



Qualitative Research Practice: Implications for the Design and Implementation of a Research Impact Assessment Exercise in Australia

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Background

On 19 June 2013, the former Department of Industry, Innovation, Climate Change, Science, Research and Tertiary Education (DIICCSRTE) and the Australian Research Council co-released *Assessing the wider benefits arising from university-based research: Discussion paper* (the ‘discussion paper’). The discussion paper sought “the views of interested parties regarding a future assessment of the benefits arising from university-based research. The proposed assessment will include a strong industry focus and will be designed to complement the assessment of academic impact being undertaken through ERA [the Excellence in Research for Australia initiative].”¹

Also in 2013, the Commonwealth engaged content experts to investigate specific aspects of a research impact assessment methodology. Prof. Lisa M. Given was contracted to provide evidence and analysis on the possible contribution that qualitative inquiry can bring to the design, development and implementation of a research impact assessment exercise in Australia. The primary goal of the project was to explore the implications for the use of research impact case studies.

The project included three phases:

- 1) An environmental scan of the literature on qualitative inquiry and research impact;
- 2) A public workshop with key stakeholders (e.g., researchers, university administrators, research office staff, communications staff, and others who may be involved in a research impact assessment process) from institutions across Australia; and,
- 3) Qualitative interviews with key stakeholders involved in university-based research.

The environmental scan of relevant literature provided data for the design of an all-day workshop, held in Sydney, Australia, 8 August 2013; twenty participants were presented with information and activities to engage with the qualitative design practices outlined in this report and to reflect on their application to a proposed research impact assessment process. University-level workshop participants came from various institutions (e.g., University of Sydney; RMIT; LaTrobe; Central Queensland University) and disciplines (e.g., engineering; chemistry; sociology; public health). Participants included a mix of early career, mid-career and senior researchers, Associate Deans Research, communications staff, and Research Office Directors. Representatives from Universities Australia, the Australian Technology Network and other industry stakeholders also participated in this event.

The commentary provided at the workshop informed the design of ten, in-depth individual interviews, where additional information was gathered on the relevant themes. Interview participants were also recruited from across Australia and represented a mix of disciplines and career stages. Although some workshop participants and interviewees had very close working knowledge of impact assessment schemes, worldwide, others had little to no prior understanding of this type of formal evaluation.

¹ Department of Industry Innovation Climate Change, Science, Research and Tertiary Education (DIICCSRTE) (2013), p. 4.

This report provides an overview of the key findings arising from all three phases of data collection, with suggestions developed in the context of qualitative inquiry as it could be applied to research impact case studies. Emergent findings related to research engagement are also discussed. The discussion paper was a key reference point for the participants in the project, given the timing of its release. This report presents analysis of the information gathered to inform the design and development of a research impact assessment exercise, with a particular focus on the use of research impact case studies, to benefit from available expertise in qualitative practice.²

Research Impact Assessment – General Context

Research impact is gaining international attention in the university sector,³ with increasing calls for evidence of the economic, social and environmental benefits of publicly-funded research⁴. In the United Kingdom (UK), for example, this has resulted in an Impact Exercise as part of the Research Excellence Framework (REF); the first round of that exercise is underway currently. In Australia, the Go8-ATN Excellence in Innovation for Australia trial was conducted in 2012, to explore the viability of a similar assessment exercise in this country. The findings of that study point to a number of challenges with the development of case studies, which may well be addressed by the use of an appropriately-designed qualitative case study approach. For example, the report notes that “While some cases were very well written and explained, a number were poorly written and lacked defined verifiable sources to back up claims.”⁵ Further, many cases were based on prospective, rather than demonstrated, impact, and the time and resources needed to gather data linking research to impact were described as significant.⁶

Recent reports examining the value of research impact assessment also mention the potential value of research impact assessment exercises for providing material that can be used, in other ways, to highlight an institution’s research reputation and the value of research.⁷ They note that Australian “universities have not been pro-active in articulating and communicating the impact of this research in a manner that is readily understood by the broader community.”⁸

What is Research Impact?

The discussion paper suggests, as a definition for research impact that it is those “positive economic, social and environmental changes that can be attributed to university research.”⁹ The aims of a research impact assessment process, as outlined in the discussion paper, may be to:

1. Demonstrate the public benefits attributable to university-based research;
2. Identify the successful pathways to benefit;

² See Appendix 1 for details on the data analysis process used to create this report.

³ See for example Grant et al. (2009); Guena & Martin (2003); Morgan Jones et al. (2013); and, Group of Eight (2011).

⁴ Department of Industry, Innovation, Science and Research (2011).

⁵ Group of Eight and Australian Technology Network of Universities (2012), p. 6.

⁶ Ibid., pp. 6-7.

⁷ Group of Eight (2011); Group of Eight and Australian Technology Network of Universities (2012); and, Morgan Jones et al. (2013).

⁸ Group of Eight and Australian Technology Network of Universities (2012), p. 5.

⁹ DIICCSRTE (2013), p. 5.

3. Support the development of a culture and practices within universities that encourage and value collaboration and engagement; and,
4. Further develop the evidence base upon which to facilitate future engagement between the research sector and research users, as well as future policy and strategy.¹⁰

What are the Expected Outcomes of a Research Impact Assessment Exercise?

Further, the paper notes that the outcomes of such an exercise include:

1. Providing an evidence base for decision making by universities, government and industry (in/outside Australia);
2. Promoting engagement both between university researchers and potential research users and in the sector;
3. Promoting research outcomes and engagement strategies of Australia's publicly funded universities;
4. Providing an evidence base for benchmarking standards within the university sector; and,
5. Linking outcomes to funding allocations.¹¹

Overall, the discussion paper notes that the principles for the design and implementation of a research impact assessment are to provide useful information to universities (with information collected and assessed at the institution level, with some disciplinary granularity), while minimising the administrative burden of such an exercise. The aim of the exercise is to encourage research engagement and collaboration outside of academe, to encourage research that benefits the nation and to involve research users in the assessment process.¹²

What Measures are Proposed to Assess Research Impact?

The discussion paper proposes that the research impact exercise consist of two distinct methodologies – i.e., the collection and assessment of: 1) research engagement metrics; and, 2) research benefit case studies. Research engagement metrics are proposed as indicators of pathways to research benefits and should meet the following criteria:

- Be quantitative, research relevant, verifiable and comparable;
- Be repeatable and time-bound;
- Be sensitive to disciplinary differences; and,
- Quantify relevant pathways to research benefits.¹³

Research benefit case studies “are a narrative method whereby an institution is able to describe research benefits.”¹⁴ A case study-based assessment should be designed to:

- Include key information to enable effective and verifiable comparison;
- Have evidence supporting the claim(s) made; and,
- Capture and encourage cross-sectoral engagement.¹⁵

¹⁰ Ibid., p. 6.

