

Extending understandings: Possibilities and considerations for mixed methods research

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Mixed methods research is increasingly popular both within and beyond education because of the advantages offered by combining qualitative and quantitative methods. Some mixed methods research, however, does not fully harness the potential or depth that mixed methods has to offer. In this article, I consider some of this potential in terms of how mixed methods research can contribute to addressing “wicked problems,” theory generation, and culturally responsive research. I then discuss two important considerations for quality mixed methods research: appropriate paradigmatic foundations and the genuine integration of qualitative and quantitative components. The article is intended to provide both provocations and resources for those learning about, teaching about, considering, using, or contributing to mixed methods research in education.

Keywords: mixed methods research, research methods, culturally responsive research, wicked problems, research quality

Introduction

Mixed methods research – defined simply here as research that combines both qualitative and quantitative data – is increasingly popular both within and beyond educational research (Greene & Hall, 2010). Combining qualitative and quantitative methods can offer researchers the “best of both worlds” as they seek to understand research problems in more than one way.

Much everyday human inquiry involves a mix of qualitative and quantitative data. When our child is ill, we might ask how she is feeling (qualitative) and also take her temperature (quantitative). When researching which new phone or laptop to purchase, we consider the price and specifications (quantitative) along with reviews from other users (qualitative). These are everyday examples, but they show how naturally we combine qualitative and quantitative information in our daily lives. The weaving together of qualitative and quantitative forms of knowledge and inquiry can be traced back for centuries in the Western scientific tradition (Maxwell, 2016). Equally, Māori, Pacific, and other Indigenous groups’ mātauranga/knowledges also integrate qualitative and quantitative elements – consider, for example, the indigenous knowledges related to agriculture, navigation, or artworks and visual storytelling.

As well as being used across a range of research fields, mixed methods is also a field of research in its own right. Debate and knowledge-building are constantly occurring as researchers try new approaches, discuss concepts and practices, and stretch the boundaries of how mixed methods research can be conducted (see, for example, the *Journal of Mixed Methods Research*). This inquiry into mixed methods research is important because it allows us to conduct better and better research: According to Greene and Hall (2010, p. 120), “a major purpose of mixed methods theory is to help

practitioners make the mixing of methods more intentional, multilevel, and thoughtful and thus yield more compelling results.”

This article has emerged from two prompts. The first was my contribution to the 2020 Cancelled Conference Conversations series (McChesney, 2020). My presentation centred on the question of paradigms for mixed methods research and drew a lot of interest from postgraduate students in particular. The second prompt was this special issue’s focus on provocations in educational research. Given these prompts, I engaged in further thinking, reading, and learning about what might be possible within mixed methods research in education. In this article, I share some of what emerged as a series of provocations for researchers, supervisors, research methods lecturers or course convenors, and postgraduate students interested in mixed methods research.

In the first section of the article, I explore the potential benefits and contributions of mixed methods research in education. Then, in the section that follows, I highlight two important considerations for doing mixed methods research well; appropriate alignment of methods and paradigms, and genuine mixing of qualitative and quantitative elements. I end by noting the potential for researchers at all levels, including postgraduate students, to contribute to the ongoing advancement of mixed methods thinking and practice. Throughout the article, I have sought to provide useful and up-to-date sources from mixed methods theory as well as relevant New Zealand-based exemplars of mixed methods studies. Thus, this article may serve as a starting point for those wishing to explore mixed methods theory and practice further.

The potential of mixed methods research in education

Combining qualitative and quantitative approaches offers the “best of both worlds.” With quantitative methods (e.g., questionnaires), we can quickly and efficiently gather and report information reflecting a large number of participants, whereas with qualitative methods (e.g., interviews, focus groups, wānanga, or observations), we can gain deeper, richer insights from a much smaller number of participants. By mixing both methods, we can gain both breadth and depth: As Greene (2012, p. 757) notes, “a mixed methods approach most importantly offers dialogic opportunities to generate better understanding of important social phenomena precisely because it legitimizes and respects multiple responses to these critical issues and invites dialogue among them.” In addition, combining qualitative and quantitative types of data is seen as a way of compensating for the weaknesses or limitations of either type of data on its own (Poth, 2019). These are fairly common justifications for using mixed methods. However, there are also other, less commonly discussed things that mixed methods research has to offer. This section highlights three of these in order to provoke thinking around the potential of mixed methods research in education.

