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VALUE ADDED BY MIXED METHODS RESEARCH:

A MULTIPHASE MIXED METHODS DESIGN

by

Courtney A. Haines

A DISSERTATION

Presented to the Faculty of

The Graduate College at the University of Nebraska

In Partial Fulfillment of the Requirements

For the Degree of Doctoral of Philosophy

Major: Psychological Studies in Education

Under the Supervision of Professor Charles J. Ansorge

Lincoln, Nebraska

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VALUE ADDED BY MIXED METHODS RESEARCH:

A MULTIPHASE MIXED METHODS DESIGN

Courtney Haines, Ph.D.

University of Nebraska, 2011

Advisor: Charles J. Ansorge

The overall purpose of this study was to examine the perceived value of mixed methods research for graduate students at a Midwestern university. A multiphase mixed methods design was used to measure graduate students perceptions of the value of a study's methodology. The study consisted of three phases. Phase I was conducted in order to construct passages and the goal of Phase II was to create a survey. These two phases were then combined to create Phase III. Part one of Phase III was an experiment that looked at the effect of a study's methodology on the value of the study. Participants were randomly assigned one of three methodologically distinct passages to read. All participants completed a value survey. Results indicated that students who read the mixed methods article perceived the passage as more valuable than students who read the quantitative or qualitative passage. Part two of Phase III involved focus groups that sought to better understand students' perception of mixed methods. Students' reported that mixed methods articles had rigorous methods, newer history, and gave readers a deep meaning of the phenomenon. This study adds to the literature base by revealing what value graduate students assign to quantitative, qualitative, and more importantly mixed methods research.

-This is dedicated to “Yamma”-

Grandma you have been such an inspiration to me. Your support, encouragement, and love have got me to where I am today. You are missed.

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Chapter I

INTRODUCTION AND PROBLEM STATEMENT

Mixed methods research has been practiced since the 1950s but formally began in the late 1980s (Creswell & Plano Clark, 2007), and is increasingly used by a growing number of researchers (Creswell, 2003; Dunning et al., 2007). Mixed methods is defined as the "mixture of qualitative and quantitative approaches in many phases in the research process. As a method it focuses on collecting, analyzing, and mixing both quantitative and qualitative data in a single study or series of studies" (Creswell & Plano Clark, 2007, p. 5). The underlying idea of mixed methods research is to combine different strengths and non-overlapping weaknesses of quantitative methods (large sample size, generalization) with qualitative methods (small sample size, in-depth). Researchers use mixed methods research for many reasons. Some of these reasons include the acknowledgement of different worldviews and paradigms, the need to ask more complex questions than one can answer with a purely quantitative or purely qualitative study, the need to generalize and contextualize, explain and understand, deduct and induct, and the integration of data collection and analysis to overcome limitations in using one method solely (Gelo, Braakmann, & Benetka, 2008).

Problem Statement

As mixed methods research increases in use it is important to understand the usefulness and value of combining two distinct methodologies. The importance in understanding the value lies in the added resources, time, and expertise it requires to conduct a mixed methods study. Oftentimes, mixed methods research requires additional time due to the increase in participants and the extra time needed to administer either

questionnaires or conduct interviews (Creswell & Plano Clark, 2011). With the need for additional time comes the need for additional resources. Researchers typically need more money for additional supplies, additional space to interview participants or administer a survey, and additional assistants to help with data collection and data analysis. In addition, mixed methods research requires knowledge of both quantitative and qualitative methodology. With the added burden that some researchers face conducting mixed methods studies, it is important to understand if mixed methods research adds any value to readers' understanding and interpretation than would a purely quantitative or purely qualitative study. To date there is no empirical study that examines the added value of a mixed methods study (Creswell & Plano Clark, 2007; Morse & Chung, 2003; Tashakkori & Teddlie, 2003a; Vidich & Shapiro, 1955).

Purpose of Study

The overall purpose of the study was to examine the perceived value of mixed methods research for graduate students at a Midwestern university. At this stage in the research, the value of mixed methods studies will be generally defined as a methodology's ability to make sense of the world, help readers better understand the study and findings, increase confidence in findings, improve accuracy and completeness, and inform and contribute to overall validity. To address the overall purpose of this research there was a need to conduct three separate phases (see Figure 1).

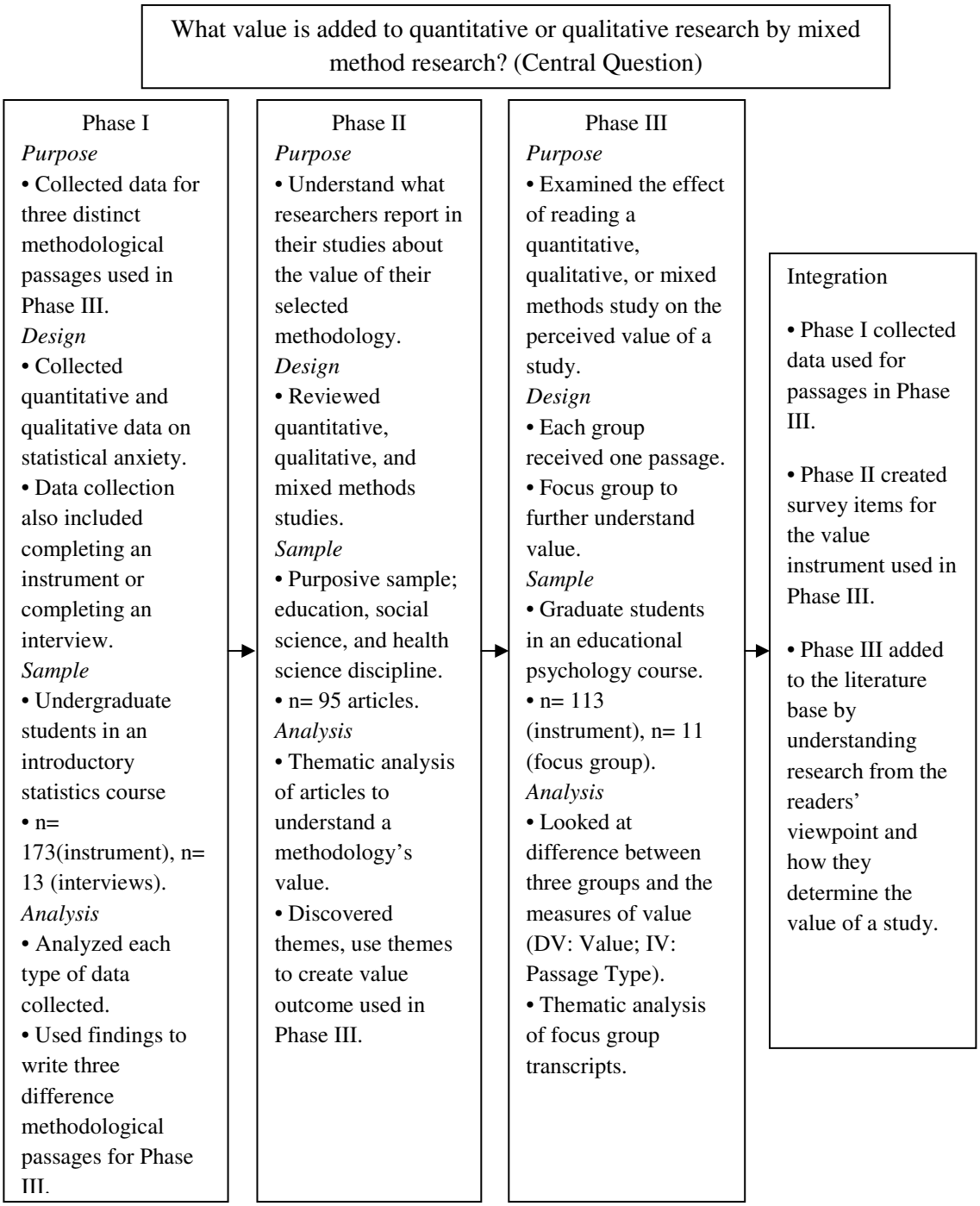

Figure 1. Overall study design

Purposes and Research Questions

The overall purpose of the study was to examine the perceived value of mixed methods research for graduate students at a Midwestern university. The investigator sought to answer the central question, "What value is added to quantitative or qualitative research by mixed methods research?"

The purpose of Phase I was to collect data in order to prepare passages that participants who were involved in Phase III read and used to assess the value of an article's methodology. The data collected were used to create three distinct methodological passages used in Phase III. A methodological passage in this study is defined as a summary of a study that differs from the other passages only with regard to the methodological specified. All three passages are identical with regard to the introduction and discussion but are different with regard to the method and results presented. One passage discussed the methods and results from a mixed methods stance while another took a quantitative stance and the other a qualitative stance. The level of the passage methodology served as the independent variable in Phase III. The participants used the passages to assess the value of a particular methodology. A sub-purpose of Phase I was to determine if quantitative data collection methods gather the same information as qualitative data collection methods. In order to compare the two types of data the researcher sought answers to the following research questions:

(a) When quantitative and qualitative instruments measure the same concept, are the measures interpreted the same way?

The purpose of Phase II was to understand what researchers reported in their studies about the value of their selected methodology. A review of quantitative,

qualitative, and mixed methods studies in selected journals from selected disciplines was provided for Phase II. By seeking to understand the value mixed methods studies provide, researchers may become better educated about the strengths and weaknesses of combining different methodologies. Also Phase II examined what researchers who depend upon only one methodology report with regard to that methodology. Phase II helped shape the definition of value for this study.

Answers to the following research questions for Phase II were sought

(a) What do researchers report with regard to the value of their chosen methodology?

The purpose of Phase III was to examine the effect of reading a purely quantitative, purely qualitative, or mixed methods study on participants' view of the perceived value of a study. Another part of Phase III was to further understand graduate students' perceptions of quantitative, qualitative, and mixed methods methodology. Answers to the following research questions for Study Three were sought:

(a) How do the three groups differ in their perceived value of a study's methodology?

(b) How do graduate students assess the value of a study's methodology?

(c) What are graduate students perceptions of mixed methods methodology?

Potential Contribution of Study

Recently, conferences have begun focusing on mixed methods research (National Research Council's Center for Education, December 14, 2004). Martin Orland (as cited in Viadero, 2005) said that "there is unprecedented interest now in the methodological quality of studies in education." This study helps address the quality others place on

quantitative, qualitative, and mixed methods studies to assist researchers who are interested in the quality of different methodologies.

This study also makes a contribution to the literature and to the field of mixed methods studies by revealing the value of studies that utilized both quantitative and qualitative approaches. More specifically, researchers will have a better idea of how graduate students perceive the value of a study's methodology. This contribution may encourage other researchers to use multiple methodologies in their research and also continue to study the value of mixed methodology.

This study will also help researchers who have taken extreme positions in the quantitative and qualitative debate see the value of integrating methods in certain situations. The results of this study may educate researchers on mixed methods research and its value in the research field.

Study Boundaries and Delimitations

The delimitations in this study stem largely from the past literature. In the area of the value of mixed methods research there are no value constructs that have been measured by researchers. Mixed methods is fairly new research methodology and no investigators have experimentally attempted to assess the value of mixed methods studies to date. Also decisions were made with regard to what to measure and what may be of importance. The scope was limited to a few specific constructs. This limitation was due to the fact that there were no other studies to expand on. The researcher therefore had to limite the scope of value to what could be found in previously published articles.

This study also has design and/or methodology characteristics that limit the interpretation of the results. The results of this study may not generalize to academic

settings other than where the data were collected. If a researcher were to replicate the study at a different institution the results may vary. This stems largely from the fact that the institution chosen for the study offers quantitative, qualitative, and mixed methods courses therefore offering graduate students opportunities to conduct different types of research. Also the participants in this study were graduate students and thereof the results cannot be generalized to other groups of individuals.

Definition of Terms

Convergent design. A convergent design involves two phases. In a convergent design the researcher conducts a quantitative study while simultaneously conducting a qualitative study. Both studies are kept independent during collection and are analyzed independently. The results are then mixed at the interpretation stage. In this study the interpretation stage created an additional product.

Explanatory sequential design. In an explanatory sequential design there are two phases. The first is a quantitative phase where the researcher collects and analyses the data followed by a qualitative phases where the researcher collects and analyses the data. The emphasis is usually placed on the quantitative phase with the qualitative phase helping understand the findings from quantitative component.

Focus group. A focus group in this study means a small group of graduate students asked to participant in the qualitative part of Phase III. During the focus group students were asked questions that strive to further understand how students value methodologies and what components they use to judge a study. Focus groups differ from interviews in the fact that each question gets asked to a group and the individuals in the

group are free to answer as they would during a one-on-one interview and build on others answers.

Mixed methods research. Mixed methods research is defined as a "mixture of qualitative and quantitative approaches in many phases in the research process. As a method it focuses on collecting, analyzing, and mixing both quantitative and qualitative data in a single study or series of studies. 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). Mixed methods research is also interchangeable with mixed methods and mixing methods.

Qualitative research. Qualitative research is defined as a study where data are collected from a small sample (usually a few participants) in the form of words. This includes studies where researchers interviewed participants and collected documents to review.

Quantitative research. Quantitative research is defined as a study where data are collected from a large sample in a numerical format. This includes survey research using Likert-type items, rating scales, and counting behaviors.

Value. Value is defined as a methodology's ability to help readers better understand the study (Hoover, & Krishnamurti, 2010) and findings (Dobson 2008), increase confidence in findings (Reed, Harrington, Duggan, & Wood, 2010; Tashakkori, & Creswell, 2008), provide more evidence (Albert, Trochelman, Meyer, & Nutter 2009) and completeness (Bishop, Brownell, Klinger, Leko, & Galman, 2010), and inform and contribute to overall validity (Gladding 1984).

Chapter II

REVIEW OF RELATED LITERATURE

Brief Overview of Research

Researchers have been using research methodologies to study areas of interest for many years. Quantitative and qualitative are two common research methodologies and both have been used for many years. While these two research designs or designs have been around for and utilized for a while they each have their own strengths and weaknesses. A third common research design is mixed methods. Mixed research is fairly new when compared to quantitative and qualitative research designs and with the increase growth comes reasoning for utilizing a methodology that combines both quantitative and qualitative approaches. This chapter will present the history of quantitative and qualitative methodology and their corresponding strengths and weaknesses that lead researchers to wonder if mixed methods research is the answer to the weaknesses of quantitative and qualitative methods. This is followed by reasons for using mixed methods research including purposes, goals, and the rationale. The growth of mixed methods including where mixed methods is today will be discussed followed by the contribution of this study.

Fieldwork was the main form of research methodology used prior to World War II (Sieber, 1973). After the war ended, the shift to survey methodology began, which some researchers attribute to the development of public-opinion polling (Sieber, 1973). The increased growth in survey research lead to a separation between the field that believed in observing participants and collecting “deep, rich” data and the field that believed in collecting “hard, generalizable” data from surveys (Benoit & Holbert, 2008;

Gelo, Braakmann, & Benetka, 2008; Johnson & Onwuegbuzie, 2004; Rauscher & Greenfield, 2009; Schulze, 2003; Sieber, 1973; Stewart et al., 2008; Vidich & Shapiro, 1955).

Quantitative and Qualitative Research

Quantitative and qualitative research have been used as separate methodologies by many researchers for many years (Sieber, 1973). In the last couple of decades researchers have begun combining the two methodologies in hopes of better understanding different phenomena (Benoit & Holbert, 2008; Cook & Reichardt, 1979; Jick, 1979; Sieber, 1973). Many researchers have made the shift to mixing methods for many reasons, including the inherent weaknesses of one method by itself. Mitchell (1999) provided a critique of his own work and stated that researchers assume that psychological attributes can be measured quantitatively, but most researchers do not have a strong definition of measurement. Toomela (2008) reported that quantitative variables are often ambiguous, and because of the ambiguity the interpretation may not be meaningful. These researchers believe that ontology or reality and epistemology or nature of variables have been ignored in quantitative research. Toomela (2008) further explained by stating that without knowing what information is encoded in a variable it is not possible to make an interpretation that is meaningful. Another critic of quantitative methods is that the method does not investigate the phenomenon researchers are interested in it only looks at the size of the problem (Chow, Quine, & Li, 2010). Since quantitative research focus on the magnitude of a construct, the “how” and “why” gets lost which some researchers argue are just as important as looking at the magnitude.

Quantitative research is not the only methodology that has been critiqued by researchers. Issues with qualitative research have also been addressed by numerous researchers (Creswell & Plano Clark, 2007; Guba, 1990; Johnson & Onwuegbuzie, 2004; Onwuegbuzie, 2000; Viadero, 1999). Researchers criticize qualitative research because they believe it lacks objectivity (Gelo, 2008; Nagel, 1986). Often in qualitative research a researcher decides what data to highlight and researchers believe this gives the researcher the opportunity to pick and choose what information will best suit his/her needs. Quantitative researchers may believe this leads to subjectivity in the inferences and conclusions of a qualitative study. Another critique of qualitative research is the lack of generalizability (Gelo, 2008). Often qualitative studies have small samples and, therefore, results cannot be generalized to the larger population as is possible with quantitative studies. Researchers believe the lack of generalizability is a weakness of qualitative research and often causes researchers to even question the usefulness of qualitative research (Viadero, 1999).

Gelo and colleagues (2008) claim the solution to critiques of qualitative research, discussed above, is the integration of quantitative and qualitative approaches, commonly referred to as mixed methods research. The aim of mixed methods research is to unite and integrate different methodological and research method perspectives (Tashakkori & Teddlie, 2003b) by combining different methodologies.

Growth of the Field of Mixed Methods

Mixed methods research began in the 1950s and was still being formed until the 1980s (Gelo et al., 2008). The idea of mixed methods research began with Campbell and Fiske in the late 1950s when they decided to use multiple quantitative data collection

techniques that lead to researchers combining quantitative and qualitative research in the 1970s (Cook & Reichardt, 1979; Jick, 1979; Sieber, 1973). Campbell and Fiske were not the only researchers that had considered mixing different types of data. Campbell and Cronbach in the mid 1970s encouraged researchers start including qualitative data in their quantitative studies. A few years later Patton provided researchers with a few ideas of how to combine quantitative and qualitative research (Creswell & Plano Clark, 2011). Since this we have seen an increase in the types of mixed methods design and definitions of key terms (Tashakkori & Teddlie, 1998). While not all researchers agree on the exact definitions and key terms this increase does show that the field is going and there is interest in the use of mixed methods. A few authors have really expanded on the ways others can combine quantitative and qualitative research by providing readers with detailed design types (Creswell & Plano Clark, 2011; Tashakkori & Teddlie, 1998).

As researchers began combining quantitative and qualitative research, Guba and Lincoln (1988) stated that quantitative and qualitative research were based on different assumptions and therefore questioned if integrating the two methodologies was appropriate. The discussion of the problems associated with integrating quantitative and qualitative research has fueled the quantitative-qualitative debate (Gage, 1989; Newman & Benz, 1998; Tashakkori & Teddlie, 1998).

Quantitative-Qualitative Debate

The critics of quantitative and qualitative research mentioned above have fueled the quantitative and qualitative research debate. The quantitative-qualitative debate started because researchers believed the two methodologies were too distinct with regard to their underlying philosophical and methodological assumptions to be combined in one

study. Most researchers' basic argument was that combining the two very distinct approaches would destroy the philosophical foundations each methodology was built upon (Lincoln & Guba, 1985; Noblitt & Hare, 1988; Rosenberg, 1988). Other researchers (Reichardt & Cook, 1979; Smith, 1983; Steckler et al., 1992) point out that they also do not believe that a researcher can subscribe to one methodology's philosophy and employ a different methodology.

"To say that mixed methods are always better would be naïve…it implies that we haven't learned enormously from classical, single-method studies" (Viadero, 2005). Researchers do not disagree that research has benefited from the single-method studies, but they argue that while quantitative studies can determine if an intervention worked they cannot determine why it was successful without the addition of another type of methodology (Benoit & Holbert, 2008).

Another problem that mixed methods research faces is the rift that exists between quantitative and qualitative researchers (Viadero, 2005). The director of the American Psychological Association's Center for Psychology in the Schools believes that mixed methods could help heal these rifts. Joseph Maxwell, a qualitative researcher, stated that while it may be of benefit to have researchers work together, often the different philosophical viewpoints get in the way of collaboration (Viadero, 2005). Maxwell worries about quantitative researchers using the data collected by the qualitative researchers to help strengthen the numbers rather than viewing qualitative researchers as an equal. Researchers argue that before we can even worry about researchers collaborating on projects we have to ensure that researchers expand their expertise so that

they have a wider understanding of different methodologies (Connelly, 2009; Johnson & Onwuegbuzie, 2004; Rauscher & Greenfield, 2009; Viadero, 2005).

Mixed Methods Research in Present Day

While the debate is ongoing, mixed methods research has not vanished. In the 1980s researchers began to consider the procedures for designing a mixed methods study and some went even further and began creating types of mixed methods studies (Greene, Caracelli, & Graham, 1989). Since then many researchers have continued to classify types of mixed methods research (e.g., Creswell, 1994; Morse, 1991; Tashakkori & Teddlie, 1998). This has lead to numerous books on mixed methods research (Creswell & Plano Clark, 2007; Creswell, 2008; Mertens, 2009; Tashakkori & Teddlie, 2003a), numerous mixed methods journals (e.g., *International Journal of Mixed Methods in Applied Business & Policy Research, Journal of Mixed Method Research*), and numerous mixed methods studies (e.g., Aldridge et al., 1999; Jenkins, 2001; Myers & Oetzel, 2003; Rogers et al., 2003). Along with increased growth in mixed methods journals and textbooks has come an increase in the number of dissertations and theses with "mixed methods" in the title (See Table 1). With the increase in mixed methods publications comes again the question of the value of mixed methods research compared to a purely quantitative or purely qualitative study.

Table 1

Number of Dissertations and Theses with "Mixed Methods" in the Title

Year Range	Number
2005-2009	2524
2000-2004	532
1995-1999	100
1990-1994	26
1985-1989	17
1980-1984	3

Note: The number represents the number of dissertations and theses which contained the words "mixed methods" in the citation and abstract. This search was conducted using the search engine "proquest" (Proquest Search Engine, 2009).

