

The Future of Mixed Methods: A Five Year Projection to 2020

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The field of mixed methods (MM) research has expanded over the last few decades with a plethora of publications, the launch of the Journal of Mixed Methods Research (JMMR), and the establishment of the Mixed Methods International Research Association (MMIRA). Given the nascent status of MMIRA, its Executive Board established a task force on the future of MM and the MMIRA, asking us to cast our gaze to the future. We provide a summary of progress in the MM field and then identify fertile topics and challenges that members of this community may engage with for the next five years (2016-2020). Our process consisted of brainstorming topics that are of relevance to the MM communities and then dividing into teams to draft sections related to those topics. We went through several rounds of drafts, comments, and revisions. The topics are discussed in separate sections, with recommendations for action for each section. The five topics that are addressed in this document include:

- Definition, character and history of MM
- Purposes, Questions, Design Research and Technological Advances
- Social Justice and the MM Researcher's Responsibility
- Teaching MM research
- MMIRA, the profession, and professional development

Definition, character and history of MM

The development of MM thinking and identification of MM as a distinct approach

Early debates about social science methods can be dated back to the 17th century and the combined use of quantitative and qualitative methods to an even earlier date. Their use has been evident in the natural as well as social sciences (Maxwell, 2016; Maxwell, Chmiel, & Rogers, 2015). Throughout the 20th century, researchers from many disciplines and countries adopted mixed and multimethod approaches (e.g., Jahoda, Lazarsfeld, & Zeisel, 1933; Platt, 1996) and especially in its later decades, advocated for the use of mixed methods (e.g., Bryman, 1988; Greene & Caracelli, 1997; Howe, 1988; Kuckartz, 1995; Rossman & Wilson, 1985; Webb, Campbell, Schwartz, & Sechrest, 1966). During the 1970s and 80s, MM emerged as a critique against quantitative research which had dominated health, education, economic, educational, and social science methods for several decades. There was often fundamental disagreement between quantitative and qualitative methodologists on the philosophical foundations of research methodology and the implications of these differences for mixing methods, sometimes referred to as the “paradigm wars” (Gage, 1989; Hammersley, 1992).

In contrast to arguments that a limited number of paradigms, incorporating “a systematic set of beliefs, together with their accompanying methods” are competing and incommensurable (Lincoln & Guba 1985, p.15), authors of the MM tradition in the 1990s proposed a more flexible approach. The milestone summarizing these early ideas and beginning the process of identifying basic terminology as well as definition of the field was the publication of a book by Tashakkori and Teddlie, *Mixed Methodology: Combining Qualitative and Quantitative Approaches* in 1998. This was followed by a rapid expansion in the acceptance and use of MM, such that by 2003 in the first edition of the *Handbook of Mixed Methods in Social and Behavioral Research*, Tashakkori and Teddlie described MM as “a distinct third methodological movement” (p. 24). Diverse opinions and many ongoing debates notwithstanding, there is now growing consensus that, like quantitative and qualitative methods, MM research is a distinct methodological approach (Johnson, Onwuegbuzie, & Turner, 2007). Creswell and Plano Clark defined MM as follows: “MM research is a research design with philosophical assumptions as well as methods of inquiry. ... Its central premise is that the use of quantitative and qualitative approaches, in combination, provides a better understanding of research problems than either approach alone” (Creswell & Plano Clark, 2007, p. 5). Further evidence of MM as a recognized distinct methodology was evidenced by the publication of *The Best Practices for Mixed Methods Research in the Health Sciences Report* (Creswell, Klassen, Plano Clark, & Smith, 2011), which provides guidelines for the US National Institutes of Health grant applicants who propose MM studies.

Growing numbers of researchers, motivated in an increasingly competitive funding climate to describe their proposed studies as methodologically novel or innovative, may consider MM research to be an apt choice. Whether and how researchers understand MM as a distinct methodology, beyond the mere inclusion of both quantitative and qualitative methods in a study, remains unclear and challenging. As is documented in a rich and growing MM research literature and the peer-reviewed *Journal of Mixed Methods Research*, mixing methods is distinguished from other methodological approaches by the rigorous adherence to quality in research methods that leads to *integration* of qualitative and quantitative methods at the analytical and results

dissemination phases, giving access to insights and understanding beyond those that might have been provided by use of quantitative or qualitative methods alone (e.g., Bazeley, 2012, 2015; Creswell, 2009; Creswell et al., 2011; Creswell & Plano Clark, 2011; Curry & Nunez-Smith, 2015; Greene, 2008; 2007; Maxwell et al., 2015; Mertens, 2015; Molina-Azorin, 2011; Tashakkori & Teddlie, 2003). Defining just what it is that is distinctive about MM is an important topic for MMIRA members and other MM researchers, especially in the context of scholars, practitioners, and the provision of formal education at the undergraduate and graduate levels.

MM definitions, typologies and terminology

During the decades of development many terms for MM research have been proposed. Some methodologists have been concerned that what was being mixed were not necessarily ‘methods’ while others considered ‘mixed’ as inappropriate (Bergman, 2011). Tashakkori and Teddlie (1998) first proposed the term Mixed Methodology which emphasizes the concept of mixing different methodologies rather than methods (e.g. procedures). Even though the critics claim to have good arguments for substituting one or another word, we agree with Max Bergman (2011) that “Disputes about an appropriate terminology are part of any discipline. ... Diverging from an established terminology also leads to confusion, rather than clarification, even though the initial aim may have been clarification” (p. 272), and call on the members of MMIRA and other users of MM to promote a common identity by using ‘mixed methods’ as the general term for the tradition.

In the rapidly growing tradition of MM, the number of authors who come from very different disciplinary as well as methodological backgrounds has increased, and new textbooks and articles have offered different definitions for MM and typologies of MM studies. Johnson, Onwuegbuzie and Turner (2007) reviewed 19 definitions of MM contributed by leaders in the field. There were important aspects that were emphasized by the majority of definitions, but none of the aspects was such that all of the authors would have included or interpreted each in an exactly identical way. In particular, definitions varied with respect to whether the mix must include both qualitative and quantitative approaches or could occur within one of these, what constitutes mixing, the stage(s) at which integration needs to be evident, and justification for using mixed methods. The plurality evident in definitions is further escalated if we take a step further to consider the numerous typologies or taxonomies of MM designs that different authors have proposed. MM research designs can be infinitely variable, depending on the immediate purposes and questions the researchers set. Since Greene, Caracelli and Graham (1989) first attempted to classify the designs used in a set of studies many authors, including Creswell and Plano Clark (2011), Morse and Niehaus (2009), Nastasi, Hitchcock and Brown (2010), Mertens (2015), and Teddlie and Tashakkori (2009), have developed design typologies to set mixed methods within an inclusive framework.

Attempts to systematize the field and to propose some shared definitions and models are helpful in certain contexts and for some purposes, as long as we keep the general framework for MM designs flexible and encourage informed creativity in methodological matters. Systematic typologies and identification of the dimensions on which MM research designs vary, illustrated by exemplary MM studies, can serve as a valuable starting point in teaching and learning. For comparative study of methods, or for a particular text or argument, we need to set boundaries and

define MM clearly in order to provide a solid conceptual framework which can be grasped by the audience when evaluating our claims and inferences.

At the same time, with respect to terminology more generally, it seems to be irrational to call upon MMIRA members, let alone the broader community of researchers, to agree about one exact definition, interpretation or way of use for every (popular) term in the field. Thus, rather than trying to specify (tie down) meanings (which will never be accepted by all in any case), perhaps the better way to proceed is to recognize this problem, to be informed, to read critically, and to ask of authors using various terms that they provide clear indication of how the term is intended to be interpreted in the given context.

Pursuit for shared terminology, definitions and boundaries of MM is important for identity and community building, academic dialogue and enhancement of the field, but it is not appropriate to limit or set out how MM might be done, nor for MMIRA to promote any single typology. It is not MM per se that matters and justifies MMIRA as an organization, it is a commitment to contribute to fostering better research and a persuasion that developing a MM framework has potential to provide the means to do so. The potential, through MMIRA, is to bring together bright and open minded thinkers from very different traditions and backgrounds in a community that fosters innovative synergies and advances methodological development. In the process, this opens up possibilities to tackle new types of problems and questions that are important for researchers and society alike.

Recommendations for the future: Definition, character and history of MM

To clearly define and set boundaries for MM as an approach to research is difficult if not impossible. However, we invite the members of MMIRA to:

- Recognize the long history of mixing methods, but also the emergence of a ‘MM movement’ in the 1980s and 1990s.
- Recognize that MM are practiced in many different ways, under different names, and/or without definition as such at all, in different disciplines and countries.
- Agree on use of ‘**mixed methods**’ as the generic term for the area, even while not necessarily agreeing on a fixed definition of that term.
- Discuss and agree on the MINIMUM criteria for MM, in order to be able to justify its distinctiveness and foster identity building. We suggest the ‘*use of more than one method, methodology, approach, theoretical or paradigmatic framework*’ and ‘*integration of results from those different components*’ as two core criteria, but recognize that there is a long tradition of emphasizing that MM is about combining qualitative and quantitative methods. MMIRA might therefore initiate this discussion, agree on minimum criteria and facilitate spreading this as a shared understanding.

Purposes, questions, design research, and technological advances

Two key issues in the field of MM research are to analyze why and how to use this methodological approach. In this regard, three important aspects related to these issues are examined in this part of the report. First, we analyze some ideas about questions and the important role that MM research can play with regard to the [relationship] alignment between the purpose for which research is conducted, the research questions, and methods. Second, we examine important aspects of specific research designs that may help advance our knowledge about relevant and interesting questions related to our practices. Third, we study the main technological advances that may help us to carry out better MM studies, emphasizing some research opportunities that new technologies provide.

Purposes, questions and mixed methods

Research questions play a key role in the process of conducting research. Onwuegbuzie and Leech (2006) indicate that forming research questions is much more difficult in MM studies. Despite the clear importance of the nature of the research questions, the attributes of strong MM research questions have remained relatively unexplored by mixed methodologists, although some authors have examined this topic in the last few years (Creswell, 2003, 2009, 2015; Creswell & Plano Clark, 2007, 2011; Gorard, 2010; Hesse Biber, 2010a; Mertens, 2015; Onwuegbuzie & Leech, 2006; Plano Clark & Badiee, 2010; Tashakkori & Creswell, 2007; Teddlie & Tashakkori, 2009).

In this section we analyze two main ideas. First, we examine two different models regarding the relationship between questions and methods. Second, we emphasize the important role of MM taking into account the influence of methods on questions and the need to extend our methodological skills. Indicating the interactive relationship between components in a mixed methods study was first emphasized by Maxwell and Loomis (2003). The interaction between the purpose for conducting research, the research questions and the methods used is even more important now that there is such an emphasis upon critical and/or transformative frameworks in mixed research designs. Thus the purpose for conducting the research is as critical as the research questions alone.

Purpose, questions and methods: The dictatorship model and the reciprocal approach

Two positions regarding the relationship between purpose, questions and methods are evident in the MM literature. On the one hand, Teddlie and Tashakkori (2010) describe the dictatorship model in which “the research question (or research problem) determines the specific methods (QUAN, QUAL, OR MMR) used within a given study (p. 17).” Thus, a researcher will select the best tools available in their methods toolbox to answer the stated questions. An appropriate approach would be to have a clear understanding of the overall purpose and a strong sense of the questions that operationalize that purpose before choosing which methods to use to answer the questions and meet the purpose. Then, the use of MM becomes appropriate if, and only if, it is called for by the purpose for conducting the research or the research questions. This model fits well with a linear process of research where the methodology is the servant of questions.