Wicked problems

First, mixed methods research has significant potential as a means for addressing “wicked problems” (Mertens et al., 2016; Poth, 2019). Wicked problems are problems that are particularly complex, multifaceted, urgent, and stubborn (Rittel & Webber, 1973). There are many such problems in social disciplines such as education, partly because of the inherent complexity of real-world educational environments (see Bourke & Loveridge, 2017 for examples of wicked problems in New Zealand education). Wicked problems are

arguably never fully solved but “at best ... are only re-solved – over and over again” (Rittel & Webber, 1973, p. 160). This means that we must be continually looking at such problems in fresh ways (Bourke & Loveridge, 2017).

According to Mertens et al. (2016, p. 225), mixed methods research in particular “has the potential to contribute to finding solutions to wicked problems because it stimulates new kinds of questions and involves the use of innovations in methodology needed to address complexity” (see also Greene, 2012; Poth, 2019). Mixing qualitative and quantitative approaches allows us to consider complex educational contexts and practices from different perspectives and helps us avoid reducing them to “simplistic analyses of cause and effect” (Poth, 2019, p. 252). Thus, a provocation for educational researchers is to consider whether the topics we are investigating could be characterised as wicked problems, and, if so, whether mixed methods might be a powerful approach to select.

Theory generation

Second, and closely related to the idea of wicked problems, mixed methods research has important potential for theory generation. Dissonance often arises in mixed methods studies when the findings from qualitative and quantitative data seem to contradict each other. Robust dialogic (back-and-forth) engagement with such dissonance can be instrumental in prompting the development of new theory, as researchers wrestle with possible explanations and engage in further or alternative analyses until they are able to propose a new way of making sense of the whole of the data set (Creamer & Edwards, 2019; Greene, 2012). This new understanding can be understood as “rupture theorising” in that it allows us to “view conventional constructs in radically new ways” (Creamer & Edwards, 2019, p. 239). In terms of provocations for educational researchers, then, how might the issues and constructs we each study be better understood if we pressed into the dissonance that mixed methods research might expose? Might this type of work help move our respective fields forward in substantial ways?

My doctoral research (McChesney, 2017) provides an example of mixed methods’ potential for prompting theory generation. The quantitative data confirmed, to some extent, my expectations (based on literature) that features of the design of teacher professional development would be associated with the professional development’s impact. However, the qualitative data predominantly highlighted other, non-design-related factors as influencing the impact of professional development. Through interrogating this dissonance between qualitative and quantitative findings, I was able to propose a new conceptual model for the trajectory from teacher professional development to impact (McChesney, 2017; McChesney & Aldridge, 2019b).

Culturally responsive research

Third, mixed methods may have untapped potential as an approach for kaupapa Māori, decolonising, Indigenous, and culturally responsive forms of research. According to Levac et al. (2018, p.12):

From Indigenous perspectives, mixing methods can contribute to the process of decolonization by challenging colonial categorizations. Mixing methods fosters multi-directional idea sharing, which can in turn lead to new data collection tools and new theoretical frameworks, and contributes to the work of bridging between

knowledge systems, particularly by privileging Indigenous knowledge and/or intentionally re-balancing power.

In offering the brief discussion that follows, I acknowledge my outsider status as a Pākehā researcher who has not personally used kaupapa Māori or decolonising research methods. I highlight here the potential of mixed methods for these forms of research because several mentions of this potential have stood out to me in my reading and learning around the ‘leading edges’ of mixed methods research. The role of this article in general, and this section in particular, is only to be a ‘provocation’ that might point readers in the direction of ideas and other sources that they may wish to explore further. The arguments below for mixed methods’ appropriateness in culturally responsive forms of research all originate with Indigenous researchers, and all sources cited in this section are works by Indigenous researchers.

I also acknowledge that there are important differences between kaupapa Māori, decolonising, culturally responsive, culturally sustaining, and other Indigenous research approaches. Detailing these differences is beyond the scope of this article, but it should be noted that these differences exist and that they matter. For example, according to Smith (1999, p. 184), “culturally sensitive models have not been satisfactory at the level of cultural safety.” Purely for ease of reading, I have used the single term “culturally responsive” hereafter as an imperfect umbrella term for this wider family of research approaches.