Reasoning Behind Mixed Methods Research

Researchers argue that mixed methods research is needed because of the reality of society. Putnam (1990) argued that social reality is causal and contextual and therefore the mixture of quantitative and qualitative methods is actually needed. Cooksy and colleagues (2001) cautioned researchers about making decisions about what method to use based on their philosophical assumptions. Instead, researchers are encouraged to make decisions about the methodology based on its ability to enhance an understanding of a concept (Chatterji, 2004; Feuer et al., 2002; Gelo et al., 2008; Newman et al., 2003).

According to Sieber (1973) every methodology has inherent weaknesses and maybe the only way to overcome the weaknesses is to use multiple methods. Patton (1999) stated there is no single method that can solve the problem of rival explanations. Every method has its weaknesses, but by combining methods one can compensate by counterbalancing with the strengths of another method (Creswell, 2003; Jick, 1979). Benefits of combining methods include the converging or corroborating of findings, minimizing alternative explanations for findings (Johnson & Turner, 2003), the reporting of a more accurate and comprehensive perspectives (Coyle & Williams, 2000), providing more breadth, depth, and richness of phenomena (Schulze, 2003), stronger inferences (Tashakkori & Teddlie, 2003b), and the expansion of a study's scope (Morse & Chung, 2003). Overall, Morse and Chung (2003) claim that mixed methods research provides a more balanced perspective than a purely quantitative or purely qualitative study. Sieber (1973) believes survey and field research possess unique characteristics that make the methods non-interchangeable. With these unique characteristics, each method can be strengthened by the other. Vidich and Shapiro (1955) stated the representative coverage of the population is probably of no greater value than the depth of understanding that interviews provide; they believe surveys provide representative information, which only means something because of information gathered from interviews and observations.

Findings from the research on mixed methods studies strengthens the argument researchers make that mixed methodology is needed (e.g., Coyle & Williams, 2000; Johnson & Turner, 2003; Morse & Chung, 2003; Schulze, 2003; Sieber, 1973, Tashakkori & Teddlie, 2003a). Although researchers make the argument that mixed methods research is the only way to be certain of findings (Coyle & Williams, 2000;

Sieber, 1973) and interpretation (Morse & Chung, 2003; Tashakkori & Teddlie, 2003b), to date no one has empirically and systematically studied the value of mixed methods research.

Goal of Mixed Methods

The goal of mixed methods research is to combine quantitative and qualitative research so that the advantages of each methodology are maximized and the disadvantages of those same methodologies are minimized (Gelo et al., 2008). Sieber (1973) discussed three research phases where mixing methods can help: (a) research design, (b) data collection, and (c) analysis. Sieber only discusses data collection and states that with regard to data collection the addition of qualitative work to quantitative work may help provide interpretation for a survey, it can help form a sampling frame, it can add to the development of the survey, and it can increase return rates.

Creswell and Plano Clark (2011) expand on the advantages of mixed methods research. They indicated mixed methods research has inherent strengths that offset the weakness of a purely quantitative or qualitative study. In quantitative research, often the context and setting are not well understood by the researcher. Also, the results of a quantitative study do not typically include quotations from subjects or participants and very little is known about the researchers' biases. These are strengths of qualitative research, but qualitative research has weaknesses of its own. Researchers also argue that in qualitative research the researcher has too much influence on data interpretation; this is not a weakness of quantitative research. Also, since a researcher may utilize many types of data collection in mixed methods research, a researcher is able to provide more evidence to answer their research questions in a mixed methods study than in a study that

involves only one methodology. Along with having additional evidence for their findings and interpretation, researchers are also able to ask different research questions in mixed methods studies and use multiple worldviews or paradigms than they would be able to in a purely quantitative study or purely qualitative study. Overall, Creswell and Plano Clark (2007) state that mixed methods research is "practical in the sense that the researcher is free to use all methods possible to address a research problem" (p. 10).

Gelo and colleagues (2008) state that mixed methods research is strong because it allows researchers to have multiple worldviews and paradigms. This in turn allows researchers to ask research questions that may be different and more complex questions than one could answer with one methodology. Mixed methods researchers address the concerns raised by Toomela (2008) by arguing that mixed methods research allows the data collection and analysis stage to be integrated better than a single methodology study. Researchers argue that by collecting qualitative data, researchers can overcome the concern about the information that is encoded in quantitative variables and therefore lead to meaningful interpretations. For example when conducting a quantitative study a researcher measures a construct and draws interpretations off of the results. Those interpretations are only accurate if the construct measured exactly what the researcher intended to measure. Some researchers argue that this is why qualitative research can help because the researcher can ask participants exactly what the researcher wants to know. In qualitative research the researcher is better able to determine what information is encoded in the quantitative variables.

The Rationale of Mixed Methods

Benoit and Holbert (2008) present five purposes of mixed methods research based on the work of Greene, Caracelli, and Graham (1989).

> These five purpose are: (1) triangulation seeks convergence, corroboration, correspondence of results from the different methods, (2) complementarity seeks elaboration, enhancement, illustration, clarifications of the results of one method with the results of another method, (3) development seeks to use the results from one method to help develop or inform the other method, where development is broadly construed to include sampling and implementations, as well as measurement decisions, (4) initiation seeks the discovery of paradox and contradiction, new perspectives or frameworks, the recasting of questions or results from one method with questions or results from the other method, and (5) explanation seeks to extend the breadth and range of inquiry by using different methods for different inquiry components. (p. 623)

Bryman (2006) expands on Greene et al. (1989) work and reviewed 232 articles examining the methods and design of the articles to understand the researchers' rationale for using the article. Bryman found that most researchers say that the reason they use mixed methods research is to enhance the study, complete the study, triangulate the findings, for sampling reasons and for a diversity of views. The study furthered examined what researchers actually practice and found that researchers mainly use mixed methods to enhance the findings, triangulate findings, provide completeness, and illustrate findings. O'Cathain and colleagues (2007) expand on this work by providing justifications for undertaking mixed methods studies. Findings show that researchers

justify mixed methods because it is comprehensiveness, increases validity, improves development of one method due to the other, can give voice to marginalized groups, can save another weaker method, or mixed methods is used because a single method is not sufficient.

Researchers have established criteria to judge the merit of a mixed methods study and came up with a list that includes relevance to research questions, transparency, need for integration of mixed methods findings, and a rationale for mixed methods research (Bryman, Becker, & Semplik, 2008). Other researchers have looked at the "yield" of mixed methods research and found that the integration of the study and the way the integration is communicated are important indicators of a study's yield (O'Cathain, Murphy, & Nicholl, 2007). The researchers state that this is a "starting point in considering the unique contribution of mixed methods research" (O'Cathain, Murphy, & Nicholl, 2007, p. 147), but it does not completely answer the question of a study's value based purely on the methodology. To date no one has evaluated whether the outcomes of a mixed methods study are perceived as more valuable than the outcomes from a quantitative or qualitative study.

While the goals (Gelo et al., 2008), advantages (Creswell & Plano Clark, 2007), purposes (Benoit & Holbert, 2008) and rationale (O'Cathain et al., 2007) of mixed methods research may be clear, the value of it is not. This becomes even more important as mixed methods is used more and more by researchers.

Value of Mixed Methods

Researchers say the value in mixed methods research is the combination of two methods with the goal of providing readers with a better understanding than a singular

method can (Creswell & Plano Clark, 2007), but no one has empirically tested this claim. So before researchers can decide if mixed methods research is the best approach for certain areas they must determine the value of mixed methods research and how it compares to the value of quantitative and qualitative research.

Present Study

This study will seek to answer the value added to quantitative or qualitative research by mixed methods research. In this study value will be defined as a methodology's ability to help readers better understand the study (Hoover, & Krishnamurti, 2010) and findings (Dobson 2008), increase confidence in findings (Reed, Harrington, Duggan, & Wood, 2010; Tashakkori, & Creswell, 2008), provide more evidence (Albert, Trochelman, Meyer, & Nutter 2009) and completeness (Bishop, Brownell, Klinger, Leko, & Galman, 2010), and inform and contribute to overall validity (Gladding 1984).

The overall purpose of the proposed study is to examine the perceived value of mixed methods studies for graduate students at a Midwestern university. This will add to the literature base by revealing the value participants assign to different methodologies (i.e., quantitative, qualitative, or mixed methods). In addition, this study will help educate researchers on the value mixed methods research can contribute to their own research. This study will also help readers understand what graduate students examine and value with regard to a study's methodology.

This study will make a contribution to the literature and largely to the field of mixed methods studies by revealing the value of studies that utilized both quantitative and qualitative approaches. More specifically, researchers will have a better idea of how

graduate students perceive the value of a study's methodology. This contribution may encourage other researchers to use multiple methodologies in their research and also continue to study the value of mixed methodology.

Chapter III

METHODOLOGY

Phase I

Overview of Phase I

Phase I was a correlational study that collected data used in Phase III. During Phase I, data were collected and used to create three distinct methodological passages that were used in Phase III. The three distinct methodological passages will be discussed in further detail later. Participants in Phase III used these passages to answer a questionnaire that measured the value of the study. It is important that the only thing that differed from passage to passage was the method used to collect data. In Phase I the investigator collected both types of data (quantitative and qualitative) so that the passages could report the same results and conclusions. In addition, by collecting both types of data the researcher was then able to combine the results and create a mixed methods passage in addition to the purely quantitative and purely qualitative passages.

A sub-purpose of Phase I was to combine the findings from the quantitative and qualitative phase to create the mixed methods phase. Phase I also helped to better understand how closely the results to a quantitative and qualitative phase mirror one another when both studies seek the same information. The collection of both quantitative and qualitative data on the same topic was a way to determine if results were similar regardless of the chosen method.

Data collection during this phase included a quantitative and qualitative component (See Appendices A through J). The quantitative component included two instruments that assessed statistical anxiety, perceived value, perceived usefulness,

perceived difficulty, and general attitudes towards statistics course. For the qualitative component the researcher sought to understand the same concepts as the quantitative instrument via interviews. All initial contacts and scripts appear in Appendices A through D. Appendices E through G include the survey used in Phase I, contact information for interviews, and the qualitative protocol used. Appendices H through J include informed consents and the approval letter from the Institutional Review Board letter.

Measuring statistics anxiety in Phase I was chosen because of the researcher's past background teaching Introductory to Statistics. Since what the passages were about was not as important as creating three methodologically distinct passages the researcher chose a personal area of interest. The researcher has always had an interest in students and their perceptions of statistics and anxiety related to it. This interest is why that topic was chosen for Phase I.

Phase I Design

Phase I included both quantitative and qualitative data collection that took place at the same time and the results from the data collection were then used to create three results passages. A detailed diagram of the steps in the research process for Phase I is illustrated in Figure 2.

Data analysis was conducted for the quantitative and qualitative data separately, and then the quantitative and qualitative results were compared using a method discussed by Creswell & Plano Clark (2007, p. 136 – 142). This method involved a convergence model where the researcher collected and analyzed the quantitative data separately from the qualitative on the same phenomenon. This involved mean analyses for the quantitative component and theme development for the qualitative data. After analysis

the results were merged by comparing and contrasting the findings during the interpretation stage. This comparison was done using a matrix. The matrix had a row for each of the relationships with a supporting quote from the participants. The matrix allows the research to look across a row to see supporting quotations for each survey findings (see Appendix K).

The results from Phase I will be used later in Phase III in the form of a passage. These passages can be found in Appendices L, M, and N.

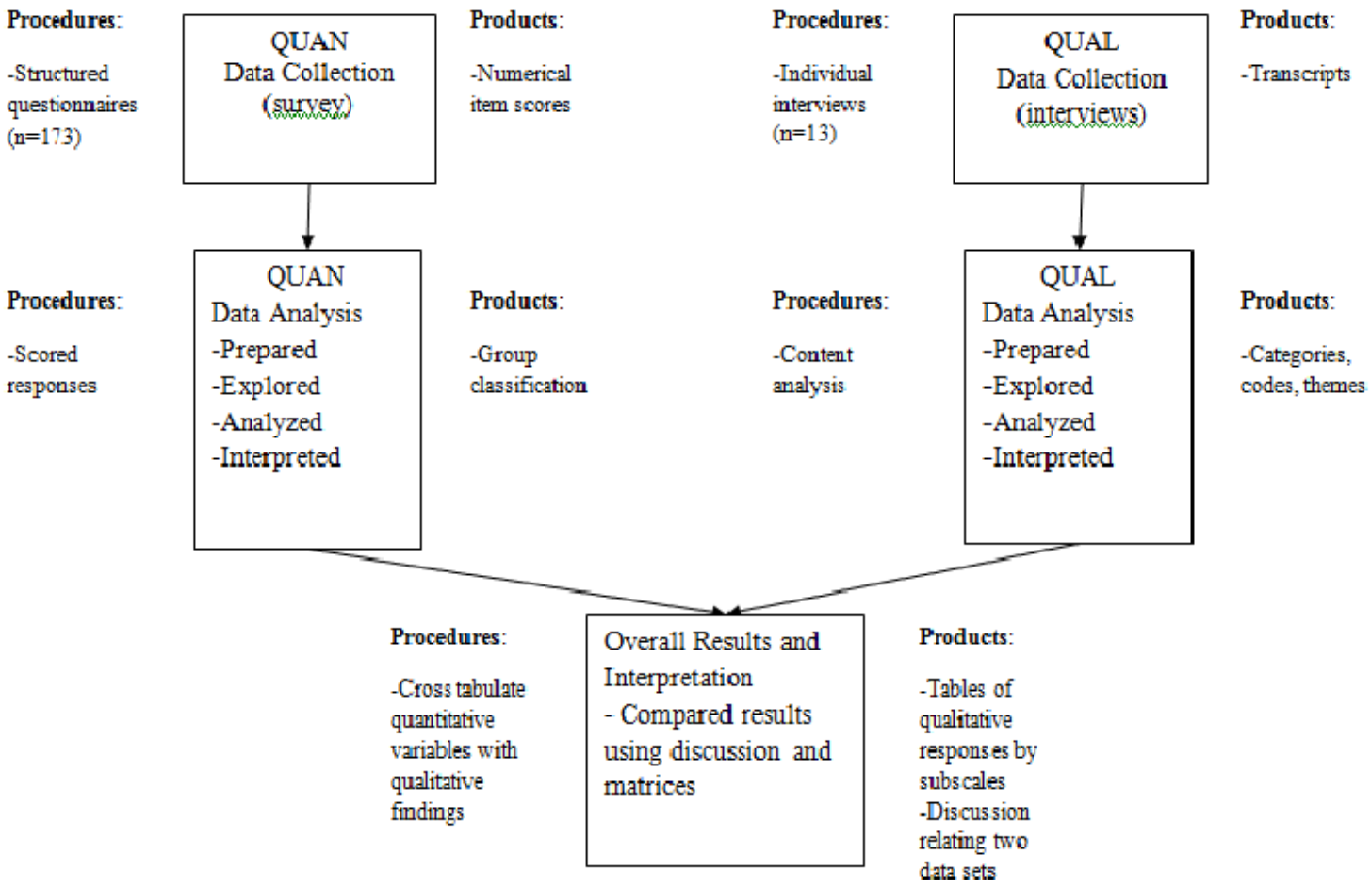

Figure 2. Phase I Design – Convergent Mixed Methods Design Comparing Statistical and Interview Data Results

Quantitative Component of Phase I

Survey instrument development. One of the instruments administered to students enrolled in an undergraduate statistics course in Phase I was the *Statistics Anxiety Measure* (SAM) developed by Earp (2007). This instrument was used to measure students' attitudes toward the class and attitudes toward mathematics as they relate to statistics anxiety. The *Statistics Anxiety Measure* (SAM) is composed of 23 items with four subscales: anxiety, class, math, and performance (see Appendix E). The coefficient alpha values for the three subscales were reported as 0.86, 0.82, 0.95, and 0.85, respectively for undergraduate students at a large Northwestern university. An overall reliability of 0.93 was reported for the instrument. The SAM instrument is significantly correlated with other measures (*Survey of Attitudes Toward Statistics* and *Statistics Anxiety Rating Scale*) of students' attitudes toward statistics (correlations range from $r = 0.211$ to $r = 0.737$).

Another instrument, *Survey of Attitudes Toward Statistics* (SATS) developed by Schau and colleagues (1995), was also used to measure students' feelings toward statistics, their attitudes toward the usefulness, relevance, and worth of statistics, their attitudes about the difficulty of statistics in the college classroom, their attitudes about their knowledge, their interest, and their effort. The SATS assessed six components of students' attitudes: (a) affect, (b) cognitive competence, (c) value, (d) difficulty, (e) interest, and (f) effort and is comprised of 36 items on a 7-point Likert-type response scale (see Appendix E). Carnell (2008) reported Cronbach alpha values ranging from 0.74 to 0.90 for value (nine items), 0.64 to 0.81 for difficulty (seven items), 0.80 to 0.92 for interest (four items), 0.80 to 0.89 for affect (six items), 0.77 to 0.88 for cognitive

competence (six items), and 0.76 to 0.91 for effort (four items) for undergraduate students at a Midwestern university. To evaluate validity, developers of the SATS correlated the instrument with the Attitude Toward Statistics (ATS) scale (Wise, 1985) and found the ATS correlated positively and significantly ($p < 0.05$) with the SATS.

The compiled draft instrument was comprised of items taken directly from the original instruments, with permission. An initial draft of the survey instrument was reviewed with regard to item wording and item order by a faculty member at the University of Nebraska – Lincoln who has knowledge of survey design. The advice offered by a faculty member was taken into consideration and appropriate changes to item wording and item order were made. Once the items were finalized, they were compiled into a questionnaire that was administered to undergraduates at a large Midwestern university. A 5-point Likert-type scale was created and respondents were asked to rate how much they agreed or disagreed, felt anxious or not anxious, and felt below average or above average with respect to the items (see Appendix E).

Power analysis. The G*Power 3 software program (Erdfelder, et al., 1996) was used to perform a power analysis. For this phase a medium effect size $d = 0.50$, $\alpha = 0.05$, power of 0.80 was calculated (Sizemore & Lewandowski, 2009; Hilton et al., 2004). For correlation the recommended sample size was 82 students and for an independent t-test the recommended sample size was 128 students. Therefore the total sample size recommended by G*Power3 was 128 participants to have adequate power to determine a medium effect size.

Participant identification and access. Institutional Review Board (IRB) approval was obtained prior to collecting data for this phase. Introductory statistics instructors

were approached by the researcher to seek their cooperation. The students of instructors who agreed to assist the investigator were asked to participate in Phase I. Once the instructors agreed, the researcher randomly chose seven sections of an undergraduate introductory statistics students to administer the survey to. The seven sections included 173 students. The instrument was administered during class time and required approximately 20 minutes to complete. Students 19 years of age or older were asked to participate. Participants were also asked to provide demographic information such as gender, age, grade level, major, ethnicity, and grade-point average (GPA). The Statistical Package for the Social Sciences (SPSS) software was used by the researcher to execute basic descriptive statistics.

Planned analysis. Survey data were analyzed using SPSS. Descriptive statistics, reliability analysis, and mean comparison analysis were conducted. First, descriptive statistics were reported by gender, age, and grade level. This information was used in the quantitative and mixed methods passage for Phase III. Second, coefficient alphas were determined to verify scale reliability. Third, to create the passages for Phase III the data were also analyzed using mean comparisons by gender groups. Some of the subscales were examined for bivariate correlations. These additional analyses were used in the results section of the corresponding passage. All statistical tests used a p-value of 0.05 as a critical value. The result section of the quantitative passage included typical statistics such as independent t-tests and correlations. The mixed methods passage also used some of this information to convey part of the results.

Qualitative Component of Phase I

Interview protocol development. The interview protocol mirrored the quantitative instrument. The instruments subscales were used to create interview questions. The interview questions were phrased as open-ended questions to elicit information from participants. The initial interview protocol was reviewed by a faculty member at the University of Nebraska – Lincoln who has knowledge of survey design. The faculty member was also asked to determine whether or not the quantitative questionnaire and qualitative interview protocol mirrored one another with regard to what was being asked of the participant. The two instruments were designed to measure the same concepts. The advice offered by the faculty member was taken into consideration and appropriate changes to question wording and order of questions were made. Once the interview questions were finalized they were compiled into an interview protocol that was administered to undergraduates (see Appendix G).

Participant identification and access. Participants for Phase I were identified via their enrollment in the undergraduate statistics course. The researcher interviewed 13 students. The number of participants was based on Stake's (2006) recommendation of sampling four to ten participants and Dukes' (1984) recommendation of studying three to ten participants. The researcher reached saturation after roughly seven participants, but conducted a few more interviews to ensure saturation. The interviews were administered outside of class time and each interview required approximately 20 minutes. Interviews were transcribed and hand coded by the researcher.

Planned analysis. The interviews were transcribed and hand coded using methods discussed by Creswell (2007). Each interview was coded separately and the codes were

then collapsed across participants into similar categories thereby creating themes. All transcripts were first read and then re-read while creating a list of codes. The initial list of codes was brief, but then the list grew as each transcript was read again. Then these codes were collapsed into categories. These categories were used to determine themes from the transcripts. Participant quotations from the transcripts were also reviewed for further description of the themes in the passages. The themes were then used to construct the matrix used to compare the quantitative and qualitative data.

Each transcription also included basic descriptive information about the participant. The themes found in the qualitative part of Phase I were also used in Phase III to create the qualitative and mixed method passages that participants read and used to answer questions about the study's value. These themes were also used in the result section of the qualitative and mixed methods passages in Phase III as evidence for the conclusions that were drawn.

Integration of Both Components in Phase I

Planned analysis. The quantitative and qualitative data were compared using the method described by Creswell & Plano Clark (2007) to determine whether or not both data collection methods revealed similar results. This was done by separately analyzing the data sets and then comparing the data through discussion and matrices. This was then compared with the quantitative data to determine if the two types of data confirmed each other. The research focused on the inferences that would be made in the quantitative and qualitative study to see if they revealed the same thing with regard to students' levels of statistics anxiety, cognitive competence, statistics difficulty, value of course, interest, effort, and performance.

