Submit to Mathematics mentor – sign;
	Submit to language mentor – sign;
	Leather bound – 1 for submission 3 for mentors;
	Submit 1 copy and 1 electronic copy
Step 7: Publishable Paper	

Figure 8: Questions and steps required for final submission and chapter 5

9. Step 7: Publishable paper

The mark of a good research student is to be able to use different research methodologies and express themselves in different formats to comply with the requirements of different journals. For this reason, and also to complete the research cycle where knowledge gained is fed back into the

academic arena, the students are asked to take the information presented in their proposal and pilot study and turn it into a publishable paper. The terms of reference for this assignment are presented in the notes and are taken from the requirements of a journal submission. The students can be asked to change the voice from third person passive, or completely change the format and layout.

The major parts of this assignment are emphasized in figure 9 below.

-(Step 1: Introduction
-(Step 2: Literature
-(Step 3: Methodology
(Step 4: Data Capturing Tool
-(Step 5: Analysis
-(Step 6: Pilot Study
-(Step 7: Publishable Paper
	Remove all double spacing;
	Remove all duplication and collapse chapters;
	Remove all indexes, cover pages etc.
	Abide by the other instructions in the assignment;
	Comply with the new numbering requirement;
	Comply with the layout instructions;
	Submit 1 hard copy and 1 electronic copy.

Figure 9: Questions and steps required for construction of the publishable paper

10. Conclusion

This model will never cease to change. Every year there is something students do not master and so the following year more emphasis or a different emphasis is placed on this problematic aspect. The development of the discipline called "Research Methodology" also expands. The past 13 years have seen a tremendous increase in the number of texts and articles available and new methodologies in South Africa.

The emphasis is also shifting in some disciplines towards a far more qualitative group of studies yet returning regularly to the concepts underlying Research.

Marks have improved radically since the adoption of this model but follow through into Masters levels has not yet occurred.

From now on, there needs to be a concerted effort to integrate more of this vastly expanding subject into the mainframe of this work so that those universal truths that underlie the discipline will expand its validity as a science and a meta-science (Barbie and Mouton 2001).

References

Ball, C.T and Pelco, L.E. (2006) Teaching Research Methods to Undergraduate Psychology Students Using an Active cooperative Learning *Approach International Journal of Teaching and Learning in Higher Education* Vol 17, No. 2 pp147-154.

Barbie, E. and Mouton, J. (2001) The Practice of Social Research Oxford University Press Cape Town.

Cooper, D.R. and Schindler, P.S. (2006) Business Research Methods 9th Ed., McGraw-Hill, Boston.

Saunders, M., Lewis, P. and Thornhill, A.(2000) *Research Methods for Business Students 2nd Ed.*, Prentice Hall, Harlow.

Welman, Kruger and Mitchell (2007) Research Methodology 3rd Ed., Oxford University Press, Cape Town.

Student Research in a Web 2 World: Learning to use new Technology to Gather Primary Data

Martin Rich

Cass Business School, London, UK

M.G.Rich@city.ac.uk

Abstract: In recent years there has been rapid growth in the number of resources available to conduct scholarly research with the assistance of the Internet. While the British Library's (2009) survey revealed a reluctance among doctoral and post-doctoral researchers to engage with new technologies, masters-level students and final-year undergraduates are often much more open to technological innovation. They are familiar with interactive tools in the classroom (King and Robinson, 2009), and used to the characteristics associated with Web 2.0 (O'Reilly, 2005), but could often benefit from guidance as to how to exploit these tools in their independent work. This paper discusses four general types of tool which can be used to gather primary data in research: Electronic web-based surveys. These can be set up very simply using software such as 'Surveymonkey', Qualtrics, or the Bristol Online Surveys system developed specifically for the UK higher education sector. As a result they are popular with students, but their very ease of use often means that little attention is paid to sampling, or to interpreting the results with caution. Blogs. Again, these are easy to set up, but it is less clear to students how they can be used as a data gathering tool. However the current author has encountered a number of instances where a student has set up a blog to invite comments on a topic, and to gather opinions from readers that might contribute to the students' work. Personal response systems or 'clickers' which are available as a computer peripheral and can be used to gather data from a group of people very rapidly. Conferencing systems which could be used in effect to conduct more or less structured interviews electronically. A simple exchange of emails would be a primitive way of achieving this, and would be asynchronous, in that the interviewee does not need to respond instantly. A synchronous equivalent could be provided using chat or instant messaging software. If four of these have the benefit of being instantly self-documenting in that any data provided is stored electronically. This is a particularly attractive attribute for masters level students, or final year undergraduates, who may be under pressure to produce some independent and original work with very limited resources. As a general observation these tools offer enhanced scope for students to carry out original and distinctive work, and to place their own stamp on their findings. If nothing else, the use of unique primary data can differentiate one student's work from that of others. But this needs to be tempered with an appreciation of the limitations of primary data and an understanding of how to use it realistically.

