

The Development and Design of an Instrument for Assessing Mixed Methods Research

Proficiency

A Dissertation Proposal

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The Development and Design of an Instrument for Assessing Mixed Methods Research Proficiency

Mixed methods research is an expanding methodology. It has experienced growth worldwide, from North American and European nations to Australia, Asia, and Africa (Camfield, Guillen-Royo, & Velazco, 2010; Chandler, Chonya, Mtei, Reyburn, & Whitty, 2009; Ngulube, 2010; Plano Clark, 2010; Zhou & Creswell, 2012). Much of the expansion of the use of mixed methods has occurred not in a single discipline but across disciplines (Denscombe, 2008). Its use has increased in fields including public policy, management and organization research, psychology, sociology, evaluation, education, and health sciences (Morse & Niehaus, 2009). Within the health sciences, researchers have applied mixed methods in specialties (Morse & Niehaus, 2009), such as primary care medicine (Creswell, Fetters, & Ivankova, 2004), trauma (Creswell & Zhang, 2009), psychiatry (Witting, Barg, & Gallo, 2006), nursing (Morse, 1991; Twinn, 2003), health services (Johnstone, 2004), and health promotion (Campbell et al., 2000). Across disciplines, graduate students' use of mixed methods has risen dramatically, as evidenced by an exponential growth of mixed methods doctoral dissertations from 1997 to 2008 (Plano Clark, 2010). Furthermore, published mixed methods articles has increased similarly from 2000 to 2008 (Ivankova & Kawamura, 2010). In the midst of this growth, a natural question arises as to how researchers acquire their skills and how institutions build their capacity to conduct mixed methods research.

Mixed Methods Growth in Health Sciences

A particular field that is experiencing the diffusion of mixed methods is the health sciences, which now has more published mixed methods articles than any other field (Ivankova

& Kawamura, 2010). This proliferation of mixed methods within the field alone makes it amenable to research on this expansion. Interest in mixed methods research appears to be increasing in the health sciences and scholars have been writing about its use in the field. For example, a textbook is devoted to mixed methods in nursing and the health sciences (Andrew & Halcomb, 2009). In addition, Padgett (2011) wrote a text focusing on the use of qualitative and mixed methods research in the public health area and discussed mixed methods in social work (Padgett, 2009). Furthermore, researchers in the health sciences have gained more funding to conduct mixed methods studies. The predominance of the United States Department of Health and Human Services National Institutes of Health (NIH) funding mechanism is a unique feature of research in the health sciences. The NIH tracks the details of all funding awards and makes details available to the public. A search of NIH awards using the NIH Research Portfolio Online Reporting Tools (RePORT) (using the text search term “mixed & method”) yielded 57 unique results from FY 1989 through FY 2013. Of the 57 awards, 33% received funding in just the last three fiscal years. Although the increase in projects identifying as mixed methods is clear, a potential counterpoint to this evidence is that the *practice* of the methodology has not actually increased and the results merely reflect the increased use of the *label* “mixed methods.” A study of United States federally funded health-related research indicated that the actual *practice* of mixed methods has increased (Plano Clark, 2010). Plano Clark examined awards funded by the NIH, the Agency for Health Care Research and Quality, and the Centers for Disease Control and Prevention and assessed whether each project met the definition of mixed methods research. She found that projects meeting definitions of mixed methods research have increased. A similar trend is evident in the United Kingdom (O’Cathain, Murphy, & Nicholl, 2007). Thus, the adoption of mixed methods in the health sciences appears to be increasing.

Mixed Methods Growth in Education

Another field experiencing growth of mixed methods studies is education. Education has the second most published number of mixed methods articles (Ivankova & Kawamura, 2010). Examining applied disciplines (e.g., education, nursing) versus pure disciplines (e.g., psychology, sociology), Alise and Teddlie (2010) reported that 24% of the published studies in education were mixed methods. Their finding reflects an increasing trend of mixed methods research in education, as compared to previous points in time (Truscott et al., 2010). Thus, two fields, the health sciences and education, have seen an increased use of mixed methods studies.

Mixed Methods Proficiency

With the increase in the use of mixed method research designs, scholars need to remain cognizant of the quality of mixed methods research. A component of the notion of quality is the use of systematic and rigorous procedures. Researchers must be proficient with mixed methods to ensure systematic and rigorous procedures and ultimately the quality of studies. At this point in the development of mixed methods, an indicator of proficiency, specifically an assessment tool, is needed. In this study, I plan to investigate how to assess proficiency to conduct mixed methods research. The following section explains my reason for investigating proficiency and assessment of mixed methods research skills. My reason is based on the demand for mixed methods education and training, the importance of mixed methods research proficiency, and the need to understand how mixed methods proficiency develops.

Demand for mixed methods education and training. The expansion of mixed methods suggests the application of mixed methods by researchers who are ostensibly new to the methodology, and the expansion is likely to bring an increased demand for education and training on mixed methods research. Mixed methods courses, however, are available in limited

frequency to researchers-in-training. Studying 100 schools of education in the United States, Leech and Goodwin (2008) found that 22% required a mixed methods course and only 20% offered a mixed methods research course as an elective. Although the offerings have likely increased since 2008, the instructors of said courses predominately represent the first generation of mixed methods faculty (Creswell, Tashakkori, Jensen, & Shapley, 2003). As such, the instructors have not likely had formal training and education in mixed methods and are therefore unlikely to have the “benefit of prior coursework to guide” (Earley, 2007, p. 146) their training efforts. A growing body of literature is beginning to fill this gap (Onwuegbuzie, Frels, Collins, & Leech, 2013) and provide guidance, as a second generation of mixed methods faculty enters the field. However, the literature focuses on pedagogic approaches with apparently less focus on how proficiency develops and how to assess proficiency. A typology of mixed methods research skill proficiency and subsequent assessment is needed.

The importance of proficiency. As an illustration of how proficiency is important in mixed methods research, consider the related issue of quality in mixed methods research. In their examination of the quality of 118 mixed methods studies in health services, O’Cathain, Murphy, and Nicholl (2008) found several deficiencies: inadequate mixed methods design description and justification, lack of transparency of both the qualitative and quantitative method, and the absence of integration of data and findings. In a similar study, Palinkas, Horwitz, Chamberlain, Hurlburt, and Landsverk (2011) analyzed 50 published and 60 NIH-funded mixed methods studies in mental health services research and found a dominance of quantitative methods in 74% of the studies and a lack of explicit mixed methods rationale in 60% of the studies. They suggested the findings, “reflect a lack of understanding or appreciation of mixed-methods designs or a decision to use them without necessarily integrating or ‘mixing’ them”

(Palinkas, Horwitz, Chamberlain, Hurlburt, & Landsverk, 2011, p. 261), which is a similar finding to Bryman's (2006) review of mixed methods studies. A lack of understanding and lack of integration suggests a problem related to proficiency with mixed methods. Distinct skills are needed to conduct high quality mixed methods research, but as noted, a way to assess those skills seems to be missing from the corpus of literature.

How mixed methods research proficiency develops. Proficiency may be considered on two hierarchical levels: the capacity among a cadre of researchers (e.g., within a field or institution) and the capacity of the individual researcher to conduct mixed methods research (see Table 1). Capacity at the group level develops through large-scale efforts to train a body of researchers to conduct mixed methods. For example, in health sciences in the United States, the National Institutes of Health funds Institutional Training (T Series) grants to train multiple scholars and Research Centers and Programs (P Series) grants for larger collaborative efforts to build or enhance research capacity in an organization (Creswell, Klassen, Plano Clark, & Smith, 2011). Thus, investigators could potentially apply for these types of funding awards to build mixed methods capacity.

Table 1

Building Capacity and Proficiency to Conduct Mixed Methods Research

	Mechanisms to Build Capacity and Proficiency
Capacity in Disciplines or Institutions	Institutional Training Centers and Programs
Proficiency in Individual Scholars	Fellowship and Career Awards Courses Workshops Professional Development Programs

It is then necessary to identify needed skills and build appropriate training programs to develop those particular skills. The skills represent the individual researcher's proficiency. Proficiency itself develops through a two step process: 1) training to acquire skills and 2) experiences with the practice of mixed methods research to develop the "mind of a researcher" (Earley, 2009, p. 103). The process is similar to medicine in the United States, for instance, in which physicians train in medical school classrooms and laboratories and then continue their practical training through internship and residency programs. Training of the individual researcher might occur through the aforementioned programs, coursework (e.g., Christ, 2009), and workshops (e.g., Creswell, 2005; Moeller & Creswell, 2013), for which demand has increased among regional, national, and international communities (Plano Clark, 2010). Proficiency further develops through experience. Research is a process; as a process, it is cyclical and iterative (Creswell, 2012). This nature of research means that although conducting research requires a core set of skills, the application of skills is context dependent. Individuals learning research must then develop a mindset about research and become reflective researchers to make research decisions within context (Earley, 2009). These reflective skills develop through experience. Thus, research training involves didactic components but also a practical or experiential component.