An alternative interactive or systemic model places research questions at the hub of the research process (Maxwell & Loomis, 2003; Maxwell, 2013; Plano Clark & Badiee, 2010). In

this model, research questions are directly related to four study components: purposes, theories and beliefs, methods, and validity considerations. While research questions play a central role, this model views them as interacting and integrated with the other interrelated components. When we focus on methods as one of the components, the idea is that research questions inform and are informed by methods, that is, there is a reciprocal relationship between questions and methods. Research questions influence the methods we use, but methods may also influence the research questions we ask. Therefore, research questions shape and are shaped by methods. This reciprocal relationship can be represented as a double-headed arrow between research questions and methods. In any case, both the dictatorship model and the reciprocal approach share the idea that the key point is the fit between questions and methods. Placing purpose and the research question at the center of this hub emphasizes the importance of these two features. This is particularly important with research that emphasizes critical or transformative intent.

The influence of methods on purposes, questions, methodology and MM

If methods may influence the research questions, then an important consequence is that by extending our methodological skills, we can improve the question-asking process. After we graduate, we usually continue to rely on the methods we initially learned. When we develop expertise in using some methods where we feel comfortable, it is hard to break from that. Extending and sharpening our methodological skills, we can increase the rigor of our conceptual thinking, see new ways to answer research questions, and even identify questions that would not have occurred to us otherwise (Edwards, 2008). And here, undoubtedly, MM can play a key role. Because MM research combines and integrates quantitative and qualitative methods, the researcher is motivated to develop a broader set of research skills. Training in MM can overcome the tendency to rely on known methods and play an important role in widening and extending our repertoire of methods if the training emphasizes the importance of combining, comparing, and mixing different methodologies,

From the point of view of the dictatorship model, MM research is not intrinsically superior to research that relies on a single method. As emphasized by this model, an important consideration prior to designing and conducting a MM study is whether MM research, as compared to other designs, best addresses the purpose for conducting the research or the research question(s). However, from the point of view of the reciprocal approach, and specifically considering that methods also influence questions, MM may be stronger than quantitative and qualitative methods. In this regard, Teddlie and Tashakkori (2003) indicated that MM studies may be superior to other approaches as MM research can answer research questions that the other methodologies cannot. MM requires that researchers go beyond their initial training in only quantitative or qualitative methods and explore new ways of doing things to answer questions that become visible and approachable through the use of MM.

As a final point, we would like to highlight that some questions cannot necessarily be categorized as quantitative, qualitative, or MM. Many research questions (for example, "What impact does this program have on clients?") are non-specific about the methods that can be used to answer them. Obviously, any research question should be potentially researchable, but discovering how, specifically, this can be done is often an inductive process that extends into the data collection and analysis phases of the study. Thus, it may be dangerous to write questions at the outset that "dictate" the methods to be used in answering the questions, as this could engender conceptual "tunnel vision," preventing the researcher from seeing alternative approaches and data that could contribute to answering the question. Therefore, we argue that

questions do not necessarily assume methods, although it might be that some methods are more appropriate than others to answer certain types of questions. Moreover, as a study proceeds, questions are often modified in response to ongoing analyses.

MM and design research

As stated earlier in the report MM research designs can be infinitely variable and the field of MM is developing rapidly. The way to open up new potentials for MM is learning about emerging methodological frameworks and applying MM principles in these new contexts. One of these new trends is applying a model of *design research* for solving complex design tasks that stakeholders from many fields face in their practices (Laurel 2003, Simonsen 2010). In the context of design research, the concept of design does not refer narrowly to the arts or architecture, but to creating something new that does not exist or "to invent and bring into being" (Webster's Dictionary and Thesaurus, 1992). It can be some technical tool, but also some syllabus or game serving learning purposes, some reform program, or anything that can be applied and used in real practice (for examples from the field of education see Plomp and Nieveen 2013, Eisenschmidt and Niglas 2014). Design research incorporating innovation and development does not always start from unexisting "realities", it can also look for solutions that will serve and suit better the needs of changed or changing environments.

Authors from various fields of research describe the model or methodology of design research in slightly different ways and present it using different labels (for example *design-based research*, *design study*, *design experiment*, *developmental research*, *evidence-based design*, etc.), but for complex design tasks the cyclical model is the most commonly suggested (Mertens, 2015) (see Figure 1). The stages within every cycle come with their own specific aims and purposes and therefore call for and accommodate the need for collecting quantitative as well as qualitative evidence to learn about the context of the design artifact or to justify and test the design solutions. Thus, design research strives to combine creativity, professional skills and knowledge with appropriate adherence to standards of quantitative and qualitative methods of research. The cycles represented below are used when the research includes the need to design a solution, rather than test an existing solution. Thus, it begins with the awareness that there is a need for development and moves through cycles of planning, designing, evaluating, and making inferences and disseminating. Mixed methods have potential to add to understandings of how to conduct design-based research because different methods can be informative at different cycles in the process.

One can find a number of dissertations, conferences papers and reflections on projects indicating the benefits that the combined use of quantitative and qualitative approaches has brought about when applied to enhancing the design process. For example Philip and De Bruyn (2013) propose a MM approach to show how behavioral and design research methods can be combined coherently. They also identify five specific MM research designs that describe how a supplementary behavioral research study can be conducted within the context of a larger design research project. Even though design research is used extensively in some fields, fundamental methodological texts about applying MM within the framework of design research are still to be written, however.

Cycles 0, 1, 2, 3, 4

0. Indicating the need for development and related knowledge

1. Analysing the problem + planning the process

(needs, goals, pre-existing knowledge, ..., new knowledge from previous cycles)

– planning the study and Design & Development process/stages

(initial plan of the study, revised plan of the study, ..., work allocation, schedule, applicable techniques and methods, ...)

2. Designing & Developing + monitoring & documenting

– conducting the D&D stage including justifying the design decisions/solutions

– monitoring the D&D process

(memos, team discussions, ...)

– describing the result of D&D process

(sketches, alternatives, resulting design and/or artifact, ...)

3. Evaluation including initial implementation

(testing the design result, evaluation according to standards, feedback from users and/or experts, ...)

4. Inferences and Generalisations + communicating the results

(concepts, models, ontologies, theories, standards, ...)

Figure 1. Stages within Design Research cycles

Advances in methods: The affordances of new research technologies

Researchers customarily look to new research technologies to provide technical efficiencies. For instance, the invention of electrical recording devices — originally, the gramophone and wire recorders — transformed the practice of interview methods. Mixing methods offers another kind of efficiency — theoretical efficiency. With MM it is often possible to develop a holistic, multi-dimensional and robust analysis of social phenomena more effectively than with a single method. For example, combining fieldwork and survey research provides such an analysis more efficiently than an ethnography (Verd, 2013). Both approaches can produce a full, robust analysis, but ethnography generally requires a bigger time investment. Thus, when MM researchers approach new research technologies they will want to consider both their technical benefits (‘affordances’) and their theoretical (analytical) benefits. We live at a time of considerable technological development. The digital/online field promises to facilitate MM research but also poses serious challenges. Here we consider three technological themes: new practitioners, new practices and new purposes; developments in MM methodologies and technologies; and hybrid methodologies and supporting technologies.

Like social research in general, the new digital and online environments bring *new users, new practices and new research purposes* into the picture. They not only include social science students previously unable to engage with professional research, such as secondary school

students, but also people with no social science background who use online tools for their own purposes as citizens, parents, clinicians, campaigners and so on. In marginalized communities and populations without traditional research resources, digital and online tools provide opportunities to engage with research on a mass scale for the first time. Here we consider citizen research; indigenous knowledge; and MM research involving marginalized populations.

Trained social scientists no longer hold hegemony over social research (Hardey and Burrows, 2008). Citizens who do not identify as professional researchers increasingly conduct research with new and different purposes, using digital/online resources and an eclectic approach to mixing findings from them (Fielding, 2014). *Citizen research* may be conducted for the public good and scientific advancement (Nielsen, 2011), as in mass participation projects like Galaxy Zoo (www.galaxyzoo.org), or for political purposes, as in the use of online petitions by the Greek public to lobby government against extreme austerity measures (Briassoulis, 2010). Citizen research may be used to bring a global dimension to groups sharing affinities like leisure interests (Tufecki, 2008; Robertson, 2000). All these purposes draw on new digital tools, and their affordances are as valuable for MM researchers as they are helpful for citizen researchers (Charmaz, 2012; Xanitoudou & Gilbert, 2010).

Like citizen research, our growing awareness of non-traditional research communities widens the boundaries around who does social research, why it is done, and what it legitimately involves. We increasingly value *Indigenous Knowledge* (IK), i.e., understandings from enculturated ways of knowing outside the Judeo-Christian tradition (Tuhiwai Smith, 1999). MM has a part to play. The IK agenda initially connected the principles of IK research and established research traditions (Evans, et al., 2009), presenting a program for the considered advancement of IK (Gobo, 2011). Calls to recognize IK's inherently critical nature (Nicholls, 2009), and texts elaborating distinctive methodologies for conducting IK research (Chilisa 2011; Liamputtong 2010; Mertens, Cram, & Chilisa, 2013) each involve a practice of MM. The limits of progress towards a fully inclusive practice of social research are seen in the fact that a key collection on IK (Denzin et al 2008) featured few non-western authors, while the gain from including new voices is illustrated by explorations such as Mertens, Cram and Chilisa's (2013) volume on indigenous research that includes 30 indigenous researchers from six continents and Ito's (2011) MM account of the relationship between Japanese peasant farmers and urban elites yearning for the old ways of the land.

The communities to which we look for IK do not have a monopoly on marginalization. *Marginalized communities* exist in the banlieues of Paris and the American rust belt. The practice of MM has a radical thread in its conviction that the full story cannot be told by single methods and/or standard methods. There are important connections to be made between MM research and empowering the marginalized (Mertens, 2010b). Such work is committed, critical, and sensitive to the interests of the researched (Mertens 2009; 2015). It requires new ethical standards and norms for the ownership of research (Beaton et al, forthcoming).

The second theme, *developments in MM methodologies and technologies*, considers the infrastructure supporting MM research and the progressive development of the MM heuristic. Regarding infrastructure, the field has gained major new resources for secondary analysis to benefit MM research designs, but at the very time that 'big data' threaten to overwhelm our capacity to absorb such resources. In the MM field's development of core methods to better support MM research designs the data integration juncture has become critical, with recognition of the imperative to specify exactly what we mean by integrating qualitative and quantitative,

and how to go about it. There are lessons here from computational techniques for coping with the data deluge using semi- and fully-automated strategies to bring datasets together while retaining data quality. Here we consider secondary analysis and archival practice; critical perspectives on data integration; and exploiting the online data deluge without drowning.

Secondary analysis has a low profile in mainstream research, yet in recent years there has been major investment in social science data archives. These comprise a valuable but underused resource for MM. One could say that secondary analysis was ‘made for’ MM, since it is inherently about combining (and contrasting) findings from datasets using different methods. Exemplars include using archival data in online research (Carmichael, 2008), combining textual and visual data (Corti, 2012), and biographical research (Valles et al., 2011).

