USING TRANSDISCIPLINARY RESEARCH TO EXPLORE SOLUTIONS TO 'WICKED PROBLEMS'

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Abstract

Transdisciplinary research (TDR) was the methodological approach used to explore challenges and opportunities for enrolled nursing in the contemporary health workforce in New Zealand. The question considered in this TDR study was how the contribution of enrolled nursing might become more visible and better understood in terms of its contribution to the health workforce. TDR was chosen as the methodological approach to enable exploration of potential innovations through a collaboration between a variety of stakeholders in a health-care delivery community.

Key words

Transdisciplinary research (TDR), methodology, 'wicked problems', collaboration, partnership.

Introduction

Transdiciplinary research (TDR) is a methodological approach that enables researchers to examine complex problems in collaboration with a wide variety of stakeholders. This article presents some practical insights from my experience of using TDR to explore the challenges and opportunities of enrolled nursing in the contemporary health workforce. The central ideas of the TDR approach are explained, including "wicked problems", definitions of TDR, the involvement of stakeholders in partnership and collaboration, and the relevance of reflection in the process of conducting a TDR study.

Wicked problems

In considering the notion of complex societal problems, the phrase "wicked problems" emerges (Mobjörk, 2010, p. 869). These "wicked problems" are complex and require a multi-faceted approach by a variety of stakeholders to find creative and flexible solutions. Roberts (2000) identified four features of "wicked problems". Firstly, Roberts asserts there is no definite statement of a problem but more of a broad disagreement of what it could be. Secondly, the exploration of solutions is unrestricted and dependent upon stakeholder points of view. The third characteristic is the problem-resolving process is multifaceted due to limitations such as resources or politics. Finally, Roberts identified that these limitations also change as stakeholders change, fail to communicate, or change the parameters by which the problem must be solved (p. 1).

The "wicked problem" for this study came from anecdotal stories relayed by enrolled nurse (EN) students and graduates. They discussed their difficulties with employment and an apparent lack of understanding by other health professionals about the EN scope of practice. ENs practise under the direction and delegation of a registered nurse (RN) or nurse practitioner (NP). They deliver nursing care and health education across the lifespan to health consumers in community, residential or hospital settings. ENs contribute to nursing assessments, care planning, implementation and evaluation of care for health consumers and/or families/whānau, while the RN maintains overall responsibility for the plan of care (Nursing Council of New Zealand, 2019). For me, having participated in successful community-wide projects in the 1990s, transdisciplinary research and innovative methodology appealed, when considering furthering my studies. It seemed timely, then, to take a formal approach to these anecdotal stories.

I considered the challenges for enrolled nursing to be "wicked problems" due to their complexity, the variety of stakeholders and viewpoints involved and the impact of resources and politics. As identified by Dorst (2018), organisations facing complex problems need to become more flexible in the way they respond to them. Dorst suggests a design-based approach which creates a framework for mixing practices, creating new insights and *"action in the space between established professions"* (p. 60). The TDR methodology was chosen because it enabled a variety of viewpoints to be considered, using a research approach that focused on "real-world" issues.

Transdisciplinary research

In preparing to conduct the research, I needed a workable definition of TDR. Westberg and Polk (2016, p. 385) define TDR as a way to *"address the complexity of societal problems through the exchange of knowledge and expertise across diverse groups of societal actors".* Similarly, Wickson et al (2006) determine TDR as focusing on complex and multi-dimensional problems and involving and developing shared methodology with multiple disciplines. Hoffmann-Riem et al (2008) define TDR as ranging from a diffuse conceptual term involving individual disciplines to any research involving stakeholders. Academic literature uses the terms "actors" interchangeably with "participants", "stakeholders" and "non-academic actors" to describe the individuals who work within the TDR framework (Hoffmann-Riem et al., 2008; Mauser et al., 2013; Wickson et al., 2006). Other writers suggest the critical difference

between transdisciplinarity and interdisciplinarity is the deliberate collaboration and intentional involvement of stakeholders in the identification of problems and the co-creation of solutions (Mobjörk, 2010; Thompson Klein, 2004; Wickson et al., 2006). I learnt from my enquiry that TDR involves the collaboration of a diverse number of interested people, focusing on a complex societal problem, and co-creating innovative sustainable solutions.

Partnerships, stakeholders and collaboration

TDR involves various actors/stakeholders from outside academia focussing on real-world issues (Binder et al., 2015). Therefore research on how enrolled nursing might become more visible and better understood in terms of its contribution to the health workforce, involved collaboration with various stakeholders in the Waikato Tainui region and other regions of Aotearoa New Zealand. Participants in the study included non-academic partners or actors in research (Belcher et al., 2016; Binder et al., 2015; Hospes et al., 2017; Schauppenlehner-Kloyber & Penker, 2015; Smith, 2007; Westberg & Polk, 2016).