The quality issues cited in the mixed methods literature (Bryman, 2006; O'Cathain et al., 2008, Palinkas et al., 2011) can be addressed through mixed methods specific skills training and education. Nevertheless, the literature appears to lack extensive investigation of capacity building and developing proficiency in mixed methods research (Onwuegbuzie, Frels, Collins, & Leech, 2013). Thus, a problem leading to this study is that little is known about the best approaches for investigators to acquire skills and for institutions to build their capacity to

conduct mixed methods research. In addition, individuals teaching and conducting mixed methods workshops need a way to assess mixed methods research skills for formative and summative purposes. Two research products, a typology and an assessment instrument, as proposed in this dissertation research, seek to address this concern and contribute to the literature.

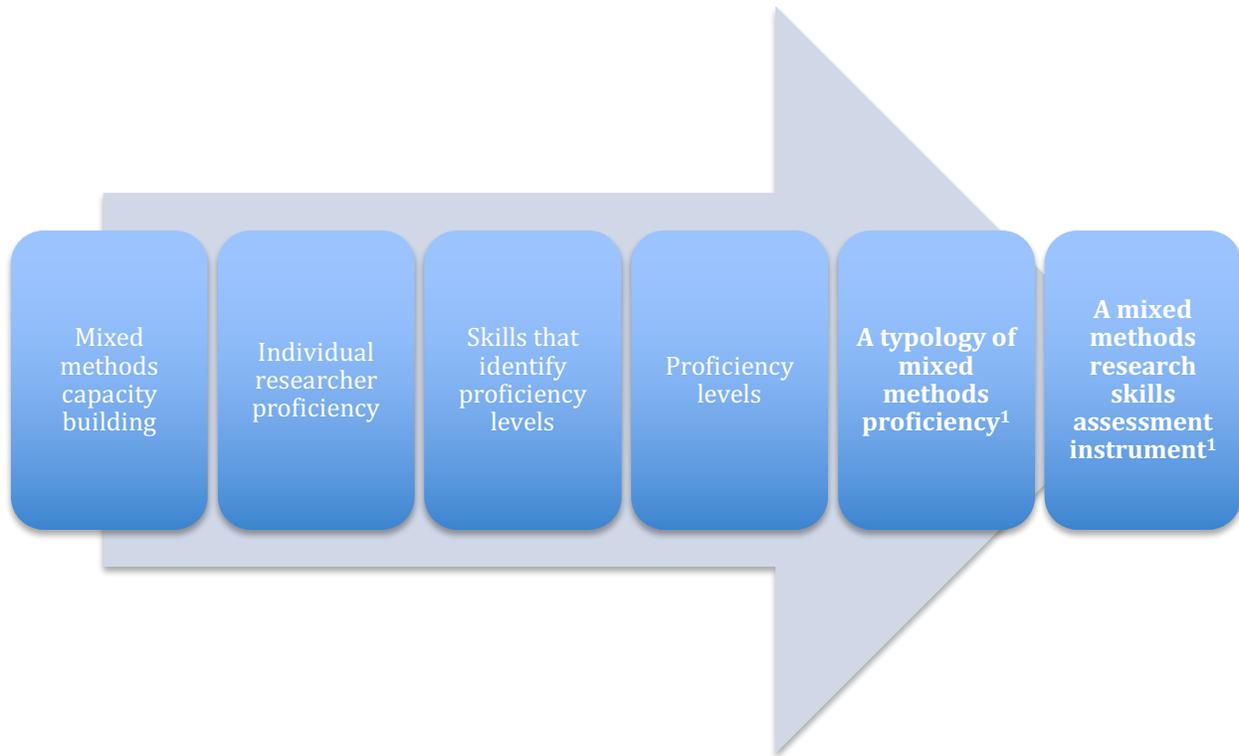


Figure 1. The overarching process leading to the proposed study. (NB: 1. Indicates the products of the proposed study)

Figure 1 depicts the justification for the proposed study. First, mixed methods capacity develops among a cadre of researchers, which can be within organizations or institutions. Developing this capacity requires developing proficiency within individual researchers. In order to develop proficiency, we need to understand what skills are markers of mixed methods proficiency and what the proficiency levels are. As McLelland (1973) wrote, “If you want to test who will be a

good policeman, go find out what a policeman does” (p. 7). Similarly, the proposed study seeks to identify what mixed methods researchers do (i.e., develop the typology) in order to understand proficiency.

Gallo, Deutsch, and Creswell (2013) have begun to identify these methodological skills in their preliminary work as part of an NIH funding application to develop a mixed methods research training program in the health sciences. Nevertheless, it is necessary to fully understand proficiency as a construct. The first phase of this proposed study seeks to develop a typology of mixed methods research proficiency. Second, an instrument is needed to assess proficiency relative to the typology. Addressing these two needs will lead to two primary products: a typology and an instrument to assess proficiency.

Practical Implications for the Study

These two products, the typology and the instrument, have practical implications for individuals learning mixed methods research. The typology is significant in two ways: 1) it will further assist learners and scholars in conceptualizing how individuals develop mixed methods research skills and 2) it will guide the development of an assessment instrument in the second phase of the study. The typology may be useful to build appropriate mixed methods training programs. Individuals learning mixed methods and scholars who are teaching, training, and mentoring in the methodology can use the typology to select defined skills, experiences, and activities in a professional development plan. The typology itself will then inform the development of a mixed methods research skills assessment instrument. In their aforementioned NIH grant proposal, Gallo et al. (2013) also drafted a methodological skills scholar self-assessment. This proposed dissertation research will also produce an assessment instrument that may be used in similar research studies. The assessment instrument is needed to assess an

individual's proficiency with mixed methods and how it changes over time. The assessment instrument has practical value as a screening instrument to assess skills. It may be used at the beginning workshops, courses, and training programs to understand baseline skills. Along with the typology, scholars might also use it for formative assessment to tailor workshops or courses. Finally, with further research on the psychometric properties in future studies, it may be used to detect skill growth over time.

From a disciplinary perspective, identifying the training and education needs to become proficient with mixed methods is important to the professional identity of mixed methods research as an emerging field. In defining the term *profession* Wilensky (1964) wrote, "Any occupation wishing to exercise professional authority must find a technical basis for it, assert an exclusive jurisdiction, link both skill and jurisdiction to standards of training, and convince the public that its services are uniquely trustworthy" (p. 138). The products of this research study, the proficiency typology and assessment instrument, may contribute to defining mixed methods research as a profession by linking skills to training needs.

Purpose

The proposed study will address mixed methods proficiency assessment. The purpose of this exploratory sequential mixed methods study is to qualitatively explore mixed methods skills in order to use that information to develop an instrument to assess proficiency to conduct mixed methods research. The initial phase will be a qualitative exploration of mixed methods proficiency through interviews with new and experienced mixed methods researchers, a review of literature related to mixed methods skills, and a review of mixed methods course and workshop materials. Because an instrument to assess mixed methods proficiency does not appear to exist, one will be developed from the qualitative findings. Specifically, I will employ a

type-building text analysis approach to develop a typology (Kuckartz, 2014). A typology is the set of all of the types, structured according to similarities and differences of multiple attributes, to describe a given phenomenon. It consists of the types and their relationship to one another (Kuckartz, 2014). I will then use this typology to develop instrument items. The final stage will involve gathering data to test the instrument. I propose administering the instrument to individuals learning mixed methods research in professional workshops and courses to collect data to obtain reliability statistics and validity evidence. This research provides guidance to individuals learning mixed methods and scholars who are teaching mixed methods. The instrument is useful for collecting a baseline assessment of proficiency at the beginning of a course or workshop, for instance. The typology can guide individuals in selecting activities in a long-term professional development plan for building mixed methods proficiency.