Keywords: Web 2; research training; primary data

1. Introduction

This paper is a response to the emergence of a number of Internet tools which can be used to gather data, and particularly to the widespread availability of these tools to university students wishing to carry out their own research. These tools typically invite participation from a number of users, a characteristic which places them within the broad category referred to as 'web 2.0' (O'Reilly, 2005). They can also be used while incurring little or no cost, and are often easy to set up for anybody with a reasonable level of familiarity with use of the world wide web.

Despite the attractiveness of these approaches to gathering data, a survey by the British Library (2009) among doctoral candidates and post-doctoral researchers revealed some reluctance to engage with these new technologies. A possible explanation is that those in the early stages of an academic career have a tendency towards risk-aversion, and therefore prefer to avoid radically new approaches to gathering data. This is consistent with the author's observation that online surveys, which take a familiar research instrument and implement it electronically, are much more widely accepted than other tools for using the world wide web in research. However, experience of working with both undergraduate and postgraduate students suggests that there is a significant group who are open to the use of web 2.0, and that opportunities exist for teaching these students how they might apply research skills to the use of new tools to gather data. Also there is a concern that these opportunities might be limited by a lack of mutual understanding between educators and students, given that students are readier than educators to use new technology to gather data.

This paper discusses a number of tools used by students to facilitate data gathering as part of their dissertation process, and reflects on students' experience of their use and the competences that these students should have. Some pointers are offered, suggesting how students can acquire these competences, which should be of interest to those concerned with teaching research methods.

ISSN 1477-7029 Reference this paper as: ©Academic Conferences Ltd

Martin Rich, M. "Student Research in a Web 2 World: Learning to use new Technology to Gather Primary Data" The Electronic Journal of Business Research Methods Volume 9 Issue 1 2011 (pp 78-86), available online at www.ejbrm.com

Because this analysis is based on a limited number of cases, readers should be cautious in inferring conclusions about how these tools might be used.

2. A brief review of relevant literature

This section reviews and discusses some of the background literature relating to the implementation of Web 2.0 in higher education. Barnatt (2009) draws connections between web 2.0 and the strategies that universities need to offer – he uses the term 'higher education 2.0' to refer to a new pedagogic landscape enabled by this new technology, with the lecturer adopting the role of a facilitator more than that of a broadcaster. He also draws attention to the need for universities to adapt to an approach which he terms a 'mashup mentality', where combining a set of different tools and resources becomes commonplace. However his conclusions centre on the benefits of making scholarly resources freely available and of academics reaching the largest possible audiences for their work. Kane and Fichman (2009) focus on one web 2.0 tool – the wiki – which makes particular allowances for the provision of user-generated content. They are cautious about the prospects for its use within higher education, but they do observe that information systems researchers have a tendency to stick to systems which were originally devised for a world based around paper They identify particular potential for wikis as tools to review and iteratively improve documents.

Lai and Turban (2008) take a broader view of the contribution of Web 2.0 to social networks. Many of their examples relate purely to users' social activities, but they discuss the opportunities for using similar networks to facilitate professional activities. Their model of social life on the Internet identifies tools, resources, and people as elements in an organisation based on trust.