Much culturally responsive research to date has been solely qualitative. Qualitative, *kanohi-ki-te-kanohi* (face-to-face) methods such as interviews, focus groups, *wānanga* (Mahuika & Mahuika, 2020), *pūrakau* (Lee, 2009), *talanoa* (Vaiotei, 2006), and *talaloto* (Naufahu, 2018) align well with key principles of culturally responsive research. Quantitative methods, in contrast, have traditionally been associated with the (post)positivist paradigm and Western hegemony that culturally responsive research seeks to resist (Berryman et al., 2013; Smith, 2005). However, as discussed in the next section, quantitative approaches do not necessarily have to be associated with a (post)positivist paradigm. Disrupting this association potentially opens up a wider range of possibilities for culturally responsive forms of research. Quantitative approaches also do not have to be used in Eurocentric ways; instead, they can be harnessed for purposes that align with the social justice and self-determination aims that Smith (1999) argues are foundational to kaupapa Māori and Indigenous research. In recent years, for example, researchers have explored critical and Indigenous approaches to quantitative research (see, for example, Sablan, 2018; Walter & Andersen, 2013). It is conceivable that these approaches could be incorporated in mixed methods research. Recent New Zealand examples showing the use of mixed methods within culturally responsive research include the work of Diamond (2013), Ford (2010), Milne (2020), Richards (2017), and Si’ilata (2014). The provocation here, then, is the suggestion that further exploring the use of mixed methods in culturally responsive research may afford some of the benefits suggested by Levac et al. (2018) above.

Mixing methods may also allow for a culturally responsive blending of paradigms. Macfarlane and Macfarlane’s (2019) *He Awa Whiria* (braided rivers) framework depicts a blending of Western knowledge and *mātauranga Māori*, offering “an approach that is potentially more powerful than either knowledge stream is able to produce unilaterally” (p. 52). Both the framework itself and this suggestion as to its potential have similarities with mixed methods research and the argument that mixing methods allows the best of

both worlds. It may be that in mixing Western and Indigenous methods and worldviews, researchers can also be combining different paradigms in the kind of dialectical approach discussed later in this article (see also Levac et al., 2018). Doing so may further leverage the potential of mixed methods research for theory generation and for tackling “wicked problems.”

Doing mixed methods research well

This section highlights two important considerations for quality mixed methods research: (1) explicit and appropriate paradigmatic foundations for mixed methods research, and (2) genuine integration of qualitative and quantitative elements. In this discussion, I am taking the view that mixed methods research is a methodology, meaning that mixed methods research comprises both paradigm/s (philosophical underpinnings or worldview/s) and methods (the practical data collection and analysis approaches).

Paradigms for mixed methods research

All research reflects particular paradigms or worldviews, whether consciously or unconsciously. It is important for mixed methods researchers to explicitly discuss the paradigm(s) used in their studies (Shannon-Baker, 2016). However, identifying appropriate paradigms and weaving them coherently into mixed methods research can be challenging (McChesney & Aldridge, 2019a).

Some researchers argue that quantitative methods belong with positivist and post-positivist paradigms, and qualitative methods with interpretivist, critical, feminist, transformative, and other paradigms (Johnson et al., 2007). This binary organisation of methods and paradigms poses problems for mixed methods researchers, however, due to the incompatibility thesis – the argument that the philosophical foundations of different paradigms are so contradictory that it is simply not meaningful to attempt to situate work within more than one paradigm simultaneously. If the incompatibility thesis is true, and, further, if particular methods belong with particular paradigms, then how can it be meaningful to mix qualitative and quantitative methods (and thus their corresponding paradigms)?

Given this conundrum, some researchers have simply side-stepped the question of paradigms when designing, conducting, and/or reporting mixed methods research (Alise & Teddlie, 2010; Greene & Hall, 2010; Shannon-Baker, 2016³). Qualitative and quantitative data are simply collected, analysed, and combined without consideration of the philosophical foundations and any logical inconsistencies that may arise. However, taking this a-paradigmatic approach ignores the important questions raised by the incompatibility thesis and may thus threaten the validity and coherence of the resulting research (McChesney & Aldridge, 2019a).

To support robust mixed methods research, a strong case can be made that it is potentially possible to situate any research method within any paradigm (Creamer 2018; Johnson & Onwuegbuzie 2004; McChesney & Aldridge, 2019a). This means that we can combine methods and paradigms in a range of ways. We can use a range of methods all within a single overarching paradigm, or we can use different methods within different

³ The scholars cited here are not guilty of this approach, but rather have documented it in their reviews of mixed methods research practice!

paradigms but then bring everything together in meaningful ways. These possibilities are unpacked further below.