¹¹ Ibid., p. 6.

¹² DIICCSRTE (2013), pp. 6-8.

¹³ Ibid., p. 9.

¹⁴ Ibid., p. 14.

¹⁵ Ibid., p. 14.

The discussion paper notes that each institution might only submit a “limited sample” of case studies; separate research areas and/or separate institutions could submit joint case studies. Although there are no prescribed metrics or data to include, institutions would provide “any relevant and verifiable data” in the case study, so that claims made are verifiable. The case studies would be assessed “primarily by research end-users” on panels created for that purpose.¹⁶ The criteria for assessment might include:

- Reach (i.e., the spread or breadth of the reported benefit);
- Significance (i.e. the intensity of the reported benefit);
- Contribution (of the research to the reported benefit); and,
- Validation (i.e., key impact claims are able to be corroborated).¹⁷

1. Qualitative Research Practice – An Overview

A key goal of this report is to provide details on the current thinking within qualitative inquiry on research assessment, including measures of research impact. As far back as 1994, “the Australian Vice-Chancellors’ Committee proposed that qualitative aspects should be incorporated” into processes of research evaluation.¹⁸ Recently, public responses to the discussion paper have highlighted the need for qualitative approaches to impact assessment, in particular.¹⁹ This first section of the report is designed to inform a non-expert audience about relevant components of the broader world of qualitative assessment (e.g., the nature of rigour in qualitative research; use of specific methodologies and methods; etc.).

1.1 Qualitative Research Paradigm

Qualitative research is grounded in an epistemological commitment to a human-centred approach to research, highlighting the importance of understanding how people think about the world and how they act and behave in it.²⁰ Key principles of qualitative inquiry include gathering data that are occurring naturally, exploring meanings (rather than behaviours, alone), and crafting studies that are inductive and hypotheses-generating, rather than ones that involve hypothesis testing.²¹ Qualitative studies typically describe phenomena about which little is known; they capture meaning (such as individuals’ thoughts, feelings, behaviour, etc.), instead of numbers and describe processes rather than outcomes.²² To understand how individuals make sense of their worlds, researchers ask people, directly, what they believe to be important about the topic or issue under study.²³ Qualitative projects are typically designed to:

- Acknowledge that knowledge is socially constructed and inextricably linked to peoples’ backgrounds, histories, cultural place, etc.;
- Present an inductive understanding of participants’ experiences;
- Reflect a dynamic, reflective and continuous process;
- Embrace context, bias and subjectivity;

¹⁶ Ibid., p. 14.

¹⁷ Ibid., p. 17.

¹⁸ Guena & Martin (2003), p. 294.

¹⁹ Australian Open Access Support Group (2013), para. 16; Knowledge Commercialisation Australia (2013), p. 5.

²⁰ Social Sciences and Humanities Research Ethics Special Working Committee (SSHRESWC) (2008), p. 2.

²¹ Silverman (2000), p. 8.

²² Creswell (2007), pp. 37-39; Palys & Atchison (2008), p. 9.

²³ Palys (2008), p. 9.

- Focus on research partnerships/engagement; and,
- Foster the emergence of concepts, theories and strategies, in the course of the research.²⁴

1.2 Qualitative Methodologies – Relevant Approaches for Documenting Impact

To achieve these goals, qualitative researchers use a range of methodologies (e.g., grounded theory; phenomenology; case study; narrative inquiry) and methods (e.g., interviews; observation; focus groups; diaries) in their projects. The case study methodology has a long-standing history in qualitative research practice. A case study design “aims to understand social phenomena within a single or small number of naturally occurring settings. The purpose may be to provide description through a detailed example or to generate or test particular theories.”²⁵ Various stakeholders may be involved in the design and implementation of the project, as participants and/or as co-researchers in the investigation.²⁶ Although the design and implementation of specific methodologies will differ, many qualitative projects start by listening to individuals engaged in the situation.²⁷

Triangulation of methods is often used to draw on the strengths of specific methods to best explore a phenomena from multiple points of view. For example, a case study of a classroom environment might include:

- Interviews with various stakeholders (students, teachers, parents, etc.);
- Observations of classroom teaching, playgrounds, and the teachers’ lounge;
- Textual analysis of instructional materials and students’ work; and,
- Other methods, to capture evidence from various data sources.

Data are gathered using many different data collection tools (e.g., fieldnotes; audiorecordings; videorecordings; photographs; etc.) and may extend over many hours, weeks, or years. Multiple sources of evidence are tracked, with materials organised to maintain an appropriate chain of evidence.²⁸ Participants are included in the study using various sampling approaches (e.g., maximum variation; purposive; snowball) to “cover the spectrum of positions and perspectives in relations to the phenomenon one is studying.”²⁹ Given the depth of data collection and analysis, sample sizes are typically small; theoretical sampling to saturation of analytic themes with a particular set of participants is common.

Many qualitative research projects are designed, very purposefully, as ‘community-based’ studies. Community-based participatory research, for example, is “an orientation to research that focuses on relationships between academic and community partners, with principles of colearning, mutual benefit, and long-term commitment and incorporates community theories, participation, and practices into the research efforts.”³⁰ In documenting research impact, for example, the main community members would include researchers and end users of the research

²⁴ SSHRESWC (2008), p. 3.

²⁵ Bloor & Wood (2006), p. 28.

²⁶ See for example Jordan (2008), p. 602 and Finley (2008), p. 98.

²⁷ Clandinin & Caine (2008).

²⁸ Yin (2014), pp. 123-126.

²⁹ Palys (2008), p. 699.

³⁰ Wallerstein & Duran (2006), p. 312.

outcomes. A community-based approach has collective action to produce change as one of its primary goals;³¹ it typically involves:

- “values, strategies, and actions that support authentic partnerships, including mutual respect and active, inclusive participation;
- power sharing and equity;
- mutual benefit or finding the “win-win” possibility; and
- flexibility in pursuing goals, methods, and time frames to fit the priorities, needs, and capacities of communities.”³²

Qualitative content analysis is another strategy for gathering and analysing data, which is used for the exploration of textual data sources (e.g., photographs; websites; policy documents, etc.). Qualitative content analysis “focuses on interpreting and describing, meaningfully, the topics and themes that are evident in the contents of communications when framed against the research objectives of the study.”³³ Increasingly, this type of analysis is also being applied to various social media, including content appearing on Facebook postings, in Twitter feeds, and on blogs. In documenting research impact, researchers could use qualitative content analysis to examine research users’ discussions of impact or to explore policy documents developed based on the research outcomes.