As a counterweight to these positive views of a world defined by ever-increasing access to information, Bawden and Robinson (2009) discuss some of the dangers associated with information. They refer to the problems associated with information overload but also set out to go beyond these and identify pathologies that may result from the overprovision of information. In terms of web 2.0 they are particularly concerned with issues around contributors' loss of identity, and the impermanence of information.

3. Electronic web-based surveys

3.1 Background

These are tools which allow a user to post a simple survey on the web, and to invite responses electronically. They include features which can generate statistics and graphs based on the responses. Among the students with whom the author discussed surveys, by far the most popular was *SurveyMonkey*, a commercial service generally run according to a subscription model where researchers could pay to put up a survey. Other survey software is available, notably *Bristol online surveys* (BOS) which is oriented specifically towards higher education and was originally devised at the University of Bristol, and Qualtrics, which is a sophisticated commercial system with a significant user base in higher education. Surprisingly, students who had access to the BOS software through their university nevertheless tended to choose SurveyMonkey, seeing it as a familiar and trustworthy commercial product and often feeling that they would have less control over their work if they used BOS, given that it was a package provided by the university. This is despite the scope to confer some authority on a survey by building it using a package provided by the university, and possibly by associating it with the university's brand.

3.2 Application

Survey software proved popular among students who were keen to gather primary data as part of an essay or dissertation. In particular dissertations were perceived as an opportunity for students to direct their own autonomous learning (Todd et al, 2004) and the use of a body of data collected through such a survey could add individuality and originality to a subject. Surveys could be implemented quickly and cheaply, and the results could be collated rapidly. The web address for the survey could be publicised by sending emails, or by inviting participants in an Internet discussion forum to visit a website. Surveys constitute a familiar research instrument, and most of the students who reported using web-based surveys had attended research methods courses which discussed the use of surveys in general – usually in the context of paper-based techniques.

Several students reported a striking level of success using survey software. One student, who set out to evaluate the business models used by developers of one very specific type of Internet application, expressed considerable pessimism in the early stages about getting survey resources, and devoted some effort to formulating an alternative strategy for his dissertation should the survey approach not prove viable. In fact, by publicising the survey in the online discussion areas frequented by this group of developers, he attracted responses from a wide range of developers, and by framing open questions and allowing respondents to provide discursive answers, he elicited the type of insight that might more typically be associated with an interview. Because some issues were mentioned by several of the respondents, the results lent themselves to a thematic analysis (Thomas and Harden, 2007) through which the student placed his individual 'stamp' on the issue. While a limitation of this approach is that it does not automatically provide for data to be shared with respondents, this student undertook to share the survey results, in an anonymised form, with any respondent who provided the student with contact details.

Another student used online survey software to conduct a psychological experiment among her peers, setting out to find out about students' possible views of knowledge sharing within the workplace. This survey set out to discover how particular areas of management theory were played out among a particular community; the student had been briefed that one promising approach to a dissertation was to find out how well the established theory in a field matched the practice. Because the students' peers were part of a group (final year undergraduates) about to enter the workforce, their perceptions as reported through the survey offered pointers about how the theory might evolve in the future to match the attitudes of this generation.

At the undergraduate or taught masters degree level most students' decisions on sampling were fairly superficial; the strongest students had chosen research designs which did not depend on a particularly representative sample. Notably in the example above using application developers, the most significant insights in the discursive responses came from individuals who had an unusual and distinctive perspective and were therefore not representative of developers as a whole.

3.3 Teaching requirements

Use of online survey software requires familiarity with basic web use – something which all of the students who discussed this approach possessed – and an understanding of the uses and limitations of survey data – an issue which is traditionally covered in research methods teaching. Areas where there is scope for more guidance in the use of surveys, particularly for students who are accustomed to using Web 2.0, include:

- Being aware of the limitations of particular sampling approaches, and possibly designing research to take full advantage of the samples which could be surveyed
- Understanding the potential to use web 2.0 resources to reach the audience who could be surveyed
- Knowing how to share results with survey respondents, who may be acculturated into the web 2.0 approach where knowledge is constructed collectively, in contrast with a the approach presupposed by surveys where knowledge is merely collected by one person
- Recognising the potential for using other web tools in place of, or in tandem with, simple web surveys. This could include specialised web survey software provided by an academic institution, or software embedded in a social networking site such as Facebook