Creswell (2009) and others rightly recognize the *critical importance of data integration* in MM. For many this is intrinsically about combining quantitative and qualitative data (Bryman, 2006; Maxwell, 2010), while canonical sources like Denzin (1970) recognize the logical possibility of ‘within method triangulation.’ Many have recognized the value of combining quantitative and qualitative data as a means to gain both analytic depth and range (Ivankova & Kawamura, 2010), but few have shown how direct integration by converting one form of data to another might be done. Data conversion is quite common. One challenge with this line of reasoning is the unintended consequence of simplification of data reducing the potential for a deep level of knowledge gained, especially when converting large qualitative data strands. Bazeley (1999, 2006) is a pioneer in this regard. This does not mean that all integration should be direct; for example, there is value in qualitative analysis of open ended questions in surveys, particularly where qualitative software renders it systematic (Fielding, et al., 2012). A considered integration strategy needs to be designed in from the outset (Creswell & Plano Clark, 2011); when this challenge is met, real analytical discovery is possible (Hesse-Biber, 2010b).

Given their openness to innovation, MM researchers may have the edge in *dealing creatively with the data deluge* while responding robustly to the data quality issues it often presents. We increasingly recognize that online environments pose problems as well as offer benefits (Morozov, 2011). Automated data analysis is one response to the information explosion but poses dangers illustrated by facile use of Sentiment Analysis (using social media to assess public opinion; Hand, 2012). Some solutions lie in exploiting the online medium itself, as Brookes (2014) illustrates regarding the use of online resources to expose scientific fraud, Smith et al. (2011) show for survey research, and Hundley and Holbrook (2012) explore in representing relationships using innovations borrowed from digital fiction.

MM researchers are not alone in being both excited and concerned by the methodological affordances of new online/digital technologies. The third theme, *hybrid methodologies and supporting technologies*, brings to notice a set of new, technologically-informed methods with potential for MM. Here we consider the intersection between code-based qualitative data analysis and content analysis; the convergence of quantitative and qualitative data visualization techniques; and the spatial and the social.

MM researchers have been keen adopters of *qualitative software* (‘CAQDAS’), which has played a role in enabling more systematic analysis of qualitative data, and its integration with quantitative data (Bazeley, 2010; Silver & Lewins, 2014). Contemporary CAQDAS increasingly offers powerful tools for semi-automation of code-based analysis (Franzosi et al., 2013). Digital tools for *content analysis* have enabled new analytic approaches to mixed datasets (Hogenraad et

al., 2003; Popping, 2009, 2015), including full automation (Grimmer & Stewart, 2013) and text mining (Lee et al., 2010), the challenge being to retain closeness to the underpinning data.

Digital tools have transformed *data visualization* across a range of fields and have enabled dry statistics to be seen in ways that catch the popular imagination (Wilkinson, 1999; Tufte, 2001, 2006; Unwin, 2006). Latterly, the visualization revolution has extended to qualitative and geographical data (Chen, et al., 2007). Techniques for combining information types in data visualization (McCandless, 2012) may particularly appeal to MM researchers.

The new human geography declares itself an inherently MM practice, combining not only social and physical geography but the quantitative and the qualitative. Innovative systems that integrate Geographical Information Systems with CAQDAS (Jung, 2009; Jung & Elwood, 2010; Cisneros-Puebla & Fielding 2009) bring together *the spatial and the social*. The new geography is also a committed research practice that seeks to place research resources in the service of communities (Craig et al., 2002), exemplified by feminist analysis of forestry resources (Nightingale, 2003), the use of MM geographic resources in urban planning (Knigge & Cope, 2006), and community safety studies (Fielding & Fielding, 2013).

Recommendations for the future: Purposes, questions, design research and technological advances

The development of research questions for MM research and alignment of those questions with an appropriate design is a fertile area for MM research development. In addition, advances in technology partnered with applications in research is also a growing area of interest for MM researcher. To address these challenges, we recommend that MMIRA:

- Foster discussion on ways of classifying designs, again without rigidly imposing a particular typology, for example, by delineating and defining dimensions on which they vary.
- We advocate seeing a reciprocal linkage between questions and designs where research questions shape and are shaped by methods. MMIRA can provide a venue for exploring ways to integrate quantitative and qualitative methods and provide or promote training in doing so. By extending and sharpening methodological skills in the MM community, MM researchers will be encouraged to identify interesting and relevant research questions and see new ways to answer them.
- MMIRA can encourage researchers to think more flexibly and to widen their methodological repertoire to include MM action research and design research studies. This will extend the range of problems we can tackle using MM.
- New digital tools encourage us to widen our repertoire of research methods, by providing not only new affordances, such as web survey software, but through helping to make connections between parts of a MM design, such as by meta-data that allows different archived datasets to be linked. MMIRA already plays a large part in promoting the considered adoption and adaptation of information technologies by mixed methods researchers. The workshop section of the MMIRA website could offer publicity to a wider selection of workshop providers than at present, conferences, and workshops conducted by leading members. Developers of relevant software maintain their own lists of workshops promoting their software and are likely to respond enthusiastically also to a further dissemination opportunity.

- MMIRA could also consider making a ‘technological affordances’ stream a standard part of its main and regional conference programs. The stream could include a ‘what we need’ forum, to which developers would be invited, from which users and potential users could specify what features they need from software to facilitate mixed methods projects.

In sum, by sharpening our methodological and technological skills, we can see new ways to answer research questions. One of the main strengths of MM research is that it emphasizes creativity and flexibility. Researchers need to be prepared to be flexible, rather than follow a script, and MMIRA can promote this orientation.

Social justice and the MM researcher’s responsibility

The world is confronted with many ‘wicked problems,’ that is, problems that involve multiple interacting systems, are replete with social and institutional uncertainties, and for which there is no certainty about their nature and solutions, with time running out to find solutions (Levin, Cashore, Auld & Bernstein, 2012; Mertens, 2015a; Rittel & Webber, 1973). Additional concepts related to researching wicked problems include the need for researchers to address power inequities, violations of human rights and impeding social justice, and strategizing for action in the form of policies and behaviors (Mertens & Wilson, 2012). Some researchers and institutions also use the term ‘grand challenges’ with a similar meaning. Grand challenges are ambitious but achievable objectives that harness science, technology and innovation to solve important problems (U.S. Office of Science and Technology Policy, 2015). Grand challenges include issues arising from environmental degradation and climate change, poverty, health, social and economic inequality, and geopolitical instability, among many others.

Wicked problems and grand challenges can be characterized in sectoral terms and as cross-cutting problems. For example, cross-cutting wicked problems include armed conflict and other forms of violence (rape, other forms of sexual violence, gang activity) and inequities on the basis of gender, disability, race/ethnicity, religion, sexual orientation or other characteristics used to deny people’s rights. Wicked problems can also be viewed as sectoral when the focus is on a specific sector such as community interactions with the criminal justice system; food insecurity; lack of access to appropriate and safe education; and lack of access to health services for such problems as HIV/AIDS, obesity, prenatal care, and substance abuse; environmental problems related to pollution and climate change; political unrest and corruption; and economic problems related to poverty and oppression.

These wicked problems and grand challenges typically call for new theories, concepts and methods. In order to promote research that helps address wicked problems and grand challenges, we explore the role of the researcher in terms of social responsibility, the use of a transformative framework for MM as offering an avenue for acting upon social responsibilities, provide an example of how MM are being used to address wicked problems successfully, and identify challenges that have not yet been met.

Researchers’ roles

Researchers in the MM community (and in general) hold different perspectives regarding their roles. Some frame their roles as producers and disseminators of new knowledge. Hence, they have a responsibility to share their knowledge in peer reviewed journals and be judged by

the impact factor of the journal where they publish (Brown & Hedges, 2009). Others view their role in terms of supporting greater social activism; hence their criterion for good research is its contribution to positive social change. There is not a clear cut line that divides researchers on this topic; rather, it is a matter of the emphasis placed on the values of creation of new knowledge and contribution to social transformation.

Researchers who place high value on contributing to supporting changes that are necessary to avoid the negative consequences of environmental degradation, poverty, and inequality believe that the ultimate measure of the quality of their research should be associated with action and change. Good research should stress the need for science designed to change society for the better. It is possible that research conducted with a mono-method (quantitative or qualitative) can also adhere to this value system and can make contributions to social transformation as well. However, a question for MM researchers concerns the role that MM can play in addressing wicked problems. Gomez (2014) argues that MM approaches are particularly germane for approaches to address these wicked problems because they allow researchers from diverse groups to have a common language to guide their inquiry, participants from vulnerable groups to be included in culturally appropriate and supportive ways, and policy makers to be part of the process of problem and solution identification and documentation. Wicked problems are complex and contextually bound; to what extent do MM provide the opportunity to capture that complexity in both quantitative and qualitative ways in order to be inclusive of the deep cultural connections that surround wicked problems as well as to provide a sense of the size and impact of the problems? (There are instances in MM when a 'problem' does not drive the purpose for conducting research.)

In this regard, researchers can use a whole range of methods and techniques for gathering information and data. MM research can help to advance a social justice research agenda to cope with wicked problems and grand challenges. However, MM researchers face a challenge that has been described as the science-practice gap emanating from a debate about rigor and practical relevance of research (Kieser, et al., 2015). From an academic point of view, rigor (in theory development, research design and inferences, and conclusions) is usually indicated as the main indicator of the quality of a study. However, in addition to rigor, scholars must also consider the practical relevance of their work. And, undoubtedly, the purpose of trying to solve wicked problems and grand challenges plays a key role within this practical relevance of research. How can MM researchers contribute to the development of strategies designed to increase rigor and address the practical relevance of their work? How can the MM community respond to a cultural climate within the academy that endorses a mono-method approach? This is an issue of particular relevance for beginning researchers who feel pressure to conform to expectations for specific mono-methods approaches, as is found in some disciplines and universities.

The purpose of science, and then our main purpose and role as researchers, is the presentation of a credible representation of phenomena, as much as possible through convincing logic and rigorous empirical methods. Researchers who prioritize social responsibility might extend the purpose to research to include the provision of valid explanations about empirical phenomena with the potential possibility of making improvements in the natural and social worlds. MM researchers face a challenge in establishing criteria that allow for critical interrogation of the meaning of credible representation and what is considered to be improvement in the world. Future discussions can explore the meaning of rigor in methods and

the meaning of improvement in the human condition, with a specific responsiveness of issues of power and diversity.

The use of MM research may facilitate and enhance the interpretation of the results obtained in order to emphasize the practical implications of a study. With regard to this practical impact, MM can be used to understand the extent to which a study's results are significant in practice by including practitioners' own discourses, with an awareness of inclusion of intended beneficiaries of interventions in culturally respectful ways. Aguinis, et al. (2010), with the goal to bridge the science-practice gap, pointed out that to demonstrate a study's practical significance, there is a need to describe quantitative results in a way that makes sense for practitioners. They suggested that this can be achieved by including practitioners in each research project as part of a qualitative study. Therefore, these authors defend MM research where a quantitative study is completed with a subsequent qualitative part where practitioners and other stakeholders become participants and collaborators. Regarding engaged scholarship, Van de Ven and Johnson (2006) also emphasize that multiple methods are needed to understand complex problems or phenomena. Researchers have a much greater likelihood of making important knowledge advances to theory and practice and solving important problems if the research is designed so that it uses multiple and different methods, comparing plausible explanations of the phenomenon being investigated from different stakeholders. Moreover, community-based participatory research may also be useful (Harper & Salina, 2000; Israel et al., 1998; Wallerstein & Duran, 2010). Members of the community are at the table from the inception of the project (indeed, they help decide what the problem is and what will happen, in collaboration with the research team).