Pragmatic Paradigm

The paradigm for this study will be pragmatism, which involves flexible and practical design decisions within the context of the study to address the research questions and ensure meaningful results. Within a pragmatic paradigm, “the essential criteria for making design decisions are practical, contextually responsive, and consequential” (Datta, 1997, p. 34). In conducting the study, I intend to make design decisions and use the methods necessary to address the research question, including gathering and analyzing data from a qualitative exploration to develop an instrument followed by quantitative analysis of data collected from administering the instrument.

Research Questions

I. Qualitative

- a. What are the indicators of mixed methods proficiency as identified by novice and experienced researchers, mixed methods literature, and mixed methods curricula?
 - b. What experiences and knowledge are necessary to develop mixed methods proficiency?
 - c. What are the proficiency levels of mixed methods research?
- II. Instrument Development
- a. What instrument can be developed from the qualitative exploration to assess proficiency with mixed methods research?
- III. Quantitative
- a. What are the levels of proficiency with mixed methods research, as identified by analysis of the latent classes in the quantitative data?
 - b. What are the reliability measures of the instrument's scores? Which items reduce the reliability of scores?
 - c. What is the construct validity evidence for the instrument's scores?
- IV. Mixed Methods Questions
- a. What was the value of the qualitative component to designing the instrument to measure proficiency to conduct mixed methods research?
 - b. How do the levels of proficiency identified by the instrument compare with the levels of proficiency identified qualitatively?

Proficiency as a Conceptual Framework

The overall framework to guide this study is the concept of proficiency. Proficiency describes the degree of skill in a certain subject area. For example, assessment of second language skills has several frameworks for classifying levels of language proficiency (e.g.,

ACTFL Proficiency Guidelines; Council of Europe Frameworks). Although proficiency often refers to language and what individuals at a certain proficiency level can do (Council of Europe, 2001), the concept can translate to mixed methods research proficiency. As researchers progress in their ability to conduct mixed methods research skills, they develop increasing proficiency. The proficiency literature is relevant because it provides a framework to describe skill development at different levels. Developing a way to assess proficiency to conduct mixed methods research is the ultimate outcome of this proposed dissertation study. The framework of proficiency adds to this study by providing levels of proficiency for mixed methods and the particular learning indicators within those levels.

Proficiency

Because the proficiency concept is well-developed in language acquisition, it will serve as model for the conceptual framework for this study. Specifically, the Common European Framework (CEF) of reference for languages has evolved as an internationally recognized standard to describe language ability (Council of Europe, 2001). The CEF for language proficiency has several distinguishing features. It describes what language learners must learn. In addition, the CEF defines levels of proficiency to measure progress over an extended period of time. It breaks proficiency into separate components to handle the complex topic of language competence. The CEF (Council of Europe, 2001) considers the general competence of language learners consisting of four aspects: knowledge, skills, existential competence, and ability to learn. *Knowledge* is a declarative knowledge gained through experience and formal learning. *Skills* is the ability to carry out procedures in a practical setting. *Existential competence* consists of individual characteristics, personality, and attitudes. Combining knowledge, skills, and existential competence, the *ability to learn* is a mobilizing factor in developing proficiency. The

benefits of the CEF include the provision of a common framework for professionals to communicate and explicit descriptors for educators to meet the needs of learners (Council of Europe, 2001). In a similar manner, a proficiency framework can provide a common language for developing skills to conduct mixed methods research. Consistent with the aim of this study, a proficiency framework will aid the identification of descriptors of proficiency for those teaching mixed methods research. Although the framework needs to be adapted to mixed methods research, the idea of a multidimensional proficiency (areas and proficiency levels) will serve as a guide for the present study. Figure 2 depicts the overall proficiency conceptual framework for the study.

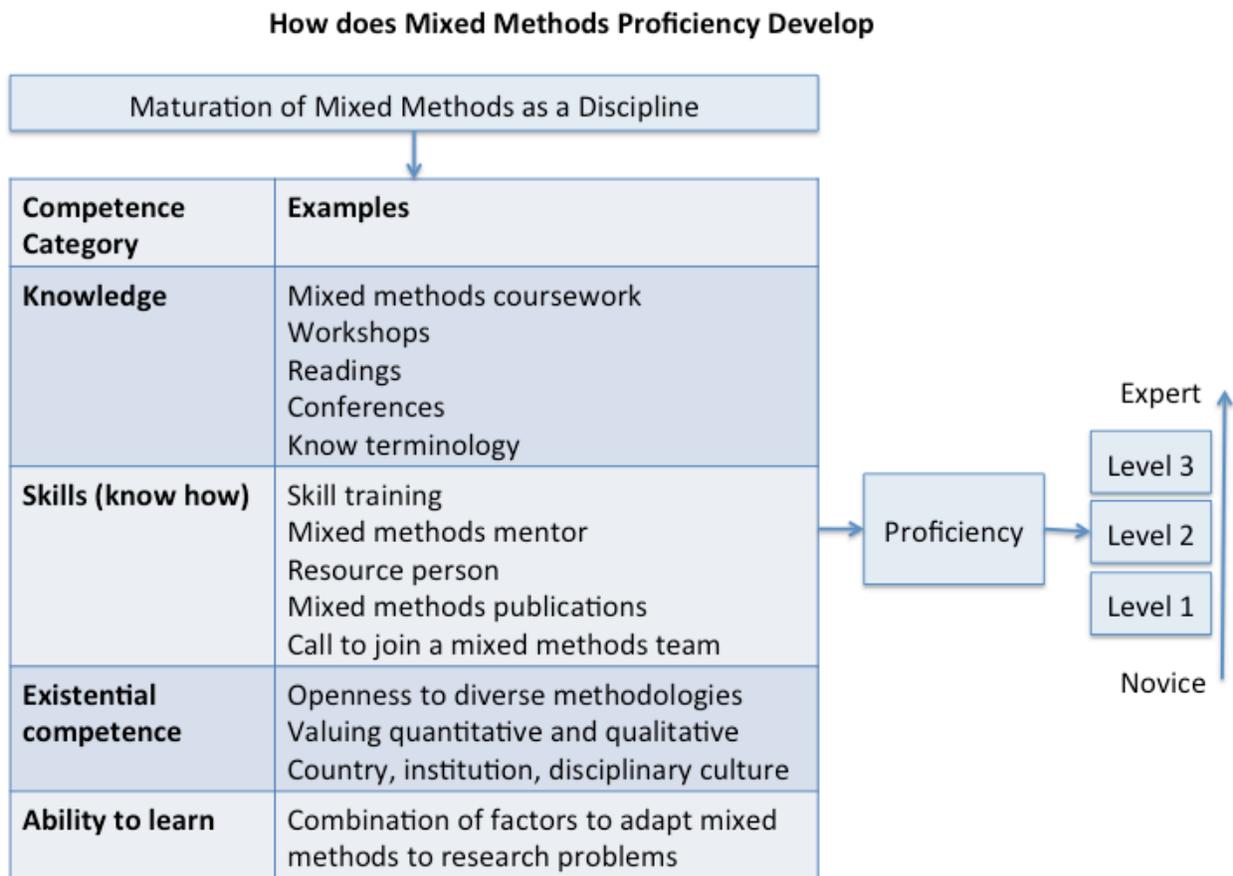


Figure 2. Proficiency as a conceptual framework for the proposed study

In writing about teaching, Creswell, Tashakkori, Jensen, and Shapley (2003) broached the idea of professional development in addition to traditional coursework as paths to learn about mixed methods research. Researchers trained in qualitative or quantitative approaches face challenges in learning mixed methods research and are likely to rely on self-study and textbooks to learn the approach. A typology to develop skills and attain proficiency can guide both coursework and professional development paths to learning mixed methods.

While proficiency relies upon having the necessary knowledge, skills, and abilities for mixed methods research, another consideration is how those attributes operate within the context of an individual and their environment. This notion of who an individual is in addition to what they can do (i.e., proficiency) is talent. Talent resides within the existential competence of the conceptual framework. Barkab and Plucker (2002) defined talent as “a set of functional relations distributed across person and context, and through which the person-in-situation appears knowledgeably skillful. In other words, ability and talent arise in the dynamic transaction among the individual, the physical environment, and the sociocultural context” (p. 174). Talent empowers individuals to excel. In terms of mixed methods, talent coupled with proficiency may distinguish top leaders in the field and warrants further investigation.