4. Blogs

4.1 Background

A 'blog' or web log, is a simple online diary that usually follows a particular format, with the most recent entry at the top of a page. Initially blogs could be dismissed as a tool for their authors to report exactly what they were doing from day to day, but a number of developments led to their broader application. The blog format proved very attractive to journalists reporting on a fast-changing sequence of events. It also evolved to allow comments on entries, and to allow links to be created between blogs, and to websites, so that blogs became a useful tool for generating ideas collaboratively. Kim (2008: 1344) observes that blogs are 'often employed by educators to overcome the weakness of current CMC [computer mediated conferencing] software'

4.2 Application

The author spoke to three students who had used blogs specifically as tools to facilitate the data gathering stage for original work carried out within an undergraduate degree. All three of these examples were in some way concerned with information and communication technology and its impact on business. One of the students saw the blog primarily as a way to record and consolidate his own ideas. In practice, this student's blog was most useful in identifying background reading for secondary research, and in articulating the student's response to some of the sources. In places, the text in the blog could be seen as a first draft in preparation for the final work, typically more descriptive and less structured than the essay that was being worked on. The blog in this case facilitated a reflective process (Schön, 1991) which was enhanced by occasional comments and questions from outsiders who were able to observe the development of the student's ideas.

The other two students used a blog more explicitly to invite comments, and to solicit ideas from readers – in the same sort of way that other students had used survey software to collect discursive results. Key differences between comments on a blog and a survey were that comments on a blog were visible to anybody, so that one commenter could build on a point made by another, and that comments could include links to other resources on the Internet. In theory, then, blogs should have been much more effective than surveys in gathering discursive data. In practice, however, these students did not attract enough visitors to their blogs to build up a critical mass of comments, and the amount of data gathered through this approach was very limited.

4.3 Teaching requirements

Students are generally aware of blogs, and familiar with browsing them, but may not realise how easy it is to set up a blog. Areas which could usefully be covered are:

- Stressing the potential for using a blog as a self-reflective tool
- Finding ways to attract worthwhile traffic to a blog which would lead to useful discussions
- Framing issues on a blog so that comments provide relevant data for the blog author
- Understanding the etiquette that should be followed if a blog is to be taken seriously by its readers.

Some useful experience relating to this particular technology came from students who had already created blogs, and were familiar both with technical aspects of setting them up, and with the challenges of creating content and inviting comments. This is an instance where these experienced students could usefully be encouraged to share their experiences with others who might wish to create a blog, especially since the concept of the 'blogosphere' depends on creating links between different blogs.

5. Personal response systems

5.1 Background

Personal response systems, or 'clickers', can be connected to a computer to allow members of an audience to vote on a question that is put in front of the audience. Although they typically have 10 or 12 buttons so can only provide a limited number of responses to a question, they do offer a very quick way of gathering data. An experienced facilitator could vary the questions answered in response to issues raised by the audience, so it is possible to introduce an element of reflection into the process. There is some experience of using these systems to encourage participation in classes in higher education (Beekes, 2006).

6. Application

Most of the students who discussed these technologies with the author had experience of using clickers in class exercises, with a member of staff acting as facilitator, and generally responded positively to these. Arrangements could be made for students to borrow the clickers, but in practice the take-up of this was very low.

There were several reasons for students' reluctance to use this technology. One was simply a fear of it proving unreliable, and a sense that university staff had access to better support and resources if the technology did not work as planned. This also deterred students from travelling with the system,

although the portability of the clickers was intended to be a benefit, in that a meeting using clickers and a laptop computer could be set up almost anywhere.

But it also became apparent that the synchronous nature of this tool – that it invited responses immediately – made it unpopular. Even students accustomed to using instant messaging and Skype in their personal lives were reluctant to gather primary data within a limited time: they had little confidence that people would turn up at a particular time outside the routine of scheduled classes. Also this technology was seen as being owned by the university in a negative manner – where the students would feel a loss of control over their own research design – and not in a constructive manner of it being a facility available for them to use.