Qualitative researchers are able to extend their analyses beyond the data gathered from human participants, directly, to a range of other data sources available on a specific topic. Texts are often used as part of the process of triangulation of data sources, as well, to complement evidence gathered during interviews, focus groups, observational research, and with other methods of data collection.

1.3 Qualitative Communication Strategies – Telling the Story of Impact

The results of qualitative research are presented in narrative form and designed to “give voice” to the participants and texts involved in the project, including multiple and/or conflicting interpretive positions.³⁴ The end result is a continuous, narrative account of people’s experiences of a phenomenon, whether a complete life history or a discrete, singular event.³⁵ In documenting research impact, for example, the narrative would include research users’ own accounts of the impact of the research outcomes, alongside the research team’s analysis of impact. The goal of the narrative account is one of “shaping and organising experiences into a meaningful whole.”³⁶

Qualitative writing conventions often include the following:

- Explicit statements on the researcher’s part in the narrative (i.e., embracing subjectivity);
- Participants’ voices included as part of the narrative;
- A range of views on the topic (including anomalies or ‘negative findings’); and,

³¹ Finley, 2008.

³² Jones & Wells (2007), p. 408.

³³ Williamson et al. (2013), p. 427.

³⁴ Fabian (2008), p. 944.

³⁵ Bloor & Wood (2006), p. 120.

³⁶ Chase (2011), p. 421.

- Evidence drawn from multiple data sources.³⁷

There are many texts that explore the nature of qualitative writing in depth.³⁸ Generally, in qualitative writing, researchers determine the point of view and the voice to present, with some features (e.g., first vs. third person) dependent on disciplinary and/or theoretical practices relevant to the investigation. Concrete examples, quotes and other forms of evidence are provided to support the claims being made, with all details formed into a coherent story that will resonate with the specific reader being addressed in a particular piece of writing (e.g., academic; community member; student).

In this way, the narrative will change depending on the audience being addressed; the narrative is tailored to suit the audience, content, message and dissemination medium. Some quantitative data may be presented, as well; however, qualitative findings are typically presented in narrative form where the results and discussion are woven together, in a coherent whole. Dissemination may be through traditional, text-based media, such as journal articles, community newsletters, etc., or through non-traditional (often multimedia) means, including plays, videos, poems, etc.

1.4 Qualitative Rigour – Evaluating the Story of Impact

Qualitative research data are gathered systematically with strategies designed to ensure rigour during data collection, analysis and writing the results of the project. Qualitative researchers across disciplines have developed practices, over several decades, to ensure the rigour of their work. Triangulation of data sources, the use of multiple research methods, involvement of multiple data coders, active engagement of participants with opposing views, member checking, and extended observation are just a few of the strategies employed to enhance rigour.³⁹

For example, in a study of young children's experience in a hospital emergency ward, a qualitative researcher will explore the topic from multiple perspectives using triangulation of sources and methods. Interviews may be conducted with the children and their family members. Focus groups may be held with physicians, nurses, and other healthcare practitioners. Observational data may be gathered in hospital waiting rooms, to see what children, their families and healthcare providers do while children are waiting to be seen by a physician. A content analysis of published documents (e.g., hospital policies; brochures provided to parents) may be completed, to see how children's needs and experiences are addressed. These various data are analysed for patterns and themes, providing evidence of children's experiences in the emergency ward, and pointing to areas for potential change in practice to suit children's needs.

Over time, and with appropriate resources, research data could then be gathered using similar methods to demonstrate the impact of the research. Interviews and focus groups could be conducted with healthcare practitioners to explore changes to practice arising from the research results; additional observational and interview data could provide evidence of how those changed healthcare practices are affecting children and their families. In designing a case study about the

³⁷ See for example Yin (2011); and, Ely (2007).

³⁸ See for example Sandelowski (1998); Wolcott (2009); Pratt (2009); Boylorn (2008); Keen and Todres (2007); and, Saldana (2011).

³⁹ Saumure & Given (2008).

impact of this research, triangulation of methods, sites, sources and participants would be very similar. However, the focus of the investigation will change, to gather data about the impact of the original study results. New research questions need to be investigated, with new data gathered to demonstrate evidence of impact. Research questions might include the following, to document changes that have occurred since the original research was conducted:

- How have healthcare practitioners' practices changed?
- How have children's experiences of care in the hospital emergency room changed?
- How have information sources provided to children and their families changed?
- How have hospital policies changed?

Triangulation is a technique commonly used in qualitative projects. Table 1 provides an overview of how triangulation might look in a study of children's experiences in the hospital emergency room. With each method, site, data source and participant group, the size and scale of the study – and of the evidence gathered for analysis – grows, tremendously. For this reason, qualitative projects can extend over several weeks, months or years. Given the emergent nature of qualitative analysis, choices about what sources or participants to add to the study may be made in the field, once initial data are gathered.

Table 1: Research Problem: How do young children experience care in the hospital emergency room?

Triangulation of Methods	Triangulation of Sites	Triangulation of Sources	Triangulation of Participants
Interviews	Hospital	Transcripts	Children, families, healthcare practitioners
Interviews	Child's home	Transcripts	Children, families
Observation	Hospital	Video-recordings & research field notes	Children, families, healthcare practitioners
Observation	Child's home	Video-recordings & research field notes	Children, families
Content analysis	Hospital	Policy documents, patient brochures, etc.	Healthcare practitioners, hospital library
Content analysis	Child's Home	Parenting guides, library resources, websites, etc.	Children, families, school & public libraries

These strategies have been refined over several decades, across disciplines, and using various qualitative methodologies. In community-based participatory research, for example, assessment of quality and rigour are embedded in the design and implementation of projects that involve users, directly, in the research.⁴⁰ Similarly, in case study approaches, triangulation, prolonged engagement, and other measures of rigour are central to the research practices employed to investigate a specific situation, location or phenomenon.