The inclusion of partners from outside a research context and/or science discipline allows a more holistic viewpoint to be developed. Scholz and Steiner (2015) identified societal actors as having differing world views. Some have goals to improve their business or manage actual issues. In contrast, other researchers/scientists seek to grow theoretical knowledge, contributing to a better understanding of the real world. Klein (2008) recognised the importance of having experts from the *"problem space"* because the group as a whole form an *"appropriate interdisciplinary epistemic community"* (p. 121). I felt this aspect of TDR was significant for the study as the research involves and impacts upon nurses, health providers and academics. Through the lens of TDR, diverse voices could be heard.

Positive outcomes from TDR partnerships include network building, trust in others, understanding of others, community identification due to involvement in a TDR project, and knowledge generation and sharing (Walter et al., 2007). Through the TDR framework, mutual and transformational learning occurs – learning that *"leaves a legacy"* (Mitchell et al., 2015, p. 93). TDR is a long-term process and work-in-progress for those working with the societal problem. I concluded that this would be the case for this study, due to the complex nature of the problem, the diversity of potential stakeholders and subsequent innovations.

The project methodology

An essential consideration in TDR is that each "wicked problem" will have its own distinctive methodology, researchers and detailed solution or solutions. In essence, there is no "one size fits all'. Bergmann et al (2012) state that if researchers want to apply the methods of one transdisciplinary problem to any other transdisciplinary problem, the methods must be *"de-coupled or de-contextualised"* (p. 20). The selected strategy must also be reassessed frequently and revised, if needed, throughout the research process. Bergmann et al (2012) describe this as the principle of recursiveness, as each step of the process is subject to iteration – the repetition of a process to create a series of outcomes. Each step requires review, given the diversity of people involved, ensuing discussions held, and alterations made. Vilsmaier and Bergmann (2017) further examine the fundamental concepts of TDR and its methodology – integration, collaboration, mutual learning, problem-framing, co-production of solutions, and bringing the solution to fruition.

Bergmann et al (2012) examine three dimensions of integration. Firstly, the cognitive-epistemic dimension explores individual differences and similarities of science and practice and the development of new methods together. Secondly, the social and organisational element considers the varying interests and activities of the research group, focusing on leadership, mutual understanding and the group's willingness to learn. Finally, communication links various communication styles, expressions and practices to find a common understanding (Bergmann, 2017).

Binder et al (2015) describe practical elements in establishing a TDR project and propose three phases:

1) Problem-framing and team-building
- Team members clarify their perspectives, problems and expectations and agree on a common set of goals for the project.

2) Project partners focusing on project work
- Individual participants focus on various components of the project and may involve participants outside the group.

3) Co-generation of knowledge and knowledge integration
- Outcomes of the research are identified for the groups of participants – practitioners look to solve societal problems or see transformations; scientists look for new knowledge regarding theory or methodology.

This last phase is the process for making the results useful for all parties. It facilitates understanding of the problem and the processes needed for developing a sustainable solution for all (p. 546).

Pohl and Hadorn (2008, p. 35) also identified the three phases of TDR as problem identification and structuring, problem analysis, and bringing results to fruition. Roodt (2020) describes TDR as a recursive process, whereby existing knowledge is combined with new concepts to co-create an updated construct. In unravelling the intricacies of the societal problem, I needed a logical approach to frame, analyse and process the area of concern, as suggested by Pohl (2011). Pohl and Hadorn (2008, pp. 431-432) identified three types of knowledge that are part of a TDR project, including systems, target and transformational knowledge. Firstly, systems knowledge identifies the problem and the difficulties with transforming the problem and concept into a workable solution. Target knowledge looks at the need for change, potential outcomes and improved practices. Transformational knowledge looks at cultural, ethical, technical, sustainable, political and social components when transforming current practice into improved practices.

Several frameworks and processes describe the transformation of problems into solutions in TDR research (Bergmann et al., 2012; Binder et al., 2015; Hoffman-Riem et al., 2008; Pohl, 2011). Wickson et al (2006) add to the picture by declaring that methodologies used in TDR need to respond to and reflect the problem and situation under investigation (p. 1049). They say *"transdisciplinarity is characterized by an interpenetration of epistemologies in the development of methodology"* and the *"dissolution of disciplinary boundaries is necessary for the construction of novel or unique methodologies tailored to the problem and its context"* (p. 1050).