6.1 Teaching requirements

For this technology the immediate teaching requirements should be focused on overcoming the barriers to use:

- Offering training, and perhaps mentoring, in setting up and using the systems
- Discussing in which cases there may be advantages in collecting data synchronously, and inviting responses within a limited time
- Explaining how the questions used within a clicker exercise can be modified 'on the fly' to introduce an element of immediate response and reflection into a session.

7. Conferencing systems

7.1 Background

In this context 'conferencing system' is used to refer to any system which could be used to conduct an interview of dialogue electronically. A simple exchange of email could be a way of achieving this, but there are attractions in using other approaches where the same information can be read by a number of participants. Social networking sites, of which Facebook is among the best known, achieve this by allowing users to post information which others can read or add to. Computer conferencing systems are not new, especially in an academic environment, but the evolution of web 2.0 has made them much more familiar, and made a much greater variety of formats and structures of communication available. One effect of this is that it is increasingly possible to replicate face-to-face data gathering approaches such as interviews and focus groups on the Internet, as well as to create completely new approaches. An example of a new approach made possible by the reach of the Internet is 'crowdsourcing' (Howe, 2006) where members of the public (or a 'crowd') could be invited to contribute ideas, and offered non-monetary incentives to do so.

In practice the two sites offering conferencing systems cited by students were Facebook, principally associated with social activities, and LinkedIn, which was seen as a system strongly oriented towards professional use. Both could be classed as web 2.0 sites in that they offer scope for participants to post their own material, and encourage users to participate in complex webs of connections between people.

7.2 Application

Social networks such as Facebook are very widely used by students, and it is natural that students should adopt these as a basis for computer conferencing. Both Facebook and Linkedin offer virtual spaces devoted to particular topics and interests, and students were able to initiate conversations in the spaces relevant to their own original work.

A particular benefit of LinkedIn is that members typically have a public profile including employment history, education, and skills. By having access to these public profiles, students could find out background information about the LinkedIn members who were contributing to discussions, and would be able to detect any bias among a group of contributors.

Similarly participants in Facebook identify themselves through interests, membership of groups, and so on. While this background information can be slightly more amorphous than the professional information posted on LinkedIn, it has a similar benefit in offering transparency and insight into the group of people involved.

One student used LinkedIn as a platform for a series of electronic focus groups around the theme of crowdsourcing. He gathered some valuable, and in some cases unexpected, responses, although he found that the focus groups needed rigorous moderation to keep the discussion close to the subject. Furthermore he noted that many participants in LinkedIn had a product or service of their own to sell, and would see involvement in the online discussions as an opportunity to get publicity for it. While this was a perfectly legitimate use of a service aimed at business users, the student found that participants who were focused on selling something of their own tended to be limited in their contributions to the discussion.

One student in particular reported using Facebook in tandem with an electronic survey, by publicising the survey to a community within Facebook where he expected to find some interest in his topic.

Silverman (2007) is highly critical of the excessive use of interviews as a research instrument, arguing that they introduce bias and that naturally occurring data is more authentic and thus more valuable. In some applications students use social networks, such as Facebook, in effect as platforms to conduct interviews electronically. But in other cases the use of social networks allows the researcher to inhabit a space between that associated with an interviewer, and that of an observer collecting naturally occurring data.

7.3 Teaching requirements

Because the use of conferencing systems builds on students' existing experience of using social networking systems, there is particular value here in adopting a constructivist approach where the educator's role is to steer the student through building on their own experience and ideas (Goodyear and Ellis, 2007). In this case there is value in:

- Exploiting the properties of particular social networks (the nature of the participants, the structure of the network itself, etc)
- Determining what approaches to data gathering can best be built into a particular social network
- Sharing ideas on the strengths and weaknesses of particular networks and approaches
- Developing moderation skills which students can apply to ensuring that discussions remain focused and relevant.