Social inequality, and thus social injustice, includes several types of inequalities: inequality of wealth; inequality of access to health care, education, housing, food, economic resources, power structures, and areas of recreation; degradation of living conditions, the environment, social structures, and relationships; and direct or indirect exploitation of groups on the basis of gender, race/ethnicity, socioeconomic status, nationality, disability or sexual orientation. The key point to researching these problems is that rather than solely relying on numerical measures and statistical analysis, MM researchers argue that including qualitative approaches enhances understandings of (in)justice and perceived fairness. The use of qualitative approaches does not guarantee that injustice and fairness will prevail; MM researchers who integrate quantitative and qualitative methods need to explore how the use of MM can contribute to increased justice.

It is our responsibility as researchers to use a variety of methods available for a better understanding of wicked problems and grand challenges. These problems and their analysis require methodological diversity. Therefore, MM research may play a key role as this methodological approach promotes the application of a diversity of methods, combining quantitative and qualitative approaches and using information from several and different stakeholders. MM researchers work from a variety of philosophical positions, any of which could be used to frame research that contributes to social transformation, such as the transformative paradigm and critical realism (Pawson, 2013). Here we discuss the transformative paradigm to illustrate how a philosophical framing for research can explicitly address issues of social justice and human rights as a means to addressing wicked problems through the use of MM.

Transformative MM research

In acceptance of a role focused on social responsibility, researchers can use a wide range of methods and techniques for gathering information and data. MM research can help to advance this research agenda to address important social and economic challenges. The transformative paradigm provides a framework that explicitly addresses social change and justice using MM designs (Mertens, 2009, 2014; 2015b; Mertens & Wilson, 2012; Cram & Mertens, 2015). The transformative paradigm does not prescribe particular approaches, but researchers need to engage in qualitative data collection to determine the focus of the inquiry, as well as to gather information using culturally appropriate methods for the research in terms of design, sampling, and data collection, analysis, interpretation and use. Therefore, it is likely that MM will be the choice of transformative researchers.

To understand different versions of reality, the researcher needs to establish an interactive link with community members. This is important in sustainable development, poverty, and environmental inequalities because many victims of injustice have experienced a history of betrayals by the powerful. We should know the different perspectives of different stakeholders; not only the insights that are afforded by statistical data. Together with quantitative statistical data, qualitative research may help to examine the different views of different interest groups and participants related to these issues.

The transformative philosophical assumptions are displayed in Table 1 along with the methodological implications of these assumptions.

MM research in service of social justice

In this section, we examine MM research that was designed and implemented in the interest of social transformation. An example is drawn from the health sector to illustrate how MM can contribute to addressing issues of human rights and social justice. A caveat should be noted: MM are not a panacea. Limitations exist in terms of the role of the researcher in addressing wicked problems and grand challenges in the form of power relationships and formal authority. Yet, we argue that use of MM designs with a focus on human rights and social justice increases the potential for research to have a positive impact on such problems and challenges.

Intimate partner violence is a wicked problem that violates human rights and is pervasive around the globe. Kyegombe, Abramsky, Devries, Starman, Michau, Nakuti, Musuya, Heise and Watts (2014) undertook a transformative MM study using a phased community mobilization intervention called SASA! in Kampala Uganda. The methodology used in this study reflects a socially responsible stance that aligns with the assumptions of the transformative paradigm. The study focused on intimate partner violence as a violation of human rights and included a contextual analysis of the inequities in intimate relationships that are reflected in the culture in Uganda. These included acknowledgement of inequitable gender norms and power imbalances between men and women that lead to intimate partner violence and negative relationship dynamics in the form of poor communication, limited joint decision making, and lack of trust and intimacy. They worked with an ecological model in order to support action necessary to shift the culture so that it was respectful of human rights as is exemplified in this statement:

Table 1. Transformative Philosophical Assumptions and Methodological Implications
Adapted from: Mertens (2015b); Mertens & Wilson (2012)

Transformative Philosophical Assumptions		
Assumptions	Characteristics	Methodological Implications
Axiological	<ul style="list-style-type: none"> • Social justice and human rights • Address discrimination and oppression • Cultural responsiveness • Address power differences • Recognize stakeholder assets • Reciprocity 	<ul style="list-style-type: none"> • Develop research teams • Build research capacity • Culturally responsive methods • Engagement with full range of stakeholders • Safety of participants • Establishment of Local Advisory Committee
Ontological	<ul style="list-style-type: none"> • Different versions of reality made visible (including the hidden versions) • Challenge versions of reality that sustain oppression 	<ul style="list-style-type: none"> • Build local research capacity • Conduct context analysis to ascertain culture and historical factors • Use culturally responsive sampling frame, aware of inclusion and safety
Epistemological	<ul style="list-style-type: none"> • Socially and historically located knowledge • Trusting relationships • Including families, schools and communities 	<ul style="list-style-type: none"> • Formulate research question inclusive of assets and risks at individual, family, and societal levels
Methodological	<ul style="list-style-type: none"> • Dialogic • MM • Use for social change • Build on community assets • Use cyclical design 	<ul style="list-style-type: none"> • Use qualitative and quantitative data collection strategies • Adapt data collection, analysis and interpretation processes for different populations • Build in processes for reporting and use of data at multiple levels

SASA! recognizes that intimate partner violence results from the complex interplay of factors which operate at the individual, relationship, community and societal levels and that if effective change is to be achieved, it is important for interventions to systematically work with a broad range of stakeholders within the community (p. 13).

Following the contextual analysis, the researchers selected community members to serve as activists to inform the development of the intervention, implement it, and assist with the evaluation of its effectiveness, using both quantitative and qualitative data collection. The capacity of the community activists was increased and power issues were addressed in the name of achieving a more equitable relationship between the researchers and the activists. Cultural responsiveness was ubiquitous in the conduct of the research. For example, the researchers used questions from the World Health Organization (WHO) Multi-Country Study on Women's Health and Domestic Violence, however, they did cognitively pretest and refine the items based on successive rounds of testing. The design for the study was a pair-matched cluster randomized trial with baseline and end-line cross-sectional surveys, a nested qualitative study, on-going operational research and an economic evaluation. The qualitative data focused on the participants' experiences of the intervention and their intimate relationship dynamics. The quantitative data analysis indicated positive shifts in the discussion and use of condoms, HIV testing, and higher levels of joint decision-making. The qualitative data confirmed these results as participants described "more supportive gender roles, improved communication, increased levels of joint decision-making and awareness of non-violent ways to deal with anger and disagreement" (p. 8). Yet, barriers remain in the form of men's resistance to give up sex with more than one woman, resistance to get HIV testing, and women's fear of retribution if they ask too many questions or refuse to have sex with their husbands. The qualitative data also revealed those aspects of SASA! that made it different from past, less successful approaches. Participants mentioned the importance of using drama as a means of conveying information and generating discussion, the emphasis on prevention of violence, focus on healthy relationships, and grassroots work by community activists. The hallmark of this research is not just that they used MM, but that the transformative approach was integrated through all aspects of the research, from the theoretical framework, the sense about cultural grounding and respect, the involvement of community members and the application of findings for the purpose of increasing human rights.

Recommendations for the future: Social justice and the MM researcher's responsibility

The world is confronted with important 'wicked problems' and 'grand challenges' for which MM approaches to research can contribute solutions.

- MMIRA can encourage researchers to think beyond the concept of methodology to explore the meaning of a socially responsible role and critically examine the philosophical assumptions that guide their thinking. The MM community can engage in creative thinking about ways that they can be part of the solutions.
- We have identified several strengths of MM as a research strategy for trying to solve challenges that resist solution. In this regard, a basic but key idea is that multiple methods are needed to understand complex problems or phenomena, with a critical lens brought to the choice of methods based on clarity of philosophical assumptions. When this critical lens is brought to

methodological decisions, then MM researchers can contribute to approaches that do not solely rely on numerical measures and statistical analysis; rather, qualitative approaches are also needed to enhance understandings of these challenges. This qualitative part can be used to know opinions about causes of these problems and their consequences and possible solutions from different stakeholders, especially from people affected by these challenges.

- MMIRA can provide researchers with opportunities to extend knowledge of how MM can enhance our ability to address wicked problems by grounding our work in explicit philosophical assumptions that support the development of solutions that are inclusive of issues of human rights and social justice.

Teaching mixed methods research

Education about MM research should not simply be sprinkled as a module within existing research methods courses. Commensurate with its status as a distinct methodological approach, the undergraduate and graduate research methods curricula should be transformed to provide formal training in qualitative and MM research, along with traditional quantitative research approaches. In this section, we explore challenges in teaching MM at the graduate and undergraduate levels. A later section includes ideas about teaching MM in a professional development context.

Despite the rapid expansion of publications on mixed method research, there is surprisingly little published information on *teaching* MM courses. The topic is addressed in these publications: the chapters on teaching in the first and second editions of the SAGE Handbook of MM in Social and Behavioral Research (Creswell, Tashakkori, Jensen, & Shapley, 2003; Christ, 2010), and papers by Bazeley (2003), Christ (2009), Mertens (2015) and Hesse Biber (2015). Bazeley (2003) provides suggestions for teaching MM; Christ (2009) reviews other articles that address specific issues in teaching MM, Mertens (2015) deals with the importance of philosophical paradigms in MM instruction, and Hesse Biber (2015) describes a case study of teaching MM along with challenges encountered. MM researchers can contribute to understanding how to teach MM by sharing their syllabi and their experiences in such teaching.

These publications display a number of common features of many MM courses, including a discussion of paradigm issues (or more broadly, "mental models"), a typology of designs, purposes for conducting a MM study, writing research questions, analyzing data, addressing validity/trustworthiness, and writing up results. Bazeley and Hesse Biber explicitly address the issues involved in teaching how to integrate qualitative and quantitative methods, data, and findings, and this deserves more attention, as integration has been identified as one of the most difficult issues in conducting MM research (Bryman, 2007; see also Maxwell, Chmiel, & Rogers, 2015).

There are a number of common practices in MM courses that are controversial, and that need scrutiny in developing the pedagogy of MM research. One is the issue of "paradigms." This term is often used to refer to a number of philosophical positions (post-positivism, realism/critical realism, interpretivism, pragmatism, transformative, etc.) from which research can be done, or to MM research itself as a "paradigm" in contrast to quantitative and qualitative research. It is questionable whether any of these are paradigms in Kuhn's sense (i.e., in the sense of being internally coherent and mutually exclusive stances), or even whether Kuhn's

conceptualization of paradigms needs to be adhered to in this context. Bergman (2008), Biesta (2010), and Hammersley (1992b) have argued that such positions are bundles of at least partially independent components, rather than being intrinsically unified, and Abbott (2004) and Maxwell (2011) have claimed that specific philosophical positions are best seen as "heuristics" that can be combined to provide a deeper understanding of the phenomena studied. This resonates with Greene's (2007) dialectic approach to MM research, in which divergent perspectives are used to deepen, rather than simply broaden or confirm, one's conclusions. This is not to downplay the importance of philosophical assumptions and "mental models," only to open up the discussion of whether these are "package deals" that must be taken as unified choices. This is an important issue for teaching MM research, as several widely-used textbooks for MM research suggest that paradigms are the "foundation" of a MM study, and that the researcher should select a particular paradigm for the study (Creswell & Plano Clark, 2011, pp. 38-45; Teddlie & Tashakkori, 2009, pp. 86-91).