Yvonna Lincoln and Egon Guba (1985) outlined the concept of 'trustworthiness' and the various criteria that mark rigorous qualitative research, in a landmark work that remains highly

⁴⁰ See for example Waterman et al. (2001); Lee et al. (2008); and, Quigley et al. (2000)

influential among qualitative researchers. In place of quantitative terms used to denote rigour (e.g., validity, generalisability and reliability), which are not appropriate for use in qualitative studies, new terms were introduced:

- Credibility;
- Transferability;
- Dependability;
- Confirmability; and,
- Reflexivity.

Each of these criteria is marked by several techniques that may be used to ensure rigour and quality in research design and implementation, such as:

- **Triangulation.** The use of multiple methods, research sites, data sources and participants to investigate a research problem from various perspectives;
- **Peer debriefing.** During data collection and analysis, a researcher will consult with peers (at times, sharing excerpts of datasets) to seek advice on development of research themes. Peers may be co-investigators in the project or independent scholars, with expertise in the methods being employed;
- **Audit trails.** Researchers keep field notes during data collection and analysis, which track decisions made about evidence gathered throughout the project;
- **Member checking.** Researchers may consult with participants or other group members to see if the analysis resonates with these individuals; and,
- **Prolonged engagement.** Researchers may spend weeks, months or years working in particular research sites, to gain as much knowledge as possible from the perspective of the research participants.⁴¹

Researchers need to decide which techniques are appropriate for a given study, depending on the methodology and overall design of the project, as well as access to particular sources of data.

2. Qualitative Impact Workshop & Interviews – Findings

This section of the report presents key findings arising from the public workshops and individual interviews. These findings are addressed in the context of qualitative inquiry, generally, with references to relevant literature provided; where appropriate, the discussion paper is referenced, given its influence on the discussions. The section begins with an exploration of research engagement, since qualitative practices can be applied to an assessment of pathways to engagement, as well to case studies. Next, an exploration of qualitative inquiry in research impact case study design, development and implementation is provided. Quotes from interview participants are provided at the start of and within each sub-section to illustrate key points of evidence. This approach is in keeping with qualitative writing practices, where participants' voices are central to the interpretation of the data presented.

⁴¹ Lincoln and Guba (1985), pp. 301-327.

2.1 Extending Beyond Metrics to Document Research Engagement Using Qualitative Practice

“I’ve had major pick up of research by companies and also by media because it’s gone out by Twitter... And then I actually have people from corporations emailing me directly and saying, ‘Can I get a copy of the article?’ and we start conversations.”

Overwhelmingly, participants expressed a preference for a multifaceted, “holistic style of assessment,” which would not reduce the evaluation to an exercise solely reliant on numbers and metrics. They agreed that metrics could be useful, where available, but needed to be complemented by qualitative approaches to data gathering. This applied not only to the case studies, but also to the strategy proposed in the discussion paper for documenting research engagement, as noted in the appendix of the discussion paper (e.g., consultancies; patents; licenses; etc.).⁴² Participants raised a number of concerns, many of which have been highlighted previously in other publications:⁴³

- Research engagement metrics are not appropriate across all disciplines;
- Although some data may be easily tracked (e.g., patents), these do not necessarily lead to impact;
- Institutions and researchers do not have ready access to most metrics, especially over the longer term, given the time lags that exist between research outcomes and research ‘use;’
- As researchers change institutions, tracking data on research engagement and/or impact is difficult;
- When research users are unknown to the researcher and/or to the institution, tracking engagement/impact data is almost impossible.

The plan to use Socio-Economic Objective (SEO) classification as a unit of evaluation for impact assessment was also discussed by participants in this study. The discussion paper notes that “SEO classification allows R&D [research and development] activity to be categorised according to the intended purpose or outcome of the research, rather than the processes or techniques used in order to achieve this objective. The purpose categories include processes, products, health, education and other social and environmental aspects that R&D activity aims to improve.”⁴⁴

However, there are a number of limitations that may be associated with SEO codes:

- The actual, demonstrated impact of the research (especially years later) may be quite different from what the researcher intended or believed would occur when SEO codes were designed at the project’s outset;
- Relying on the SEO alone may leave a number of research users unidentified in the process of gauging research impact;
- Limiting potential users to those included in the SEO code will affect the credibility of the assessment, as involving all types of research users is needed for appropriate evaluation; and,
- Some disciplines do not have clear links to R&D, as defined by the SEO classification scheme, which would constrain the potential identification of research impact.

⁴² DIICCSRTE (2013), p. 22.

⁴³ See for example Group of Eight (2011) and Grant et al. (2009).

⁴⁴ DIICCSRTE (2013), p. 22.

The participants agreed that using qualitative research approaches to document engagement – in addition to impact – would enrich the metrics-based approach by extending the body of evidence available to assess pathways to impact. However, even where participants mentioned ongoing and successful engagement with research users, they noted that they did not track details of that engagement in systematic ways that would meet the standard for providing verifiable evidence. As tracking and analysing such data falls outside of researchers' everyday practices, they noted the time, funding and technical supports needed to gather these data – particularly longitudinally.

Suggestions:

- Include qualitative measures of research engagement, alongside metrics, to capture a more complete range of potential pathways, across disciplines;
- Identify other engagement metrics (e.g., altmetrics⁴⁵), including those that can provide qualitative data for further analysis (e.g., twitter feeds of users discussing research);
- Include strategies for identifying research users during and/or after the completion of the project, not only at the project proposal stage (i.e., when SEO codes are applied);
- Encourage the use of qualitative content analysis to assess textual data provided by research users (e.g., forum postings about a revised policy document); and,
- Encourage the use of qualitative methods (e.g., interviews; journals) to track research users' experiences, directly, from the time that projects are developed.

2.2 How Useful and Appropriate are Qualitative Case Studies for Documenting Impact?

“Case study methodology...has the potential to be very robust, to be trustworthy, and...when done properly, people who perhaps are more comfortable with positivist or quantitative research, can feel more comfortable”

Workshop attendees and interview participants also discussed the usefulness and viability of reporting case studies of research benefit. Participants supported the idea that metrics, alone, should not form the basis of a research impact assessment exercise; they also supported the development of case studies or other approaches to illustrate the benefits of university research. However, they were unclear as to who best would create these documents and/or the types of data that should inform their development.

Overall, most participants were unfamiliar with case study methodology as it is enacted in qualitative research. Concerns were raised, initially, about the objectivity and rigour of such cases (i.e., when relying on a 'lay' understanding of case study, as it is often termed in practical settings⁴⁶), highlighting the lack of knowledge of appropriate research practices for case study development. Those familiar with case study methodology were adamant that this approach would be beneficial to a research impact assessment exercise and – if enacted properly – would be just as rigorous and trustworthy as other (i.e., metrics-based) approaches.