Pilot Results of Phase I

To provide committee readers with an example of various components of Phase I that were used in later phases pilot data were collected. Institutional Review Board approval was granted prior to collection of data (See Appendix J). Also included in the appendices are the initial contact e-mails and data collection scripts (See Appendices A through I). The data were analyzed and presented in a matrix (See Appendix K).

Pilot phase. During the pilot phase the researcher collected quantitative and qualitative data about statistical anxiety from undergraduate students in introductory statistics during early December 2009. This information was used to illustrate how the passages used in Phase III would appear. Also the pilot data allowed the researcher to illustrate how the quantitative and qualitative results would be compared. There were 88 students who completed the questionnaire and four students who participated in an interview. The pilot data was combined with the final results presented in chapters four and five so the pilot results will not be presented in this paper. The findings from the pilot mainly served to ensure the study could be conducted as planned and to also provide the committee with examples of what the final product would look like.

Phase II

Overview of Phase II

Phase II was a literature synthesis that reviewed the quantitative, qualitative, and mixed methods literature to learn what researchers had reported with regard to the value, importance, and/or worth of their chosen methodology. The review of the literature provided evidence for the value researchers see in a particular methodology. This information was integrated in Phase III where the purpose was to seek to further

understand the value readers placed on various articles based on the study's methodology. The purpose of Phase II was to understand what researchers reported in their studies about the value of mixed methods, quantitative, and qualitative methodology.

In this phase the researcher sought to explain what investigators believed about the value, importance, and/or worth of collecting quantitative, qualitative, or both quantitative and qualitative data. Once this data was collected the information was to also create a scale to use in Phase III. Specifically, the information gathered from the articles about the value of the chosen methodology was used to create themes. These themes were in turned used to create survey items constructed to assess those themes. These survey items were compiled and then used to create the value survey used in Phase III. The value survey was the dependent variable in the quantitative phase and will be discussed in more detail later.

Phase II Design

Phase II included only qualitative data collection that was used to further understand the value researchers placed on their chosen methodology (See Figure 3). Phase II included a review of the literature concerning quantitative, qualitative, and mixed method studies. The articles were scanned for any mention of the value or significance of the chosen methodology. The article did not have to focus on value but it did have to discuss the importance or value of the chosen methodology somewhere in the context of the study. One the article was chosen the exact phrase was put into a table. This table was later used in data analysis. Data analysis involved thematic analysis using

an analytic strategy. The findings were also used to help shape the quantitative instrument used in Phase III.

Qualitative Component of Phase II

Selection of articles. The review of the literature was limited to journal articles available in print. This was chosen because it was crucial to read the entire article not just the abstract. The researcher first attempted to select articles published in the last five years because the concept of combining quantitative and qualitative data into one research design is a phenomenon that has emerged within the last 10 years (Creswell & Plano Clark, 2007). Reviewing most of the articles published in the last five years was done first because mixed methods research has seen a large growth in the last five years with the creation of a mixed method journal. When it was discovered that the five-year range was not sufficient for finding quantitative and qualitative articles that discussed the value of the chosen methodology somewhere in the article the researcher expanded the time frame so adequate articles could be located. The time frame was lengthened to 50 years because quantitative and qualitative research has been around for a longer period of time. This larger time frame also allowed the researcher to find articles that adequately discussed the value of the selected methodology. The researcher continued searching the literature until at least 30 articles that discussed the value of the methodology were located in each methodological field.

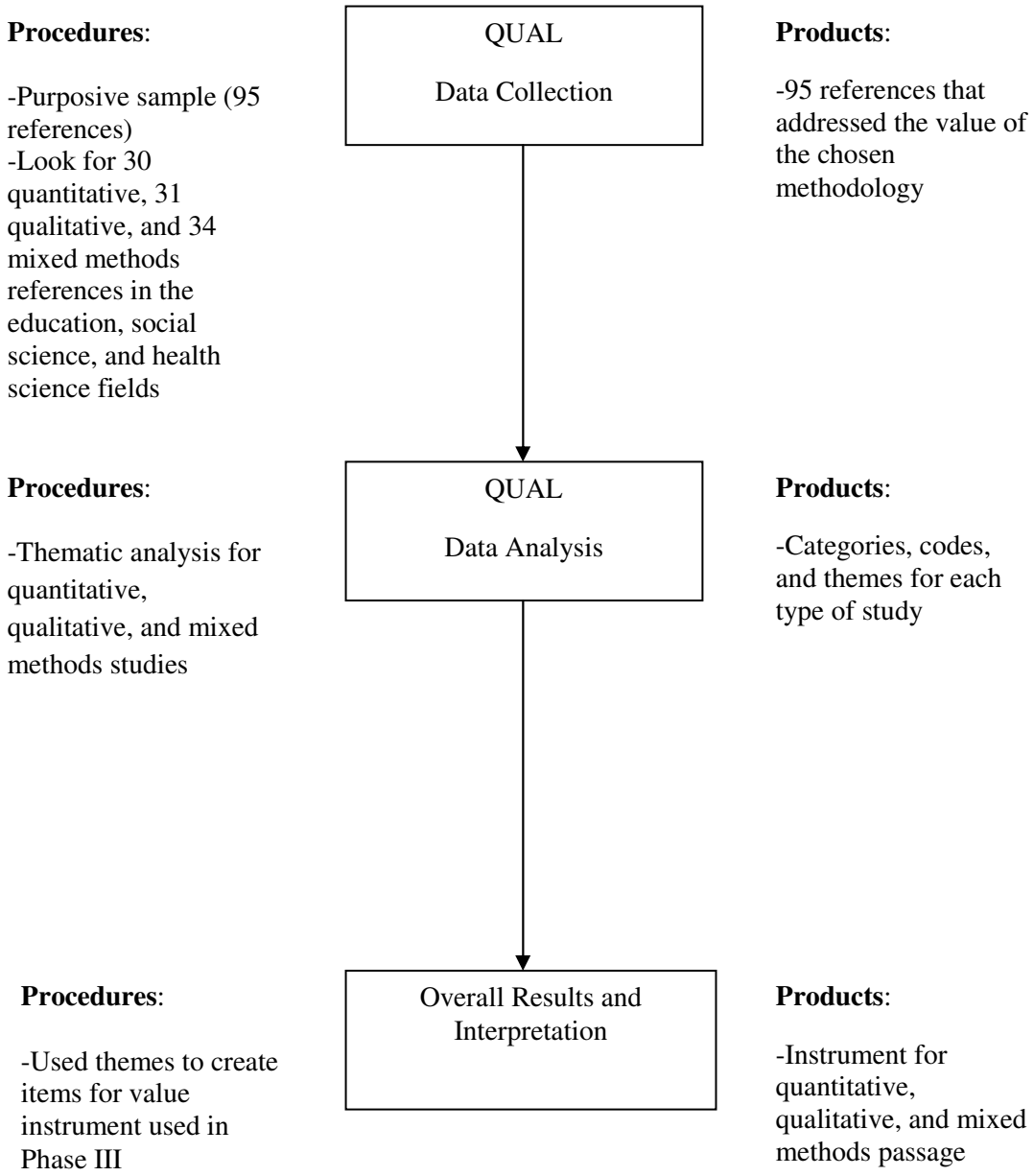

Figure 3. Phase II design

Purposive sampling, a qualitative sampling technique, was used so the researcher could best answer the research questions (Creswell, 2007). In this phase articles from empirical and methodological journals in the field of education, social science, and health science were reviewed. By examining different disciplines common patterns dealing with the value of a methodology were identified. Quantitative, qualitative, and mixed methods articles in peer reviewed journals were reviewed. The researcher reviewed 95 journal articles total. There were 30 quantitative articles, 31 qualitative articles, and 34 mixed methods articles from the field of education, social science, and health sciences. In all 95 articles the author(s) discussed the value of the chosen methodology somewhere in the article. This section was placed in a table which is discussed in more detail below.

The PsycINFO and ERIC database were accessed to identify articles within the three methodologies. Searches were first limited by date (January 2005 – January 2010), by document type (journal article), and by language (English). Discipline specific search terms included: "education," "social science," and "health science." Search terms to assist in identifying specific methodological studies included: "mixed methods," "quantitative," and "qualitative." For example a search would include only peer reviewed journal articles published during 2005 to 2010 with mixed methods and education as a keyword. The articles that fit this criteria were then reviewed to see if the article included any mention of the value of mixed methods. If they did not they were discarded but if there was mention somewhere in the article about the value or significance of mixed methods the particular section in the article that contained this information was placed into a table. This process continued until at least 30 articles were found with the key word of mixed methods. The articles were considered mixed methods if one of the key words

was mixed methods. The researcher did not make any assumption about whether the article was a “true” mixed methods study. This was not done because determining if the study was a “true” mixed methods study is out of the scope of this study.

This search was then conducted on articles containing qualitative and quantitative as the key words. The time frame then was expanded due to the lack of articles that discussed the value of the methodology. There were lots of articles containing quantitative and education as key words for example but there were not 30 articles that were located with those key words that also discussed the value of quantitative methods in that time frame. So if 30 articles discussing the value of their chosen methodology could not be found during the search a wider time frame was selected. As discussed above a wider time frame was selected due to the inability to find 30 quantitative and 30 qualitative articles that discussed the value of the methodology.

Planned analysis. The researcher catalogued studies by type (i.e., quantitative, qualitative, or mixed methods study) and then reviewed the study’s methodology and what the researcher reported with regard to the value of the methodology. The articles were then analyzed using the analytic strategy to identify issues (Creswell, 2007). These issues were used to create codes that were then collapsed into themes. Notes taken by the researcher were summarized for each study. After all the studies had been summarized the researcher began identifying codes. Codes in this study included a brief note of what the researcher mentioned when talking about the value of the study’s methodology. The codes were then reduced into themes and the themes were presented using evidence from the reviewed articles. Codes and themes were created for each methodology. At the end of all analyses there were quantitative themes, qualitative themes, and mixed methods

themes. Since the themes were used to create one survey for Phase III the three groups of themes were combined into overarching themes. These overarching were then used to create survey items for the survey used in Phase III. This process will be discussed in further detail later.

Phase III

Overview of Phase III

Phase III was an explanatory sequential study that examined the value of mixed method studies and sought to further understand how students' value certain methodologies. For Phase III the researcher used data collected from Phase I to write three parallel passages that differed only with respect to the methodology discussed. Phase III used these passages as a way to measure perceived value. The purpose of Phase III was to examine the effect of reading a purely quantitative, purely qualitative, or mixed methods study on participants' view of the perceived value of a study. Another part of Phase III was to further understand graduate students perceptions of quantitative, qualitative, and mixed methods methodology.

Phase III Design

Phase III included quantitative and qualitative data collection that was used to understand the perceived value of a study based on three different methodological passages (see Figure 4). The overall design was an explanatory sequential design with the quantitative component helping shape the qualitative questions that were used to further understand the quantitative findings. The quantitative component involved mean comparisons of the three groups' value scores. Prior research experience, prior course work, and/or number of research projects involved on was used as covariates to control

for prior knowledge of the different methodologies. The findings were used to illustrate how graduate students judge a study's methodology. Phase III also included focus groups that allowed the researcher to further understand how graduate students determine the value of a methodology.

Quantitative Component of Phase III

Passage development. Three passages were developed based on the findings from Phase I. The passages were identical except for the methodological approach and the presentation of the findings. For example, in the purely quantitative passage the reader was informed that participants in the study were administered a questionnaire and the results were presented in a typically quantitative format. Example statistics included means, standard deviations, t-values, and correlation values. This differed from the qualitative study where the reader was informed that the participants were interviewed and the result section included themes from the interview along with quotations from participants. Each passage was administered randomly to a graduate student who was instructed to review the passage and respond to the questionnaire that followed. Each student read only one passage.

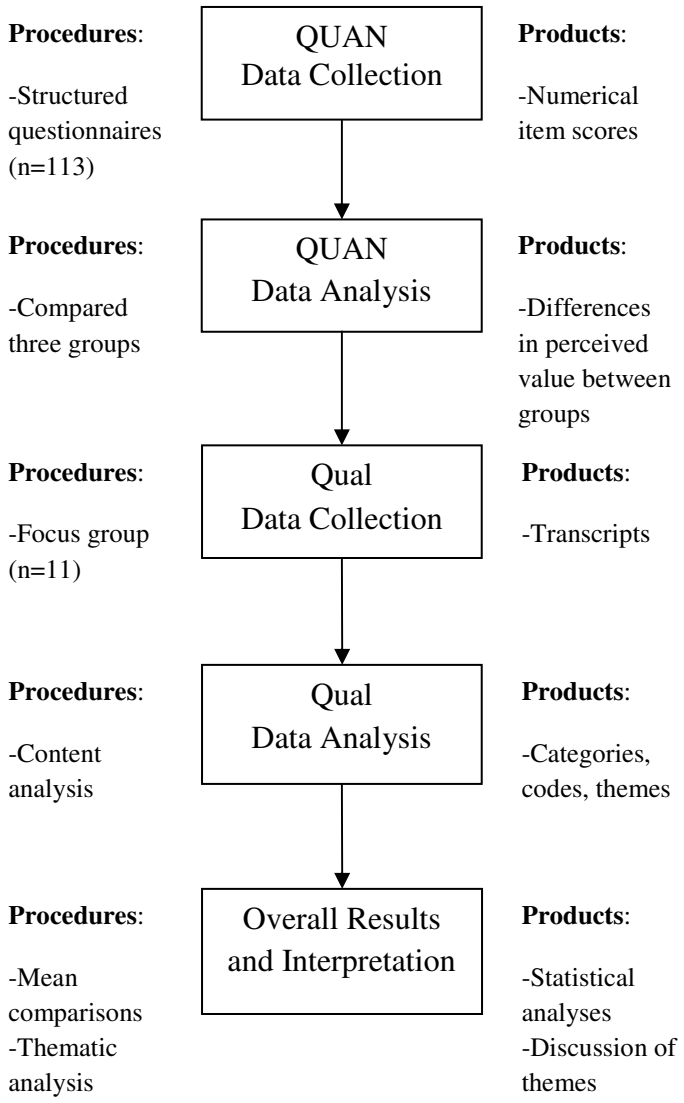

Figure 4. Phase III design

Survey instrument development. The instrument used in Phase III was developed by the researcher and included items that measured the methodology's value. This instrument was developed using the themes found in Phase II to develop questions participants could answer about a study's methodology. The themes from the quantitative, qualitative, and mixed methods articles were combined to create overarching themes. These themes were then used to create items. For example one of the overarching themes was a "better understanding" of the study. This overarching theme was then used to create survey items that addressed whether the study's methodology the participants read in Phase III provided them with the best understanding. An few example items that were created for the "better understanding" theme are, "The study's design is optimal for readers having a deeper understanding", "The chosen methodology provides readers with a better understanding of the findings," and "This study's methodology provides me with a better understanding of student's perceptions of their statistics course." A large pool of items were created based on the overarching themes for Phase II and then complied into an initial draft of the survey.

An initial draft of the survey instrument was reviewed by the faculty member who reviewed the instruments used in Phase I. The advice offered by the faculty member was taken into consideration when designing the survey. Once the items were finalized, they were compiled into a survey that was administered to graduate students at a large Midwestern university. Each questionnaire item was on a Likert-type scale where respondents were asked to rate how much they agreed or disagreed with a particular item. Before the survey was administered to graduate students a pilot study was conducted where nine graduate students were asked to review the instrument for clarity and

understanding. These nine students were asked to help with clarity and wording of items. The nine graduate students were also asked to note any items they felt should not be included due to awkward wording, confusion, or irrelevance. The graduate students suggested that one item be reworded. There feedback was taken into consideration and used to create the final instrument. The final instrument was comprised of 39 items.

Power analysis. The G*Power 3 software program (Erdfelder, et al., 1996) was used to perform a power analysis. For this phase a medium effect size $f = 0.25$, $\alpha = 0.05$, power of 0.80, with three groups was calculated (Sizemore & Lewandowski, 2009; Hilton et al., 2004). For ANOVA the recommended sample size was 159 students and for an ANCOVA the recommended sample size was 179 students. Therefore the total sample size recommended by G*Power3 was 179 participants to have adequate power to determine an effect.

Participant identification and access. IRB approval was obtained prior to collecting data for this phase. Instructors teaching graduate courses were approached by the researcher to seek their cooperation. If the instructor agreed to cooperate then graduate students in the course were forwarded an email asking to participate in Phase III. The email contained a brief summary of the study, a link to the survey, and contact information if they had any questions. If they chose to participate in the study and clicked on the link they were randomly assigned to one of three groups by the survey software. They were then directed to the informed consent page and once they agreed to participate they were presented with one of the passages. Each of the three passages contained a brief summary of a research project. The only differences between the three passages were the data presented. One passage presented only quantitative results while another

presented only qualitative results. The third passage presented both results (mixed methods). After they finished reading the passage they were then presented with the value survey on a separate web page. After answering the survey they were asked if they would be willing to be contacted about participating in a focus group. After agreeing or declining they were thanked for their help.

The researcher administered the survey to 113 students, 19 years of age and older, who volunteered and had previously completed a letter of informed consent. These students had varying levels of research experience and exposure to various methodologies. They were roughly in their second or third year of graduate course. The instrument was administered outside of class time and required approximately 30 minutes to complete. Participants were also asked to provide demographic information such as gender, age, ethnicity, degree, number of years they have been a graduate student, and prior research experience (See Appendix R). Data were collected using a web-based survey program (SurveyGizmo), and were analyzed using into the Statistical Package for the Social Sciences (SPSS).

Planned analysis. Once data was downloaded survey items that needed to be reversed coded were before any analyses were done. Since the survey was created just for this study an exploratory factor analysis (EFA) was conducted to determine the number of subscales. The results from the EFA were used to create a value score or scores depending on results. Survey data were also analyzed using SPSS. Descriptive statistics and group mean comparisons were conducted. Descriptive statistics were reported by gender, age, research experience, and passage type. In addition, the three passage groups were compared to determine if they were significantly different. The level of significance

used was $p < 0.05$. A one-way analysis of variance (ANOVA) was selected to analyze the data with the measures of value being the dependent variables and passage type being the independent. Also, reliability was calculated using Cronbach's alpha procedure. The reliability was calculated on the value score. Validation procedures are outside the scope of this study since this survey was not created to be used in another study. The sole purpose of the survey in Phase III is just to answer this study's research question.

Qualitative Component of Phase III

Focus group protocol development. The focus group protocol included open-ended questions that sought to further understand the value participants place on a certain methodologies and how graduate students judge the merit of a study. The initial protocol was reviewed by a faculty member who reviewed the quantitative instrument in this phase and by an experienced group of graduate students. The advice offered by the faculty member and graduate students was considered when preparing the focus group questions. Once the focus group questions were finalized they were compiled into a focus group protocol that was administered to 11 graduate students in focus groups setting. These questions were created based on the findings of the quantitative component. This was the explanatory sequential component to the study.

Participant identification and access. Participants for the qualitative component of Phase III volunteered at the end of the quantitative study to be contacted later about participating in a focus group. The researcher administered the interview questionnaire to 11 students. The number of participants was based on Stake's (2006) recommendation of sampling four to ten participants and Dukes' (1984) recommendation of studying three to ten participants. The researcher met with the focus groups for approximately 45 minutes

outside of class time. Notes were taken during the focus groups and reviewed later for key findings. Focus groups notes were hand coded by the researcher.

Planned analysis. The focus groups notes were hand coded using methods discussed by Creswell (2007). Focus groups notes were coded and the codes were used to create themes. This method mirrored the qualitative method used in Phase I. Focus groups notes also included basic descriptive information about the participants.

Method Summary

Integrating the Studies. The three phases were combined into a multiphase mixed methods design. A multiphase mixed methods design involved several stages that came together to answer a central question. In this study the three phases answered the overall question, "What value is added to quantitative or qualitative research by mixed methods research?"

The purpose of Phase I was twofold. The first purpose was to collect data for Phase III. Data collected in Phase I were used to create three different methodology passages used to determine the value of quantitative, qualitative, and mixed methods studies. Phase I also helped the researcher learn how quantitative and qualitative results mirror each other when the instrument used in a quantitative study matched the instrument used in a qualitative study.

The purpose of Phase II was to understand what researchers reported in their studies about the value of their selected methodology. Results from Phase II assisted the researcher with the interpretation of Phase III. The findings in Phase II focused on the value of mixed method studies from the eyes of the individuals who conducted research in various fields.

Phase III built on Phase II and further explained the value of a mixed methods study by assessing perceived value. Phase III also added to Phase II by examining research from the readers' viewpoint and how they determined the value of a study based on the study's methodologies. Phase III also sought to understand how graduate students judge the value of a study by conducting focus groups. The purpose of Phase III was to examine the effect of reading a purely quantitative, purely qualitative, or mixed methods study on participants' view of the perceived value of a study.

Chapter IV:

PHASE I AND PHASE II RESULTS

Phase I

The purpose of Phase I was to collect data in order to prepare passages that participants who are involved in Phase III will read and use to assess the value of an article's methodology. A convergent mixed methods design was used to collect both quantitative and qualitative data that were used to create three passages for Phase III.

This chapter begins with results from the quantitative data analysis portion of Phase I. Next, reliability analyses were calculated and descriptive statistics are reported for all subscales, including the mean, standard deviation, and number of respondents. Demographic characteristics are reported by gender, ethnicity, and class standing. Appropriate analyses were performed to examine the relationship between various subscales. The investigator will next discuss the qualitative results. This will include presentation of the themes and supporting evidence. Demographic information is presented for all interview participants. Finally, the last section of the chapter is a description of how the quantitative and qualitative results were used to create the three distinct methodological passages.

Quantitative Phase of Phase I

Reliability

Subscale reliabilities were determined for the six subscales of the Survey of Attitudes Toward Statistics (SATS) scale. Reliabilities ranged from 0.554 for the Effort subscale to 0.871 for the Interest subscale. These reliabilities are comparable to reliabilities reported by Schau and colleagues (2003) except the effort subscale which is

lower than previously reported reliabilities. Scale reliabilities for the four subscales of the Statistics Anxiety Measure (SAM) instrument ranged from 0.733 for the Class subscale to 0.939 for the Math subscale. These reliabilities are comparable to the reliabilities reported by Earp (2007). For number of items and Cronbach's alpha for each subscale see Table 2.