8. Paper, face-to-face, or electronic?

It is worth reflecting on the characteristics of different media, and what alternatives exist to the electronic tools that are discussed here. Surveys are a well-established instrument for use in student research, and are naturally well suited to being implemented using the web. The alternative would be to send out paper forms, which would introduce a considerable cost and, particularly for students with limited resources, be a deterrent to contacting potential respondents unless they were almost certain to complete the survey. So the use of electronic media offers scope to approach a large audience in the anticipation that a small proportion will respond and provide useful information.

With electronic communication some other sampling issues arise. In many cases, students are operating in a worldwide environment when they are using the Internet. This can be valuable and appropriate: for example the student who interviewed Facebook application developers came across respondents in several different countries, all of whom were dealing with an international market, and who encountered broadly the same issues, irrespective of what country they were in. But on other occasions this can be problematic; it can be hard to limit the recipients of surveys to people in one country or one region, and sometimes misunderstandings can arise simply because it is not apparent to respondents where the questioner is.

Additionally there are issues of accuracy around sampling with electronic surveys. Some electronic survey tools do provide facilities to trace and isolate multiple responses from the same computer, and comparable suspicious behaviour such as an excessive number of identical responses. Nevertheless the results obtained through an electronic survey which is widely circulated should be treated with considerable caution, and students need to acknowledge the limitations of data when they generalise from it.

In other cases, such as the use of social networks to conduct discursive conversations with subjects, electronic tools can be regarded as alternatives to face-to-face conversation. In such circumstances

these tools offer possibilities which in the past were simply not available, to hold a complex and nuanced conversation with somebody who has not the time or the flexibility to visit the student conducting the research. However the dialogue remains qualitatively different from that which would take place in a face-to-face setting, with no possibilities for observing body language for example. So discussions conducted electronically have a distinct 'flavour' that students can usefully recognise and adapt to.

Dearstyne (2007) discusses web 2.0 tools from the viewpoint of an information management practitioner. In his analysis one of the primary characteristics of web 2.0 tools is encapsulated in the term 'workstyle' which he uses to indicate the way that knowledge workers share their contributions and build on one another's work. There is an apparent paradox in that the examples discussed in this paper relate mostly to students' individual work. But by using web 2.0 tools to gather primary data, students have the opportunity to build creatively and innovatively on information that has been provided to them by others, and to use some of the benefits of being connected to a larger group. This is arguably most apparent in the case of the student who used crowdsourcing as a theme. While the conclusions and frameworks presented within this student's work were original, and the student's intellectual contribution to these was never in any doubt, they were constructed to some extent using ideas and concepts that had originated with other people who assisted with the project.

9. Pedagogic issues

Because the tools discussed here can be used by students to create original and distinctive knowledge, they are consistent with trends that have emerged over the years towards learning that is constructivist, in that it encourages students to contribute their own thoughts and ideas actively to the learning process, and student centred.

The self-documenting nature of discussions that take place using social networking websites offers scope for discourse analysis using tools such as the language/action perspective (Winograd, 1987). Such analysis could provide a deeper understanding of students' research and learning processes, and potentially form the basis for students to reflect on their own approaches to gathering data.

Ramsden (2003:87) in a discussion encompassing the nature of good university teaching, and the difference between 'deep' and 'surface' learning, identifies a 'commitment to encouraging student independence' as one of the characteristics associated with effective teaching in higher education. The electronic tools discussed here do offer significant practical support for students to work independently in a manner that can yield valuable results.

10. Concluding remarks

From this small-scale inquiry it appears that each of the electronic techniques discussed imposes a different set of requirements for teaching research methods. There are some common themes, however; it is important to build on students' existing experience but also to encourage the use of new tools. There are potential benefits from using a variety of tools, and there are benefits in being prepared to use facilities offered by a university, such as some of the online survey and personal response systems.

Knowledge management (Grossman, 2007) has emerged since the mid-1990s as a significant academic area within business and management. Students who are carrying out independent work need to practise effective knowledge management, recognising that knowledge is complex, is constructed over time, and has a tacit dimension. Using the tools described offers students an opportunity to gather original data rapidly and to build valuable connections between primary data and their own ideas. An important benefit is that electronic tools are usually self-documenting: for example web survey software can produce reports automatically, and discussions that take place using computer conferencing are instantly documented.