Similarly, typologies of MM designs (e.g., convergent parallel, explanatory sequential, embedded, transformative, etc.; see Creswell & Plano Clark, 2011, and Teddlie & Tashakkori, 2009), which are prevalent in the MM literature, have been criticized by Bryman (2006, 2007), Guest (2013), and Maxwell & Loomis (2003; Maxwell, Chmiel, & Rogers, 2015) as failing to capture the actual diversity of MM studies. Christ combines his use of these typologies with Maxwell's interactive model of design. The utility of such typologies deserves further discussion.

Finally, validity is a critical concept when teaching MM. The treatment of validity in MM research has seldom taken notice of recent developments in measurement and quantitative research. The most far-reaching of these is Messick's (1995; cf. Brinberg & McGrath, 1985; Lissitz, 2009) assertion that validity is a property of the interpretations of, and inferences from, test scores, not of the tests themselves. Similarly, Shadish, Cook, and Campbell's (2002) text on experimental design states that, "validity is a property of inferences. It is *not* a property of designs or methods" (p. 34). As a result, criteria that simply determine what methods are used (typical of both quantitative and qualitative research), and widely employed in MM textbooks, (e.g., Creswell & Plano Clark, 2011, pp. 210-212; Teddlie & Tashakkori, 2009, pp. 208-214) are not adequate to assess the validity of a study's conclusions. Teachers of MM research need to engage with this important concept in their courses.

Transforming the undergraduate research methods curriculum with qualitative and MM research

Quantitative research methods are foundational to the traditional undergraduate social sciences curriculum; not so qualitative or MM research. Consequently, undergraduate and graduate students can graduate having learned little or nothing about qualitative or MM research. As such, the contemporary undergraduate research curriculum is out of step with the innovative MM approaches that have burgeoned in the social sciences, and that increasing numbers of researchers use.

The Office of Behavioral and Social Sciences Research (OBSSR) of the National Institutes of Health's (NIH) (Creswell, Klassen, Plano Clark, & Smith, 2011) prioritization of more sophisticated and diverse methodological strategies to address complex issues problems, necessitates that students receive formal education in innovative methods such as qualitative and MM research. The undergraduate research curriculum is the natural starting point for this

education. Accordingly, we propose a way forward for developing a transformed undergraduate research methods curriculum into which training about qualitative and MM are infused seamlessly with traditional quantitative approaches.

Kitano's (1997) model of multicultural course change provides an apt template for the transformation of the undergraduate research methods curriculum. Kitano's model proposes three levels of course change: *exclusive*, *inclusive*, and *transformed*. The exclusive course represents the most traditional route in the sense that it "presents and maintains traditional, mainstream experiences and perspectives of the discipline" (p. 23). In the exclusive approach, qualitative or MM approaches receive token acknowledgement. The transformed course, "... challenges traditional views and assumptions; encourages new ways of thinking; and conceptualizes [research methods] in light of new knowledge, scholarship, and ways of knowing" (Kitano, 1997, p. 23). Kitano's transformed course approach aligns well with Mertens' transformative paradigm for MM research. The transformative paradigm and related philosophical paradigms (see the section on *Philosophical Framing for MM Research* in this report) emphasize the roles that power and privilege play in all aspects of the research process and how quantitative and qualitative methods can be deployed to promote social justice (Mertens, 2007, 2009, 2010a, 2010b). The transformed curriculum should include an introduction to philosophy of science course in which students learn the philosophical paradigms that underlie qualitative, quantitative and MM, and learn to think critically about the assumptions that guide their research questions, research designs, analyses, and interpretations (Mertens, 2010a).

In general, most researchers are products of educational settings that have historically privileged one method—quantitative or qualitative methods—over the other; rarely both. It is likely that many researchers who find themselves drawn to MM research will have little or no formal education or training in MM research. Thus, the risk that researchers who have been trained primarily in quantitative methods, but not qualitative or MM research, will conduct MM research that is more quantitatively oriented simply because they are more knowledgeable about and proficient with quantitative approaches is substantial. Similarly, a risk exists that researchers who have been trained primarily in qualitative methods, may be less knowledgeable about and proficient with quantitative approaches compared with those with more considerable quantitative training. Transforming the research methods curriculum to more equitably represent qualitative and MM will expand the methodological toolkit that students can access to help answer research questions. Students who learn quantitative methods exclusively tend to learn that methods drive the research process rather than the other way around. Nor are they knowledgeable about the philosophical or theoretical underpinnings of a MM approach, or the multitude of qualitative methods, methodologies and analytical strategies that can be mixed with quantitative approaches to truly capitalize on the advantages of using both (Creswell & Plano Clark, 2011). And of course, the transformed undergraduate research methods curriculum would be incomplete without at least one introduction to MM research course. Like the qualitative course, the MM research course would provide students with topics such as: a historical overview of MM, and the philosophical assumptions that undergird MM, various MM designs, and strategies of data analysis and interpretation. More specialized and advanced undergraduate courses could focus on specific MM designs (e.g., explanatory sequential, embedded, transformative) and related analyses.

Alas, the infusion of more qualitative and MM research courses is just one component of the transformed research methods curriculum; advanced training for faculty is another. Like their students, many faculty members are graduates of programs that provided little or no opportunity for formal or advanced training in qualitative or MM research. In recognition of the relative dearth of formal educational opportunities for qualitative and MM research at the undergraduate and graduate level, the OBSSR/NIH (Creswell et al., 2011) recommended that applicants submitting MM grant applications to NIH “participate in formal training opportunities (e.g., courses, conferences, workshops, journals, special issues, article and book readings) to learn about MM” (p. 35). Formal training in qualitative and MM research and pedagogy would also be beneficial for instructors who teach the transformed research methods curriculum.

Although the undergraduate research methods curriculum has been our primary focus, we would be remiss if we failed to note the need for curricular transformation at the graduate level where qualitative and MM courses remain relatively rare. This next generation of social science researchers will confront a complex and complicated array of social, behavioral, health, educational and political issues and problems. A transformed research methods curriculum in which qualitative and MM research are infused along with rigorous training in statistics and experimental design will help ensure that future generations of researchers are methodologically well-equipped to advance empirical knowledge about and inform interventions to address these complex and complicated issues and problems.

Teaching MM: Philosophical framing

Understanding MM approaches involves understanding the philosophical stances, theoretical perspectives, and practical strategies that have emerged in the research world associated with advances in MM. If researchers do not acknowledge (or know) the philosophical assumptions that underlie their work, this does not mean that they have no philosophical assumptions. It merely means that they are operating with unexamined assumptions. Bawden (2006) commented about the danger of holding an unexamined philosophical position based on the argument that a researcher’s worldview, made up of philosophical assumptions about the nature of ethics (axiology), reality (ontology), knowledge (epistemology), and systematic inquiry (methodology), profoundly influences the approaches he or she chooses to use. He states, “Given the paramount influence that the worldview perspective that any individual ...brings to bear in any particular exercise...it is not only regrettable when the issue of perspectives remains unaddressed but also grossly negligent” (p. 38). Not all researchers agree with this position that understanding paradigms is important as a starting point for MM researchers, however, arguing for example, that it is more natural for novice researchers to start with a real world problem and the questions and methods that stem from that (e.g., Gorard, 2010). This is a point for future consideration in the MM research community.

The interdisciplinary landscape of mixed-methods research is rich and can accommodate a range of paradigmatic approaches to the research process (Mertens & Hesse Biber, 2014). The field of MM seeks to remap and reshape the paradigmatic landscape, often to address the thorny paradigmatic issues involved in the mixing of methods and methodologies within a single research project. For example, dialectical pluralism is envisioned to stand at the nexus of the constructivist and postpositivist paradigms (Greene & Hall, 2010; Johnson, 2011). Dialectical pluralism is seen as a philosophical stance that allows researchers to engage in MM inquiries

while experiencing the tension between the assumptions of the postpositivist and constructivist paradigms. Another, the pragmatic paradigm (Biesta, 2010; Morgan, 2007) supports the use of MM based on the assumption that there is not one set of methods that is appropriate; rather, the criteria for choosing methods include what method fits with the research questions. Biesta (2010), Greene and Hall (2010), and Denzin (2012) warn against an overly simplistic application of the pragmatic philosophy in research, as in: if the method fits the question, then use it. Biesta (2010) outlines the basic principles of pragmatism as a philosophy that can inform MM evaluators because Dewey held that no knowledge claim can be documented as providing the truth. Rather, different knowledge claims result from different ways of engaging with the social world. The transformative paradigm (Mertens, 2009; 2015; Mertens & Wilson, 2012) contains philosophical assumptions that emanate from an ethical stance that emphasizes the pursuit of social justice and the furtherance of human rights. Based on this axiological assumption, the evaluator is able to derive implications for the nature of reality, knowledge, and systematic inquiry that are commensurate with this ethical assumption. The methodological and utilization implications of research conducted within these respective paradigms are quite different. As teachers of MM, we have a responsibility to nurture our students' abilities to think through their choices for MM research based on a critically examined understanding of their philosophical assumptions.

However, as we state above, MM research is not a panacea. Even excellent technical expertise in MM is insufficient in the quest to address wicked problems and grand challenges. Researchers need critical examination of their guiding philosophical assumptions in order to be responsive to social justice concerns. Researchers also need to recognize that limitations exist in terms of the role of the researcher in addressing wicked problems and grand challenges in the form of power relationships and formal authority. The appropriate application requires that scholars develop an ethical stance that is inclusive of human rights and social justice concerns and the concomitant set of research skills needed for this type of research. In this regard, researchers need to engage with critical philosophical issues and obtain training in quantitative, qualitative, and MM research to carry out an appropriate design and integration of the two parts, and in order to take advantage of the potential of approaches such as transformative MM. Additional discussion about the training of MM researchers is found in later parts of this document.

Recommendations for the future: Teaching MM research

The students in universities today are our research colleagues of tomorrow. One of the most important roles that MMIRA can play is to inform the preparation of new researchers. To this end, we recommend:

- MMIRA could support a study of campus climates with regard to MM versus mono-methods, taking into account issues of professional culture and the impact of power and privilege in the university systems.
- Include teaching about philosophical frames for MM research, including post-positivism, constructivism, pragmatism, transformation, dialectical pluralism, realism/critical realism.
- Challenge the MM dichotomy of qualitative and quantitative by focusing on strategies for integration

- MMIRA could solicit and share exemplary syllabi, teaching activities, and curriculum materials.
- MMIRA could devote sessions at the professional conference to demonstrating effective teaching practices in MM and encourage members to conduct research on the effectiveness of these practices.
- Research could be conducted that would inform the relationships between the teaching of MM research and its practice.
- MMIRA could sponsor training for teachers of research to enhance their abilities to teach MM research.
- The development of guidelines for introducing MM into the undergraduate and graduate research curriculum.
- It might also be worthy to do some type of assessment of existing MMR curriculum at the undergraduate and graduate level. This might be done in the form of a survey of various departments across disciplines to determine the extent to which and interest in teaching MM. Having some data like this could guide future MMR education and advocacy efforts.
- Offer mentoring/team experience in mixed methods, e.g., through listing available experts and opportunities on the website.
- Develop a resource pool of ‘fun’ ways to teach mixed methods.