Data Analysis for Phase I

Descriptive statistics and Pearson correlations were used to examine each of the quantitative research questions.

Descriptive statistics. Table 3 presents descriptive statistics for the participants in Phase I. The majority of the participants were white (90%), female (70%), and majoring in nursing (16%). A majority of the participants were sophomore (56%). Descriptive statistics for each subscale are presented for grade level (See Table 4) and gender (See Table 5).

Pearson correlations. Table 6 presents the subscales used in the study and how they correlated with each other, as well as means and standard deviations. The Affect subscale average score was positively correlated with the Cognitive Competency and Class subscale average score. The Cognitive Competency subscale average score was inversely correlated with the Anxiety subscale average score, but was positively correlated with the Math subscale average score. The Value subscale average score was positively correlated with the Class subscale average score. The Effort subscale average was not significantly correlated with the Value subscale or the Anxiety subscale.

Table 2

Reliability Information for SATS and SAM Subscales

Subscale	Number of Items	Cronbach's Alpha
SATS:		
Affect	6	0.851
Cognitive Competence	6	0.863
Value	9	0.805
Difficulty	7	0.796
Interest	4	0.871
Effort	4	0.554
SAM:		
Anxiety	4	0.836
Class	8	0.733
Math	6	0.939
Performance	5	0.894

Table 3

Descriptive Statistics for Phase I Participants

	n	%
Participants	173	
Gender:		
Female	113	70
Male	49	30
Ethnicity:		
African-American	4	2
Asian-American	4	2
Caucasian, Non-Hispanic	153	91
Latino-American	4	2
Other	5	3
Class Standing:		
Freshman	18	11
Sophomore	97	56
Junior	40	23
Senior	15	9
Graduate	2	1

Table 4

Descriptive Statistics (Mean and SD) by Grade Level

	Freshman n = 18	Sophomore n = 97	Junior n = 40	Senior n = 15	Graduate n = 2
Affect	3.57 (0.84)	3.41 (0.77)	3.38 (0.81)	3.64 (0.75)	4.58 (0.35)
Cog Com	3.84 (0.68)	3.85 (0.70)	3.84 (0.65)	3.88 (0.55)	4.50 (0.71)
Value	3.40 (0.60)	3.22 (0.77)	3.16 (0.69)	3.69 (0.63)	4.39 (0.24)
Difficulty	3.02 (0.61)	3.10 (0.59)	3.01 (0.64)	2.76 (0.52)	-*
Interest	3.04 (0.92)	2.81 (0.81)	2.87 (0.79)	3.33 (0.88)	-*
Effort	3.89 (0.53)	3.87 (0.64)	3.85 (0.57)	3.90 (0.75)	4.38 (0.53)
Anxiety	1.81 (0.72)	1.07 (0.81)	1.99 (0.83)	1.78 (0.66)	1.38 (0.53)
Class	3.35 (0.54)	3.07 (0.61)	3.10 (0.63)	3.05 (0.43)	4.44 (0.44)
Math	3.25 (1.29)	3.30 (1.09)	3.53 (1.06)	3.08 (1.07)	-*
Perform	3.71 (0.79)	3.71 (0.77)	3.69 (0.72)	3.67 (0.03)	4.80 (0.28)

*Values omitted due to small sample size and missing data.

Table 5

Descriptive Statistics (Mean and SD) by Gender

	Males n = 49	Females n = 113
Affect	3.53 (0.88)	3.39 (0.75)
Cog Com	4.01 (0.60)	3.76 (0.68)
Value	3.40 (0.66)	3.20 (0.78)
Difficulty	3.03 (0.57)	3.03 (0.60)
Interest	3.10 (0.92)	3.10 (0.80)
Effort	3.85 (0.65)	3.85 (0.61)
Anxiety	1.93 (0.78)	1.90 (0.81)
Class	3.19 (0.64)	3.07 (0.61)
Math	3.67 (0.79)	3.24 (1.18)
Perform	3.83 (0.81)	3.65 (0.71)

Table 6

Correlations, Means, and Standard Deviations for all Subscales

	Affect	Cog Com	Value	Difficulty	Interest	Effort	Anxiety	Class	Math	Perform
Affect		0.812*	0.419*	0.513*	0.592*	0.150*	-0.522*	0.702*	0.532*	0.656*
Cog Com			0.328*	0.548*	0.425*	0.143	-0.580*	0.583*	0.602*	0.669*
Value				0.53	0.653*	0.074	-0.346*	0.539*	0.237*	0.264*
Difficulty					0.073	-0.075	-0.383*	0.302*	0.367*	0.402*
Interest						0.244*	-0.275*	0.654*	0.257*	0.373*
Effort							0.013	0.228*	0.092	0.147
Anxiety								-0.331*	-0.376*	-0.434*
Class									0.444*	0.470*
Math										0.405*
N	173	173	173	173	173	173	172	173	173	172
Mean	3.47	3.86	3.27	3.05	2.90	3.87	1.88	3.12	3.40	3.72
SD	0.79	0.67	0.74	0.60	0.84	0.62	0.79	0.61	1.10	0.75

Qualitative Phase for Phase I

Data Analysis of Phase I

Thematic analysis was used to analyze the qualitative data collected using the interview protocol. The qualitative data collection was used to support and further understand each of the quantitative research questions. Demographic information was also collected from the interview participants.

Demographic Information

The qualitative component of Phase I included 13 participants. The majority of participants were white (88%), females (61%), and studying nutrition (22%). A majority of the participants were sophomore (50%).

Thematic Analysis of Phase I

Thematic analysis revealed four themes. These four themes are difficulty, anxiety, value, and effort.

Difficulty. When talking about the difficulty of the course, participants mentioned how hard certain homework and exam problems were. They also discussed struggling with the math component of the course and mentioned having hard times in past math courses. Participants who saw statistics as difficult reported less confidence in their abilities. One participant stated, “I think that my skills are definitely lacking ... my knowledge about statistics is limited.”

Anxiety. When students were commenting about statistics they mentioned having higher levels of anxiety compared to other courses. Many students mentioned that their anxiety comes from the use of numbers and calculations throughout the course. One student stated, “Sometimes I get anxious, because I know I'm not doing well and I really

don't want to have to retake this course." Some students stated that their anxiety impacted their ability to do as well as they would like to in the course.

Value. While students struggled with various components of the course, students saw the usefulness of the course. While students stated that they were only taking the course because it was required they could see how it could be used in their future career. One student stated that she thought "every student should take a statistics course because it is not difficult and it is very relevant to everyday life." Another student said, "I think I will use statistics in almost any profession I might employ because statistics is very relevant to the work life."

Effort. In addition in seeing the value of the course, some students reported putting considerable effort into the course. When asked to compare the amount of time they spent on their statistics class compared to other courses, most students reported spending more time on statistics than other courses. One student said, "I would say that my skills are good/above average because I went to the class often and worked hard to achieve good grades." However, students who reported spending more time also reported doing better in the course compared to students who reported spending less time. One student stated, "…as I worked harder throughout the semester I began to understand the concepts and I received better grades."

Integration of Quantitative and Qualitative Results

Mixed Methods Results for Phase I

The survey and interview results were merged together (see Table 7) to further understand how other statistics students described relationships among certain variables found in the quantitative component of the study.

Table 7

Matrix Combining Survey and Interview Findings

Findings from Survey	*Supportive Quotations from Interview Participants*
Relationship between anxiety and performance	"No (I wasn't anxious), I took a course in high school so some of the material was familiar and it was not that tough"
Relationship between class and performance	"Sometimes I get anxious, because I know I'm not doing well and I really don't want to have to retake this course"
Relationship between anxiety and interest	"I definitely will not ever use it in my personal life"
Relationship between cognitive complexity and difficulty	"However, as I worked harder throughout the semester I began to understand the concepts and I received better grades"

Results from Phase I

Summary of Phase I

The findings from this study were used to create three distinct methodological passages to be used in Phase III. The findings also addressed one research questions dealing with the comparison of the quantitative and qualitative data collection.

Research question. When quantitative and qualitative instruments measure the same concept, are the measures interpreted the same way?

Overall the results revealed that the instruments are interpreted in approximately the same way. Respondents who answered the quantitative survey reported lower levels of anxiety (M = 1.87, SD = 0.79) that also surfaced frequently in the qualitative interviews. Of the 13 participants interviewed, 12 reported statistics does not cause excessive anxiety. One participant stated, "No, (I don't feel anxious) because it is pretty easy and it is nothing I am going to build on," while another stated he did not feel anxious because "compared to my other classes I am doing pretty well."

With regard to the value of statistics most students interviewed seem to see the value but did not know if they would really use it. One student stated, "There is probably some use but I won't be doing it, like it will be just looking at stats from other studies to help me help someone else." Another student saw more value in statistics. "I would like to go into physical therapy so there is always research being done on what works and what is being done and I think it would be a good thing to use." The majority of response articulating the value of statistics mirror the quantitative findings where most of the participants reported a value level slightly above average (M = 3.27, SD = 0.74).

Students surveyed and interviewed reported above average effort when asked about the energy they put into their statistics course. Interviewed participants reported studying for statistics more than any other courses and working hard for the statistics class, especially when tests were scheduled. Surveyed participants reported a slightly above average effort level (M = 3.87, SD = 0.62). The interview findings appear to mirror the quantitative findings with regard to effort.

Difficulty of the material was another concept measured. Students who were surveyed reported the difficulty of statistics being about average (M = 3.05, SD = 0.60).

When asking participants about their skills most students reported an average skill level. One student stated, “I have basic skills. I still have to do some learning and re-teaching.” When asked about their skills one student stated , “They are probably average” and another stated, “I would say that my skills are good because I went to class often and worked hard to achieve good grades.”

Phase II

The purpose of Phase II was to understand what researchers report in their studies about the value of their selected methodology. Phase II was a literature synthesis of quantitative, qualitative, and mixed methods literature to determine what researchers have reported with regard to the value of their chosen methodology. The information gathered from Phase II was used to create survey items for the instrument employed in Phase III.

This section begins with information about each type of article reviewed. Quantitative, qualitative, and mixed method methodology articles were reviewed. Next, thematic analyses are reported for each type of article presenting exact quotes, codes, and corresponding themes. The investigator will then discuss overarching themes across all articles. The last section of the chapter deals with how themes from the quantitative, qualitative, and mixed methods articles were used to create survey items for Phase III.

Phase II Review of Articles

Article Information

The author reviewed 95 articles from peer-reviewed journals. Upon review of the literature, 31 articles were discovered where the author(s) discussed the value of qualitative methods. The earliest article was published in 1984 and the most recent article was published in 2010. While reviewing quantitative articles, 30 articles were found where author(s) discussed the value of quantitative methods. The earliest article was published in 1957 and the most recent article in appeared in 2010. While reviewing mixed methods articles, 34 articles were found where the author(s) discussed the value of using mixed methods. The earliest article was published in 2005 and the most recent article was published in 2010.

Once the articles were reviewed the exact text that discussed the value of the methodology was placed in Appendices O through Q. Appendix O includes the information gained from reviewing the quantitative article. Appendix P includes the information from the review of the qualitative articles and Appendix Q includes information from the mixed methods articles. Then each article was analyzed individually and the findings are presented below.

Qualitative Articles in Phase II

Thematic Analysis

Upon reviewing 31 qualitative articles for the value of qualitative methodology eight codes were found. These codes included the following: (a) contribute to field, (b) deep understanding, (c) explore, (d) flexible design, (e) insight, (f) participants' voice, (g) psychometrics, and (h) rich data. Researchers specifically wrote about the ability to explore particular phenomenon using qualitative methods and therefore having a deeper understanding of the findings than researchers would have with another type of methodology. Reed and colleagues (2010) utilized a qualitative approach "to explore stroke survivors' needs and their perceptions" (p. 16). Researchers also discussed the value of qualitative methods as being the ability to have the participants' voice throughout the findings and therefore allow more insight into what is being reported. For example, Horowitz (2010) used interviews to allow "students to describe their goals in their own words and did not restrict their response" (p. 219). Qualitative researchers also mentioned improving instruments using qualitative methods. Some researchers stated that "cognitive interviewing is a qualitative means to evaluate and improve questionnaires" (Dietrich & Ehrlenspiel, 2010, p. 58). Other researchers mentioned benefits that included

more insight, gaining perspective of the participants, and a more flexible design using a qualitative method. Overall, researchers reported qualitative methods being the best method to answer their research questions. Contreras-McGavin and colleagues (2007) "argue that qualitative approaches should … be employed to help develop … richer and more meaningful" (p. 70) understandings of various concepts.

All the codes were condensed into three themes describing the value of qualitative articles. These three themes included deep understanding, participants' voice, and a flexible design. These themes were combined with the themes for the quantitative and mixed method articles and used to create four overarching themes that describe the value of all three types of articles. These overarching themes are presented later in this section.

Quantitative Articles in Phase II

Thematic Analysis

Upon review of 30 quantitative articles eight codes describing value were found. These codes included (a) assisting future research, (b) better understanding, (c) comparing participants, (d) developing instruments, (e) empirical evidence, (f) generalizibility, (g) larger samples, and (h) psychometrics. Specifically, Brock (2010) discussed how quantitative methods provide "a better understanding of the process" (p. 138) of events and therefore provide more information for those creating quantitative measures than a qualitative article would. When discussing how quantitative methods provide information, researchers discussed how quantitative findings "also provide some guidelines for making … plans or decisions" (Chen & Cheng, 2009, p. 1294). Researchers also discussed how quantitative methods may be used to find significant differences between various groups (Klein, Hack, Gallagher, & Fanaroff, 1985).

Researchers also mentioned the ability to control for various characteristics in quantitative studies. Cooper and Brooks (1979) stated, “a major advantage of the present design is that ethnicity is a randomly assigned variate” (p. 149) and the design also allows researchers to control for other various characteristics. Gladding (1984) also discussed the value of quantitative measures because they have been “tested and retested on various groups and that the researchers have been most careful to ensure high levels of reliability and validity” (p. 103).

All of the codes were condensed into three themes that capture the value of quantitative, qualitative, and mixed methods methodology. These themes were statistics, understanding, and evidence. These themes were combined with the themes from the qualitative and mixed methods articles to create four overarching themes that describe the value of a methodology broadly.

Mixed Methods Articles in Phase II

Thematic Analysis

Upon review of 34 mixed methods articles, 10 codes describing value were discovered. These codes included (a) capitalize on strengths and minimize weaknesses, (b) complete picture, (c) complex research questions, (d) confidence, (e) contribute to field, (f) better understanding, (g) explore, (h) psychometrics, (i) rich data, and (j) confirm findings. Carr (2008) discussed how mixed methods “connects quantitative and qualitative data, drawing on two research studies, to give greater understanding” (p. 124) to various research topics. Powell and colleagues (2008) expanded on this idea by discussing how “mixed methods techniques results in richer data being collected, leading to a greater understanding of underlying phenomena” (p. 291). With regard to minimizing

weaknesses Lai (2010) stated that "the goal of mixed methods research is not to replace either quantitative or qualitative research but rather to draw from the strengths and minimize the weaknesses of both in single research studies and across studies" (p. 424). Wall and colleagues (2008) expanded on that notion by defining "the value of mixed methods in terms of increased confidence of findings" (p. 63), and Clark and colleagues (2010) stated that mixed methods includes "both types of data to develop a more complete understanding of the participants' perceptions" (p. 159).

All of these codes were condensed into four themes that described the value of mixed methods methodology. These themes included confirm findings, capitalize on strengths and minimize weakness, complex research questions, and better understanding. These themes were combined with the themes from the qualitative and quantitative articles to create four overarching themes that describe the value of methodology broadly.

Overarching Themes in Phase II

The qualitative, quantitative, and mixed methods themes were further condensed into four overarching themes. This was done because Phase III only included one survey. The reason there was one survey was so each group could answer the exact same questions about their particular passage so results could be compared across groups. Since Phase III only included one survey that had to be applicable to students who read the mixed methods passage, the quantitative passage, and the qualitative passage the themes from Phase II for each type of article were condensed into overarching themes. Condensing the themes allowed the research to create items that could be answered no matter what passage the students in Phase III read. These themes were (a) increased understanding, (b) role of researcher and participants, (c) increased evidence, and (d)

research design. Each of these overarching themes lead to creation of items for the survey used in Phase III.

The "increased understanding" overarching theme included sub-themes from quantitative, qualitative, and mixed methods articles dealing with having a better and deeper understanding of the findings given the chosen methodology. This theme is supported by article passages such as "while this study was able to lend to fuller understanding to the graduate student socialization process more research is certainly needed" (Gardner, 2010, p. 77). Another passage that supports the theme is from Reed and colleagues (2010). Qualitative methods "set out to achieve increased understanding of participants' lived experience of the scheme in the context of their stroke and their perceived needs, a phenomenon not easily accessed by quantitative means" (p. 22).

The overarching theme "role of researcher and participants" included sub-themes from all three types of articles dealing with such concepts as generalizibility, involvement of the researchers, and information provided from participants. This theme is supported when researchers mention that the importance of quantitative research is the "detachment of (the) researcher" (Atkins, 1984, p. 252). In one of the qualitative articles the researcher discussed the role of the participants. "A qualitative interview approach is an appropriate method to obtain patient perspectives" (Yardley et al., 2009, p. 602). Court (2008) expands further upon the role of the researcher and participants by stating that "rich analytic description should include both the voices of the researched and the undisguised voice of the researcher, who reveals him- or herself and his or her subjectivity in the interpretive account that he or she writes" (p. 410).

The “increased evidence” theme was found in all three articles with passages such as “interviewing was used as the main data collection tool and was selected for its ability to provide insight into students’ experiences, particularly at school, as they related to their parents’ academic support and influence” (Bitew & Ferguson, 2010, p. 151-152). In a qualitative article Horowitz stated, “One strength of qualitative research is the depth of information that it provides” (2010, p. 239). Passages such as these shaped the increased evidence theme.

The “research design” overarching theme was articulated in the three types of method articles with authors discussing such things as the ability to answer particular research questions and address the study’s purpose. In one article Wright and Tolan (2009, p. 14) argued, “Qualitative designs strengthen their validity when a thorough description is provided of the data collection and analysis method.” In another article the following was stated: “…a mixed methods approach for the study was necessary because no single data source could provide the range of data necessary to address the research questions. From the conception of the study to reporting study results, the mixed methods approach was used to provide the framework for planning, conducting, organizing, analyzing, and reporting the research findings” (Morell & Tan, 2009, p. 260). These passages comprised the research design theme.

Defining Value

The findings from Phase II were also used to help craft the definition of value. The codes and themes were used to better understand what researchers feel the value of their methodology was. This was done to ensure that the survey that measures value covers the topics that researchers discussed in their articles from Phase II. While not

every component mentioned in the articles could be captured the big concepts that were mentioned in most articles are represented in the definition below.

The definition of value that derived from the review of studies was; value is defined as a methodology's ability to help readers better understand the study (Hoover, & Krishnamurti, 2010) and findings (Dobson 2008), increase confidence in findings (Reed, Harrington, Duggan, & Wood, 2010; Tashakkori, & Creswell, 2008), provide more evidence (Albert, Trochelman, Meyer, & Nutter 2009) and completeness (Bishop, Brownell, Klinger, Leko, & Galman, 2010), and inform and contribute to overall validity (Gladding 1984).

Phase II Results

Summary of Phase II

The findings from this study were used to create a value survey to be used in Phase III. The findings also addressed one research question dealing with what researchers report with regard to their chosen methodology's value.

Research question. What do researchers report with regard to the value of their chosen methodology?

With regard to the quantitative articles reviewed the researcher discovered eight codes. These codes included assisting future research, better understanding, comparing participants, developing instruments, empirical evidence, generalizibility, larger samples, and psychometrics. These codes were condensed into three themes; statistics, understanding, and evidence.

The qualitative articles revealed eight codes. These codes included contribute to field, deep understanding, explore, flexible design, insight, participants' voice,

psychometrics, and rich data. These codes were further condensed into three themes. These three themes included deep understanding, participants' voice, and a flexible design.

When reviewing the mixed methods articles 10 codes were discovered. These codes included capitalize on strengths and minimize weaknesses, complete picture, complex research questions, confidence, contribute to field, better understanding, explore, psychometrics, rich data, and confirm findings. These codes were condensed into four themes; confirm findings, capitalize on strengths and minimize weakness, complex research questions, and better understanding.

The themes from the quantitative articles, qualitative articles, and mixed methods articles were combined into four overarching themes. The four overarching themes included increased understanding, role of researcher and participants, increased evidence, and research design. The four overarching themes were used to create 39 items for the value survey used in Phase III.

Creating Value Survey for Phase III

The overarching themes from Phase II were used to create approximately 39 items for the value survey in Phase III (Appendix R). Individual items were written for each overarching theme. For the overarching theme "increased understanding" and "role of the researcher or participants" nine items were created for each. An example item for the "increased understanding" theme is, "*I have a clear understanding of what the researcher found*" and an example item for the "role of the researcher or participants" theme is, "*Results were impacted by the researcher's previous beliefs about the study*." For the "increased evidence" theme 14 items were created to cover main concepts found in Phase

II. An example item for the evidence theme is, "*I think more evidence could have been provided*." The theme "research design" consisted of seven items and an example item is, "*The research design is the best design for what the study wanted to address*." The items were compiled to create the value instrument. The items were assumed to assess value because they were created based on what researchers said about the value of their chosen methodology. The themes from Phase II captured the value of a methodology and therefore creating items assessing these themes were believed to assess value. The validation of this instrument is outside the scope of this study and could be answered in a follow-up study.