⁴⁵ For details see Priem et al. (2011).

⁴⁶ Blatter (2008).

Overall, a number of questions were raised about the use of case studies for impact assessment:

- How can case studies be compared across institutions and disciplines? What is the goal of this type of assessment?
- How much time and money will be needed (for researchers and others, such as research office staff) to gather data and develop cases studies?
- Who will write the case study narratives? Researchers have some knowledge, but lack the communications' expertise needed to write for the proposed audience for the cases (e.g., panels comprised primarily of research users).

The burden on researchers and institutions in preparing case studies was the overriding concern raised in the workshop and the interviews. However, participants also worried that case studies might be eliminated from an assessment exercise (which would then rely solely on metrics) due to the perception that cases are “too cumbersome” to prepare. Participants expressed a preference for both qualitative and quantitative measures of research impact, with the appropriate resources provided to gather and report the necessary data. This point was also raised in the Excellence in Innovation for Australia trial, as universities reported challenges with the time and resources needed to trace information from research to impact.⁴⁷

Suggestions:

- Ensure that the design and assessment of case studies conforms to the research principles and practices of qualitative case study methodology; and,
- Involve qualitative research experts in the design of data collection, analysis and writing practices for case study development.

2.3 How do we Define ‘Research Impact’ for use in Qualitative Case Study Designs?

“Impact is something that is judged not by the person who generates the new knowledge...but by the recipients of new knowledge of whether they find that actually it makes a difference [to] the economic generation of a nation or the life of an individual.”

Overall, there was also a lack of understanding, intuitively, about the definition of ‘research impact’ that was being used to shape an assessment exercise. This has implications for qualitative design of case studies, as researchers must ensure that data gathered are appropriate and verifiable. The discussion paper defines research benefits as “positive economic, social and environmental changes that can be attributed to university research,” and notes that such benefits “do not include changes to the body of academic knowledge but may include improvements within universities, including on teaching or students, where these extend significantly beyond the university.”⁴⁸ Only a few participants understood that the definition of impact was to explore a demonstrated change outside of academe, such as changing a child’s experience in a classroom or developing an innovation that is used by industry.

Overwhelmingly, participants discussed the concept of ‘impact’ in academic terms, referring to the impact factor of journals, citation rates, and other traditional measures of academic impact. Where research users were mentioned, participants used such terms as “community engagement”

⁴⁷ Group of Eight and Australian Technology Network of Universities (2012), pp. 6-7.

⁴⁸ Ibid., p. 5.

or “outreach” and focused, primarily, on dissemination of research results (e.g., media coverage about research), rather than tracking demonstrable change. The focus on academic impact is quite common in research publications and in many of the support materials available to researchers to support measurement of ‘research impact,’⁴⁹ so this finding is not surprising.

However, this has significant implications for the types of data to which researchers (and institutions) can point in tracking evidence of impact as defined in the discussion paper. Documenting and tracking evidence of research impact outside of academe typically falls outside the boundaries of a researcher’s daily practice, making ready access to verifiable data a challenging proposition. The types of data required to demonstrate evidence of research impact outside of academe are not typically tracked or even available, to either researchers or their institutions.

Suggestions:

- Change the term ‘Research Impact’ to ‘Impact outside Academe’ to make the intention of this measurement exercise clear and to distinguish it from academic measures of research impact; and,
- Provide examples of the types of evidence that researchers could provide to document demonstrated change in the community (e.g., interview data documenting tool use).

2.4 What Impact Data can be Collected, Stored and used in Qualitative Case Studies?

“Where are the resources going to be to not only compile these [research impact] cases, but to try to collect the data to support them?”

The lack of available data noted in discussions of research engagement also extends to the lack of evidence on hand to document research impact in qualitative case studies. Participants noted that the “uptake” of research lies in the hands of other people, beyond the research team (such as industry partners or individual citizens). Involving these research users in qualitative data gathering exercises about research impact is vital to building the evidence base of impact data. It may be possible, for example, to interview people who have benefited from the research, to track trade publications mentioning the application of research in practice, or to maintain ongoing discussions with policy-makers and others who have applied research findings to their activities. However, participants took issue with a number of presumptions in the discussion paper, which would affect the data collection process:

1. That research users may not be aware of, nor can they document, the link between research projects and their current policies/practices; and,
2. That researchers may not be aware of, or in contact with, the various research users who may apply the results of their research.

In addition to time lags and other challenges noted previously in documenting evidence of impact,⁵⁰ workshop participants and interviewees discussed the challenges for researchers and institutions in gathering and reporting data that sit outside the boundaries of current research activity. Overall, they questioned whether the “evidence base”⁵¹ for documenting research

⁴⁹ See for example Griffith University Library (2013).

⁵⁰ Group of Eight (2011); Grant et al. (2009).

⁵¹ DIICSRTE (2013), p. 6.

impact was already being captured and documented by researchers and/or institutions, or whether the type of evidence required could be gathered, at all. Participants noted that research users may be influenced by many different sources of knowledge and, therefore, not able to draw clear links to what specific element of a project had an impact on their work. Similarly, although researchers share the results of their work publicly, they may not be able to track the influence of that research, let alone gather and report verifiable evidence of its impact. Even where research processes are very direct (e.g., funded by an industry partner), the evolution of ideas over many years makes tracking and reporting impact data very difficult.

Where evidence can be gathered, data collection should ideally occur while the research is ongoing and then continue after the project has ended. In case study designs, “qualitative researchers collect data themselves through examining documents, observing behavior, and interviewing participants. They may use a protocol – an instrument for collecting data – but the researchers are the ones who actually gather the information. They do not tend to use or rely on questionnaires or instruments developed by other researchers.”⁵² Purely retrospective data gathering exercises, particularly when assessing impact many years beyond the end of a research project, cannot provide a complete picture (or verifiable evidence) of the impact of the research. Ideally, evidence needs to be gathered both during and following project implementation, so that impact can be tracked ‘as it happens’ and then follow that impact into the future, long after the project ends. This is important, as people’s memories will fade, and as key data required to verify the origin of an impact may be lost, over time.