MMIRA, the profession, and professional development

Professional development is essential in any field. The question arises then as to how MMIRA might contribute, in the first instance, to the professional development of methodologists with an interest in mixed methods, and secondly, to the development of social science researchers (and social science) more generally. The second question will be addressed first, as implications from it flow into the question of specialised training.

Fostering an interest in methods

Historically, the majority of mixed methods studies have involved a combination of a survey and interviews (Bryman, 2006). These are still the methods most researchers think of when they decide to do a mixed methods study. Researchers and academic teachers who are more focused on substantive areas of research than on methodology are reticent to expend time and effort pursuing new understanding of methods and often rely for the rest of their career on the methods they learned in their own graduate studies. These methods can then be inappropriately applied, or the methods might drive, or at least limit, their research questions.

Developing an interest in methods amongst academic researchers must, necessarily, precede developing an interest in mixed methods. Mixed methods is just one choice among several approaches, and should always be seen in that context. How, then, might that interest be fostered?

Research generally and methodological skills in particular must be valued at the institutional and departmental level, with a strong commitment by senior management, if they

are to be valued by the individuals who make up the departments (Creamer, 1998; Creswell, 1985; Creswell & Brown, 1992; Pelz & Andrews, 1976). It is not sufficient, however, to simply declare that research is important and then expect staff to draw on their own resources; it requires clearly defined objectives and plans. Valuing of research is demonstrated through investment in research, recognition of achievement, promotion policies, release time for research activity, and other forms of *tangible* support to staff undertaking research. Tangible support might include allocating funding to attend methodological workshops and conferences, or creating annual prizes for methodologically innovative published articles. Special recognition in some form might be given, also, to those who teach research methods classes. Support to methods teachers could be provided (along with encouragement to other researchers to see the importance of methods) through encouraging staff with research grants to contribute to the methods class by offering a session on the methods being used in their grant project. Another possibility would be to have those with grants provide sessions at a departmental ‘methods festival’ at a time when all staff and students can be expected to participate.

Interest in methods amongst graduate students, who are the future generation of academic researchers, can be sparked through innovative and interesting teaching programmes, taught by passionate people. The quality of undergraduate and graduate level teaching or the provision of other research development opportunities in that period is therefore critical (as explained in the section on teaching methods). Interest can also be sparked through encouraging experienced mixed methods researchers to make it possible for beginning and early career researchers to participate in their team when working on a mixed methods project (i.e., through in-team mentoring).

Collegial culture and interaction is important to building *and maintaining* interest in methods amongst academics and consequently in their students (Laudel & Gläser, 2008).

I was originally driven by substantive concerns relating to my fields in criminology and political deviance, then came to work in a department whose ‘mission’ was methods. I found that it formed a lingua franca – everyone in the department had at least one thing in common, an engagement with particular research methods. So instead of being divided up into people that research health, people that researched crime etc., we shared an interest in methodological advancement. As I learned more about methods I wasn’t familiar with before, it seemed natural and inevitable to develop an interest in mixed methods. (Nigel Fielding, email communication, 17/03/2015)

Lessons for the promotion of mixed methods research can be drawn from the experience of qualitative researchers. Acceptance of the value of qualitative methods by prestigious funding bodies, mainstream journals, grant review panels, and disciplinary associations all served to foster the development of those methods and the researchers who used them.

Professional development of researchers and methodologists with an interest in mixed methods

If mixed methods is to be promoted as an approach to research, it must be done in the context of improving the way people do methods in general. The development of skills in mixed methods requires a broad base of skills in methods more generally. What is needed, therefore, is

both broad based and specific professional development in research methods in general and mixed methods in particular. Specific suggestions for the role of MMIRA in fostering on-going professional development are included in the final section of this document.

Disciplines and collaboration

Competing with a disciplinary focus poses a number of issues for MMIRA which mean that we need to develop a very clear idea of what we think MMIRA should aim to achieve and what it realistically can achieve given these constraints, and how best to do it, in the interests of improving the way people 'do methods':

- Some disciplines lack methodological mentors with knowledge and understanding that encompasses more than a single approach (usually quantitative-statistical).
- It is very difficult to 'sell' a methods-based professional association because, if academics are funded for only one conference per year, they will choose a discipline-based conference before a multi-disciplinary, methods-based one.

Interprofessional/interdisciplinary communication and collaboration is difficult, despite being valued by many. Different methodological traditions, assumptions, terminology, and writing guidelines intervene. Aside from these practical difficulties, in some places there is a strong cultural barrier to interdisciplinary collaboration. In France, for example, theory and philosophy is discipline specific and tends to be more important than practical application in academic discourse. Business studies (including management and organization science) is especially likely to be regarded there (and elsewhere?) as outside the orbit of social sciences, because of its practitioner focus and association with commercial interests.

In continental Europe, MM is not seen as a distinct tradition, yet mixed methods are extensively used. This means: a) very diverse kinds of work are being labelled as MM, and b) MM lacks identity. Consequently, a MM association might struggle to be seen as having relevance. The variation across disciplines and across continents is important for MMIRA to be aware of and to address as it moves forward in its development.

Recommendations for the future: MMIRA, the profession, and professional development

In this section, we focus on the ways that MMIRA can demonstrate leadership in a systemic way in the academy through its activities, organizational policies, and web presence.

- Collegial activities can be provided through conferences and related professional development activities (see below).
- If local chapters are established, these would then have a role in developing collegial networks.
- Develop a list of exemplary mixed methods studies to use as examples. This will require working out what makes them exemplary to start with.
- If methodology and methods generally attract more interest from graduate students than senior academic staff, then it makes sense to target students and research assistants in efforts to disseminate and develop fresh thinking on methods. If this is to be effective, they will also need to be resourced to the extent that they can defend their position with senior staff.

MMIRA sponsored programs

These are offered as suggestions for programmes that potentially can be offered through MMIRA to foster the professional development of its members.

Conferences, meetings and workshops

- Currently MMIRA is committed to a biennial international conference, with regional conferences conducted in alternate years.
- Training workshops should be offered with every international and regional conference. Regional conferences would therefore span at least two days, in order to justify the travel for those coming from some distance.
- MMIRA could sponsor half-day and full-day workshops separately from conferences.
- There is scope for sponsoring a range of alternative types of more local meetings, such as local area colloquia, seminars, or round-table meetings with students. These could be a particular focus of chapters in the association.
- There is also scope for including specific mixed methods focused activities within disciplinary or other conferences, as has happened in some qualitative conferences, for example. This might be a particularly useful way of breaking down barriers in particular disciplines and opening communication with the wider association. It would also help to overcome the problem that academics who are funded for one conference per year only give preference to a disciplinary conference over a methods one.

Journal

- Perhaps there could be a specific section in the *Journal of Mixed Methods Research* for brief articles about methodological advances or new methodological options. There is already scope for reviews of new books and software which is currently undersubscribed.

Web

- There is a place on the MMIRA website for a discussion forum. To date this has not been used. Should it be promoted (e.g., through publicity and contributions from some 'leading' members), or should we perhaps be alternatively promoting use of the Methodspace mixed methods group for this to members of the association? This is currently barely used, but has the potential to expose a much larger audience, including from Africa, the Middle East and South Asia. Note, however, it is not reasonable to expect members to engage with both options.

In addition to current resource offerings, the website might include

- Reviews of software useful for mixed methods projects.
- Information about people with particular skills who are willing to provide specific assistance to novice researchers either voluntarily or for a fee.
- Similarly, a place where needed and available expertise (e.g., for projects) can be matched up, and also where opportunities might exist for early career researchers to join a mixed methods team.
- Direct links – NCRM, UK Data Service, Methodspace, or other venues
- A training register – what is available, and where.

Credentials and awards

- The issue of MMIRA providing some kind of course development offering a credential and/or formal recognition for skills development through training programmes was discussed earlier in the development of the association, but was put aside at the time as it was too complex at that time in the Association's development. At some stage, as the Association matures, this question should be revisited. At the very least, in the meantime, a MMIRA certificate of attendance should be available to those who participate in workshops and, if needed, conferences.

Final Implications

The Task Force realizes that there are many implications for adopting or promoting the recommendations for future directions found herein, not least of which are the need for funding and time. As MMIRA is a volunteer organization, some consideration might be given to finding funding to support the implementation of these recommendations. In our view, this is an exciting time to be a MM research methodologist and we are hopeful that the broader MM community will benefit from the thoughts that are expressed in this document.

References

- Abbott, A. (2004). *Methods of discovery: Heuristics for the social sciences*. New York: W. W. Norton.
- Aguinis, H., Werner, S., Abbott, J., Angert, C., Park, J., & Kohlhausen, D. (2010). Customer-centric science: Reporting significant research results with rigor, relevance, and practical impact in mind. *Organizational Research Methods*, 13, 515-539.
- Bawden, R. (2006). A systemic research of an agricultural development: A focus on the worldview challenge. In B. Williams & I. Iman (Eds.), *Systems concepts in research* (pp. 35-46). Point Reyes, CA: Edge Press of Inverness.
- Bazeley, P. (1999). The bricoleur with a computer: Piecing together qualitative and quantitative data. *Qualitative Health Research*, 9, 279-287.
- Bazeley, P. (2003). Teaching mixed methods. *Qualitative Research Journal*, 3 (Special Issue), 117-126. (www.latrobe.edu.au/aqr)
- Bazeley, P. (2006). The contribution of computer software to integrating qualitative and quantitative data and analysis. *Research in the Schools*, 13(1), 63-73.
- Bazeley, P. (2010). Computer assisted integration of mixed methods data sources and analyses. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (2nd ed., pp. 431-467). Thousand Oaks, CA: Sage.
- Bazeley, P. (2012). Integrative analysis strategies for mixed data sources. *American Behavioral Scientist*, 56(6), 814-828.
- Bazeley, P. (2015). Writing up multimethod and mixed methods research for diverse audiences. In S. Hesse-Biber & B. Johnson (Eds.), *Oxford Handbook of multimethod and mixed methods research inquiry* (pp. 296-313). New York: Oxford University Press.
- Beaton, B. et al (in press). Engaging remote indigenous communities using appropriate online research methods. In N. Fielding et al, *Handbook of online research methods* (2nd ed.). London: Sage