Mixed methods proficiency literature. The extant literature appears to focus on how to teach mixed methods research courses (e.g., Bazely, 2003; Christ, 2009; Christ, 2010; Earley, 2007; Earley, 2009; Ivankova, 2010; Onwuegbuzie et al., 2013). Within this area, several papers present strategies for teaching mixed methods. Tashakkori and Teddlie (2003) addressed teaching mixed methods within the five components of the research process: conceptualization, research design, data collection, data analysis, and inference. In addition, the *International Journal of Multiple Research Approaches* published a 2010 special issue on “Teaching Mixed

Methodologies.” The articles focus on specific contexts and issues related to teaching mixed methods, including teaching to doctoral students (Baran, 2010), teaching online (Ivankova, 2010), embedding philosophical frameworks (Mertens, 2010), and training in organizations (Hansson, 2010). While the focus on proficiency in mixed methods relates to its teaching strategies, developing the typology and instrument to assess proficiency enters less explored areas of the research (Onwuegbuzie et al., 2013). The recent NIH grant of Gallo et al. (2013) proposed a framework of needs for learners (e.g., skills in quantitative or qualitative research). Their conceptual framework has three proficiency levels: mixed methods learner, mixed methods investigator, and mixed methods methodologist/consultant. The proposed study seeks to build on this recent work.

Learning Trajectory Development

A concept closely related to proficiency is learning trajectory development. Learning trajectories are relevant as they have provided a framework for learning complex material in other fields, such as mathematics. Learning trajectories attempt to place a framework around the progression of learning a topic. The topics are based on the typology of content. Learning trajectories consist of evidence-based hypotheses about the levels of thinking, knowledge, and skill in using knowledge, through which students proceed as they learn and reach their learning objectives (Daro, Mosher, Concoran, 2011). The pedagogical approach to develop these trajectories often involves problem-based learning and scaffolding techniques (Bruning, Schraw, & Norby, 2011). As individuals progress through the learning trajectory, proficiency increases.

The Development of Mixed Methods Research

The genesis of mixed methods can be traced to the late 1950s with Campbell and Fiske’s multitrait/multimethod approach that combined multiple forms of quantitative data to gain a

more complete understanding of traits (Creswell, 2014b). As the need and recognition of the value of integrating qualitative and quantitative data advanced, prime leaders in the United Kingdom (e.g., A. Bryman, J. Fielding, N. Fielding), the United States (e.g., A. Brewer, J. Creswell, J. Greene, J. Hunter), and Canada (e.g., J. Morse) emerged and further developed the field (Creswell & Plano Clark, 2011). The leaders came from various fields, including education, nursing, and the social sciences. Additional markers of its development include the increase in publications, journals devoted to mixed methods research (e.g., *Journal of Mixed Methods Research* and *the International Journal of Multiple Research Approaches*), the initiation of the Mixed Methods International Conferences, and the recent formation of the Mixed Methods International Research Association (Creswell, 2014a).

Standards Maturity

As mixed methods develops as a methodology, its standards also mature. Prime leaders and scholars new to the discipline conducted mixed methods research and then wrote papers, wrote books, and organized conferences. Through these scholarly activities, standards for mixed methods research procedures and design features emerged and matured. We can trace this maturation through ten scientific developments that embody mixed methods design features (Creswell, in press). The design features are (Creswell, in press): (a) identifying the essential characteristics of mixed methods research, (b) identifying a mixed methods design based on a parsimonious set of basic and advanced designs that guide the task of conducting mixed methods, (c) structuring the writing of a study to align with the specific designs, (d) using a distinct language and terminology to communicate regarding mixed methods and define the field, (e) writing a mixed methods research question, (f) incorporating philosophies and theories into mixed methods studies, (g) using joint displays to present the quantitative and qualitative

results together in a study, (h) recognizing and acknowledging methodological issues or threats to validity in the mixed methods designs, (i) discussing value added by mixed methods relative to a single method approach, and (j) applying criteria to evaluate the quality of a mixed methods study.

Amidst these developments, Creswell (2009) proposed a “map of the field” (p. 95) of mixed methods research, discussing five domains: philosophical and theoretical issues, techniques of mixed methods, nature of mixed methods, politicization of mixed methods, and adoption and use of mixed methods. The map of the field serves as a preliminary typology of mixed methods research. This dissertation study fits within the domain of adoption and use of mixed methods (see Figure 3).

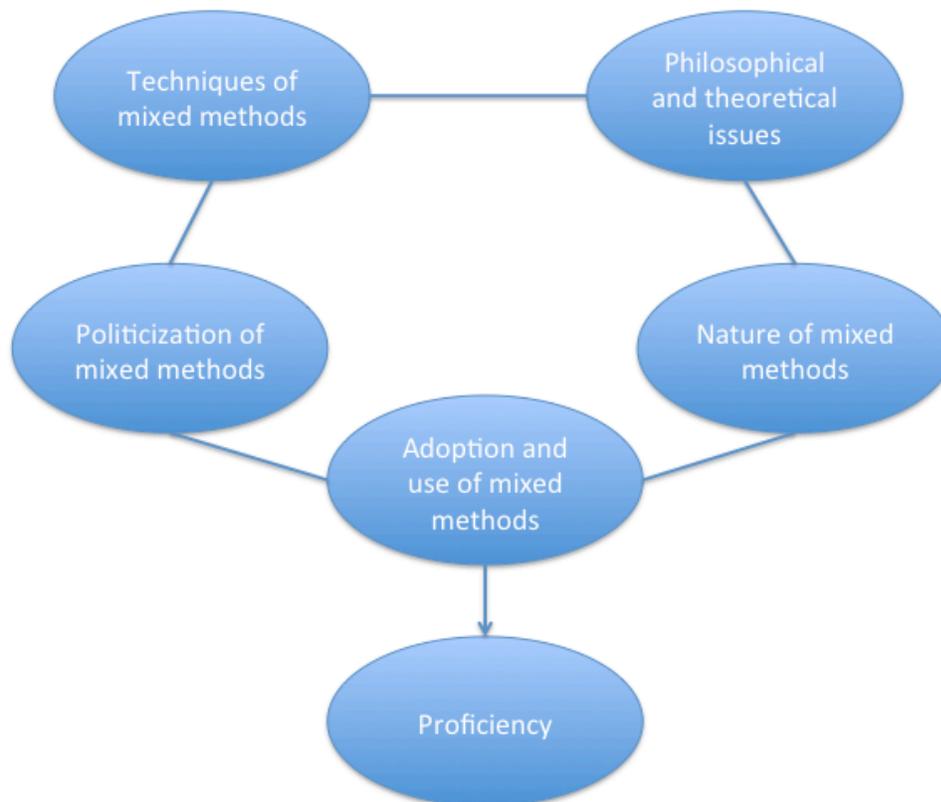


Figure 3. A map of the field of mixed methods research (Creswell, 2009) presents a typology of mixed methods

Summary of Conceptual Framework

The conceptual framework guiding this study is proficiency. This conceptual framework includes descriptors and proficiency levels. The evolving typology of content and learning trajectory development provides the path for scholars to attain proficiency to conduct mixed methods research. The relatively small body of related mixed methods literature consists of 17 articles that are devoted to teaching mixed methods research courses (Onwuegbuzie et al., 2011). The topics of learning mixed methods, developing, and assessing proficiency, however, appear to be less explored.

Methods

This study will employ mixed methods research. Mixed methods research involves merging qualitative and quantitative data within a single study or series of studies. Mixed methods consists of defining characteristics (Creswell & Plano Clark, 2011): 1) collecting and analyzing both quantitative and qualitative data, 2) using practical and rigorous methods, 3) combining (i.e., integrating, mixing) qualitative and quantitative strands by applying a specific mixed methods design, and 4) framing the evaluation design within a broader philosophical or theoretical framework. The particular reason for using mixed methods for this study is for instrument fidelity (Collins, Onwuegbuzie, & Sutton, 2006). Moreover, beginning with a qualitative exploration and proficiency typology is a strategy to enhance the relevance and utility of the resulting assessment instrument (Collins, Onwuegbuzie, & Sutton, 2006).

Research Design

For the study, I will employ a mixed methods exploratory sequential design for the purpose of instrument development. In this design, the researcher begins with a qualitative

exploration of data, develops an instrument, and then tests the instrument quantitatively within a different, larger sample (Creswell & Plano Clark, 2011). A mixed methods approach is useful for optimal quantitative instrument development (Onwuegbuzie, Bustamante, & Nelson, 2010; Creswell & Plano Clark, 2011). The exploratory sequential design, beginning with qualitative data collection and analysis to build a quantitative survey, is often used for instrument development when one does not exist (e.g., Clark, Shahrouri, Halasa, Khalaf, Spencer, & Everson-Rose, 2012; Myers & Oetzel, 2003). Onwuegbuzie et al. (2010) recommend extensive literature reviews and qualitative data collection (e.g., interviews, focus groups) to develop the construct of interest when developing instruments. Crede and Borrego (2013) took this approach when developing a survey to assess graduate engineering student experiences in research groups. Crede and Borrego used qualitative themes to identify constructs for the survey. Next, they combined fieldnotes, interview data, and analytic memos to operationalize the construct and create Likert-type scale items. For example, interview quotes were reworded into items. To ensure construct representativeness, Crede and Borrego then added additional items, as needed, to each construct based on a review of the literature.