The minimum number of items for each theme was four based on recommendations by Tabachnick and Fidell (2001). Four to 10 items per factor is considered reasonable when creating a survey. The "increased evidence" theme had a few more items created because this theme was very prevalent in Phase II and the researcher tried to represent the multiple meanings authors mentioned when they talked about the value of their methodology being the benefit of increased evidence. Another consideration when creating items was the sample size. The researcher who conducted this study planned on collecting 200 responses so a 40-item survey was the maximum number of items that could be included. This is based on the minimum sample size of five which is needed to meet the assumption of an EFA according to Tabachnick and Fidell (2001). The final value instrument included 39 items and was used in Phase III.

Shaping Phase III

The purpose of Phase III was to examine the effect of reading a purely quantitative, purely qualitative, or mixed methods study on participants' view of the

perceived value of a study. In order to examine the effect of a study methodology's three distinct passages needed to be created that could be used to evaluate the value of the methodology. This was done in Phase I. The findings from Phase I were used to create three methodological distinct passages. The quantitative study in Phase I created a quantitative passage and the same was done with the qualitative findings. A mixed methods passage was also created using both the quantitative and qualitative data. Also, in order to judge the value of the passage, a survey measuring value was needed. This survey was created based on Phase II. Four overarching themes from quantitative, qualitative, and mixed methods articles were discovered in Phase II. These overarching themes were used to create 39 items that composed the value survey used in Phase III. Phase I and Phase II were instrumental in shaping Phase III.

Chapter V

PHASE III RESULTS

Phase III

This section begins with results from the quantitative data analysis portion of Phase III, and is followed by a presentation of the qualitative findings. The chapter concludes with a summary of the quantitative results and qualitative findings followed by a brief summary of how the two components are connected.

The quantitative results begin with a discussion of response rates and then moves to the discussion of reliability analyses that were calculated and concludes with the reporting of descriptive statistics for the final scale, including the mean, standard deviation, and number of respondents by gender and class standing. Demographic characteristics are reported for age, gender, ethnicity, class standing, and grade-point average. An exploratory factor analysis was conducted to determine the number of factors that comprised the value scale. Group differences were inspected upon determination of the items that composed the value scale.

The researcher will then discuss the qualitative results. This will include presentation of the themes and supporting evidence. Demographic information is presented for all interview participants. Finally, the closing section of the chapter is concerned with how the quantitative and qualitative results were used to create the mixed methods results.

Quantitative Phase in Phase III

Response Rate

It was impossible to determine how many students were forwarded the link to the survey because instructors in the College of Education and Human Sciences were asked to forward the e-mail to any students they thought might be interested. Therefore there is no way of knowing how many students were forwarded the e-mail by an instructor. Since there is no way of knowing how many students received the email there is also no way of knowing if the sample is representative of the College of Education and Human Sciences. A completion rate was calculated based on the number of students who completed the survey out of the number of students who clicked on the survey link. An overall completion rate of 58% was achieved.

Once the graduate students clicked on the survey link provided in the e-mail they were randomly assigned to one of three groups. If they were assigned to the quantitative group they read the quantitative passage and then completed the survey. The directions and survey were identical for each group but the passage differed based on what group the student was assigned to. So the quantitative group saw the exact same directions and survey as the qualitative group but they each read different passages and therefore were answering the survey based on the passage they saw.

Descriptive Statistics

Descriptive statistics were calculated for each item by group. These results are presented below (Table 8). The table includes means and standard deviations.

Table 8

Means and standard deviations by group for each item of value survey

Survey Item	Quant. Group	Qual. Group	Mixed Group
I am confident in the interpretation of the results.	3.08 (0.92)	3.14 (0.87)	3.73 (0.72)
I think more evidence could have been provided. (R)	2.14 (0.79)	2.00 (0.77)	2.52 (1.06)
Having the participants' voice throughout the results are important to me.	3.32 (1.03)	3.74 (1.04)	3.94 (0.80)
This study had the participants' voice in the results.	2.49 (1.04)	4.02 (0.64)	4.00 (0.67)
I think the methodology is sufficient to address the study's purpose.	3.08 (0.92)	3.52 (0.97)	4.00 (0.66)
The chosen methodology provides readers with a deeper understanding of the findings.	2.65 (0.92)	3.43 (0.99)	3.84 (0.95)
I have a clear understanding of what the researcher did.	3.41 (1.09)	3.55 (0.92)	3.94 (0.86)
I have a clear understanding of what the researcher found.	3.32 (1.06)	3.67 (0.61)	3.91 (0.84)
I have a clear understanding of the methodology the researcher chose.	3.32 (1.08)	3.50 (0.83)	3.94 (0.90)

This methodology explored students' experiences in their statistics course.	2.73 (1.12)	3.86 (0.99)	3.75 (1.24)
I would have a better understanding of the findings with a different method. (R)	2.97 (0.76)	3.12 (0.99)	3.66 (0.83)
I would have a better understanding of the findings if more information about the methodology was provided. (R)	2.32 (0.82)	2.38 (1.06)	2.81 (1.03)
The results are useful.	3.46 (0.87)	3.60 (0.85)	3.94 (0.62)
This is a strong methodological study.	2.62 (0.86)	2.74 (0.95)	3.72 (0.89)
Nothing could be done to improve this study.	1.81 (0.70)	1.95 (0.84)	2.66 (0.97)
Having a large number of participants is important.	3.95 (0.78)	2.98 (1.18)	3.84 (0.88)
This study would be stronger with a different method. (R)	2.62 (0.83)	2.81 (0.73)	3.31 (0.69)
I have a deeper understanding of the study after reading the results.	2.89 (0.94)	3.50 (0.89)	3.87 (0.66)
This study's methodology provides me with a better understanding of student's perceptions of their statistics course.	2.97 (1.09)	3.67 (0.81)	3.97 (0.70)
The study's methodology did not influence the findings. (R)	2.95 (0.81)	3.40 (0.91)	2.75 (0.84)

Results were impacted by the researcher's previous beliefs about the study.	3.11 (0.74)	2.84 (0.84)	3.47 (0.80)
Knowing how much the researcher was involved in the study would impact my view of the importance of the findings.	2.97 (0.96)	2.50 (0.92)	2.78 (1.04)
This methodology is the best for ensuring the results are not influenced by the researcher.	3.05 (0.91)	2.51 (0.91)	3.34 (0.90)
The sample is sufficient for the conclusions that were drawn.	3.30 (0.91)	3.02 (0.99)	3.41 (0.98)
Participant selection was appropriate for this methodology.	3.46 (0.77)	3.42 (0.91)	3.75 (0.76)
This methodology is sufficient to generalize to other college students enrolled in statistics.	3.05 (1.03)	2.21 (0.94)	3.44 (1.24)
After reading the results I have a clear understanding of what the participants were reporting.	3.14 (1.06)	3.31 (0.87)	3.81 (0.78)
There is sufficient evidence for the interpretations drawn.	3.00 (0.88)	2.86 (0.92)	3.66 (0.97)
The chosen methodology is appropriate based on the study's purpose.	2.97 (0.83)	3.53 (0.91)	4.09 (0.73)
The research design is the best design for what the study wanted to address.	2.81 (0.81)	3.00 (1.05)	3.84 (0.88)

My understanding of this study was impacted by the chosen methodology.	3.16 (0.90)	3.50 (0.89)	3.41 (0.91)
The involvement of the researcher impacted the study's results.	3.24 (0.64)	2.77 (0.78)	3.13 (0.79)
I would have a better understanding of the results had the researcher provided more evidence. (R)	2.16 (0.73)	2.31 (0.78)	2.63 (0.87)
Selection of the participants was appropriate based on the study's purpose.	3.35 (0.82)	3.45 (0.77)	3.84 (0.72)
I think another methodology would better address the study's purpose. (R)	2.68 (0.78)	3.02 (0.78)	3.28 (0.85)
The findings from this study are reliable because of the chosen methodology.	2.92 (0.86)	2.83 (0.88)	3.38 (0.83)
The study's design is optimal for readers having a deeper understanding.	2.54 (1.02)	3.07 (1.09)	3.56 (0.98)
The design is appropriate for this study.	3.16 (0.76)	3.48 (0.67)	3.78 (0.71)
The chosen methodology provides readers with a better understanding of the findings.	2.70 (0.78)	3.48 (0.83)	3.72 (0.96)

Table Note: "R" represents a reverse-coded item. Standard deviations are presented in parentheses.

The descriptive statistics showed some interesting differences. Overall the mixed methods group perceived the passage as providing readers with a deeper understanding, a stronger methodological study, a better understand of the results, more reliable findings, and an optimal design for readers having a deep understanding. The graduate students who read the mixed methods passage also felt that is was a better design for the study compared to the graduate students who read the qualitative and quantitative passages.

Exploratory Factor Analysis

An exploratory factor analysis (EFA) was conducted on the 39 items created for the Value Scale. Principal axis factoring was used because the primary purpose of the EFA was to identify the factor(s) that comprise the value scale. It was assumed that based on how the survey was created there would be four factors. However, since survey items were created from passages in an article it was important to explore the data and see how many factors were returned. The initial eigen values showed the first factor explained 35% of the variance, the second factor 9% of the variance, the third and fourth factor 5% of the variance, and the fifth factor 4% of the variance. The sixth, seventh, and eighth factors had eigen values of just over one, each factor explaining approximately 3% of the variance. One, two, three, and four factor solutions were examined, using varimax rotations of the factor loading matrix. The one factor solution, which explained 35% of the variance, was preferred because of the cross-loading of items on factor two and three. The four factor model was also thrown out because the fourth factor was only comprised of four items that did not fit together. It was determine that the four factor model was just catching the items that did not fit in any other factor. There were also an insufficient number of primary loadings on factors two and three and difficulty in interpreting the

second, third, and fourth factors. It was recommended that each factor has at least three strong loadings of 0.40 or greater. This will ensure each factor has a strong reliability. A loading of 0.40 or greater was selected based on recommendations from Tabachnick and Fidell (2001).

During several steps, a total of six items were eliminated because they did not contribute to a simple factor structure and failed to meet a minimum criteria of having a primary factor loading of 0.40 or greater. The items “Having the participants’ voice throughout the results are important to me” and “Results were impacted by the researcher’s previous beliefs about the study” did not load above 0.40. The item “Knowing how much the researcher was involved in the study would impact my view of the importance of the findings” did not load above 0.30. The item “The involvement of the researcher impacted the study’s results” did not load above 0.20. The items “Having a large number of participants is important” and “My understanding of this study was impacted by the chosen methodology” did not load above 0.05 (see Table 9).

Table 9

Survey items removed from survey with corresponding factor loading

Survey Item	Factor Loading
Results were impacted by the researcher's previous beliefs about the study. (R)	0.354
Having the participants' voice throughout the results are important to me.	0.323
Knowing how much the researcher was involved in the study would impact my view of the importance of the findings.	0.204
The involvement of the researcher impacted the study's results.	0.103
My understanding of this study was impacted by the chosen methodology.	-0.071
Having a large number of participants is important.	-0.064

Table Note: "R" represents a reverse-coded item.

A principle axis factor analysis of the remaining 33 items was conducted with the first factor explaining 41% of the variance. Most items had primary loadings over 0.50. Reliability was calculated for the 33 items and the Cronbach's alpha coefficient was 0.95. The factor loading matrix for the final solution is presented in Table 10. These items were used to create a value score for each participant.

Demographics

A total of 113 graduate students completed the survey. Of the 99 participants who provided their gender, 66 were females (67%) The mean age was 33 years (SD = 10.17). A majority of the participants were Caucasian (83%). The mean number of years as a graduate student was 3.35 years (SD = 2.39). Participants reported they had participated in slightly more than four research projects (M=4.43, SD = 4.21) with most of those projects being quantitative (M = 3.61, SD = 3.76).

Research Question

How do the three groups differ in their perceived value of a study's methodology?

Group Differences

There was a significant difference between participants who read the three passages on their perceived value of the study, $F(2, 112) = 15.52$, $p < 0.01$. Post-hoc tests showed the group that read the quantitative (M = 2.89, SD = 0.51) and the group that read the qualitative passages (M = 3.08, SD = 0.55) were significantly different from the group that read the mixed methods passage (M = 3.59, SD = 0.61) on their perceived value of the study. Overall, participants who read the mixed methods passage rated it higher than the groups that read the quantitative and qualitative passage.

Table 10

Factor loadings and communalities based on a principle axis factor analysis for 33 items

Survey Item	Factor Loading
I am confident in the interpretation of the results.	0.73
I think more evidence could have been provided. (R)	0.63
This study had the participants' voice in the results.	0.45
I think the methodology is sufficient to address the study's purpose.	0.72
The chosen methodology provides readers with a deeper understanding of the findings.	0.74
I have a clear understanding of what the researcher did.	0.47
I have a clear understanding of what the researcher found.	0.55
I have a clear understanding of the methodology the researcher chose.	0.61
This methodology explored students' experiences in their statistics course.	0.49
I would have a better understanding of the findings with a different method. (R)	0.61
I would have a better understanding of the findings if more information about the methodology was provided. (R)	0.49
The results are useful.	0.58
This is a strong methodological study.	0.81

Nothing could be done to improve this study.	0.74
This study would be stronger with a different method. (R)	0.68
I have a deeper understanding of the study after reading the results.	0.62
This study's methodology provides me with a better understanding of student's perceptions of their statistics course.	0.60
The study's methodology did not influence the findings. (R)	0.42
This methodology is the best for ensuring the results are not influenced by the researcher.	0.45
The sample is sufficient for the conclusions that were drawn.	0.43
Participant selection was appropriate for this methodology.	0.41
This methodology is sufficient to generalize to other college students enrolled in statistics.	0.45
After reading the results I have a clear understanding of what the participants were reporting.	0.74
There is sufficient evidence for the interpretations drawn.	0.76
The chosen methodology is appropriate based on the study's purpose.	0.77
The research design is the best design for what the study wanted to address.	0.74
I would have a better understanding of the results had the researcher provided more evidence. (R)	0.55
Selection of the participants was appropriate based on the study's purpose.	0.50

I think another methodology would better address the study's purpose. (R)	0.50
The findings from this study are reliable because of the chosen methodology.	0.68
The study's design is optimal for readers having a deeper understanding.	0.77
The design is appropriate for this study.	0.70
The chosen methodology provides readers with a better understanding of the findings.	0.77

Table Note: “R” represents a reverse-coded item.

Controlling for Prior Experience

Because the ANOVA revealed differences between the three groups' an analysis of covariance (ANCOVA) was conducted to control for prior experience since it was assumed this could impact participants' views of certain methodologies. The researcher assumed that graduate students with more experience conducting certain types of studies may feel they are more valuable. For example students that conduct mixed methods studies may feel they are more valuable since they conduct those types of studies more frequently. The independent variable, passage type, involved three levels: quantitative, qualitative, and mixed methods. The dependent variable was perceived value of the methodology. The assumptions for ANCOVA were met. In particular, the homogeneity of the regression effect was evident for the covariate. The ANCOVA was significant, $F(2, 98) = 12.60$, $p < 0.01$. When controlling for prior experience the group that read the mixed methods passage had the largest adjusted mean ($M = 3.57$), followed by the group that read the qualitative passage ($M = 3.15$), and the group that read the quantitative passage had the smallest adjusted mean ($M = 2.88$). LSD follow-up test were conducted to evaluate pairwise differences among the adjusted means. There were significant differences in the adjusted means between the quantitative and mixed methods groups and the qualitative and mixed methods group.

The ANOVA showed that graduate students perceived the mixed methods passage as more valuable than a quantitative or qualitative study. The ANCOVA further expanded on these results by revealing that even controlling for prior experience still showed graduate students perceived the mixed methods passage as more valuable.

Results for the ANOVA and ANCOVA both revealed that the students who read the mixed methods passage reported the highest perceived value.

Qualitative Phase

Data Analysis

Thematic analysis was used to analyze the qualitative data collected during the focus groups. The qualitative data collection was used to support and further understand the findings from the quantitative component of Phase III.

The qualitative component of Phase III included 11 participants. The majority of the participants were females (72%) and there were three males who participated. All participants were graduate students.

Addressing Research Questions

The focus groups were structured to answer two research questions. The first research question was "How do graduate students assess the value of a study's methodology?" The second research question was "What are graduate students' perceptions of mixed methods methodology?"

Research Question 1

Focus groups revealed five findings for each methodology that addressed how graduate students assess the value of a methodology. The findings are presented below based on methodology.

Qualitative methodology. When students were asked how they assess the value of qualitative studies, students discussed such things as design type, sampling, coding, quotations from participants, and validation. Graduate students' reported that the value of good qualitative study was in the author description of the design type utilized. Students

felt this was two-fold. First they expect to see exactly what design type was used, and second, students expect the proper components of that design throughout the study. Corresponding to the design is the sampling procedure. Students judge the value of a qualitative study based on "the information about the sampling procedure" used in the study. Students also mentioned that when judging the value of a qualitative study they look at the coding methodology used and evaluated how appropriate it is for the study. They also mentioned that the "depth of information" provided about the coding method is important. When reading an article, students stated they wanted to have a clear idea of how the findings were obtained.

Another component students' evaluate when judging an article is the use of participants' voice. Participants stated that in a good qualitative study a readers would "hear voices" and "stories" throughout the study's findings. Graduate students stated that "without quotations from the participants in the study" a qualitative methodology has not truly been employed. Graduate students look for the use of participants' voice to validate the findings of the study. Another key component of qualitative studies that participants mentioned was not only the use of quotations to validate the study but also the use of such techniques as member checking to validate the study. Graduate students' believed that validation techniques should be explained in detail and should convince readers that the findings are accurate. Graduate students rationalized that a superior qualitative study has a clear design type, discussion of sampling procedures, details about coding procedures, quotations from participants, and discussion of validation techniques.

Quantitative methodology. When students were asked how they assess the value of quantitative studies, students discussed such things as instrument selection, research

questions, sampling procedures, design, and limitations. Students considered the common components of a method section to be important to a quantitative study. Students judged the study based on the instrument chosen and "the instrument statistics like reliability and validity." Research questions are another component of a typical method section that is judged. Students stated that they assess the value of a study based on how important the research questions are and how the "methodology answers the research questions" presented in the study. Students also stated how important the sampling procedures are to the value of a quantitative study. Students wanted to see "information about sample" including "participants' background" and how participants were chosen.

Graduate students also used the study's design to judge the value. Students wanted to see a "design that is useable" and a "design that controls for the effects of independent variables" in a valuable study. Since the design is so crucial to a quantitative study in graduate students' eyes they thought that this should dictate other components of the study such as the assumptions that are listed, the "tables and graphs" provided, and the analyses that are used. Graduate students also mentioned limitations when asked how they assess the value of a study. Graduate students believed that in a valuable quantitative study the author lists the limitations "so that future researchers know what problems they might have." Graduate students also took into account the limitations listed when judging the value. The graduate students stated that if limitations were extensive then it raised a red flag about the quality of the study. Graduate students rationalized that a superior quantitative study had a discussion of instrument selection, appropriate research questions, description of sampling procedures and design, and discussion of limitations

Mixed methods methodology. When graduate students were asked about how they judged the value of a mixed methods study, students mentioned rationale, research team, data collection timeline, description of both components, and integration. Graduate students mentioned throughout the focus groups the importance of the study's rationale when judging a study. Graduate students stated that a valuable study has a strong rationale backed by a "mixed methods purpose." Graduate students also wanted to have a discussion "of the team and their expertise" in the paper. Students regarded the expertise of the team as very valuable to a mixed methods study because researchers "need to know quantitative and qualitative" methods in order to combine both methods into a strong mixed methods study.

With regard to the methodology of a valuable mixed methods study, graduate students discussed the need for a complete detailed timeline of when each component of the study took place and exactly what was collected at each phase. Students stated that it is "important to know when and what was collected" so that one can "have a better idea of exactly what was going on." A broader theme that was tied to this was the idea of having a detailed description of both components. Students not only talked about knowing when data were collected, but also what was collected, from whom, and what was done with the data collected. Students stated that a strong mixed methods study should make readers feel like they are the researcher. Graduate students wanted enough information provided that they could picture exactly how the study was conducted, almost as if they had done it themselves. Graduate students stated that a strong paper contains a "blueprint" of what was done. Graduate students stated that this should be followed by a clear description of how the data were "mixed" or "integrated." Students

stated that a high-quality mixed methods study discusses how the researcher(s) "combined" the two types of data collection and that the qualitative "informs the quantitative" and vice versa. Graduate students rationalized that a superior mixed methods study has a strong rationale, discussion of a qualified research team, details of data collection timeline, description of both components, and discussion of integration of both components.

Research Question 2

Focus groups revealed three themes when asked about their perceptions of mixed methods methodology. The three themes, rigorous method, audience, and history, are presented below.

Rigorous method. When graduate students were asked about their perception of mixed methods studies they mentioned rigorous method. Students discussed such things as the strength of the approach used, the objectivity, and complexity. Specifically, students discussed how a mixed methods study is more complex than a purely quantitative or qualitative study because it requires "knowledge of both," a design that integrates both quantitative and qualitative methods, and a mixing component. Graduate students expanded by saying because it is so complex "no one wants to do mixed methods studies" but when done correctly the method is very rigorous.

Audience. Graduate students also discussed how important the audience is in the perception of a mixed methods study. Students stated that before a researcher starts a mixed methods study he/she wants to have a good idea who their audience is. While graduate students felt that "everyone can gain something" from a mixed methods study students did not feel that everyone is open to a mixed methods study. Graduate students

stated that some people do not perceive mixed methods study very highly with regard to rigor and therefore considering your audience is important when deciding to do a mixed methods study. Another component to the audience theme that was voiced during the focus groups was the "deeper meaning" that readers walk away with from a mixed methods study. Students discussed how a mixed methods study leaves readers with a "full story" composed of "multiple perspectives."

History. Another theme that came up when graduate students were asked about their perception of mixed methods was the history. Graduate students discussed how mixed methods has a "short history" and is still "building a reputation." Students discussed the limited references that exist to help researchers interested in mixed methods. Creswell, Plano Clark, Tashakkori, and Teddlie were mentioned as some of the references available to researchers interested in conducting a mixed methods study but also commented how the field is not as populated with studies as the quantitative and qualitative fields. Students believe mixed methods methodology is contemporary and once researchers start to realize that "everyone can gain something" more researchers will consider mixing quantitative and qualitative methods.