Participants noted many issues affecting availability and use of impact data:

- The take up of research is in the hands of research users (including those with no direct connection to the research) and may occur without the researchers’ knowledge and/or involvement. As a result, unless research users document or advertise their take up of research, impact is very difficult – if not impossible – to track;
- Funding, staff time, and other resources necessary for capturing evidence of research impact outside of academe are not available within existing research project budgets and/or institutional operating budgets;
- Gathering data related to research impact constitutes its own, separate process, and not one that is currently captured by existing data sources;
- Relocation and attrition of research staff affects the availability of information and funding needed to gather evidence linking research projects with impact, particularly over long periods of time;
- Research users (e.g., industry partners; individual participants) may not be reachable in the future and/or may no longer have information available to provide evidence of impact; and,
- Researchers and institutions do not have access to the infrastructure needed for ongoing collection, storage and analysis of impact data.

Many of these problems have also been noted in initial feedback on the UK’s new REF process. As one researcher noted, “The major difficulty in writing impact case studies...was acquiring the necessary evidence of research impact between 1 January 2008 and 31 July 2013 because much

⁵² Creswell (2007), p. 38.

of it was information that institutions did not own or record for other purposes (such as the effect of research on public policy).”⁵³

Although these issues are important to address in the design of research impact case studies, the merits of this approach for documenting and sharing the impact of research outcomes on research end users cannot be understated. These issues can be remedied in a well-designed and well-implemented approach to case study, as used by qualitative researchers. For example, if institutions were required to provide a sample of research impact case studies they could choose to focus on those projects where verifiable data were readily at hand. Over time, and with sufficient resources, ongoing collection of data could also be integrated into researchers’ routine practices.

Suggestions:

- Create national funding schemes to support data gathering about the impact of research (e.g., longitudinal data tracking; qualitative research with community stakeholders); and,
- Encourage grant recipients, where possible, to plan ways to document evidence of research impact throughout all phases of a research project; and,
- Create communications channels for research users to share how research has changed their practices (whether personal or at an organisational level).

2.5 Who Should Produce Qualitative Case Studies? How Should they be Designed, especially for General/Mixed Audiences?

“The researcher would be involved, but there would certainly need to be specific writers who have training in writing these kinds of things.”

The difficulty of crafting compelling narratives of research impact has been highlighted in the literature⁵⁴ and by the participants in this project. In addition to the general qualitative writing practices outlined previously in this section (e.g., including participants’ voices in the narrative; providing evidence of triangulation), specific strategies for designing case study narratives are outlined in the research literature. Attention should be paid, for example, to the flow of the document, as well as to the content; description and analysis must be provided, along with evidence to support claims.⁵⁵ In writing a case study, a typical design includes:

- 1) opening with vignettes to draw the reader into the case;
- 2) identifying the issue, purpose, and method of the case to give the reader background;
- 3) providing extensive description of the case and context;
- 4) presenting the main issues to let the reader understand the complexity of the case;
- 5) discussing the issues in a deeper way with some evidence provided;
- 6) making assertions and summarising what the author understands about the case and conclusions arrived at; and,
- 7) closing with a vignette to remind the reader of the experience with the case.⁵⁶

⁵³ Jump (2014), para. 10.

⁵⁴ Group of Eight and Australian Technology Network of Universities (2012), p. 7 and Higher Education Funding Council for England, Scottish Funding Council, Higher Education Funding Council for Wales, and Department for Employment and Learning, Northern Ireland (2010), pp. 16-17.

⁵⁵ Creswell (2007).

⁵⁶ Creswell (2007); Stake (1995).

However, many researchers are not familiar with the process of case study narrative development, nor will they have the expertise needed to write these documents for general and/or mixed audiences (i.e., to communicate with a diverse impact assessment panel). Identifying who should be involved in the writing of these narratives is a key component of the process. Although the participants in this project agreed that researchers must be involved, directly, in the case study development, communications staff, research administrators and others need to be involved as part of the case study development team. The preference for a team-based approach, including the following types of members, was noted:

- The researcher(s) to be profiled in the case study narrative, as the person with direct knowledge of the research itself and the evidence of impact;
- Professional writers (e.g., university communications staff), who understand the research context and have the skills needed to translate knowledge for a general or mixed audience;
- Qualitative researchers to guide the development of the case study narrative, including strategies for writing for diverse audiences; and,
- Research users representing various audiences for the case study (e.g., industry representatives; citizens) to provide feedback on the content and design.

Once identified, case study developers must ensure that case study narratives are written in ways that speak to a broad cross-section of potential audiences. As assessment panels may involve a mix of research users, researchers, clinicians, or other stakeholders, the challenge is to present the case study in ways that will be understood by all groups. As a recent article on the UK's 2014 REF exercise notes, this is not easy to achieve; one researcher stated that the "requirement to satisfy three audiences at once [as] case studies will be examined by a range of assessors" is problematic.⁵⁷

Universities could develop expert teams to work with the researchers to be profiled in the impact case studies; in this way, the researcher's knowledge of the research itself can inform the design, while qualitative researchers, research users and communications staff can provide guidance on the development of the narrative for a general audience. However, participants stressed that such teams did not currently exist within their institutions. Although some current staff may have the requisite skills (and could be seconded to these teams), new staff may need to be hired to develop these cases. Similarly, a diverse group of research users would need to be recruited to review various types of research projects, across disciplines.

Suggestions:

- Encourage universities to use a team-based approach to case study development, including qualitative experts, professional writers, researchers, and research users, for effective case study development; and,
- Create a case study development 'best practices toolkit' to guide the development of compelling narratives, drawn from the qualitative research and communications literature.

⁵⁷ Jump (2014), para. 11.

2.6 Who is a ‘Research User’?

“There’s a lag effect...so how many years later that your original article...how that’s picked up and how governments or agencies in community and service make use of a concept or an idea. I think that’s going to be even more longer term and you’re not sure where that’s going to happen.”

Participants in the workshop and interviews talked, at length, about the nature of the research ‘end-user,’ given the importance of the user’s role in both capturing data on research impact and in serving as members of potential panels to assess the impact of a university’s research. Just as qualitative research is designed to ‘give voice’ to participants engaged in the inquiry, research impact case studies must involve the users of research in their design. The challenge, however, is identifying the various potential research users who may benefit from research, a point that has been raised in other documents, as well.⁵⁸

Although projects designed with an industry or community partner, for example, may initially have a very clear and direct research user in mind, the project may also have an impact on other groups and individuals, in future, both locally and internationally. Ensuring that case study development teams and research assessment panels have representation from a range of potential end-users is paramount. Some reports note that engaging research users in the impact assessment process involves time and resources for those individuals, as well as for the universities and researchers themselves.⁵⁹

Suggestions:

- Encourage the involvement of a broad mix of research users in providing feedback during all aspects of case study development and assessment;
- Ensure case study assessment panels include a wide range of research users, across various impact contexts and user types; and,
- Encourage appropriate design of case study narratives to allow the message to be communicated to and assessed by a cross-section of audiences.