Anticipated challenges of this study include the time and effort involved. Because the design is sequential, data collection and analysis must occur in phases for the qualitative and quantitative strand. Thus, the data collection and analysis burden increases relative to a monomethod study. A related challenge is that two IRB submissions and approvals are likely required, one for the qualitative phase and follow-up submission for the quantitative instrument once developed.

Qualitative Data Collection and Analysis (Phase 1)

The first phase of the study will be a qualitative exploration to identify a typology of mixed methods proficiency development. The goal of this phase is to construct a typology of mixed methods proficiency and generate findings that will inform development of an instrument to assess mixed methods proficiency.

Data collection. Qualitative data collection will consist of the following procedures: (1) searching literature regarding mixed methods skill development, (2) conducting semi-structured interviews with social and health sciences researchers learning mixed methods research and social and health sciences scholars who are experts at conducting mixed methods studies, and (3) gathering curricula from mixed methods courses and workshops. Use of multiple data sources is a method to bolster qualitative validity (Creswell, 2013; Maxwell, 2013) and a practice recommended by Onwuegbuzie et al. (2010) for instrument development. I will search the literature relevant to mixed methods learning and teaching using both databases (e.g., PsycINFO, ERIC, PubMed, Google Scholar) and a manual review of references in the existing body of literature. The search will be limited to the title or abstract, and the search terms will be “mixed method*” AND “teaching”; “quantitative and qualitative” AND “teaching”; “mixed method*” AND “learning”; and “quantitative and qualitative” AND “learning”. I will specifically select literature in the health sciences and social sciences. The sampling of interview participants will be purposeful, using a maximum variation strategy.

Prior to any participant recruitment, I will obtain project approval from the University of Nebraska-Lincoln Institutional Review Board. I plan to recruit eight individual participants who are experienced with conducting mixed methods research and novice mixed methods researchers. Recruitment tactics will include advertisement in Methodspace and contacting scholars with particular expertise in teaching mixed methods. In addition, I will seek an equal number of

participants in social sciences and the health sciences. This participant mix will be consistent with the available literature and the intended audience of this research. After obtaining a signed informed consent, I will schedule one-on-one telephone-based participant interviews and allot 60 minutes for each interview. The actual semistructured interviews with all participants will occur via telephone. Telephone interviews may yield methodological benefits by narrowing the epistemological distance between me as a novice and expert participants as elite scholars (Stephens, 2007). It also brings practical benefits by mitigating the physical distance from participants and reducing the burden to participants (Mikecz, 2012). Participants may benefit from reflecting on their own experiences in developing mixed methods research proficiency.

Appendix B provides the full, proposed set of interview questions. The questions are open-ended questions to allow maximum freedom of response within the constrained topical space. The interview items consist of orienting information, experiences with mixed methods, experience learning mixed methods, and recommendations for assessment. I derived the interview questions from the questions on the qualitative research questions, the information needed to develop a typology, and Leech's (2010) interview questions with the early developers of mixed methods. In addition to the main questions, I have included probes and follow-up questions to be used as needed. Finally, although several course syllabi are available through university websites and in the existing literature on teaching mixed methods, I will ask interview participants to share whatever curricula documentation they are willing to share for analysis. Each interview will be recorded digitally and sent to a professional transcriptionist skilled in transcribing research interviews.

Data analysis. The protocol for data analysis for qualitative data will be: (1) importing interview transcripts, literature, and curricula into MAXQDA for coding and analysis and (2)

conducting coding and identify themes from codes. I plan to use qualitative data analysis software, MAXQDA Version 10 (VERBI GmbH, 2011) to support thematic coding and type-building text analysis. Using an inductive process, the first step after importing transcripts and documents into MAXQDA will be to read through the data several times to obtain a general sense of the meaning related by the participant or within the other material. The text-based material permits qualitative analysis, identifying key segments of text, assigning codes to label those segments, and grouping those codes into themes (Creswell, 2013). During the analysis, I will record memos during the analysis process of salient ideas about the data, meaning, and connections. The desired product of the qualitative phase is a typology of mixed methods proficiency. A typology is the set of all of the types that describe a phenomenon and consists of multiple types along with their relationship to each other (Kuckartz, 2014). To develop a typology, I will employ type-building qualitative text analysis. Type-building text analysis consists of grouping individuals according to similarity and differences with regard to specific attributes and characteristics (Kuckartz, 2014). Within each type, the individuals should be as homogenous as possible, and different types should be as heterogeneous as possible. For this dissertation study, I intend to group the research participants (i.e., those learning mixed methods and those practicing mixed methods), based on patterns among codes and the attribute space that emerges to construct a typology of mixed methods proficiency. The outcome of this analysis will be a description of the typology. I will then use the typology, including the text segments and themes, to guide the development of the proficiency assessment instrument.

Mixed Methods Instrument Development (Intermediate Phase)

The instrument development phase is an intermediate phase of the study. The instrument development consists of two steps: (1) developing the mixed methods proficiency assessment

instrument and (2) conducting a pilot test of the instrument (Onwuegbuzie et al., 2010). For the first step, I will use the typology to determine the key proficiency constructs. Those constructs will become the scales of the instrument. Next, I will develop the specific items within each scale. I will use quotes from participants to inform item language whenever possible in the item writing process. The items will have corresponding Likert-type response options. The rating scale for the proposed instrument will build on the Harnisch and Shope (2007) self-rating of education competencies for teachers. The scale for this proposed instrument will assess mixed methods skills in different ways. In their rating scale, Harnisch and Shope (2007) presented a matrix of items by prompts with Likert-type ratings. For each item respondents rated their extent of technological knowledge to four prompts: 1) “Converse about the content in general ways;” 2) “Give explanations about critical concepts;” 3) “Apply knowledge to challenging practical problems;” and 4) “Give expert advice.”

Following the process of Crede and Borrego (2013), I will then use the literature to add additional items and ensure construct representativeness. As recommended by Onwuegbuzie et al. (2010), the next step is to pilot test the instrument. I intend to pilot test the instrument at an upcoming mixed methods workshops for which I am serving as an assistant. The participants of the workshops represent an international audience of participants. The target sample size for the pilot test is ten individuals. I will administer the instrument to participant over several days. Each participant will complete the instrument individually, followed by a ten-minute feedback interview. I intend to develop a new iteration of the instrument after pilot administration. (Note: Because the instrument will be developed after the qualitative phase, a draft does not appear in the appendices of this proposal.)

Quantitative Data Collection and Analysis (Phase 2)

The second phase will involve field testing of the instrument developed after the qualitative phase. The goal of this phase is to generate the final form of an instrument to assess proficiency with mixed methods.

Data collection. Quantitative data collection will consist of the following procedures: (1) recruiting a larger sample of different individuals than in the initial qualitative strand and (2) administering the instrument in workshops and courses to gather data to test the instrument. Although recruitment will target a different sample of individuals from those in the qualitative strand, the population will be the same (i.e., individuals at various stages of mixed methods proficiency in the health sciences and social sciences). This sampling strategy is consistent with the exploratory sequential mixed methods design (Creswell & Plano Clark, 2011). I plan to recruit individuals attending mixed methods workshops.

The target sample size is 100 individuals based on the planned analyses (see Data analysis section). Coefficient alpha sample size guidelines range from 15 to 400. Fleiss (1986) recommended a sample size of 15 to 20 for reliability assessment, and Charter (1999) recommended a sample size of 400 for a precise estimate of coefficient alpha reliability. An exact calculation of sample size using Bonett's (2002) formula yielded a target of $n = 13$, based on $\alpha = .05$, $\beta = .05$, 25 items, and a required coefficient alpha = .8. Because latent class analysis will be the primary method of analysis to gather evidence of validity of the typology and mixed methods proficiency levels, it is equally important to examine its sample size requirements. Latent class analysis sample sizes guidelines depend on the number of latent classes, the size of latent classes, and characteristics of the data (Marsh, Lüdtke, Trautwein, & Morin, 2009). For this study, the anticipated number of latent classes is two to four from an instrument of 25 – 50 items. Although the exact sample size requirements for latent class analysis are not possible to

determine, a sample size of 100 allows for adequate analysis (Nylund, Asparouhov, & Muthén, 2007; Wurpts, 2012). Thus, based on the guidelines for the two analyses, the target sample size is 100. After developing the instrument, I will calculate the exact sample size and submit an IRB change request.