- Bergman, M. (2008). The straw men of the qualitative-quantitative divide and their influence on mixed method research. In Bergman, M. (Ed.), *Advances in mixed method research* (pp. 11-21). Thousand Oaks, CA: Sage.
- Bergman, M. (2011). The good, the bad, and the ugly in mixed methods research and design. *Journal of mixed methods Research*, 5(4) 271–227.
- Biesta, G. (2010). Pragmatism and the philosophical foundations of mixed methods research. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (2nd edition, pp. 95-118). Thousand Oaks, CA: Sage.
- Briassoulis, H. (2010). Online petitions: New tools of secondary analysis? *Qualitative Research*, 10(6), 715-722.
- Brinberg, D., & McGrath, J. E. (1985). *Validity and the research process*. Harvard University Press.
- Brookes, P. (2014). Internet publicity of data problems. *Peer J*, e313.
- Brown, B.L., & Hedges, D. (2009). Use and misuse of quantitative methods: Data collection, calculation, and presentation. In D.M. Mertens & P. Ginsberg (Eds.), *Handbook of social research ethics* (pp. 373-386). Thousand Oaks, CA: Sage.
- Bryman, A. (2006). Integrating quantitative and qualitative research: How is it done? *Qualitative Research*, 6, 97-113.
- Bryman, A. (2007). Barriers to integrating quantitative and qualitative research. *Journal of Mixed Methods Research*, 1(1), 8-22.
- Bryman, A. (1988). *Quantity and quality in social research*. London: Routledge.
- Carmichael, P. (2008). Secondary qualitative analysis using internet resources. In N. Fielding, R. Lee & G. Blank (Eds.), *Handbook of online research methods*. London: Sage
- Charmaz, C. (2012, May 18). Grounded theory in global perspective [PowerPoint slides]. Presentation to the *Eighth International Congress of Qualitative Inquiry*, Urbana-Champaign IL, USA.
- Chen, C., Hurdle, W., & Unwin, A. (ed.) (2007). *Handbook of data visualization*. Springer.
- Chilisa, B. (2011). *Indigenous research methodologies*. London: Sage
- Christ, T. (2009). Designing, teaching, and evaluating two complementary mixed methods research courses. *Journal of Mixed Methods Research*, 3(4), 292-325.
- Christ, T. (2010). Teaching mixed methods and action research: Pedagogical, practical, and evaluative concerns. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in Social and Behavioral Research* (2nd edition, pp. 643-676). Thousand Oaks: Sage.
- Cisneros-Puebla, C., & Fielding, N.G. (2009). CAQDAS-GIS convergence: Towards a new integrated mixed method research practice? *Journal of Mixed Methods Research*, 3(4), 349-370.
- Corti, L. (2012). Perspectives on working with archived textual and visual material in social research. *International Journal of Social Research Methodology*, 15(4).
- Craig, W.J., Harris, T.M. & Weiner, D. (Eds.) (2002). *Community participation and geographic information systems*. London: Taylor and Francis.
- Cram, F., & Mertens, D.M. (2015). Transformative and indigenous frameworks for multimethod and mixed methods research. In S. Hesse Biber & B. Johnson (Eds.) *Oxford handbook of multimethod and mixed methods research inquiry* (pp. 91-109). London: Oxford University Press.

- Creamer, E. G. (1998). *Assessing faculty publication productivity: issues of equity* (Vol. 26). Washington D.C.: The George Washington University, Graduate School of Education and Human Development.
- Creswell, J. W. (1985). *Faculty research performance: Lessons from the sciences and the social sciences*. Washington, D.C.: Association for the Study of Higher Education; ERIC Clearinghouse on Higher Education.
- Creswell, J.W. (2009). *Research design. Qualitative, quantitative and mixed methods approaches*. (3rd ed.). Thousand Oaks: Sage.
- Creswell, J.W. (2015). Revisiting mixed methods and advancing scientific practices. In Hesse-Biber, S., & Johnson, B. (Eds.), *The Oxford handbook of multimethod and mixed methods research inquiry* (pp. 57-71). New York: Oxford University Press.
- Creswell, J. W., & Brown, M. L. (1992). How chairpersons enhance faculty research: A grounded theory study. *Review of Higher Education*, 16(1), 41-62.
- Creswell, J. W., Klassen, A. C., Plano Clark, V. L., & Smith, K. C. (2011). Best practices for mixed methods research in the health sciences. Retrieved from http://obssr.od.nih.gov/scientific_areas/methodology/mixed_methods_research/pdf/Best_Practices_for_Mixed_Methods_Research.pdf
- Creswell, J.W., & Plano Clark, V.L. (2007). *Designing and conducting mixed methods research*. Thousand Oaks: Sage.
- Creswell, J.W., & Plano Clark, V.L. (2011). *Designing and conducting mixed methods research*. (2nd ed.). Thousand Oaks: Sage.
- Creswell, J., Tashakkori, A., Jensen, K., & Shapley, K. (2003). Teaching mixed methods research: Practices, dilemmas, and challenges. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 619-637). Thousand Oaks: Sage.
- Curry, L., & Nunez-Smith, M. (2015). *Mixed methods in health sciences research: A practical primer*. Thousand Oaks, CA: Sage.
- Denzin, N. (1970). *The Research act in sociology*. Chicago: Transaction.
- Denzin, N. (2012). Triangulation 2.0. *Journal of Mixed Methods Research*, 6(2), 80–88.
- Denzin, N., Lincoln, Y., & Tuhiwai Smith, L. (Eds.) (2008). *Handbook of critical and indigenous methodologies*. Thousand Oaks CA: Sage.
- Edelson, D.C. (2002) Design Research: What We Learn When We Engage in Design, *Journal of the Learning Sciences*, 11:1, 105-121, DOI: 10.1207/ S15327809JLS1101_4.
- Edwards, J.R. (2008). To prosper, organizational psychology should ... overcome methodological barriers to progress. *Journal of Organizational Behavior*, 29, 469-491.
- Eisenschmidt, E. & Niglas, K. (2014). Implementing a design research approach and facilitating networking in the process of educational change. *International Journal of Multiple Research Approaches*, 8(2), 221-232.
- Evans, M., Hole, R., Berg, L.D., Hutchinson, P., & Sookraj, D. (2009). Common insights, differing methodologies: Toward a fusion of indigenous methodologies, participatory action research, and white studies in an urban aboriginal research agenda. *Qualitative Research*, 15(5), 893-910.
- Fielding, J.L., & Fielding, N.F. (2013). Integrating information from multiple methods into the analysis of perceived risk of crime: The role of georeferenced field data and mobile methods. *Journal of Criminology*, Volume 2013, Article ID 284259.

- Fielding, J. et al (2012). Opening up open-ended survey data using qualitative software. *Quality and Quantity*, available via Springerlink Online First from 7 May 2012.
- Fielding, N.G. (2014). Qualitative research and our digital futures. *Qualitative Inquiry*, 20(9), 1064-1073.
- Franzosi, R., Doyle, S., McClelland, L.E., Putnam Rankin, C., & Vicari, S. (2013). Quantitative narrative analysis software options compared: PC-ACE and CAQDAS (ATLAS.ti, MAXqda, and NVivo). *Quality & Quantity*, 47(6), 3219–3247.
- Gage, N.L. (1989). The paradigm wars and their aftermath: A “historical” sketch of research on teaching since 1989. *Educational Researcher*, 18(7), 4-10.
- Gobo, G. (2011). Glocalizing methodology? The encounter between local methodologies. *International Journal of Social Research Methodology*, 14(6), 417-437.
- Gomez, A. (2014). New developments in mixed methods with vulnerable groups. *Journal of Mixed Methods Research*, 8(3), 317-320.
- Gorard, S. (2010). Research design, as independent of methods. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (2nd ed., pp. 237-251). Thousand Oaks, CA: Sage.
- Greene, J. C. (2007). *Mixed methods in social inquiry*. San Francisco: Jossey-Bass.
- Greene, J. C. (2008). Is mixed methods social inquiry a distinctive methodology? *Journal of Mixed Methods Research*, 2(1), 7-22.
- Greene, J., & Hall, J. (2010). Dialectics and pragmatism: Being of consequence. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social research* (2nd ed., pp. 119–143). Thousand Oaks, CA: Sage.
- Greene, J. C., Caracelli, V. J., & Graham, W. F. (1989). Toward a conceptual framework for mixed-method evaluation designs. *Educational Evaluation and Policy Analysis*, 11(3), 255-274.
- Greene, J. C., & Caracelli, V. J. (Eds.). (1997). *Advances in mixed-method evaluation: The challenges and benefits of integrating diverse paradigms*. San Francisco: Jossey-Bass.
- Grimmer, J., & Stewart, B.M. (2013). Text as data: The promise and pitfalls of automatic content analysis methods for political texts. *Political Analysis*, 21(3), 267–297.
- Guest, G. (2013). Describing mixed methods Research: An Alternative to Typologies. *Journal of Mixed Methods Research*, 7(2), 141-151.
- Hammersley, M. (1992a). The paradigm wars: Reports from the front. *British Journal of Sociology of Education*, 13(1), 131-143.
- Hammersley, M. (1992b). Deconstructing the qualitative/quantitative divide. In M. Hammersley (Ed.), *What's wrong with ethnography?* (pp. 159-173). London: Routledge.
- Hand, D. (2012, July 25). Open data creates pitfalls as well as opportunities. *Research Fortnight*.
- Hardey, M., & Burrows, R. (2008). New cartographies of ‘knowing capitalism’ and the changing jurisdictions of empirical sociology. In N. Fielding, R. Lee, & G. Blank (Eds.), *The Sage handbook of online research methods* (pp. 507-518). London: Sage.
- Harper, G. W., & Salina, D. D. (2000). Building collaborative partnerships to improve community-based HIV prevention research. *Journal of Prevention & Intervention in the Community*, 19, 1-20.
- Hesse-Biber, S.N. (2010a). *Mixed methods research. Merging theory with practice*. New York: The Guilford Press.
- Hesse-Biber, S.N. (2010b). Emerging methodologies and methods practices in the field of mixed methods research. *Qualitative Inquiry*, 16(6), 415-418.

- Hogenraad, R., Mckenzie, D., & Peladeau, N. (2003). Force and influence in content analysis: The production of new social knowledge. *Quality and Quantity*, 37(3), 221-238.
- Howe, K. R. (1988). Against the quantitative-qualitative incompatibility thesis or dogmas die hard. *Educational Researcher*, 17(8), 10-16.
- Hundley, M., & Holbrook, T. (2012, May 18). Late to the eParty? Academics and the reshaping of author/ity [PowerPoint slides]. Presentation to the *Eighth Congress of Qualitative Inquiry*, Urbana-Champaign IL, USA.
- Israel, B. A., Schulz, A. J., Parker, E. A., & Becker, A. B. (1998). Review of community-based research: Assessing partnership approaches to improve public health. *Annu Rev Public Health*, 19, 173-202.
- Ito, I. (2011). Globalizing the rural. *International Review of Qualitative Research*, 4(3), 279-290.
- Ivankova, N. & Kawamura, Y. (2010). Emerging trends in the utilization of integration designs in the social, behavioural and health sciences. In Tashakkori, A. & Teddlie, C. (Eds.), *Handbook of mixed methods in social and behavioural research* (2nd ed., pp. 581-611). Thousand Oaks: Sage.
- Jahoda, Lazarsfeld, & Zeisel, 1933. *Die Arbeitslosen von Marienthal*. English translation published in 1971, as *Marienthal: The sociology of an unemployed community*. Chicago, IL: Aldine Atherton.
- Johnson, B. (2010). A history of philosophical and theoretical issues for mixed methods research. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social research* (2nd ed., pp. 69-94). Thousand Oaks, CA: Sage.
- Johnson, R. B., Onwuegbuzie, A. J., & Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, 1(2), 112-133.
- Jung, J-K. (2009). Computer-aided qualitative GIS: A software-level integration of qualitative research and GIS. In Cope, M. & Elwood, S. (Eds.), *Qualitative GIS: a new approach* (pp. 115-135). London: Sage.
- Jung, Jin-Kyu & Elwood, Sarah (2010). Extending the qualitative capabilities of GIS. *Transactions in GIS*, 14(1), 63-87.
- Kieser, A., Nicolai, A., & Seidl, D. (2015). The practical relevance of management research: Turning the debate on relevance into a rigorous scientific research program. *Academy of Management Annals*, 9, 143-233.
- Kitano, M. K. (1997). What a course will look like after multicultural change. In A. K. Morey & M. K. Kitano (Eds.), *Multicultural course transformation in higher education: A broader truth* (pp. 18-34). Boston: Allyn & Bacon.
- Knigge, L., & M. Cope, (2006). Grounded visualization: Integrating the analysis of qualitative and quantitative data through grounded theory and visualization. *Environmental Planning A*, 38, 2021-2037.
- Kuckartz, U. (1995). Case-oriented quantification. In U. Kelle (Ed.), *Computer-aided qualitative data analysis: Theory, methods and practice* (pp. 158-176). Thousand Oaks, CA: Sage.
- Kyegombe, N., Abramsky, T., Devries, K.M., Starmann, E., Michau, L., Nakuti, J., Musuya, T., Heise, L., & Watts, C. (2014). The impact of SASA!, a community mobilization intervention, on reported HIV-related risk behaviours and relationship dynamics in Kampala, Uganda. *Journal of the International AIDS Society*, 17, 1-16.
- Laudel, G., & Gläser, J. (2008). From apprentice to colleague: The metamorphosis of early career researchers. *Higher Education*, 55(3), 387-406.