Qualitative and quantitative methods can be combined within a single overarching paradigm. This approach avoids the problem of incompatibility, since only one philosophical worldview is being used. Typically, mixed methods studies that reflect this approach have involved a positivist or post-positivist paradigm (Alise & Teddlie, 2010), but other paradigm choices are possible. Exemplars of this approach include my doctoral research, which used an interpretivist paradigm (McChesney, 2017; McChesney & Aldridge, 2019a); Jarrett's (2014, 2017) Master's research, located within a transformative paradigm; and Si'ilata's (2014) doctoral research, which combined a critical theory paradigm with Pasifika research methods.

More than one paradigm can also be combined in a single mixed methods study. Pragmatism (Greene & Hall, 2010; Johnson & Onwuegbuzie, 2004) has become popular as a way to justify combining paradigms on the grounds that "research methods should *follow* research questions in a way that offers the best chance to obtain useful answers" (Johnson & Onwuegbuzie, 2004, p. 17-18; emphasis in original). Practical (i.e., pragmatic) rather than philosophical considerations take precedence here, and it is assumed that different paradigms "are logically independent and therefore can be mixed and matched ... to achieve the combination most appropriate for a given inquiry problem" (Greene & Caracelli, 1997, p. 8). In practice, however, this pragmatism becomes hard to distinguish from the a-paradigmatic stance described earlier. Pragmatism has thus drawn much critique, being characterised as "the pacifier in the paradigm wars" (Bergman, 2011, p. 271).

Multiple paradigms can be combined more richly within a mixed methods study through the use of a dialectical approach (Greene, 2012; Greene & Hall, 2010). Here, the researcher is highly conscious of the different worldviews and ways of knowing that each paradigm entails, and the researcher deliberately moves back and forth between paradigms to create dialogue that leads to "richer, deeper understandings of the social phenomena being studied" (Greene, 2012, p. 757). Real care and depth are needed in order to combine paradigms in non-trivial ways. Cronenberg and Headley (2019) have provided useful reflections on their use of the dialectic stance in their respective doctoral studies, illustrating what it takes to pursue a genuine, dialectic integration of two distinct paradigms. MacFarlane and MacFarlane's (2019) *He Awa Whiria* also facilitates meaningful integration across paradigms.

Whatever stance is taken, my provocation here is that it is important for mixed methods researchers to explicitly acknowledge the paradigm(s) as well as the methods that comprise their methodology, and to consider the implications of their paradigmatic positioning. The claims made early in a thesis or journal article about the paradigm(s) that frame the research should then be "lived out" in the way that the study has been conducted, described, interpreted, and discussed.

Qualitative-quantitative integration

A second important consideration for doing mixed methods research well is ensuring that the qualitative and quantitative elements are genuinely integrated. Many studies with the label "mixed methods" are actually two separate studies – one qualitative and one quantitative – that both attempt to answer the same research question(s). Qualitative and quantitative data may be collected and analysed separately, and the findings from each

type of data may also be (largely) reported separately. Such studies are common but do not reflect the full potential of mixing methods (Yin, 2006; Guetterman et al., 2020).

Robust mixed methods research involves intentional and meaningful integration of the qualitative and quantitative elements – integration that leads to “a new whole or a more holistic understanding than achieved by either alone” (Fetters & Molina-Azorin, 2017, p. 293). This integration can occur at many stages of a research study (Creamer, 2018; Fetters & Molina-Azorin, 2017; Guetterman et al., 2020). At the outset, research questions can be designed to draw on both qualitative and quantitative data, rather than having separate questions for each type of data. Data collection could be designed so that at least some participants contribute both qualitative and quantitative data, rather than having separate samples for the two data types. Data analysis can emphasise bringing qualitative and quantitative data together, using any of a wide range of strategies discussed in the mixed methods literature (for an introduction, see Fetters & Molina-Azorin, 2017) – or even a new approach developed to suit a particular study. The text(s) that report the study can have qualitative and quantitative data and findings interwoven, rather than reporting the findings of each data set separately. The findings across multiple research questions can also be brought together to present a coherent, integrated discussion with meta-inferences across the whole data set (Creamer, 2018); this practice is especially important if different research questions do draw on different types of data, or if different phases of the study used different types of data (e.g., in sequential research designs; see Creswell & Plano Clark, 2017). Integration can also be considered in relation to the research team, the literature review and rationale that frame a study, the language used when describing a study, and the approaches to research integrity and dissemination (Fetters & Molina-Azorin, 2017).