Other literature revealed it was acceptable to use traditional forms of research methods in TDR projects: mixed-method (Thompson et al., 2017), and quantitative and qualitative methods (Claasen et al., 2015; Krettek & Thorpenberg, 2011). The most reassurance was

provided by Leavy (2016), who stated *"any TDR design can use any method in pursuit of the research objective"* (p. 54) and methods were only tools for data collection. Leavy provides a sense of comfort that researchers can still use traditional methods, as it is more the philosophy and process that defines transdisciplinary research.

Reflection in transdisciplinary research

Researchers have highlighted the importance that reflection plays in TDR (Finlay, 2002; Palaganas et al., 2017; Patnaik, 2013). The need to reflect, review and reiterate the research process is essential to producing solutions that are fit for purpose and meaningful to the context. Reflection and reiteration are equally important at the group and individual levels: the group level when participants are together considering the project and the individual level when considering a researcher's involvement.

Reflection for researchers is therefore essential, as the researcher's worldview and potential areas of bias may have an impact on the understanding of the problem, the research method, the design and the solutions (Wickson et al., 2006). This reflection contributes to the deconstruction of current knowledge and the rebuilding of new group and individual bodies of knowledge (Wickson et al., 2006, p.1053-1054). This deconstruction and co-creation of knowledge is further elaborated by Popa et al (2015), who proposed four main characteristics of reflexivity related to TDR:

- collaborative deliberation to develop a shared understanding of a problem;
- the social relevance of the problem-framing;
- social experimentation and collective learning processes;
- critical and transformative character of the research agenda.

Reflection is therefore required in all stages of TDR, from discussing the problem and its societal relevance, formulating the action plan, and reviewing learning outcomes to the contribution of the research and transformation of the problem (p. 3). With the diversity of worldviews and knowledge in the stakeholder group, reflection is essential for each member to understand each other and the "wicked problem". Roux et al (2010) propose the idea of co-reflection by the entire stakeholder group – and support the aspirations of individuals, sub-groups and research funders. Roux et al (2010) introduced the need for a facilitated workshop at the start of the research and then regularly after that to enable *"learning by doing"* (p. 735). This co-reflection offers opportunities for stakeholders to understand each other's worldviews better, while working collectively towards a *"defined social purpose or aspiration goal"* (p. 737).

Group reflections for this project centred on updates on research progress and discussion among the stakeholder group on the role of the EN. The discussions initially centred on the methodology of the project and potential areas of inquiry, processes involved, ethics approval, and updates from group members on the topic from their perspective. Many participants have an active role in the development or employment of ENs, particularly in the Waikato district, but also from a national or regional perspective. Other participants were involved with health-service delivery, and while might not necessarily work or employ ENs, they could see the potential for the development of this role. Group reflection focused on the development of the research project and then later on the findings. Discussions were noted in my portfolio and stakeholders were followed up by email or as part of regular meetings. An email update for stakeholders was disseminated to participants towards the end of the research to discuss the progress and findings.

I found the involvement of the stakeholders to be invaluable for my own understanding of the issues and how the problems affected a variety of people from different parts of the health sector. The group also guided me on my research journey, offering suggestions and opportunities for reflection with kanohi-ki-te-kanohi (face-to-face) discussions. The group has specialised knowledge of the wicked problems being addressed. It could now be likened to *"communities of practice",* as proposed by Lave and Wenger (1991), where people form a group with a common interest in a particular area and share knowledge and experiences.

Iteration was a fluid process; it was incorporated throughout the research project and occurred at many stages. This included the development of the "wicked problem", the ethics application process, construction of the survey questions, dissemination of the surveys and project information-sharing. Mutual learning occurred as group participants took part in ongoing discussions and knowledge-sharing about the development of the role and the broader socio-political and health workforce influences that affect the EN. Participants were able to share developments, trends and strategies that were in place for the role of the EN, and also discuss further challenges or opportunities that they had noted as part of their day-to-day roles.

Networking with stakeholders was also a key component of the TDR methodology. This occurred either in groups or with individuals, and relationships developed over time. Participants pledged support and ongoing contribution to the project and are keen to be a part of future knowledge-sharing, research outcomes and development of the role. Mutual learning transpired for the participants from their involvement in the research, information-sharing, networking and discussions held during the process. As participants come from a variety of backgrounds, they were able to share their knowledge in their collective groups and learn from each other about developments of the role and how to consider moving forward with potential innovations. The group had evidence of the difficulties faced by ENs, both present and historical (Gibson & Heartfield, 2005; Ministry of Health, 2019; Nursing Review, 2017; Prinsloo, 2014).

In summary, the TDR process is underpinned by a fluid research methodology involving integration and collaboration, responding to people, problems and the context in which the research is conducted. TDR methodology evolves due to many factors: wicked real-world problems that may in themselves be evolving, a range of stakeholders including academic and non-academic actors, varying epistemologies, knowledge and practice, and reflection and iteration.

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