- Laurel, B. (ed) (2003). *Design research: methods and perspectives*. Cambridge, Massachusetts: The MIT Press.
- Lee, S., Song, J., & Kim, Y. (2010). An empirical comparison of four text mining methods. *Journal of Computer Information Systems*, 51(1), 1–10.
- Levin, K., Cashore, B., Bernstein, S., & Auld, G. (2012). Overcoming the tragedy of super wicked problems: Constraining our future selves to ameliorate global climate change. *Policy Sciences*, 45, 123-152.
- Liamputtong, P. (2010). *Performing qualitative cross-cultural research*. Cambridge University Press: Cambridge.
- Lincoln, Y.S., & Guba, E.G. (1985). *Naturalistic Inquiry*. Beverly Hills, CA: Sage.
- Lissitz, R. W. (2009) (Ed.). *The concept of validity: Revisions, new directions, and applications*. Information Age Publishing.
- Maxwell, J. (2010). Using numbers in qualitative research. *Qualitative Inquiry*, 16(6), 475-482.
- Maxwell, J. (2011). Paradigms or toolkits? Philosophical and methodological positions as heuristics for mixed methods research. *Mid-Western Educational Researcher* 24(2), 27-30.
- Maxwell, J. (2013). *Qualitative research design: an interactive approach* (3rd edition). Sage Publications.
- Maxwell, J. (2016). Expanding the history and range of mixed methods research. *Journal of Mixed Methods Research*, 10(1), 12-27.
- Maxwell, J., Chmiel, M., & Rogers, S. (2015). Designing integration in mixed method and multi-method research. In S. Hesse-Biber and B. Johnson (Eds.), *Oxford Handbook of multimethod and mixed methods research inquiry* (pp. 223-239). Oxford, UK: Oxford University Press.
- Maxwell, J., & Loomis, D. (2003). Mixed methods design: An alternative approach. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 241-271). Thousand Oaks, CA: Sage Publications.
- McCandless, D. (2012). *Information is beautiful*. Collins.
- Mertens, D. M. (2007). Transformative paradigm: Mixed methods and social justice. *Journal of Mixed Methods Research*, 1, 212-225.
- Mertens, D. (2009). *Transformative research and evaluation*. NY: Guilford Press.
- Mertens, D. (2010). Philosophy in mixed methods teaching: The transformative paradigm as illustration. *International Journal of Multiple Research Approaches*, 4, 9–18.
- Mertens, D.M. (2010). Transformative mixed methods Research. *Qualitative Inquiry*, 16(6), 469-474.
- Mertens, D. M. (2014, October). Issues for a better future: Transformative mixed methods research and cultural diversity, social justice, gender and ethics. Presentation at the International Conference on Symbiotic Life, Science & Technology, Yonsie University, Seoul, Korea.
- Mertens, D.M. (2015a). Mixed methods and wicked problems. *Journal of Mixed Methods Research*, 9(1), 3-6.
- Mertens, D.M. (2015b). *Research in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods*. Thousand Oaks, CA: Sage.
- Mertens, D.M., & Hesse Biber, S. (2014). Mixed methods and credibility of evidence in research. In D.M. Mertens & S. Hesse Biber (Eds.), *Mixed methods and credibility of evidence in research. New directions for research*, 138, 5-13.

- Mertens, D.M., Cram, F., & Chilisa, B. (2013). *Indigenous pathways into social research*. Walnut Creek, CA: Left Coast Press.
- Mertens, D.M. & Wilson, A.T. (2012). *Program evaluation theory and practice*. NY: Guilford Press.
- Messick, S. (1995). Validity of psychological assessment. *American Psychologist*, 50(9), 741-749.
- Molina-Azorín, J. F. (2011). The use and added value of mixed methods in management research. *Journal of Mixed Methods Research*, 5(1), 7-24.
- Morgan, D. (2007). Paradigms lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. *Journal of Mixed Methods Research*, 1(1), 48-76.
- Morozov, E. (2011). *The net delusion: The dark side of internet freedom*. Public Affairs.
- Morse, J.M., & Niehaus, L. (2009). *Mixed method design: Principles and procedures*. Walnut Creek, CA, USA: Left Coast Press Inc.
- Nastasi, B.K., Hitchcock, J.C., & Brown, L.M. (2010). An inclusive framework for conceptualizing mixed methods design typologies: moving toward fully integrated synergistic research models. In A. Tashakkori & C. Teddlie (Eds.), *Handbook of mixed methods in social & behavioral research* (2nd ed). Thousand Oaks, CA: Sage.
- Nicholls, R. (2009). Research and indigenous participation: Critical reflexive methods. *International Journal of Social Research Methodology*, 12(2), 117-126.
- Nielsen, M. (2011). *Reinventing discovery: The new era of networked science*. Princeton, NJ: Princeton University Press.
- Nightingale, A. (2003). A feminist in the forest: Situated knowledges and mixing methods in natural resource management. *ACME: An International E-Journal for Critical Geographers*, 2(1), 77-90.
- Onwuegbuzie, A.J., & Leech, N.L. (2006). Linking research questions to mixed methods data analysis procedures. *The Qualitative Report*, 11, 474-498.
- Pawson, R. (2013). *The science of evaluation*. Thousand Oaks, CA: Sage.
- Pelz, D. C., & Andrews, F. M. (1976). *Scientists in organisations*. Ann Arbor, MI: Institute for Social Research, University of Michigan.
- Philip, H., & De Bruyn, P. (2013). A mixed methods approach to combining behavioral and design research methods in information systems research. *ECIS 2013 - Proceedings of the 21st European Conference on Information Systems*.
- Plano Clark, V.L., & Badiie, M. (2010). Research questions in mixed methods research. In A. Tashakkori & C. Teddlie (eds.), *Handbook of mixed methods in social & behavioral Research*. Thousand Oaks: Sage.
- Platt, J. (1996). *A history of social research methods in America, 1920-1960*. Cambridge, England: Cambridge University Press.
- Plomp, T., & Nieveen, N. (2013) Educational design research – Part B: Illustrative cases. Enschede, the Netherlands: SLO.
- Popping, R. (2015). Analyzing open-ended questions by means of text analysis procedures. *Bulletin de Methodologie Sociologique*, October, 2015.
- Popping, R. (forthcoming). Online tools for content analysis. In N. Fielding et al (eds) *Handbook of online research methods* (2nd ed.). London: Sage.
- Popping, R., & Roberts, C.W. (2009). Coding issues in semantic text analysis. *Field Methods*, 21 (3), 244-264.

- Rittel, H. W. J., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, 4, 155-169.
- Robertson, R. (2000). Social theory, cultural relativity and the problem of globality. In A. King (Ed.), *Culture, globalization and the world system* (pp. 69-90). Minneapolis MN: University of Minnesota Press.
- Rossmann, G. B., & Wilson, B. L. (1985). Numbers and words: Combining quantitative and qualitative methods in a single large-scale evaluation study. *Evaluation Review*, 9(5), 627-643.
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston: Houghton Mifflin.
- Silver, C., & A. Lewins (2014). *Using software in qualitative research*. London: Sage
- Simonsen, J. [et al.] (eds) (2010). *Design research: synergies from interdisciplinary perspectives*. London; New York: Routledge.
- Smith, S.N., Fisher, S.D., & Heath, A. (2011). Opportunities and challenges in the expansion of cross-national survey research. *International Journal of Social Research Methodology*, 14 (6), 485-502.
- Tashakkori, A., & Creswell, J. (2007). Editorial. Exploring the nature of research questions in mixed methods research. *Journal of Mixed Methods Research*, 1, 207-211.
- Tashakkori, A., & Teddlie, C. (1998). *Mixed methodology. Combining qualitative and quantitative approaches*. Thousand Oaks: Sage.
- Tashakkori, A., & Teddlie, C. (2003). *Handbook of mixed methods in social & behavioral research*. Thousand Oaks: Sage.
- Teddlie, C., & Tashakkori, A. (2003). Major issues and controversies in the use of mixed methods in the social and behavioral sciences. In A. Tashakkori & C. Teddlie (eds.) *Handbook of mixed methods in social & behavioral research*. Thousand Oaks: Sage.
- Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research. Integrating quantitative and qualitative approaches in the social and behavioral sciences*. Thousand Oaks: Sage.
- Tufecki, Z. (2008). Grooming, gossip, Facebook and Myspace. *Information, Communication and Society*, 11(4), 544-564.
- Tufte, E. (2001). *Visual display of quantitative information*. Graphics Press.
- Tufte, E. (2006). *Beautiful evidence*. Graphics Press.
- Tuhiwai Smith, L. (1999). *Decolonizing methodologies: Research and indigenous peoples*. NY: St Martin's Press.
- U.S. Office of Science and Technology Policy (2015). *21st Century Grand Challenges*. The White House: US Government. <https://www.whitehouse.gov/administration/eop/ostp/grand-challenges>. Accessed July 1, 2015.
- Unwin, V. (2006). *Graphics of Large Datasets*. Springer.
- Valles, M.S., Corti, L., Tamboukou, M., & Baer, A. (Eds.) (2011). Qualitative archives and biographical research methods. *Forum Qualitative Sozialforschung/Forum: Qualitative Social Research*, 12(3), <http://www.qualitative-research.net/index.php/fqs/issue/view/38> [Accessed: April 15, 2012]
- Van de Ven, A.H., & Johnson, P.E. (2006). Knowledge for theory and practice. *Academy of Management Review*, 31, 802-821.

- Wallerstein, N., & Duran, B. (2010). Community-based participatory research contributions to intervention research: The intersection of science and practice to improve health equity. *American Journal of Public Health, 100*, S40-S46.
- Webb, E. J., Campbell, D. T., Schwartz, R. D., & Sechrest, L. (1966). *Unobtrusive measures: Nonreactive research in the social sciences*. Chicago: Rand McNally
- Wilkinson, L. (1999). *The grammar of graphics*. Springer.
- Xanitoudou, M., & Gilbert, N. (2010). *The processes of methodological innovation: Successful development and diffusion*. Guildford, U.K.: University of Surrey Press.
- Yin, R. (2008), *Case study research*, fourth edition, Sage.