2.7 How Should Qualitative Case Studies be Assessed?

“There’s going to be so much variation in what institutions submit, I don’t know whether you’ll be able to compare them. You won’t be comparing apples with apples.”

Participants also questioned the process of assessing case study narratives and whether these were to be used as comparators across institutions or assessed solely on their own merits. Although comparative case study approaches exist, these studies are designed to be comparative (at a content level) from the outset; in effect, “the main feature is that the same case (or its interpretation) is repeated two or more times, in an explicitly comparative mode.”⁶⁰ For this reason, although case studies provide a robust approach to documenting evidence of research impact, attempting to compare across cases raises the same problems highlighted in the proverbial ‘apples and oranges’ comparison. Comparing the impact of a medical intervention to

⁵⁸ Grant et al. (2009).

⁵⁹ Morgan Jones et al. (2013), p. 20.

⁶⁰ Yin (2014), p. 188.

the impact of an educational intervention raises issues, as the sites, participants, and data sources on which the cases are developed are very different. Similarly, comparing two medical interventions may be problematic, as the sites, participants and data sources will vary. Individual case studies are designed to be assessed only on their own merits, based on the processes of data collection and analysis, as well as the narrative product that is created. In comparing research processes and products across cases, this is best done with research designs using the same methodologies and methods. For example, projects designed using grounded theory methodologies involving triangulation of qualitative methods (such as interviews and document analysis) may be comparable, even across different disciplines, settings and populations.

While the process of gathering evidence to support case studies may be evaluated using the trustworthiness criteria outlined previously (i.e., credibility, transferability, dependability, confirmability and reflexivity), qualitative researchers also assess the product (i.e., the case study document) based on the quality of the narrative.⁶¹ Together, these elements provide a strategy to evaluate the quality of the case study narrative, particularly when assessing cases discussing very different topics and providing different types of evidence of research impact. Lincoln and Guba (2002) provide four classes of criteria with which to evaluate case study reports:

- Resonance – “criteria that assess the degree of fit, overlap, or reinforcement between the case study report as written and the basic belief system undergirding that alternative paradigm which the inquirer has chosen to follow;”⁶²
- Rhetoric – criteria “relevant to assessing the form, structure, and potential characteristics of the case study,”⁶³ including unity, organisation, simplicity/clarity, and craftsmanship;
- Empowerment – criteria “assessing the ability of the case study to evoke and facilitate action on the part of the readers,”⁶⁴ including fairness, educativeness, and actionability.
- Applicability – criteria that “assess the extent to which the case study facilitates the drawing of inferences by the reader that may have applicability in his or her own context or situation.”⁶⁵

At a practical level, then, case studies need to be assessed on the quality of their data collection and analysis processes. The case documentation would need to address issues of triangulation, peer debriefing, member checking, or other techniques designed to enhance rigour of data collection (as discussed in section 1.4 of this report). Similarly, the case study product would need to be assessed for the merits of the communication strategy employed, with particular attention paid to qualitative writing conventions (as discussed in section 1.3).

Suggestions:

- Apply case study methodology assessment criteria at both the process (evidence gathering) and product (narrative) stages of development; and,

⁶¹ See for example Creswell (2007); Lincoln and Guba (2002); and, Stake (1995).

⁶² Lincoln and Guba (2002), p. 4.

⁶³ Ibid., p. 5.

⁶⁴ Ibid., p. 8.

⁶⁵ Ibid., p. 9.

- Create a case study assessment ‘best practices toolkit’ to guide the design and evaluation of the process (evidence gathering) and product (narrative), drawn from the qualitative research literature.

2.8 What Other Strategies could be used in place of a Formal Exercise?

“Perhaps social network analysis to look at the strong networks of the university that have been created through research activities to determine how well connected the university is in its community, how influential the university is in particular institutions and organisations.”

Workshop participants and interviewees also discussed potential alternatives to a formal assessment exercise on research impact. Individuals identified a number of ideas that could be implemented nationally in Australia (whether at institutional, funding agency and/or government levels), including:

- Reward systems (e.g., academic prizes) to recognise research that has had an impact in the community;
- Public awareness campaigns (e.g., dedicated websites) to share the stories of research impact, more broadly; and,
- Outreach programs (e.g., social media strategies) to engage research users during projects and after projects are completed.

These ideas mirror many of the new and existing strategies in place in other countries, as well as at local and state levels within Australia. Such strategies are intended to foster collaboration between researchers and their communities, as well as to share the impact of university-based research with the public. Existing initiatives may serve as models for a nationwide approach to documenting and celebrating research impact across Australia, particularly as alternatives to a formal evaluative process. The following are examples of various types of research impact activities, across sectors, in Australia and elsewhere:

Granting Agency Initiatives

Grains Research and Development Corporation (GRDC) (Australia)

The GRDC publishes a bi-monthly newspaper, hosts video/TV series, and hosts radio programs designed to share stories of impact arising from funded research project. Their flagship publication *Ground Cover*, for example, “provides technical information for grain growers, including updates on research, trials, new varieties, farmer activities and case studies.”⁶⁶

Celebrating Impact (United Kingdom)

The UK’s Economic and Social Research Council presents an annual prize to researchers whose funded projects have had an impact on society. The website presents information on each year’s award winners, including videos about the projects and their outcomes. The agency also provides

⁶⁶ Australian Government, Grains Research and Development Corporation (2014), para. 1.

an ‘impact toolkit’ to help researchers in “developing an impact strategy, promoting knowledge exchange, public engagement and communicating effectively with your key stakeholders.”⁶⁷

Impact Awards (Canada)

The Social Sciences and Humanities Research Council of Canada has implemented a number of awards to recognise and promote research impact. Examples include: the Connection Award (\$50,000) for research that has “generated intellectual, cultural, social and/or economic impacts;”⁶⁸ the Partnership Award (\$50,000) for a formal partnership that, through mutual co-operation and shared intellectual leadership and resources, has demonstrated impact;⁶⁹ and, *The Storytellers* project (25 x \$3,000 awards) for postgraduate students to showcase a research project at their institution that is having an impact on the lives of Canadians.⁷⁰

National Institutes of Health (United States)