I plan to administer the instrument to a group of individuals with heterogeneous proficiency levels. Having participants across proficiency levels should ensure adequate variance for planned analysis of construct validity. To meet this requirement, I will again recruit from two populations of individuals: those learning mixed methods and those practicing mixed methods. I intend to recruit from participants registered to attend a series of upcoming mixed methods workshops in the fall of 2014. I will obtain permission from the site before entering and collecting any data. The participants at the workshops will have various skill levels from beginner to expert mixed methods researchers and represent diverse nationalities. As with the qualitative strand, I will obtain informed consent before administering the instrument. Participants will receive a hyperlink to the instrument. To efficiently collect data, I plan to use Qualtrics web-based survey software. Using this system will ease the data collection burden and improve the likelihood of obtaining clean data ready for analysis.

Data analysis. I will use SPSS and LEM software to facilitate quantitative analysis. Analysis will consist of three procedures: (1) descriptive statistics (SPSS), (2) internal consistency reliability evaluation using coefficient alpha (Cronbach, 1951) (SPSS), and (3) construct validation of scores on the instrument using latent class analysis (LEM). The first step of analysis will be to obtain descriptive statistics of the instrument data. This stage is important to gain a general sense of the data and to test assumptions for further analysis. Next, reliability evaluation will consist of internal consistency analysis by examining coefficient alpha

(Cronbach, 1951) for the items. I intend to use SPSS to determine coefficient alpha. The general cutoff for internal consistency will be an item coefficient $\alpha = .80$. Items with a coefficient alpha less than this value are candidates for removal. Finally, the method of analysis to begin gathering preliminary evidence of construct validity of the typology of mixed methods proficiency levels is latent class analysis. Latent class analysis is similar to cluster analysis in that it is a technique to examine categorical observed variables to yield a categorical latent trait (i.e., latent classes) rather than a continuous latent variable (McCutcheon, 1987). Latent classes will then correspond to the mixed methods proficiency levels. To conduct the analysis, I will use the LEM software program.

Ethical Issues

With the exploratory sequential design, ethical issues must be considered for both the qualitative and quantitative strand. Ethical issues are most likely to arise in data collection. Key issues relate to accurately conveying the study purpose, attending to power issues in qualitative data collection, keeping sensitive information confidential, and protecting anonymity of participants (Creswell, 2012). In the quantitative phase, it will be necessary to work with a gatekeeper to obtain permission to disseminate study recruitment materials at workshops or training sessions, to avoid disruption at the session, and to protect the anonymity of participants.

Upon approval of the study proposal, I will prepare submission material for Institutional Review Board (IRB) approval. IRB submission will occur in phases: one for the qualitative strand followed by one for the quantitative strand after the final instrument is developed (i.e., after the intermediate phase). As noted, I will obtain informed consent before conducting individual interviews. The agreement will specify the audio recording and transcription of the conversation. I will obtain a signed confidentiality agreement with the transcriptionist before

exchanging data. Participants will receive assurance that we will make every effort to preserve their anonymity hold any information shared verbally or through documentation in confidence.

Strategies for Validating Findings

In the qualitative strand I intend to apply four qualitative validation strategies: (1) conduct respondent validation, (2) obtain multiple data sources, (3) search for discrepant and negative cases, and (4) obtain an external audit. Respondent validation, also called member checking, involves soliciting feedback from participants regarding findings (Maxwell, 2013). After conducting analysis and developing themes, I will share a summary of the findings with participants and ask whether I captured their intended meaning. Next, the qualitative strand will involve multiple data sources. The data sources are a form of rich data. By conducting interviews, using verbatim interview transcripts, and writing detailed descriptions the analysis will be based on rich data (Maxwell, 2013). The combination of literature, interviews, and mixed methods curricula material is a way to find corroborating evidence through identifying a code or theme in more than one source (Creswell, 2013). In addition, I will search for discrepant evidence and negative cases to uncover flaws in analysis and biases (Maxwell, 2013). In this process, I will identify discrepant data across interviews, course material, and literature and then identify negative or disconfirming data within data sources. The fourth validation strategy is to obtain an external audit of the qualitative analysis. I intend to hire a consultant with a doctorate, who is skilled in qualitative research to conduct a review of the data and qualitative findings. Finally, it will be necessary to acknowledge and clarify my researcher bias. As someone who is also studying and learning mixed methods, my personal experience may interact with the analysis. Use of memos and outside review of coding will be a way to understand and clarify my bias.

In the quantitative strand, the validation strategies seek to control threats to external validity of the results (i.e., generalizability of the results). The quantitative strand itself is designed to enable generalization to mixed methods proficiency in social and health sciences. Analysis of field data from the mixed methods proficiency instrument is intended to test the typology. I will use model fit of the latent class analysis as an initial step to gather preliminary evidence of construct validity. In addition, I will conduct post hoc calculation of the statistical power of analyses as an assessment of the statistical conclusion validity of results (Shadish, Cook, & Campbell, 2002).

Preliminary pilot findings (if available)

None

Implications/Conclusion

This study may have implications for individuals teaching or learning mixed methods. It may be useful for those conducting workshops, teaching courses, or managing mixed methods training programs. In addition, the typology may be a useful way to conceptualize mixed methods proficiency development and inform future research in the relatively limited body of literature specifically related to mixed methods skill development. Finally, it may yield insight into how a field emerges.

References

- Alise, M., & Teddlie, C. (2010). A continuation of the paradigm wars? Prevalence rates of methodological approaches across the social/behavioral sciences. *Journal of Mixed Methods Research, 4*, 103-126.
- Andrew, S., & Halcomb, E. (Eds.). (2009). *Mixed methods research for nursing and the health sciences*. Oxford, UK: Wiley-Blackwell.
- Baran, M. (2010). Teaching multi-methodology research courses to doctoral students. *International Journal of Multiple Research Approaches, 4*, 19-27. doi: 10.5172/mra.2010.4.1.019
- Barab, S. A., & Plucker, J. A. (2002). Smart people or smart contexts? Cognition, ability, and talent development in an age of situated approaches to knowing and learning. *Educational Psychologist, 37*, 165-182.
- Bazeley, P. (2003). Teaching mixed methods. *Qualitative Research Journal, 3*, 117-126.
- Bonett, D. G. (2002). Sample size requirements for testing and estimating coefficient alpha. *Journal of Educational and Behavioral Statistics, 27*, 335-340.
- Bruning, R.H., Schraw, G.J., & Norby, M.M. (2011). *Cognitive psychology and instruction* (5th ed.). Boston, MA: Pearson.
- Camarinha-Matos, L. M., & Afsarmanesh, H. (2005). Collaborative networks: a new scientific discipline. *Journal of Intelligent Manufacturing, 16*, 439-452.
- Camfield, L., Guillen-Royo, M., & Velazco, J. (2010). Does needs satisfaction matter for psychological and subjective wellbeing in developing countries: A mixed-methods illustration from Bangladesh and Thailand. *Journal of Happiness Studies, 11*, 497-516.

- Campbell, M., Fitzpatrick, R., Haines, A., Kinmonth, A. L., Sandercock, P., Spiegelhalter, D., & Tyrer, P. (2000). Framework for design and evaluation of complex interventions to improve health. *BMJ*, *321*, 694-696.
- Chandler, C. I. R., Chonya, S., Mtei, F., Reyburn, H., & Whitty, C. J. M. (2009). Motivation, money and respect: A mixed-method study of Tanzanian non-physician clinicians. *Social Science and Medicine*, *68*, 2078-2088.
- Charter, R. A. (1999). Sample size requirements for precise estimates of reliability, generalizability, and validity coefficients. *Journal of Clinical and Experimental Neuropsychology*, *21*, 559-566.
- Christ, T. W. (2009). Designing, teaching and evaluating two complementary mixed methods research courses. *Journal of Mixed Methods Research*, *3*, 292–325.
- Christ, T. W. (2010). Teaching mixed methods and action research: Pedagogical, practical, and evaluative considerations. In A. Tashakkori & C. Teddlie (Eds.), *Sage handbook of mixed methods in social and behavioral research* (2nd ed., pp. 643–676). Thousand Oaks, CA: Sage.
- Clark, C. J., Shahroui, M., Halasa, L., Khalaf, I., Spencer, R., & Everson-Rose, S. (2012). A mixed methods study of participant reaction to domestic violence research in Jordan. *Journal of Interpersonal Violence*, *27*, 1655-1676.
- Collins, K. M. T., Onwuegbuzie, A. J., & Sutton, I. L. (2006). A model incorporating the rationale and purpose of conducting mixed methods research in special education and beyond. *Learning Disabilities: A Contemporary Journal*, *4*, 67-100.
- Cooke, J. (2005). A framework to evaluate research capacity building in health care. *BMC Family Practice*, *6*, 44-54.