Phase III Summary

Quantitative Summary

Overall, results showed students who read the mixed methods passage scored higher on perceived value when compared to the quantitative and qualitative group. Participants reading the quantitative passage scored the passage lower on perceived value compared to the other two groups.

Qualitative Summary

Overall, findings suggest that students judge the value of a study based on the details of the various components of the methodology. Students also perceive mixed methods as new, something that everyone can gain something from, and rigorous in nature.

Integration of Quantitative and Qualitative Results

Connecting the Two Phases

Overall, quantitative results show that students judge the mixed methods passage as more valuable than students who read the quantitative and qualitative passage. Qualitative findings show that students judge the value of a study based on the method chosen and while mixed methods may be newer in nature than quantitative and qualitative research, students felt that anyone can gain something from a mixed methods study.

The qualitative component of Phase III revealed that students judge a mixed methods study more harshly than a quantitative or qualitative study. This finding is based on the fact that students reported using more criteria to judge a mixed methods article than they do a quantitative or qualitative article. This finding explains why students would judge a mixed methods study as more valuable when done correctly. With students reporting using more criteria to judge a mixed methods article it means that when all the criteria is there it would be more valuable.

The qualitative findings also revealed that students felt mixed methods studies present more evidence for the findings if done correctly. This finding supports the quantitative findings dealing with graduate students perceiving the mixed methods results

as more valuable. By providing more evidence for the findings the graduate students felt that people who read the mixed method article would be more confident. This increased confidence in mixed methods research was first reported in the quantitative component of Phase III and then further understood when asking graduate students about the value of mixed methods studies.

Overall, the qualitative component of Phase III sheds additional light on the quantitative component by further understanding all the criteria students use to judge an article. The quantitative results showed that graduate students perceived mixed methods studies as more valuable and the focus groups further expanded on this when graduate students stated that they felt mixed methods results are more complex in nature when done correctly and that mixed methods studies have something for everyone.

Chapter VI

DISCUSSION

Summary of Major Findings

Results from Phase I revealed that students with less anxiety have higher beliefs in their ability and they also believe they will perform better in the course. Results also revealed that students with lower anxiety have higher interest levels in statistics. Also students who have a more positive attitude about the class tend to have a higher belief in the value of statistics. Results from Phase I also showed that when quantitative and qualitative instruments measure the same concepts the interpretation of the measures is the same. These findings were used to create three passages used in Phase III.

Results from Phase II provided four themes from quantitative, qualitative, and mixed methods studies that encompassed the value of a study. These themes were increased understanding, the role of the researcher and participants, increased evidence, and research design. These themes provided an understanding of how researchers value their methodology. These themes were then used to create items for the survey used in Phase III.

Results from Phase III revealed that graduate students who read the mixed methods passage scored higher on perceived value when compared to students who read the quantitative and qualitative passages. Participants who read the quantitative passage scored the passage lower on perceived value compared to the other two groups. The findings from the qualitative component of Phase III suggested that students judge the value of a study based on the details of the various components of the methodology.

Students also perceive mixed methods as new, something that everyone can gain something from, and rigorous in nature.

Overall, Phase III quantitative results revealed that students judged the mixed methods passage as more valuable than students who read either the quantitative or the qualitative passage. Qualitative findings showed that students judge the value of a study based on the method chosen and while mixed methods may be newer in nature than quantitative and qualitative research, students felt that anyone can gain something from a mixed methods study.

Findings Related to Literature

Quantitative and qualitative methods have been criticized by researchers for years. Qualitative research has been criticized for lacking such things as objectivity (Gelo et al., 2008; Nagel, 1986) and generalizability (Gelo et al., 2008) while quantitative research has been criticized for lacking participants' voice and a meaningful interpretation (Toomela, 2008). Articles reviewed in Phase II confirmed the importance of rich data (Curry & Hanson, 2010), generalizability (Park & Choi, 2009), participants' voice (Zayaz & Finch, 2009), and meaningful interpretations (Viadero, 2005; Carr, 2008). These articles also highlighted the importance of capitalizing on strengths of a methodology while minimizing weaknesses (Greene, 2008).

With critiques of quantitative and qualitative methodology being voiced by researchers many researchers have turned to mixed methods methodology as a way to answer the critiques of quantitative and qualitative methods. Mixed methods methodology received support for many reasons. The most important reason for choosing mixed methods research is that it combines the strengths of each methodology and

minimizes the weaknesses (Creswell & Plano Clark, 2007). Another reason for selecting mixed methods research was the need to understand what information is encoded in a variable so the interpretation is meaningful (Toomela, 2008). This finding was also supported by graduate students in focus groups. Graduate students mentioned that mixed methods is critical in understanding complex phenomena because it allows readers to understand and explain. This expands on Schulze (2003) findings that mixed methods provides more breadth, depth, and richness.

Bryman's (2006) work focused a great deal on the rationale for using mixed methods researchers presented in their study. One of the big things graduate students mentioned in the focus groups in Phase III was the importance of the rationale in the study. Students stated that the reason the author mentions for using mixed methods is critical in judging the value of the study. Graduate students expanded on this by stating that a valuable mixed methods study has a strong rationale for using the methodology along with a clear purpose. In addition to the rationale graduate students also wanted to see a detailed timeline of when the quantitative and qualitative component took place. The quantitative and qualitative sections also need to have a strong rationale in order to be perceived valuable by a graduate student. Bryman (2006) found that most researchers say the rationale for using mixed methods is to enhance the findings. This was an area graduate students touched on during the focus group. Graduate students stated that in a valuable mixed methods study one methodology informs the other. The ability of one methodology to inform the other often allows a more complete picture.

Researchers have claimed that mixed method research provides a more balanced perspective (Morse & Chung, 2003) and is therefore needed (e.g., Coyle & Williams,

2000; Johnson & Turner, 2003; Morse & Chung, 2003; Schulze, 2003; Sieber, 1973, Tashakkori & Teddlie, 2003a). Graduate students confirmed these statements by rating the mixed methods passage as having more value than students who read a quantitative or qualitative passage. Graduate students expanded on the findings by revealing how they judged a study. Mixed methods studies were judged more harshly than quantitative and qualitative studies, but students saw more value in mixed methods study. When asked what value students see in mixed methods methodology students discussed confirmation of results, deeper meanings, multiple perspectives, and rigor. This expands on what other researchers have stated about the value of mixed methods. Coyle and Williams (2000) stated that mixed methods is the only way to be certain of findings, and other researchers stated that mixed methods are the only methods that provides the most accurate interpretation (Morse & Chung, 2003; Tashakkori & Teddlie, 2003b). Creswell and Plano Clark (2007) summed it up by stating the value of mixed methods is the combination of two methods with the goal of providing readers with a better understanding than a singular method can.

Limitations of Study

Not Generalizable to Other Universities

The results from this study should not be used to predict or suggest what graduate students may say about the value of mixed methods at other universities. The results should also not be used to predict how all graduate students will judge quantitative, qualitative, and/or mixed methods studies. Other researchers could consider looking at the impact of additional information on the perceived value.

Measurement Error

Measurement error may lead to biased results. While the researcher took care to randomize presentation of passages, readers should take care in interpreting results to avoid interpreting beyond the intention of the researcher. Another component of this study to consider is the length of the passages. In Phase III the mixed methods passages was longer and therefore the findings could have been influenced by the additional information and detail.

Non-response Bias

Graduate students in the areas of psychology, education, and administration were contacted to participate. Not all students who were sent the e-mail completed the survey. If all graduate students in the study completed the survey results may have been different from those presented above. Also there is no way of knowing if the sample is representative because the email was forwarded by instructors to students and therefore it is not known who completed the survey.

Implications

Value of Study's Methodologies

Results suggest that a mixed methods methodology holds the most value for researchers when compared to quantitative and qualitative methods. This means that researchers should take care when selecting a methodology because studies are valued differently based on the chosen methodology. Students' view mixed methods as more valuable because of the multiple perspectives, deep meaning, multiple strengths, and objectivity.

Evaluation of Study's Methodologies

The findings also suggest that researchers should carefully review what they include in their studies because methodologies are evaluated in different ways. For example, when asked to evaluate a quantitative study, students' reported looking for information about the instrument, design, and analyses. When asked how they judge the merit of a qualitative study, students discussed important information about the design, the use of participants' voice, and the details of the analysis. Graduate students mentioned judging the integration of the various components, the rationale, and the description of the design. All of these components should be considered when conducting a study because readers will evaluate the study.

Mixed Methods Field

The findings from this study also contribute in large to the field of mixed methods. Since mixed methods has received a formal name other researchers have began critiquing it. With this critic comes the natural question of the value of mixed methods compared to past methodologies. No empirical studies have been examined the value of mixed methods so this study begins the groundwork for looking at the value of mixed methods. This study gives researchers an idea of how to assess value and what modifications can be made to the survey to create a future study. Future researchers now have an idea of what graduate students report with regard to the value of particular methodologies and how they judge a mixed methods study. This allows future researchers to take these findings and create interview protocols or additional surveys that assess the value of mixed methods from the eyes of researchers or other research consumers.

Future Research Possibilities

Future researchers should consider the further examination of mixed methods research by qualified researchers. While this study examined what researchers report about their methodology, it is important to understand what other researchers see with respect to the value of mixed methods. Future researchers should consider conducting a study where researchers in the field are interviewed about their perceived value of their chosen methodology. This study examined existing articles that discussed the value of the methodology but lacked researchers opinions that are not published. Researchers have reasons for selecting the methodology they do and this may not always be articulated in a published article. This information could be gathered by conducting interviews with researchers currently conducting research.

Researchers should also consider examining the value of mixed methods in different domains. This study only reviewed articles in the social science field and researcher should consider the value of mixed methods in other fields. Researchers in other fields such as Art, English, or Physics may value certain methodologies differently than Social Science researchers. These fields also conduct quantitative, qualitative, and mixed methods studies and the value in those methodologies may be different for different fields.

Future researchers could also improve upon the value survey used in Phase III. This survey will need to be used with different samples to establish the validity of the interpretation. A single sample is not sufficient to draw conclusions about the validity of the interpretations. This survey should also be expanded upon based on additional findings with different populations. Researchers should also consider creating three

separate surveys that address the value of the particular passage. For example a quantitative value survey would be paired with a quantitative passage and the same for qualitative and mixed methods.

Researchers should also consider looking at the impact of the length of the study. In Phase III the mixed methods passage was longer in length which is a reflection of a typical mixed methods study but the length and additional information may impact the results. In this study there is no way of determining the impact of length and additional information. Future researchers could consider adding a fourth group to Phase III where there are two mixed methods passage, one which is the same length as the quantitative and qualitative passage with less details and another that is similar to the mixed methods passage used in Phase III.

Significance of Work

The significance of this study lies in the fact that no prior empirical studies have been conducted that examines the value of mixed methods. This study also makes a contribution to the literature and largely to the field of mixed methods. The field has seen intense growth in the last 10 years, but no one has examined the value of the methodology. This study lays the groundwork for future studies. With the addition of this study to the literature future researchers can now continue looking at the value of mixed methods because there is a starting point. This study has shown that graduate students view mixed methods as more valuable than quantitative and qualitative studies. It also provides detailed information on what researchers say in their studies about the value of their chosen methodology. The findings from this study can also help future researchers

develop a better understanding of the value of methodologies and what is still left unanswered. Also this study provides some ideas for future research.

This study also adds to the literature base by revealing what value graduate students assign to quantitative, qualitative, and mixed methods. Results from this study should help educate researchers on the value of mixed methods research that may, in turn, contribute to their own research. Also by understanding what graduate students' examine and judge when reviewing a study may help researchers understand what should be highlighted in a study. More specifically, researchers now will have a better idea of how graduate students perceive the value of a study's methodology. This contribution may encourage other researchers to use multiple methodologies in their research and also continue to study the value of mixed methodology.

This study also gives researchers an idea of what researchers' value of their chosen methodologies. By understanding what value researchers see in quantitative, qualitative, and mixed methods other researchers can better understand what methodology they select for future studies. Also, by understanding what researchers' value about their study, future researchers may develop rubrics for judging the merit of a study.

This study has contributed to the literature base, researchers' understanding of mixed methods, and laid the groundwork for future studies examining the value of mixed methods. As mixed methods studies continue to increase, researchers want to understand the value of the methodology and this study sheds light on the potential mixed methods could add to their research.

Chapter VII

SUMMARY

The overall purpose of this study was to examine the perceived value of mixed methods research for graduate students at a Midwestern university. A multiphase mixed methods design was used to measure graduate students perceptions of the value of a study's methodology. The study was comprised of three phases.

Phase I was designed to collect data in order to prepare passages that participants who were involved in Phase III read and used to assess the value of an article's methodology. The data collected were used to create three distinct methodological passages used in Phase III. A quantitative passage was based on the survey component of Phase I and a qualitative passage was based on the interviews conducted in Phase I. The results of the survey were combined with the findings from the interviews to create a mixed methods passage.

The purpose of Phase II was to understand what researchers reported in their studies about the value of their selected methodology. A review of quantitative, qualitative, and mixed methods studies in selected journals from selected disciplines was provided for Phase II. The themes from the quantitative articles, qualitative articles, and mixed methods articles were combined into four overarching themes. The four overarching themes included increased understanding, role of researcher and participants, increased evidence, and research design. The four overarching themes were used to create 39 items for the value survey used in Phase III.

The purpose of Phase III was to examine the effect of reading a purely quantitative, purely qualitative, or mixed methods study on participants' view of the

perceived value of a study. Another part of Phase III was to further understand graduate students' perceptions of quantitative, qualitative, and mixed methods methodology.

Quantitative Summary

Overall, results showed students who read the mixed methods passage scored higher on perceived value when compared to the quantitative and qualitative group. Participants reading the quantitative passage scored the passage lower on perceived value compared to the other two groups.

Qualitative Summary

Overall, findings suggest that students judge the value of a study based on the details of the various components of the methodology. Students also perceive mixed methods as new, something that everyone can gain something from, and rigorous in nature.

Connecting the Two Phases

Overall, quantitative results show that students judge the mixed methods passage as more valuable than students who read the quantitative and qualitative passage. Qualitative findings show that students judge the value of a study based on the method chosen and while mixed methods may be newer in nature than quantitative and qualitative research students felt that anyone can gain something from a mixed methods study. Qualitative findings also expanded on quantitative results by providing a better understanding of the criteria graduate students use to judge an article.

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Appendix A

PHASE I: INITIAL CONTACT OF INSTRUCTORS FOR STUDENT SURVEY PARTICIPATION

Initial contact (survey) – E-mailed to EDPS 459 instructors

Hello.

I contacting you to seek permission to ask your students to participate in a research study I am conducting. I am interested in looking at students' anxiety levels and attitudes toward the usefulness, relevance, and worth of statistics.

Agreeing to participate would involve allowing me to come into your classroom to administer a quick survey. The survey will take no longer than 20 minutes and all students, 19 years or older, are free to participate. In any case, your students' answers will be completely anonymous.

Please let me know if you would be willing to allow me to approach your students about participating.

Thank you.

Courtney Haines

Appendix B

PHASE I: INITIAL CONTACT OF INSTRUCTORS FOR STUDENTS INTERVIEW PARTICIPATION

Initial contact (interview) – E-mailed to EDPS 459 instructors

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Hello.

I contacting you to seek permission to ask your students to participate in a research study I am conducting. I am interested in looking at students' anxiety levels and attitudes toward the usefulness, relevance, and worth of statistics.

Agreeing to participate would involve allowing me to come into your classroom to ask for volunteers who would be willing to participate in an interview. The interview will take no longer than 20 minutes and all students, 19 years or older, are free to participate. In any case, your students' answers will be completely anonymous.

Please let me know if you would be willing to allow me to approach your students about participating.

Thank you.

Courtney Haines

Appendix C

PHASE I: SCRIPT OF WHAT STUDENTS COMPLETING SURVEY WILL BE TOLD

Survey Participation Script:

I am currently a graduate student who is interested in student's views and opinions of statistics. I am looking for volunteers to complete a survey that will require approximately 20 minutes to complete and I believe you might be able to provide valuable information since you are enrolled in a statistics class this semester.

This survey will ask you questions dealing with your opinions and experiences in statistics. This survey will be anonymous and confidential. Your teacher will not have access to your answers. You must be 19 years old to participate. If you are willing to participate please read and sign the informed consent form. I will collect the signed copy and your can keep a copy for your records. Are there any questions?

Appendix D

PHASE I: SCRIPT OF WHAT STUDENTS PARTICIPATING IN INTERVIEW WILL BE TOLD

Interview Participation Script:

I am currently a graduate student who is interested in student's views and opinions of statistics. I am currently a graduate student who is interested in student's views and opinions of statistics. I am looking for volunteers to complete a survey that will require approximately 20 minutes to complete and I believe you might be able to provide valuable information since you are enrolled in a statistics class this semester.

During the interview you will be asked question dealing with your opinions and experiences in statistics. The interview will be anonymous and confidential. Your teacher will not have access to your responses. You must be 19 years old to participate. If you are willing to participate provide your name and contact information. By providing your contact information you are agreeing to be contacted about possible participation in an interview. The interviews will take place on an agreed upon date, time, and location such as a room on campus, library, or coffee shop. Are there any questions?

Appendix E

PHASE I: QUANTITATIVE INSTRUMENT

This survey asks a number of questions about student's perception of statistics. The scale changes throughout the survey. Please read the instructions and the questions carefully. You may use either a pen or pencil to fill in the circles corresponding to your answer.

- **Do not put your name or any other identifying information anywhere on this survey**. Your responses are anonymous and held in strict confidence. Only group scores will be reported from this research.
- **If you do not understand a question, if a question is unclear to you, or if a question does not apply to you, please leave it blank**. Otherwise, please answer the questions by selecting the answer that best represents your opinion.
- **Your honest and open responses are important to us—please help us by telling us how you really feel about these issues**. Remember that you are replying anonymously—no one will be able to know your answers to these survey items.

Item	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
1. I complete all of my statistics assignments.	O	O	O	O	O
2. I work hard in my statistics course.	O	O	O	O	O
3. I like statistics.	O	O	O	O	O
4. I feel insecure when I have to do statistics problems.	O	O	O	O	O
5. I have trouble understanding statistics because of how I think.	O	O	O	O	O
6. Statistics formulas are easy to understand.	O	O	O	O	O
7. Statistics is worthless.	O	O	O	O	O
8. Statistics is a complicated subject.	O	O	O	O	O
9. Statistics should be a required part of my professional training.	O	O	O	O	O

Item	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
10. Statistical skills will make me more employable.	O	O	O	O	O
11. I have no idea of what's going on in this statistics course.	O	O	O	O	O
12. I am interested in being able to communicate statistical information to others.	O	O	O	O	O
13. Statistics is not useful to the typical professional.	O	O	O	O	O
14. I study hard for every statistics test.	O	O	O	O	O
15. I get frustrated going over statistics test in class.	O	O	O	O	O
16. Statistical thinking is not applicable in my life.	O	O	O	O	O
17. I use statistics in my everyday life.	O	O	O	O	O
18. I am under stress during statistics class.	O	O	O	O	O
19. I enjoy taking statistics courses.	O	O	O	O	O
20. I am interested in using statistics.	O	O	O	O	O
21. Statistics conclusions are rarely presented in everyday life.	O	O	O	O	O
22. Statistics is a subject quickly learned by most people.	O	O	O	O	O
23. I am interested in understanding statistical information.	O	O	O	O	O
24. Learning statistics requires a great deal of discipline.	O	O	O	O	O
25. I have no application for statistics in my profession.	O	O	O	O	O
26. I make a lot of math errors in statistics.	O	O	O	O	O
27. I attend every statistics class session.	O	O	O	O	O
28. I am scared by statistics.	O	O	O	O	O

29. I am interested in learning statistics.	O	O	O	O	O
30. Statistics involves massive computations.	O	O	O	O	O
31. I can learn statistics.	O	O	O	O	O
32. I understand statistics equations.	O	O	O	O	O
33. Statistics is irrelevant in my life.	O	O	O	O	O
34. Statistics is highly technical.	O	O	O	O	O
35. I find it difficult to understand statistical concepts.	O	O	O	O	O
36. Most people have to learn a new way of thinking to do statistics.	O	O	O	O	O

Item	Not Anxious	Slightly Anxious	Anxious	Very Anxious	Extremely Anxious
37. How anxious does formulating and testing hypotheses make you?	O	O	O	O	O
38. How anxious does interpreting statistics make you?	O	O	O	O	O
39. How anxious does developing conclusions based on mathematical solutions make you?	O	O	O	O	O
40. How anxious does reading statistical studies make you?	O	O	O	O	O

Item	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
41. I was hesitant to register for this class.	O	O	O	O	O
42. Based on past experience, I expect the material covered in this class and the exams to be difficult.	O	O	O	O	O
43. I've avoided taking this class as long as possible.	O	O	O	O	O
44. I expect this class to be boring.	O	O	O	O	O
45. I am only taking this class because it is required.	O	O	O	O	O

Item	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
46. I lack motivation to learn or continue learning statistics.	O	O	O	O	O
47. Taking this class will have little impact on my life.	O	O	O	O	O
48. There is no room to be creative in statistics.	O	O	O	O	O
49. My math reasoning ability is low.	O	O	O	O	O
50. Math is my least favorite subject.	O	O	O	O	O
51. I have never enjoyed working with numbers.	O	O	O	O	O
52. I have never enjoyed classes that involve math.	O	O	O	O	O
53. I have low self-esteem when it comes to math.	O	O	O	O	O
54. Math is the subject where I have the least amount of confidence.	O	O	O	O	O

Item	Fail	Below Average	Average	Slightly Above Average	Above Average
55. How well do you expect to perform with regard to developing appropriate methodology to test a given hypothesis?	O	O	O	O	O
56. How well do you expect to perform with regard to solving equations using the calculator/computer?	O	O	O	O	O
57. How well do you expect to perform on exams?	O	O	O	O	O
58. How well do you expect to perform with regard to explaining your answers?	O	O	O	O	O
59. How well do you expect to perform on quizzes?	O	O	O	O	O

How old are you? →	What is your gender? → M F
What is your ethnicity? (circle one) Caucasian, non-Hispanic African-American Asian-American Latino-American Native-American Other	What is your class standing? (circle one) Freshman Sophomore Junior Senior Graduate
Is this a required course for you? → Y N	
Is this your first undergraduate statistics course? → Y N	
What is your overall GPA (approximately)? →	
What is your major? →	
If employed how many hours a week, on average, do you work? →	

THANK YOU FOR YOUR TIME AND YOUR HELP!