The United States Department of Health and Human Services has a dedicated website for showcasing research impact. They highlight advances made in medical research through project profiles, reports, and other documents aimed at the general public; one example is a video entitled “6 Awesome Technologies your Tax Dollars are Paying to Create.”⁷¹

Canadian Cancer Society (Canada)

In 2011–2012, the Canadian Cancer Society funded more than \$46 million in research supporting close to 300 projects. As the largest national charitable funder of cancer research in Canada, their website provides details on their research activities, with a focus on research impact. They provide details on current projects, including links to journal articles and other publications, to demonstrate the “most high-impact” studies they fund.⁷²

Grant-funded Projects

ResearchImpact (Canada)

Canada’s knowledge mobilization network started as a grant-funded initiative in 2006; it now includes ten universities and various industry/community stakeholders. The network uses a broker model “to match researchers with key policy-makers in government, health, and social service agencies...to ensure that leading-edge academic research is employed by policy-makers and community groups to develop more effective, efficient, and responsive public policies and social programs.”⁷³

Impact of Social Sciences: Maximising the Impact of Academic Research (United Kingdom)

Funded by the Higher Education Funding Council for England, the aim of this multi-year project is to “demonstrate how academic research in the social sciences achieves public policy impacts, contributes to economic prosperity and informs public understanding of policy issues and

⁶⁷ Research Councils UK, Economic and Social Research Council (2014), para. 1.

⁶⁸ Government of Canada, Social Science and Humanities Research Council (2014), para. 22.

⁶⁹ Government of Canada, Social Science and Humanities Research Council (2014).

⁷⁰ Government of Canada, Social Science and Humanities Research Council (2014).

⁷¹ U.S. Department of Health and Human Services, National Institutes of Health (2013).

⁷² Canadian Cancer Society (2013), para. 1.

⁷³ ResearchImpact (n.d.), para. 2.

economic and social changes.”⁷⁴ The group is creating quantitative metrics for assessing impact, publishes a regular blog on project developments, and has published a handbook for academics to maximising research impact.

CRACK IT Challenge (United Kingdom)

An initiative of the National Centre for the Replacement, Refinement & Reduction of Animals in Research (NC3Rs), the CRACK IT Challenge is “a competition designed to support the development of new...technologies and approaches which will improve business processes or lead to new marketable products.” Challenges are posed by the scientific and business communities, so that the resulting research projects will have a direct impact on real-world problems. The scheme is funded by the NC3Rs with in-kind and/or co-funding arrangements with industry and academic sponsors.⁷⁵

University Initiatives

The Open University (United Kingdom)

The Open University (OU) shares stories of communities benefitting from university research on a dedicated “Research Impact” section of its website. The site states that “Knowledge exchange is fundamental to the OU's mission to be ‘open to people, places, ideas and methods’. We aim for all research to have a distinct and material impact across the economy, society and cultural life.”⁷⁶ Case studies (including multimedia formats) are presented, along with publication lists and other resources; the site also includes a social media platform for sharing research impact stories via Twitter, Google+ and other media.

Queen’s University Belfast (United Kingdom)

Queen’s University Belfast has a dedicated section on its website that showcases stories of research impact. They present case studies of ‘pioneering researchers,’ along with publications and other resources. The University also hosts a number of ‘impact events’ in the community, including talks on research impact and research ‘showcase days’ aimed for the general public.⁷⁷

Analysis Summary

Overall, there is a great deal of potential for qualitative research practices to inform assessment processes on research engagement and research impact. Project participants noted a preference for more “holistic” approaches to evaluative design, which would use both quantitative metrics and qualitative measures. Qualitative case study methodology can inform the design and assessment of case study narratives for research impact; similarly, qualitative content analysis can enhance the range and usefulness of research engagement metrics. However, there is a need for a team-based approach within universities to ensure that appropriate expertise guides the process; qualitative research experts, communications experts, and research users from various backgrounds must be engaged in case study development, in particular. Additional resources to

⁷⁴ London School of Economics and Political Science, Impact of Social Sciences (2014), para. 1.

⁷⁵ CRACK IT (2014), para. 1.

⁷⁶ The Open University (2014), para. 1.

⁷⁷ Queen’s University Belfast (2014).

support data collection, analysis and writing, will be needed, as these activities fall outside researchers' normal practices. The development of various 'toolkits' to support evidence-gathering and writing related to research impact is one possible strategy to support researchers and institutions in the creation of research impact materials. However, the implementation of prizes, funding schemes, web development projects, and other strategies employed worldwide may also serve as viable alternatives to a formal assessment process.

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Appendix 1 – Data Analysis Process

The analysis was completed using an inductive, grounded theory approach, where core themes are identified as they emerge from the data. The comments made at the public workshop and the data gathered during individual interviews were reviewed, independently; then, initial emergent themes were compared across the datasets, and in the context of the environmental scan of published literature, to ensure a thorough analysis of cross-cutting themes. This type of thematic analysis allows for the identification of ‘core’ themes (i.e., where there is a major saturation of – or overwhelming agreement on – the concepts identified) and of ‘common’ themes (i.e., minor saturation). This also allows for an analysis of anomalies, or themes that are mentioned less often, but that are valuable because they provide a glimpse into alternate views, counter-examples and individual cases. In qualitative analysis, these latter themes are examined alongside the ‘core’ and “common” themes, to provide insight into the individualized needs of participants. Unlike quantitative analysis, these themes are not treated as ‘outliers’ that are removed from the results; rather, these ‘hidden gems’ often point to areas of concern, caution or positive attributes to be highlighted – particularly when results are intended to inform policy decisions.

Qualitative analysis focuses, first, on the coding and classification of themes emerging from the data; once that work is complete, analysis can then move to a more in-depth examination of the results, including the creation of models and advanced modes of representation of the data. Researchers use a variety of methods to complete their initial analysis (of the type represented in this report). Some scholars code transcripts by hand, using physical markers (e.g., sticky notes, highlighters, organizational binders, whiteboards) to note common themes; others use computer software packages to facilitate the analysis (including Microsoft *Office* products, wikis, as well as proprietary qualitative data management software). For this project, given the timelines involved in the completion of initial analysis, transcription tools and *Office* products (e.g., *PowerPoint*) were used to facilitate analysis. However, it should be noted that the intellectual work involved in the coding process is the same, regardless of the tool used to facilitate this work. For further information on the intellectual coding process that informs this report, please see Prof. Given’s award-winning paper (co-authored by Prof. Hope Olson), “Knowledge organization in research: A conceptual model for organizing data,” *Library and Information Science Research* 25 (2003), 157-176.