A significant concern is that students tend to rely excessively on data that is easy to collect, rather than data which can usefully be analysed, and there is a danger that the use of electronic tools can exacerbate this, by making it tempting to gather superficial data. Bryman and Bell (2007) offer extensive advice, pitched at a level appropriate to students carrying out an independent piece of work, on how to conduct a survey. Much of this is relevant to students using Internet tools to gather data, but it needs to be tempered with a considerable awareness of the limitations of these approaches.

It is also important that educators encourage students to use a variety of tools, and to explore unfamiliar approaches; discomfort with a particular tool among staff can be a significant barrier to its use, and can be in contrast to students' familiarity with it (King and Robinson, 2009). All these approaches offer scope for students to produce independent and original work with limited resources, and it would be a pity if students were constrained only by excessive caution among their teachers.

References

Barnatt C (2009) Higher education 2.0. International journal of management education 7 (3) 47-56

- Bawden D and Robinson L (2009): The dark side of information: overload, anxiety and other paradoxes and pathologies. *Journal of information science* 35 (2) 180-191
- Beekes W (2006) The 'millionaire' method for encouraging participation. Active learning in higher education 7(1) 25-36
- British Library/JISC (2009) Researchers of tomorrow- interim research report 1 Retrieved 1 December 2009 from http://explorationforchange.net/attachments/054_Summary%20Report%20Final.pdf
- Bryman A and Bell E (2007): Business Research Methods. Oxford: Oxford University Press.
- Dearstyne B (2007): Blogs Mashups and Wikis, Oh My! *Information management journal* 41 (4) 24-33 Goodyear P and Ellis R (2007) Students' interpretations of learning tasks: Implications for educational design.
- Proceedings of Ascilite conference 339-346 Grossman M (2007) The emerging academic discipline of knowledge management. *Journal of information* systems education 18 (1) 31-38
- Howe J (2006) The rise of crowdsourcing. *Wired* June. Retrieved 19 March 2010 from http://www.wired.com/wired/archive/14.06/crowds.html
- Kane G and Fichman R (2009): The shoemaker's children: using wikis for information systems teaching, research and publication. *MIS quarterly*, 33 (1) 1-17
- Kim H N (2008) The phenomenon of blogs and theoretical model of blog use in educational contexts. *Computers* and education 51 1342-1352
- King S O and Robinson C L (2009) Staff perspectives on the use of technology for enabling formative assessment and automated feedback. *ITALICS 8 (2)* Retrieved 1 December 2009 from http://www.ics.heacademy.ac.uk/italics/vol8iss2/pdf/ItalicsVol8Iss2Jun2009Paper3.pdf
- Lai L and Turban E (2008): Groups formations and operations in the web 2.0 environments and social networks. Group decision and negotiation. 17 387-402
- O'Reilly T (2005) What is Web 2? Retrieved 1 December 2009 from http://oreilly.com/web2/archive/what-is-web-20.html
- Ramsden P (2003): *Learning to teach in higher education (2nd edition).* London, Routledge Falmer.
- Schön D (1991): *The reflective practitioner*. Aldershot: Avebury. (originally published in UK by Maurice Temple Smith, 1983)
- Silverman D (2007): A Very Short, Fairly Interesting, Reasonably Cheap Book about Qualitative Research. London, Sage.
- Thomas J and Harden A (2007) *Methods for the thematic synthesis of qualitative research in systematic reviews.* ECRM National Centre for Research Methods working paper. Retrieved 19 March 2010 from http://eprints.ncrm.ac.uk/468/1/1007_JTAHthematic_synthesis.pdf
- Todd M, Bannister P and Clegg S (2004) Independent inquiry and the undergraduate dissertation: perceptions and experiences of final-year social science students. *Assessment evaluation in higher education 29 (3)* 335-353
- Winograd T (1987) A language/action perspective on the design of cooperative work. *Human-computer interaction 3 (1)* 3-30