- Council of Europe. (2001). *Common European framework of reference for languages: Learning, teaching, and assessment*. Cambridge, UK: Cambridge University Press.
- Crede, E., & Borrego, M. (2013). From ethnography to items: A mixed methods approach to developing a survey to examine graduate engineering student retention. *Journal of Mixed Methods Research, 7*, 62-80.
- Creswell, J. W. (2005). Mixed Methods. In *Workshop hosted by the Veterans Affairs Ann Arbor Health Care System, Center for Practice Management and Outcomes Research*. Ann Arbor, MI.
- Creswell, J. W. (2009). Editorial: Mapping the field of mixed methods research. *Journal of Mixed Methods Research, 3*, 95-108.
- Creswell, J. W. (2012). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (4th ed.). Upper Saddle River, NJ: Pearson.
- Creswell, J. W. (2013). *Qualitative inquiry and research design: Choosing among five approaches* (3rd ed.). Thousand Oaks, CA: Sage.
- Creswell, J. W. (2014a). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). Thousand Oaks, CA: Sage.
- Creswell, J. W. (2014b). *A concise introduction to mixed methods research*. Thousand Oaks, CA: Sage.
- Creswell, J. W. (in press). Revisiting mixed methods and advancing scientific practices. In S.N. Hesse-Biber & R.B. Johnson (Eds.), *Oxford Handbook of Mixed and Multiple Research Methods*. Oxford, UK: Oxford University Press.

- Creswell, J. W., Klassen, A. C., Plano Clark, V. L., & Smith, K. C. (2011). Best practices for mixed methods research in the health sciences. Washington, DC: National Institutes of Health. Retrieved from http://obsr.od.nih.gov/mixed_methods_research
- Creswell, J. W., & Plano Clark, V. L. (2011). *Designing and conducting mixed methods research* (2nd ed.). Thousand Oaks, CA: Sage.
- Creswell, J. W., Tashakkori, A., Jensen, K. D., & Shapley, K. L. (2003). Teaching mixed methods research: Practices, dilemmas, and challenges. In A. Tashakkori, & C. Teddlie, (Eds.), *Handbook on mixed methods in the behavioral and social sciences* (pp. 619–637). Thousand Oaks, CA: Sage.
- Creswell, J. W., & Zhang, W. (2009). The application of mixed methods designs to trauma research. *Journal of Traumatic Stress, 22*, 612-621. doi: 10.1002/jts.20479
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*, 297-334.
- Currall, S.C., Towler, A.J. (2003). Research methods in management and organizational research: Toward integration of qualitative and quantitative techniques. In: Tashakkori, A., Teddlie, C. (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 513–526). Thousand Oaks, CA: Sage.
- Daro, P., Mosher, F.A., & Concoran, T. (2011). *Learning trajectories in mathematics: A foundation for standards, curriculum, assessment, and instruction*. Philadelphia, PA: Consortium for Policy Research in Education.
- Datta, L. (1997). A pragmatic basis for mixed methods designs. *New Directions for Evaluation, 74*, 33-46.

Denscombe, M. (2008). Communities of practice a research paradigm for the mixed methods approach. *Journal of Mixed Methods Research, 2*, 270-283.

Earley, M. A. (2007). Developing a syllabus for a mixed-methods research course. *International Journal of Social Research Methodology, 10*, 145-162. doi:10.1080/13645570701334118

Earley, M. A. (2009). Developing reflective researchers. In M. Garner, C. Wagner, & B. Kawulich (Eds.), *Teaching research methods in the social sciences* (p. 103-110). Surrey, England: Ashgate.

Gallo, J. J., Deutsch, C., & Creswell, J. W. (2013). Mixed Methods Research Training Program (R25 Grant Application): National Institutes of Health.

Grange, A. (2005). Building research capacity. *Nursing management, 12*(7), 32-37.

Hansson, J. (2010). Program implementation in health services. *International Journal of Multiple Research Approaches 4*, 40-48.

Harnisch, D. & Shope, R. (2007). Developing Technology Competencies to Enhance Assessment Literate Teachers. In R. Carlsen et al. (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference 2007* (pp. 3053-3055). Chesapeake, VA: AACE.

Hunt, M. (1997). *How science takes stock: The story of meta-analysis*. New York, NY: Russell Sage Foundation.

Ivankova, N.V. (2010). Teaching and learning mixed methods research in computer mediated environment: Educational gains and challenges. *International Journal of Multiple Research Approaches, 4*, 49-65.

Ivankova, N. V., & Kawamura, Y. (2010). Emerging trends in the utilization of integrated designs in the social, behavioral, and health sciences. In A. Tashakkori & C. Teddlie (Eds.),

- Sage handbook of mixed methods in social and behavioral research* (2nd ed., pp. 581--611). Thousand Oaks, CA: Sage.
- Johnstone, P. L. (2004). Mixed methods, mixed methodology health services research in practice. *Qualitative Health Research, 14*, 259-271.
- Kuckartz, U. (2014). *Qualitative text analysis: A guide to methods, practice, and using software*. London, UK: Sage.
- Leech, N. L. (2010). Interviews with the early developers of mixed methods research. In A. Tashakkori & C. Teddlie (Eds.), *Sage handbook of mixed methods in social and behavioral research* (2nd ed., pp. 253-272). Thousand Oaks, CA: Sage.
- Liles, D., Johnson, M., Meade, L., & Underdown, D. (1995). *Enterprise engineering: A discipline?* Proceedings of the Society for Enterprise Engineering (SEE) Conference, Orlando, FL. <http://www.webs.twsu.edu/enteng/ENTENG1.html>
- Marsh, H. W., Lüdtke, O., Trautwein, U., & Morin, A. J. S. (2009). Classical latent profile analysis of academic self-concept dimensions: Synergy of person- and variable- centered approaches to theoretical models of self-concept. *Structural Equation Modeling, 16*, 191-225.
- Maxwell, J. A. (2013). *Qualitative research design: An interactive approach* (3rd ed.). Thousand Oaks, CA: Sage.
- McCutcheon, A. C. (1987). *Latent class analysis*. Beverly Hills: Sage.
- McClelland, D. C. (1973). Testing for competence rather than for "Intelligence." *American Psychologist, 28*, 1-14.
- Mertens, D. M. (2010). Philosophy in mixed methods teaching: The transformative paradigm as illustration. *International Journal of Multiple Research Approaches 4*, 9-18.

- Mikecz, R. (2012). Interviewing elites: Addressing methodological issues. *Qualitative Inquiry*, *18*, 482-493. doi: 10.1177/1077800412442818
- Mixed Methods International Research Association. (2014). *MMIRA Inaugural Conference 2014*. Retrieved from <http://mmira.wildapricot.org/Default.aspx?pageId=1665517>
- Moeller, A., & Creswell, J. W. (2013). *The confluence of language assessment and mixed methods*. Four-day workshop presented at the University of Cambridge, UK.
- Morse, J.M. (1991). Approaches to qualitative-quantitative methodological triangulation. *Nursing Research*, *40*, 120-123
- Myers, K. K., & Oetzel, J. G. (2003). Exploring the dimensions of organizational assimilation: Creating and validating a measure. *Communication Quarterly*, *51*, 438-457. doi: 10.1080/01463370309370166
- Ngulube, P. (2010). Mapping mixed methods research in library and information science journals in Sub-Saharan Africa 2004-2008. *The International Information and Library Review*, *42*, 252-261.
- Niglas, K. (2007). Introducing the qualitative quantitative continuum: An alternative view of teaching research methods courses. In M. Murtonen, J. Rautopuro, & P. Vaisanen (Eds.), *Learning and teaching of research methods at university* (pp. 185–203). Turku, Finland: Finnish Educational Research Association
- Nylund, K. L., Asparouhov, T., & Muthén, B. O. (2007). Deciding on the number of classes in latent class analysis and growth mixture modeling: A Monte Carlo simulation study. *Structural Equation Modeling*, *14*, 535-569.