Appendix F

PHASE I: INTERVIEW CONTACT INFORMATION

E-mail to arrange interview

Hello.

I am contacting you because you volunteered to participate in an interview about your opinion of statistics. The interview will take no longer than 20 minutes. Please let me know if the following dates or time will work. If none of the times work please let me know what times would work for you.

--LIST DATES AND TIMES HERE--

Thank you.

Courtney Haines

Appendix G

PHASE I: QUALITATIVE INTERVIEW PROTOCOL

**Questions 1 through 12 mirror the areas of the Survey of Attitudes Toward Statistics instrument.

**Questions 13 through 16 mirror the areas of the Statistics Anxiety Measure instrument.

1. When you think of your statistics course what feelings come to mind?

2. When you think of your statistics course what would say about your skills?

3. When you think of your statistics course what would you say about your knowledge?

4. Explain how you feel about the usefulness of statistics in your personal life?

5. Explain how you feel about the usefulness of statistics in your professional life?

6. Explain how you feel about the relevance of statistics in your personal life?

7. Explain how you feel about the relevance of statistics in your professional life?

8. Explain how you feel about the worth of statistics in your personal life?

9. Explain how you feel about the worth of statistics in your professional life?

10. What is your view of the difficulty of statistics?

11. What is your interest level is statistics?

12. How much work would you say you put into learning statistics over the course of the semester?

13. Do you feel anxious about this course? Why or why not?

14. How would you describe your attitude toward statistics?

15. How would you describe your attitude toward math in general?

16. How would you describe your personal performance in the course?

Appendix H

PHASE I: INFORMED CONSENT FOR SURVEY

Identification of Project:

Understanding Students' Opinions of Statistics

Purpose of the Research:

The purpose of this study is to better understand your views' of statistics. This study will also seek to further understand anxiety levels, what contributes to them, and what you struggle with while learn statistics. You are being asked to participate since you are currently enrolled in undergraduate statistics.

Procedures:

Participation in this study will require approximately 20 minutes of your time. You must be 19 years of age or older to participate. You will be asked to complete a survey that asks questions dealing with anxiety and your overall experience in your statistics course.

Risks and/or Discomforts:

There are no known risks or discomforts associated with this research.

Benefits:

The benefits of participating will include being able to provide information about your experience in undergraduate statistics course to other researchers and students if the results of the study are published.

Confidentiality:

Any information obtained during this study which could identify you will be kept strictly confidential. The data will be stored in a locked cabinet in the investigator's office and will only be seen by the investigator during the study and for eighteen months after the study is complete. The information obtained in this study may be published in scientific journals or presented at scientific meetings but the data will be reported as aggregated data.

Compensation:

There will be no compensation for participating in this research.

Opportunity to Ask Questions:

You may ask any questions concerning this research and have those questions answered before agreeing to participate in or during the study. Or you may call the investigator at any time, office phone, (402) 472 – 9460. If you have questions concerning your rights as a research subject that have not been answered by the investigator or to report any concerns about the study, you may contact the University of Nebraska-Lincoln Institutional Review Board, telephone (402) 472-6965.

Freedom to Withdraw:

You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the investigators or the University of Nebraska. Your decision will not result in any loss or benefits to which you are otherwise entitled.

Consent, Right to Receive a Copy:

You are voluntarily making a decision whether or not to participate in this research study. Your signature certifies that you have decided to participate having read and understood the information presented. You will be given a copy of this consent form to keep.

Signature of Participant:

_____ _____

Signature of Research Participant *Date*

Name and Phone number of investigator(s)

Courtney A Haines, Principal Investigator *Office: (402) 472 – 2224*

Dr. Charles Ansorge, Secondary Investigator *Office (402) 472 – 1702*

_____

Appendix I

PHASE I: INFORMED CONSENT FOR THE INTERVIEW

Identification of Project:

Understanding Students' Opinions of Statistics

Purpose of the Research:

The purpose of this study is to better understand your views' of statistics. This study will also seek to further understand anxiety levels, what contributes to them, and what you struggle with while learn statistics. You are being asked to participate since you are currently enrolled in undergraduate statistics.

Procedures:

Participation in this study will require approximately 20 minutes of your time. You must be 19 years of age or older to participate. You will be asked roughly 6 to 8 questions dealing with your experience in statistics. Interviews will take place at an agreed upon location such as a campus office, library, or coffee shop. This interview will be audio taped with your permission.

Risks and/or Discomforts:

There are no known risks or discomforts associated with this research.

Benefits:

The benefits of participating will include being able to provide information about your experience in undergraduate statistics course to other researchers and students if the results of the study are published.

Confidentiality:

Any information obtained during this study which could identify you will be kept strictly confidential. The data will be stored in a locked cabinet in the investigator's office and will only be seen by the investigator during the study and for eighteen months after the study is complete. The information obtained in this study may be published in scientific journals or presented at scientific meetings but the data will be reported as aggregated data. The audiotapes will be erased after transcription.

Compensation:

There will be no compensation for participating in this research.

Opportunity to Ask Questions:

You may ask any questions concerning this research and have those questions answered before agreeing to participate in or during the study. Or you may call the investigator at any time, office phone, (402) 472 – 9460. If you have questions concerning your rights as a research subject that have not been answered by the investigator or to report any concerns about the study, you may contact the University of Nebraska-Lincoln Institutional Review Board, telephone (402) 472-6965.

Freedom to Withdraw:

You are free to decide not to participate in this study or to withdraw at any time without adversely affecting your relationship with the investigators or the University of

Nebraska. Your decision will not result in any loss or benefits to which you are otherwise entitled.

Consent, Right to Receive a Copy:

You are voluntarily making a decision whether or not to participate in this research study. Your signature certifies that you have decided to participate having read and understood the information presented. You will be given a copy of this consent form to keep.

_____ Check here if you agree to be audio taped during the interview.

Signature of Participant:

_____ _____

Signature of Research Participant *Date*

Name and Phone number of investigator(s)

Courtney A Haines, Principal Investigator *Office: (402) 472 – 2224*

Dr. Charles Ansorge, Secondary Investigator *Office (402) 472 – 1702*

Appendix J

PHASE I: INSTITUTIONAL REVIEW

BOARD APPROVAL LETTER

November 24, 2009

Courtney Haines
Department of Educational Psychology

Charles Ansorge
Department of Educational Psychology
202 MABL UNL 68588-0345

IRB Number: 20091110393 EX
Project ID: 10393
Project Title: Understanding Students' Opinions of Statistics

Dear Courtney:
This letter is to officially notify you of the approval of your project by the Institutional Review Board (IRB) for the Protection of Human Subjects. It is the Board's opinion that you have provided adequate safeguards for the rights and welfare of the participants in this study based on the information provided. Your proposal is in compliance with this institution's Federal Wide Assurance 00002258 and the DHHS Regulations for the Protection of Human Subjects (45 CFR 46) and has been classified as exempt.

You are authorized to implement this study as of the Date of Final Approval: 11/24/2009. This approval is Valid Until: 12/15/2010.

1. The approved informed consent forms have been uploaded to NUgrant (files with -Approved.pdf in the file names). Please use these forms to distribute to participants. If you need to make changes to the informed consent forms, please submit the revised forms to the IRB for review and approval prior to using them.

We wish to remind you that the principal investigator is responsible for reporting to this Board any of the following events within 48 hours of the event:
• Any serious event (including on-site and off-site adverse events, injuries, side effects, deaths, or other problems) which in the opinion of the local investigator was unanticipated, involved risk to subjects or others, and was possibly related to the research procedures;
• Any serious accidental or unintentional change to the IRB-approved protocol that involves risk or has the potential to recur;
• Any publication in the literature, safety monitoring report, interim result or other

finding that indicates an unexpected change to the risk/benefit ratio of the research;
• Any breach in confidentiality or compromise in data privacy related to the subject or others; or
• Any complaint of a subject that indicates an unanticipated risk or that cannot be resolved by the research staff.

This project should be conducted in full accordance with all applicable sections of the IRB Guidelines and you should notify the IRB immediately of any proposed changes that may affect the exempt status of your research project. You should report any unanticipated problems involving risks to the participants or others to the Board.

If you have any questions, please contact the IRB office at 472-6965.

Sincerely,

Mario Scalora, Ph.D.
Chair for the IRB

Appendix K

PHASE I: DATA COMPARISON MATRIX

Findings from Survey	*Supportive Quotations from Interview Participants*
Relationship between anxiety and performance	"No (I wasn't anxious), I took a course in high school so some of the material was familiar and it was not that tough"
Relationship between class and performance	"Sometimes I get anxious, because I know I'm not doing well and I really don't want to have to retake this course"
Relationship between anxiety and interest	"I definitely will not ever use it in my personal life"
Relationship between cognitive complexity and difficulty	"However, as I worked harder throughout the semester I began to understand the concepts and I received better grades"

Appendix L

PHASE III: QUANTITATIVE PASSAGE

Undergraduate Students' Perceptions of Statistics: A Quantitative Study

Introduction

With many fields requiring students to complete some form of statistics prior to graduation the number of students enrolled in these courses is increasing (Loftsgaarden & Watkins, 1998). With this increase in enrollment comes the need to better understand student learning and how attitudes impact learning outcomes (Schau et al., 1995). Researchers have found that students' attitudes toward statistics affect enrollment, achievement, and class climate (Gal et al., 1997). The need for the current study lies in the fact that few studies exist to support the belief that attitudes towards statistics impact student learning outcomes (Hilton et al., 2004). The purpose of this study was to better understand undergraduate students' views of statistics. This study sought to further understand anxiety levels, what contributes to them, and what students struggle with while learning statistics.

Methods

Participants included 173 undergraduate students enrolled in an introductory statistics course at a large Midwestern university. Majority of the participants were female (70%) with an average age of 20.32 (SD = 2.07). Participants were administered a 59-item questionnaire assessing statistical anxiety. One of the instruments used was the Survey of Attitudes towards Statistics (SATS) developed by Schau (1995) and the other was the Statistical Anxiety Measure (SAM) developed by Earp (2007). The SATS instrument contained 36 items measuring six components of students' attitudes. The

SAM instrument contained 23 items making up four subscales. Data were entered and analyzed using statistical software. The software was used to calculate descriptive statistics and analyze results. The descriptive statistics are presented in Table 1 below.

Table 1. Descriptive Information from the Quantitative Survey

Instrument	*Subscale*	*Number of Subscale Items*	*N*	*Mean*	*Standard Deviation*
Survey of Attitudes Toward Statistics (SATS)	Affect	6	173	3.46	0.79
	Cognitive Competence	6	173	3.86	0.67
	Value	9	173	3.27	0.74
	Difficulty	7	173	3.05	0.60
	Interest	4	173	2.90	0.84
	Effort	4	173	3.87	0.62
Statistical Anxiety Measure (SAM)	Anxiety	4	172	1.88	0.79
	Class	8	173	3.12	0.61
	Math	6	173	3.40	1.10
	Performance	5	172	3.72	0.75

Results

There was a significant relationship between anxiety and performance, $r(171) = -0.43$, $p < 0.05$. There was a significant relationship between students' view of the class and their performance, $r(172) = 0.47$, $p < 0.05$. There was also a relationship between

students' interest in statistics and their anxiety, $r(172) = -0.28$, $p < 0.05$. There was a significant relationship between cognitive competence and perceived difficulty, $r(173) = 0.55$, $p < 0.05$. The relationship between effort and perceived value of statistics was not significant, $r(173) = 0.07$, n.s.

Discussion

Overall results reveal that students with less anxiety have a higher belief in their ability to perform well in the course. Students with lower anxiety level also have higher levels of interest in statistics. Also students who have a more positive attitude about the class tend to have a higher belief in their abilities. These findings can help statistics instructors plan course lessons that help ease student anxiety. This study can also help researchers better understand how students' attitudes impact students' learning outcomes. Future researchers should expand the scope to examine how students actually did in the course. Researchers could also study retention of material and how that is related to the perceived usefulness of statistics.

Appendix M

PHASE III: QUALITATIVE PASSAGE

Undergraduate Students' Perceptions of Statistics: A Qualitative Study

Introduction

With many fields requiring students to complete some form of statistics prior to graduation the number of students enrolled in these courses is increasing (Loftsgaarden & Watkins, 1998). With this increase in enrollment comes the need to better understand student learning and how attitudes impact learning outcomes (Schau et al., 1995). Researchers have found that students' attitudes toward statistics affect enrollment, achievement, and class climate (Gal et al., 1997). The need for the current study lies in the fact that few studies exist to support the belief that attitudes towards statistics impact student learning outcomes (Hilton et al., 2004). The purpose of this study was to better understand undergraduate students' views of statistics. This study sought to further understand anxiety levels, what contributes to them, and what students struggle with while learning statistics.

Methods

This study was framed within an exploratory design to understand participants experience with statistics. The qualitative design involved semi-structured interviews that explored the experiences and perceptions of undergraduates experience in an introductory statistics course. Participants include 13 undergraduate students enrolled in an introductory statistics couse at a large Midwestern university with a mean age of 19.56 (SD = 1.12). Eight participants were female. Participants were asked questions on eight main topics. The questions dealt with students perceptions of statistics, how they feel

with regard to the usefulness of statistics, and their anxiety with regard to the course. The open-ended questions were adapted from two instruments. The first was the Survey of attitudes Toward Statistics (SATS) developed by Schau (1995) and the other was the Statistical Anxiety Measure (SAM) developed by Earp (2007). The SATS instrument measured six components were used to create 10 open-ended questions. All the interviews were tape-recorded and transcribed verbatim for qualitative analysis. Interview transcripts were first openly coded to identify relevant codes. The open codes were then collapsed into themes that were used to detect similarities and differences across participants. Quotations from participants and themes are presented in Table 1 below.

Table 1: Interview Participants Quotations and Qualitative Themes

Code	*Theme*
• I thought it was going to be easy, but it was difficult • I think that my skills are definitely lacking • I think that I would say I am not good at stats at all. Math hasn't really been my strong suit ever in my life.	Difficulty
• No (I wasn't anxious), I took a course in high school so some of the material was familiar and it was not that tough. • When I think of my stats course, I kind of get stressed out • Yes I am anxious. I feel this way because math is the one subject that is bringing my GPA down.	Anxiety
• I definitely will not ever use it in my personal life • I don't really think that stats play a role at all in my personal life • I don't think it's useful or relevant right now • Statistics is very relevant and useful to my personal life	Value
• I have basic knowledge, still had to teach myself some things • I could have put more work into but I just can't learn from our teacher • My skills have definitely improved over the semester in this statistics course because I worked hard to obtain good grades and understand the concepts.	Effort

Results

Four main themes emerged from the data (Table 1).

Difficulty. When talking about the difficulty of the course participants mentioned how hard certain homework and exam problems were. They also discussed struggling with the math component of the course and mentioned having hard times in past math courses. Participants who saw statistics as difficult reported less confidence in their abilities. One participant stated "I think that my skills are definitely lacking … my knowledge about statistics is limited."

Anxiety. When students were talking about statistics they mentioned having higher levels of anxiety compared to other courses. Many students mentioned that their anxiety comes from the use of numbers and calculations throughout the course. One student stated that "sometimes I get anxious, because I know I'm not doing well and I really don't want to have to retake this course." Some students stated that their anxiety impacted their ability to do as well as they would like to in the course.

Value. While students struggled with various components of the course students did see the usefulness of the course. Students stated that while they were taking the course because it was required they could see how it could be used in their future career. One student stated that they thought "every student should take a statistics course because it is not difficult and it is very relevant to everyday life." Another student said "I think I will use statistics in almost any profession I might employ because statistics is very relevant to the work life."

Effort. In addition to seeing the value of the course some students reported putting lots of work into the course. When asked to compare the amount of time they spent on

their statistics class compared to other courses most students reported spending more time on statistics than other courses. One student said, “I would say that my skills are good/above average because I went to the class often and worked hard to achieve good grades.” However, students who reported spending more time also reported doing better in the course compared to students who reported spending less time. One student said that “as I worked harder throughout the semester I began to understand the concepts and I received better grades.”

Discussion

Overall results reveal that students with less anxiety have a higher belief in their ability to perform well in the course. Students with lower anxiety level also have higher levels of interest in statistics. Also students who have a more positive attitude about the class tend to have a higher belief in their abilities. These findings can help statistics instructors plan course lessons that help ease student anxiety. This study can also help researchers better understand how students’ attitudes impact students’ learning outcomes. Future researchers should expand the scope to examine how students actually did in the course. Researchers could also study retention of material and how that is related to the perceived usefulness of statistics.

Appendix N

PHASE III: MIXED METHODS PASSAGE

Introduction

With many fields requiring students to complete some form of statistics prior to graduation the number of students enrolled in these courses is increasing (Loftsgaarden & Watkins, 1998). With this increase in enrollment comes the need to better understand student learning and how attitudes impact learning outcomes (Schau et al., 1995). Researchers have found that students' attitudes toward statistics affect enrollment, achievement, and class climate (Gal et al., 1997). The need for the current study lies in the fact that few studies exist to support the belief that attitudes towards statistics impact student learning outcomes (Hilton et al., 2004). The purpose of this study was to better understand undergraduate students' views of statistics. This study sought to further understand anxiety levels, what contributes to them, and what students struggle with while learning statistics.

Methods

Quantitative methods. Participants included 173 undergraduate students enrolled in an introductory statistics course at a large Midwestern university. Majority of the participants were female (70%) with an average age of 20.32 (SD = 2.07). Participants were administered a 59-item questionnaire assessing statistical anxiety. One of the instruments used was the Survey of Attitudes towards Statistics (SATS) developed by Schau (1995) and the other was the Statistical Anxiety Measure (SAM) developed by Earp (2007). The SATS instrument contained 36 items measuring six components of

students' attitudes. The SAM instrument contained 23 items making up four subscales. The descriptive statistics are presented in Table 1 below.

Qualitative methods. To better understand students' perceptions of statistics 13 students were interviewed with a mean age of 19.56 (SD = 1.12). Eight participants were female. Participants were asked questions on eight main topics. The questions dealt with students perceptions of statistics, how they feel with regard to the usefulness of statistics, and their anxiety with regard to the course. All the interviews were tape-recorded and transcribed verbatim for qualitative analysis. Interview transcripts were first openly coded to identify relevant codes. The themes are presented in Table 2 below (See Table 2). The qualitative codes and quotations were used to support the quantitative data and to further understand how students felt about statistics.

Table 1. Descriptive Information from the Quantitative Survey

Instrument	*Subscale*	*Number of Subscale Items*	*N*	*Mean*	*Standard Deviation*
Survey of Attitudes Toward Statistics (SATS)	Affect	6	173	3.46	0.79
	Cognitive Competence	6	173	3.86	0.67
	Value	9	173	3.27	0.74
	Difficulty	7	173	3.05	0.60
	Interest	4	173	2.90	0.84
	Effort	4	173	3.87	0.62
Statistical Anxiety Measure (SAM)	Anxiety	4	172	1.88	0.79
	Class	8	173	3.12	0.61
	Math	6	173	3.40	1.10
	Performance	5	172	3.72	0.75

Table 2: Interview Participants Quotations and Qualitative Themes

Code	*Theme*
• I thought it was going to be easy, but it was difficult • I think that my skills are definitely lacking • I think that I would say I am not good at stats at all. Math hasn't really been my strong suit ever in my life.	Difficulty
• No (I wasn't anxious), I took a course in high school so some of the material was familiar and it was not that tough. • When I think of my stats course, I kind of get stressed out • Yes I am anxious. I feel this way because math is the one subject that is bringing my GPA down.	Anxiety
• I definitely will not ever use it in my personal life • I don't really think that stats play a role at all in my personal life • I don't think it's useful or relevant right now • Statistics is very relevant and useful to my personal life	Value
• I have basic knowledge, still had to teach myself some things • I could have put more work into but I just can't learn from our teacher • My skills have definitely improved over the semester in this statistics course because I worked hard to obtain good grades and understand the concepts.	Effort

Results

Quantitative and qualitative results. There was a significant relationship between anxiety and performance, $r(171) = -0.43$, $p < 0.05$. Participants who reported lower levels of anxiety reported higher performance. One participant reporting little anxiety stated that "I have learned a lot in this statistics class … I definitely have more knowledge about statistics because of this course." There was a significant relationship between students' view of the class and their performance, $r(172) = 0.42$, $p < 0.05$. Also participants who also had a more positive attitude of the course tended to do better in the course. "I would say that my skills are good/above average because I went to the class often and worked hard to achieve good grades." There was also a relationship between students' interest in statistics and their anxiety, $r(172) = -0.28$, $p < 0.05$. Participants with less anxiety also reported more interest in the course. One participant stated that "I think I will use statistics in almost any profession I might employ because statistics is very relevant to the work life." There was a significant relationship between cognitive competence and perceived difficulty, $r(173) = 0.55$, $p < 0.05$. Participants who saw statistics as difficult reported less confidence in their abilities. One participant stated "I think that my skills are definitely lacking ... my knowledge about statistics is limited."

Mixed Method Results. The survey and interview results were merged together (see Table 3) to further understand how other statistics students described relationship among certain variables found in the qualitative component of the study.