In the past two decades, mixed methods theory and practice have advanced significantly in terms of understanding what it means to integrate qualitative and quantitative elements in robust ways. Mixed methods researchers are continually being challenged to pay more attention to integration (Fetters & Molina-Azorin, 2017). Considering the paradigmatic foundations for mixed methods research, as highlighted in the previous section, is also relevant here, since without sound paradigmatic positioning, integration of qualitative and quantitative elements may not be meaningful or defensible. My provocation here, then, is that those using mixed methods must ensure that they are guided by current developments and debate in the field – which, at present, emphasise attending to paradigms and integration.

Final thoughts

In any research study, design and methodological decisions should be driven by the aims, priorities, and research questions. A mixed methods approach is certainly not always or automatically the best way to conduct research (Greene, 2012). However, there are many educational and other social research contexts in which mixed methods research, done well, has much to offer. In this article, I have considered some potential benefits of mixed methods research. Beyond the “best of both worlds” considerations, mixed methods potentially has much to offer research that addresses “wicked problems,” research that seeks to extend theory, and culturally responsive research. I have also highlighted two considerations for doing mixed methods well: aligning paradigms with methods in appropriate and meaningful ways, and ensuring that qualitative and quantitative elements of a mixed methods study are genuinely integrated. Throughout this article, I

have highlighted sources that provide useful examples and discussions of these aspects of mixed methods research, in the hope that the provocations presented here will lead readers to further reading and learning in areas that interest them.

I end by offering two further provocations, particularly to postgraduate researchers and their supervisors. The first is that we must remember that mixed methods is not a fixed discipline or methodology. Methods textbooks often present lists or typologies of mixed methods “designs,” and it may seem as if these were the only options that researchers may choose from. In fact, these lists and typologies were only created as ways to summarise the most common things that researchers have done to date and to offer scaffolds for those new to mixed methods – the lists of “designs” are not intended to constrain what is possible (Bergman, 2011; Creswell, 2011). Research methods are continually evolving (Creswell, 2011). It is wise, of course, for those new to mixed methods research to begin by familiarising themselves with what has been done before, and to consider the benefits and challenges of the various common designs. However, thereafter, the challenge is to identify a methodology (comprising paradigm(s) as well as methods) that is appropriate for the specific research topic and context in question, and to justify these decisions explicitly and thoughtfully.

My final provocation is that researchers at all levels, including postgraduate researchers, should remember that mixed methods is a field of research in its own right, and one that we can all contribute to. In planning a research study, we may develop a new approach to mixed methods or modify an existing approach in an interesting way. As a study evolves, researchers may also adapt or extend a research design, moving away from the more typical design they had originally conceived, and/or may become aware of how what they are doing is, in fact, somewhat unique. Where such development occurs, postgraduate and other researchers should consider publishing articles about their use of mixed methods, contributing to the wider field of discussion about mixed methods research. Journals such as the *Journal of Mixed Methods Research* or the *International Journal of Research and Method in Education* are worth considering here; the editorials of these journals often contain helpful advice about how to write a publishable methods article. I published such an article based on my doctoral study (McChesney & Aldridge, 2019a), and there are many other examples of methods articles published based on postgraduate research, whether involving mixed methods or other methodologies (see, for example, Cronenberg & Headley, 2019; Lee, 2009; Lehner-Mear, 2020; Msoroka & Amundsen, 2018; Naufahu, 2018; Ong, 2020). Such articles should offer postgraduate students both exemplars and courage in considering writing their own methods article(s).

Just as educational practices continually advance, so too do research methods advance. Mixed methods research will best realise its potential (including for addressing wicked problems, theory generation, and/or culturally responsive research) when it is conducted in line with current best practices (including attending carefully to paradigms and integration) – and when we all contribute to thinking, talking, and writing about how to make mixed methods research better and more powerful.

Nau te rourou, nāku te rourou, ka ora ai te iwi
With your contribution and mine, the people will flourish

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