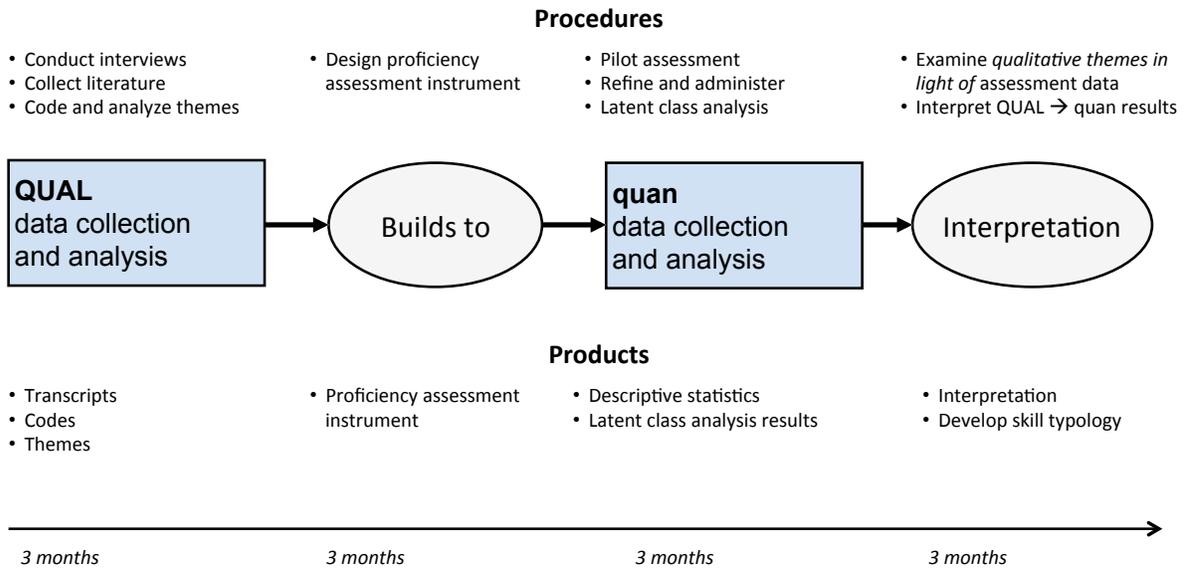
- O’Cathain, A., Murphy, E., & Nicholl, J. (2007). Why, and how, mixed methods research is undertaken in health services research in England: A mixed methods study. *BMC Health Services Research*, 7(85). doi:10.1186/1472-6963-7-85
- O’Cathain, A., Murphy, E., & Nicholl, J. (2008). The quality of mixed methods studies in health services research. *Journal of Health Services Research & Policy*, 13(2), 92-98.
- Onwuegbuzie, A., & Leech, N. (2005). Taking the “Q” out of research: Teaching research methodology courses without the divide between quantitative and qualitative paradigms. *Quality & Quantity*, 39, 267-296. doi:10.1007/s11135-004-1670-0
- Onwuegbuzie, A. J., Frels, R. K., Leech, N. L., & Collins, K. M. T. (2011). A mixed research study of pedagogical approaches and student learning in doctoral-level mixed research courses. *International Journal of Multiple Research Approaches*, 5, 169-199.
- Onwuegbuzie, A. J., Frels, R. K., Collins, K. M. T., & Leech, N. L. (2013). Conclusion: a four-phase model for teaching and learning mixed research. *International Journal of Multiple Research Approaches*, 7(1), 133-156.
- Padgett, D. K. (2011). *Qualitative and mixed methods in public health*. Thousand Oaks, CA: Sage.
- Padgett, D. K. (2009). Qualitative and mixed methods in social work knowledge development. *Social Work*, 54, 101-105.
- Palinkas, L. A., Horwitz, S. M., Chamberlain, P., Hurlburt, M. S., & Landsverk, J. (2011). Mixed-methods designs in mental health services research: A review. *Psychiatric Services*, 62, 255-263.

- Plano Clark, V. L. (2010). The adoption and practice of mixed methods: U.S. trends in federally funded health-related research. *Qualitative Inquiry, 16*, 428-440. doi: 10.1177/1077800410364609
- Stephens N. (2007). Collecting data from elites and ultra elites: Telephone and face-to-face interviews with macroeconomists. *Qualitative Research, 7*, 203-216.
- Stephens J., Levine R., Burling A.S., & Russ-Eft D. (2011) *An organizational guide to building health services research capacity* (Prepared by American Institutes for Research under contract 233-02-0082, AHRQ Publication No. 11(12)-0095-EF). Rockville, MD: Agency for Healthcare Research and Quality.
- Tashakkori, A., & Teddlie, C. (2003). Issues and dilemmas in teaching research methods courses in social and behavioural sciences: US perspective. *International Journal of Social Research Methodology, 6*, 61-77.
- Truscott, D. M., Swars, S., Smith, S., Thornton-Reid, F., Zhao, Y., Dooley, C., & ... Matthews, M. (2010). A cross-disciplinary examination of the prevalence of mixed methods in educational research: 1995-2005. *International Journal Of Social Research Methodology, 13*, 317-328. doi:10.1080/13645570903097950
- Twinn, S. (2003). Status of mixed methods research in nursing. In: Tashakkori, A., Teddlie, C. (Eds.), *Handbook of mixed methods in social and behavioral research* (pp. 541–556). Thousand Oaks, CA: Sage.
- VERBI GmbH. (2011). MAXQDA [Computer software]. Retrieved from <http://www.maxqda.com/>

Wittink, M. N., Barg, F. K., & Gallo, J. J. (2006). Unwritten rules of talking to doctors about depression: Integrating qualitative and quantitative methods. *Annals of Family Medicine*, 4, 302-309. doi: 10.1370/afm.558

Wurpts, I. C. (2012). *Testing the limits of latent class analysis*. (Thesis). Retrieved from ProQuest Dissertations and Theses. (Order No. 1509188)

Appendix A. Mixed methods procedural diagram



Appendix B

Assessing Proficiency to Conduct Mixed Methods Interview		
Interviewer:		
Interviewee:		
Date:	Time:	Place:
Interviewer Introduction		
Purpose of study: The purpose of this study is to qualitatively explore mixed methods skills in order to use that information develop an instrument to assess proficiency to conduct mixed methods.		
Obtain Informed Consent		
Any questions before we begin?		
Record Session		

Interview Questions

1. What type of work do you do?
 - a. What is your position?
 - b. How would you characterize your field?

2. What is your definition of mixed methods research?

3. Tell me about your role in conducting mixed methods research.

4. How long have you been doing this work?

5. Tell me a bit about your education and training.
 - a. Content focus?
 - b. Research methods?
 - c. Did your program value both quantitative and qualitative methods?
 - d. After learning (quan/qual), how did you learn about the other approach?

6. What was your process of developing your expertise in mixed methods?
 - a. Initially?
 - b. Ongoing?
 - c. Mentored experiences?

7. What do prospective mixed methods researchers need to develop expertise?
 - a. Course work, workshops, reading?
 - b. Experiences?
 - c. Teaching and training?

8. What are some other ways mixed methods researchers can hone their skills?

9. What are some characteristics or markers that distinguish a novice from an expert in mixed methods?

10. What are your recommendations to assess proficiency in mixed methods?
 - a. How do you assess learners (e.g., in classes, workshops)?
 - b. How do you know if a student has met their learning outcomes?

11. Would you be willing to share any material from mixed methods courses or workshops you have taught, so that I can better understand the skills required for mixed methods?
 - a. Syllabus?
 - b. Topics covered?
 - c. Assignment instructions?

Closing

Thank you for your time today. Would you like an abstract or report of the results from this study?

Appendix C

Timeline for Proposed Study

Timeline	Task
Jan	Final draft to readers
Sep	Quan Analysis
Sep	Quan Data Collection at workshops
Sep	Instrument Development
Sep	External Audit of Coding and Themes
Aug	Qual Interview Analysis
Aug	Qual Interviews
July - Sep	Draft first three chapters
July	IRB application
July – Aug,	Literature review and analysis
Jul	Dissertation Proposal
Mar	Final draft of proposal