Table 3: Matrix Combining Survey and Interview Findings

Findings from Survey	*Supportive Quotations from Interview Participants*
Relationship between anxiety and performance	"No (I wasn't anxious), I took a course in high school so some of the material was familiar and it was not that tough"
Relationship between class and performance	"Sometimes I get anxious, because I know I'm not doing well and I really don't want to have to retake this course"
Relationship between anxiety and interest	"I definitely will not ever use it in my personal life"
Relationship between cognitive complexity and difficulty	"However, as I worked harder throughout the semester I began to understand the concepts and I received better grades"

Discussion

Overall results reveal that students with less anxiety have a higher belief in their ability to perform well in the course. Students with lower anxiety level also have higher levels of interest in statistics. Also students who have a more positive attitude about the class tend to have a higher belief in their abilities. These findings can help statistics instructors plan course lessons that help ease student anxiety. This study can also help researchers better understand how students' attitudes impact students' learning outcomes. Future researchers should expand the scope to examine how students actually did in the

course. Researchers could also study retention of material and how that is related to the perceived usefulness of statistics.

Appendix O

PHASE II: QUANTITATIVE VALUE TABLE

Citation	Exact Text – Quotation from Article	Codes	Themes
Albert, N. M., Trochelman, K., Meyer, K. H., & Nutter, B. (2009)	"Differences in continuous measures by race (African American and non-African American) were analyzed using a *t*-test for unequal variance, and categorical measures by race were analyzed using a chi-square or Fisher's Exact Test. Multiple linear regression was used to determine the demographic, socioeconomic, and medical history characteristics that were associated with illness belief scores." (pg. 114) "Our results lay the foundation for future research to better understand predictors of illness belief accuracy and how HF beliefs influence coping. Factors identified here as being predictive of illness belief inaccuracy suggest that HF education must be individualized to meet learning capacity and learning needs and styles. Additionally, HF education should include family members or others who can provide social support, especially when a patient lives alone. HF beliefs should be assessed based on identity, timeline, consequences, and control factors to promote education that may maximize the patient's ability to develop goals for coping that direct self care maintenance and management behaviors." (p. 124)	-Better understanding -Comparing participants -Empirical evidence	-Statistics -Understanding
Atkins, M. J. (1984)	"to collect data; Detachment of researcher" (p. 252)		

Brock, S. E. (2010)	"These findings provide one milestone for educators to use to measure whether sufficient incidences of transformative learning have occurred if this outcome has been deemed important." (p. 137) "This study has provided an initial foray into establishing quantitative targets for evaluation and a better understanding of the process of transformative learning, especially the importance of the 10 precursor steps hypothesized by Mezirow." (p.138) "In several cases, questionnaire items that had a positive relationship to transformative learning were too broadly worded to give the practitioner an adequate sense of what to do in the classroom." (p. 138)	-Comparing participants -Developing instruments	-Statistics
Center, B. A., Skiba, R. J., & Casey, A. (1985)	"Increased attention to quantitative indices of effect may also help direct the attention of reviewers to small effects or complex interactions in large data bases (Pillemer, 1984). Finally, the introduction of quantitative synthesis may provide some impetus toward increasing the empirical basis of research in special education (Sindelar & Wilson, 1984)." (p. 387)	-Assisting future research -Empirical evidence	-Evidence
Chen, Y., & Cheng, K. (2009)	"One class was assigned to experimental group 1, and learnt using the creative problem solving (CPS) strategy applied to a web-based cooperative learning (CSCL) method; another experimental group 2 used the CSCL, and the control group (CG), used traditional lecturing." (p. 1283) "Differences in achievement among the three classes reached significant levels, and the achievement of group	-Assisting future research -Comparing participants -Psychometrics	-Statistics -Evidence

	1 was significantly better than that of the control group." (p. 1283) "Analysis of the results revealed that the reliability of the overall scale was .81 and those of subscales ranged between .36 – .73 for pretest, with 0.94 on the overall scale and .32 – .83 on subscales for posttest, which were considered acceptable." (p. 1288) "The research instrument used here could help future researchers or accounting teachers. The findings of the study also provide some guidelines for making teaching plans or decisions." (p. 1294)		
Cooper, J. L., & Brooks, K. S. (1979)	"A major advantage of the present design is that ethnicity is a randomly assigned variate as regards other expectancy, a control not available to researchers investigating ethnicity differences in self-expectations." (p. 149)	-Comparing participants	-Statistics
Crocker, L. M., Miller, M. D., & Franks, E. A. (1989)	"Measurement experts often advise practitioners of the importance of assessing the extent to which items on an achievement test match a curriculum during test development or test selection. Yet there have been relatively few attempts to develop quantitative indices of content validity (Thorndike, 1982, p. 185). Moreover, the indices that have been proposed have not been widely adopted by practitioners. Our purpose is to provide a summary of analytic methods that may be useful in content validation" (p. 179) "The chief advantage of using this index is that the matching process is fairly straightforward and thus requires less time to compute than other approaches" (p. 181)	-Developing instruments -Psychometrics	-Statistics -Evidence

	"Nevertheless, these values are useful in measuring the overlap of the test with the curriculum" (p. 192)		
Dailin, L., Fengyan, C., Shuangxu, Y., & Fenglong, Z. (2008)	"Timely collection of feedback on the quality of teaching from graduates and their employers is of great significance in distance education, and can help enhance the quality of teaching and improve management and all-round learner support. However, since the graduates left university some years ago, are now widely dispersed and consequently may have changed jobs various times, it becomes more difficult to collect feedback effectively at low cost, and it is even more challenging to establish a regular mechanism for collecting this feedback" (p. 215)	-Comparing participants -Larger samples	-Statistics
Dunnington, M. J. (1957)	"The purpose of this study was to determine whether statistically significant differences in aggressive, imaginative, and verbal behavior could be found between a group of high status children and a group of low status children in a nursery school. Two standardized situations were developed to derive quantitative measures of the behavior" (p. 110)	-Comparing participants -Developing instruments	-Statistics -Evidence
Ethington, C. A. (1988)	"The exploratory approach of this method does not test hypotheses, but involves a decomposition of the data, producing patterns of effects that are not necessarily apparent in the summary data." (p. 355) "The results of this study show that the pattern of differences in quantitative performance measures is the same for groups of intended undergraduate majors as for those students who had completed their undergraduate study." (p. 358)	-Assisting future research -Comparing participants	-Statistics -Understanding
Gladding, S. T. (1984)	"Other impressive qualities about the instrument-in-progress are that it has	-Psychometrics	-Statistics

	been tested and retested on various groups and that the researchers have been most careful to ensure high levels of reliability and validity." (p. 103) "A final commendable aspect of these articles is the ability of both research groups to report quantitative results. Too often, studies are reported in vague terminology. The work of both groups is quite clear. Most terms are precisely defined, and both groups give examples of the instruments with which they are working." (p. 104)		
Grover, G., Heck, J., & Heck, N. (2010)	"Administering the pretest using a larger sample set and with students from different institutions may result in more definitive findings. Conducting the test across different universities with different instructors should also provide a much larger data set, although it presents difficulties with controlling for possible professor effects." (p. 66)	-Generalizibility -Larger samples -Psychometrics	-Statistics -Understanding
Hall, M. C. (2009)	"The results from this study support the earlier conclusion by Hall (2008) that the two surveys "Is Online Learning Right for Me?" and "What Technical Skills Do I Need?" have low predictive validity. Although many of the items listed on these surveys have face validity with regard to traits and skills needed for success in distance education, the lack of internal reliability and predictive validity should be a consideration for institutions considering the use of these surveys for counseling or dispensing advice." (p. 344)	-Psychometrics	-Statistics
Hilari, K., Northcott, S., Roy, P., Marshall, J.,	"The main strength of our study was the inclusion of people with aphasia." (p. 187)	-Better understanding -Empirical evidence	-Statistics -Understanding -Evidence

Wiggins, R. D., Chataway, J., & Ames, D. (2010)	"Other studies also indicate that in the longer term post stroke (more than three months) functional outcome is not related to depression. Our finding may suggest that at the later stages post stroke other factors, rather than stroke-related disability, may become increasingly important in determining whether people will be distressed or not." (p. 187) "Our finding is limited by having only 11 people with aphasia at six months. Still, this finding may also point to the importance of other factors, such as social factors in relation to distress. Social factors have often been neglected in studies exploring post-stroke distress." (p. 188) "Although the association between loneliness and depression is well established for the general population, this finding confirms the relationship in the stroke population as well." (p. 188) "Our finding enriches this picture: it appears that social factors prior to the stroke (i.e. not just those caused by the stroke) make a person more at risk of developing post-stroke depression." (p. 188) "The strengths of our study are a longitudinal design, the inclusion of people with aphasia and a wide range of variables, including social factors, in the exploration of predictors of distress post stroke." (p. 188)	- Generalizibility -Larger samples	
Hoover, A., & Krishnamurti, S. (2010)	"investigated issues (habits, safety issues, attitudes, and education) related to MP3 player use in college students spread over different geographical locations of the United	-Assisting future research -Better understanding -	-Understanding -Evidence

	States" (p. 73) "These results suggest that young adults who like to listen to MP3 players often incorporate this activity within their daily lifestyle" (p. 75 – 76).	Generalizibility -Larger samples	
Hutchison, D. (2009)	"Education, and information about education, is highly structured: individuals are grouped into classes, which are grouped into schools, which are grouped into local authorities, which are grouped into countries. The degree of similarity among members of a group, such as a school or classroom, is a very important factor in the design and analysis of studies in education" (p. 109) "The aim of this article is to provide information on this degree of similarity within schools to enable those involved in carrying out surveys of schools to do so most efficiently in terms of resources and minimum disturbance of schools" (p. 109)	-Better understanding -Comparing participants -Empirical evidence -Larger samples	-Statistics -Understanding -Evidence
Jackel, B., Wilson, M., & Hartmann, E. (2010)	"Although the results presented here were based on a convenience sample and cannot be generalized to other parents of children with CVI, the data provide a glimpse into the difficulties that this group of parents faced as they tried to get services and appropriate diagnoses for their children." (p. 619)	-Comparing participants	-Understanding
Kavale, K. A., & Nye, C. (1985)	"Meta-analysis typically attempts to answer questions that are broad in scope in order to portray an entire domain." (p. 444) "Meta-analysis typically attempts to be inclusive by capturing a majority of the studies in the area under consideration." (p. 444)	-Assisting future research -Empirical evidence	-Understanding -Evidence

Klein, N., Hack, M., Gallagher, J., & Fanaroff, A. A. (1985)	"Matched-sample t tests were performed on all outcome measures in order to determine the significance of the mean differences of the children who were VLBW infants and their matched control children who had been born at full term." (p. 532)	-Better understanding -Comparing participants -Larger samples	-Statistics
Park, J., & Choi, H. J. (2009)	"This study added additional evidence for the latter by showing that the persistent learners did not differ from the dropouts in their individual characteristics." (p. 215) "Accordingly, the results were hardly generalizable to learners in different environments, and additional empirical evidence was needed to support the contention." (p. 215) "To involve additional relevant factors and to expand the model to better explain and predict adult learners' decision to drop out of online courses." (p. 216)	-Empirical evidence -Generalizibility	-Evidence
Parsons, S., Lewis, A., & Ellins, J. (2009)	"To seek a wider range of views, Whitaker (2007) conducted a postal survey of parents of children with ASD in one local authority in England, with a specific focus on satisfaction with mainstream educational provision (published since we undertook our study)." (p. 38)	-Better understanding -Generalizibility	-Statistics -Understanding
Perez-Turpin, J. A., Cortell-Tormo, J. M., Suarez-Llorca, C., Chinchilla-Mira, J. J., & Cejuela-Anta, R. (2009)	"The relation between the patterns of the offensive and defensive movements with the type of movements is a key point in our research." (p. 216) "This analysis helps us to discover the physical work load in beach volleyball." (p. 216) "Improved understanding of the gross movement patterns and movement	-Better understanding -Comparing participants	-Statistics -Understanding

	types is very important for establishing specific beach volleyball training drills and programmes." (p. 217)		
Pfeiffer, S. I., Overstreet, J. M., & Park, A. (2010)	"Our interest was in learning more about the state of public residential academies nationwide" (p. 26) "We developed a comprehensive survey questionnaire with the goal of sharing it with the directors of each of the 17 residential academies nationwide" (p. 26 – 27)	-Better understanding -Psychometrics	-Statistics -Understanding
Pulcini, J., Jelic, M., Gul, R., & Loke, A. Y. (2010)	"To describe international trends on the developing role of the nurse practitioner-advanced practice nurse (NP-APN), including nomenclature, levels and types of NP-APN education, practice settings, scope of practice, regulatory policies, and political environment" (p. 31)	-Assisting future research -Better understanding -Larger samples	-Statistics -Understanding -Evidence
Rubin, D., Robinson, B., & Valutis, S. (2010)	"the ability to use and critically evaluate research findings provides the foundation for selecting the best available interventions for client systems" (p. 40) "During the 1980s and early 1990s, multiple reviews and surveys attempted to describe student research in social work curricula" (p. 40) "We developed a 48-item electronic survey to address the research questions" (p. 42)	-Assisting future research -Empirical evidence	-Evidence
Schlomske, N., & Pirnay-Dummer, P. (2009)	"This indicates that the reference models provide appropriate indicators for predicting the development of expertise." (p. 761) "This study shows that is possible to predict a group's learning behavior and progress." (p. 762) "Something which is still unclear is	-Better understanding -Comparing participants -Psychometrics	-Statistics -Understanding

	the unusually high correlation of the learner progression trajectory. This would even be surprising if the testing had been applied to the very same group, e.g., to account for retest reliability" (p. 762) "Even with a completely new group and a new instructor, the reference models of the previous group could be used to predict the learners' progress over time" (p. 762)		
Sears, S. J., & Navin, S. L. (1983)	"While stressors in school teaching and school administration have been researcher, for the most part, stressors in school counseling have been considered. For this reason, 240 school counselors were surveyed to investigate 1) the prevalence of experienced stress, 2) the source of stress, and 3) if a relationship exists between perceived stress and certain biographic variables." (p. 333) "Relationship between perceived stress and biographic characteristics. To determine if the biographic characteristic of sex, age, marital status, years of counseling experience and assigned grade level and the self-reported counsel stress are independent, the Statistical Package for the Social Sciences Subprogram Cross Tabs was used." (p. 336)	-Better understanding -Comparing participants	-Statistics -Understanding
Siegel, C., Laska, E., Griffis, A., & Wanderling, J. (1978)	"These quantitative norms must be used concomitantly with review criteria or measures that relate directly to the impact of the treatment process on patient outcome. It is in this arena that major difficulties will arise in determining the appropriateness of the care being rendered. Quantitative norms can act to serve as initial guideposts but the ultimate issue is what is best for the patient." (p. 358)	-Comparing participants -Larger samples	-Statistics -Understanding

Waxman, H. C. (1985)	"To answer these questions, this study quantitatively, synthesized experiemental and quasi-experimental, published and unpublished research on the effects of adaptive education on student outcomes in naturalistic settings. The techniques of research synthesis that were applied derive from the work of Glass, McGam, and Smith (1981) and Hunter, Schmidt, and Jackson (19820 on meta-analysis, as well as contributions by Hauser-Cram (1983), Cooper and Rosenthal (1980), and Walberg and Haertel (1980)." (p. 228)	-Assisting future research -Better understanding -Empirical evidence	-Understanding -Evidence
Wuthnow, R. (1976)	"The relation between these variables could be tested most rigorously with quantitative, longitudinal data from a systematic sample of nations." (p. 87) "The same criticism can be made concerning other theoretically important issues, such as the relations between religious change and social integration, the effects of separation between church and state, or the relations between ethnic diversity and religious commitment. All could usefully be examined with quantitative cross-national research" (p. 87 – 88) "Earlier it was suggested that quantitative longitudinal, cross-national data on religiosity should be useful in assessing theories relating modernization and secularization." (p. 93-94)	-Comparing participants -Empirical evidence -Larger samples	-Statistics -Evidence

<u>Themes</u>
-Statistics
-Understanding
-Evidence

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Appendix P

PHASE II: QUALITATIVE VALUE TABLE

Citation	Exact Text – Quotation from Article	Codes	Themes
Atkins, M. J. (1984)	Qualitative focus on: Discovery and understanding of personal meaning; Illumination of intersubjective construction of reality; Claim for relative truths; General held to be inherent in particular; Reliance on informed judgment of reader to assess generalization to other known contexts; Relationships and distinctions between cases; The unique an acceptable subject of research; Processes; Arts paradigms; Researcher as own instrument in collection of evidence; Involvement/participation of researcher" (p. 252)	-Deep understanding	-Deep understanding
Baker-Henningham, H., & Walker, S. (2009)	"This study shows how in-depth interviews with teachers can assist in evaluating the acceptability and usefulness of a school-based intervention from the teachers' perspective. This methodology can inform future implementation by identifying the skills teachers find most useful and those that are more difficult and may need additional emphasis. In-depth interviews can also assist in identifying the scope of potential outcomes and in building hypotheses about the mechanism by which the intervention achieves its effects" (p. 640-641)	-Contribute to field -Explore -Flexible design	-Deep understanding -Flexible design

Bitew, G., & Ferguson, P. (2010)	"This paper is a qualitative study as it is concerned with explaining and assessing the parents' involvement with their children's schooling (Kumar, 1996; Patton, 2002) in particular, but also the link between parental involvement and influence and the students involvement in educational and friendship communities. Interviewing was used as the main data collection tool and was selected for its ability to provide insight into students' experiences, particularly at school, as they related to their parents' academic support and influence." (p. 151-152)	-Deep understanding -Insight	-Deep understanding
Bjerga, H., & Rasmussenb, L. R. (2008)	"Both studies use qualitative interviews as a way of studying subject formations in educational history" (p. 721) "Within this performance of identity the interviewee enacts different subject positions and thereby actualises contexts of time and space that are outside the actual interview. Looking at the enactments enables us to gain knowledge about the subject positions linked to school and education that have found their way into the memories enacted in the interview. And as we have argued, this may work as an entrance for understanding how school and education has been practised, lived and experienced from a pupil's perspective." (p. 730-731)	-Deep understanding -Insight	-Deep understanding
Contreras-McGavin, M., & Kezar, A. J. (2007)	"leaders in the assessment arena suggest that qualitative approaches such as portfolios are more mature means to assess student learning and best support efforts to improve learning" (p. 70) "we argue that qualitative approaches should also be employed to help	-Deep understanding -Insight -Rich data	-Deep understanding

	develop a richer and more meaningful portrait of undergraduate student learning on college and university campuses" (p. 70) "Furthermore, qualitative assessment can inform our understanding of areas where we have quantitative measures, such as moral judgment, that are captured in only limited ways" (p. 71) "Qualitative portfolios can provide a deeper and broader understanding of student learning in a number of ways" (p. 72)		
Court, D. (2008)	"Rich analytic description should include both the voices of the researched and the undisguised voice of the researcher, who reveals him- or herself and his or her subjectivity in the interpretive account that he or she writes" (p. 410) "For me the result has been, among other things, new insight into the Canadian culture from which I come, new understanding of the complexities of cultural study and the insider or outsider status of the researcher (see Banks 1998), and new engagement with my own religion, including more passionate prayer, more anger at God, leading to more intimate conversations, deeper engagement, and more committed seeking for meaning" (p. 412) "Interestingly, qualitative researchers also walk a kind of invisible bridge when, after intensive data collection, engagement with study participants and struggles to externalize their own experience, prejudice, values, and beliefs and separate these from the people they are studying, they make	-Deep understanding -Participants' voice -Rich data	-Deep understanding

	the leap of faith from factual data to inspired interpretation" (p. 424)		
Delyser, D. (2008)	"And qualitative writing seeks to retain the individuality of such materials, most often avoiding aggregation of data and representing empirical materials in richly descriptive accounts. Rather than speak of 'generalizability' (where data or interpretations are understood to be directly transferable to other places or situations), qualitative researchers more often engage social theory as a means to speak beyond the nuances of their empirical studies. Such insights often enable other qualitative researchers to gain insight into places, people and situations very different from those originally studied" (p. 234)	-Flexible design -Insight -Rich data	-Deep understanding -Flexible design
Demerath, P. (2006)	"A core assumption is that qualitative research contributes understandings that are central to Western science. This centrality derives from the essential role context plays in the social sciences (Flyvbjerg, 2001), and the overarching purpose of qualitative inquiry to understand action-in-context. Indeed, anthropologists, working in a parent discipline of qualitative methodology, have recently been described as 'keepers of context and interrelatedness' (Goldschmidt, 2001, p. 803), and, as Laura Nader observes, the inferences they build from these commitments enable them to make connections that are not made elsewhere" (p. 98) "Qualitative researchers, including Forsythe above, often use the term 'flexible' with regard to methods, and this is another convention that can mystify researchers from other traditions. Because what we learn in part shapes where we next look and	-Deep understanding -Flexible design	-Deep understanding -Flexible design

	what we next ask, our designs are flexible and emergent. Thus, while quantitative studies are typified by rigid controls, qualitative researchers and ethnographers often, astonishingly, have to actively give up control if they are truly going to get close to the local or *emic* point of view" (p. 102)		
Dietrich, H., & Ehrlenspiel, F. (2010)	"Cognitive interviewing is a qualitative tool to gain insight into this process by means of letting respondents think aloud or asking them specific questions (Willis, 2005). It allows one to evaluate whether an individual respondent understands and processes the instrument's items as was intended by the instrument's developer." (p. 51) "The comparison between the respondent's processing of each item and that intended by the researcher can enhance wording and construction of any instrument in which questions are used for data collection. This comparison, in turn, can increase the instrument's reliability (e.g., refining ambiguously worded items) and validity." (p. 51) "Cognitive interviewing is a qualitative means to evaluate and improve questionnaires." (p. 58)	-Deep understanding -Insight -Participants' voice -Psychometrics	-Deep understanding -Participants' voice
Dobson, S. (2008)	"Hartley and Jory (2000) noted that questionnaire data tended to lack the rich description and feel for respondents gained from more qualitative data" (p. 278) "The argument made in this essay has been for a qualitative approach in the desire to achieve a theoretical understanding of the viva in higher education" (p. 285)	-Deep understanding -Rich data	-Deep understanding

Egilson, S. T., & Traustadottir, R. (2009)	"The study was framed within an inductive perspective to capture the participants' understanding and experiences" (p. 23) "The qualitative design involved naturalistic observations and semi-structured interviews that explored the experiences and perspectives of pupils, teachers, and parents regarding the assistance provided to pupils with physical disabilities in general education settings" (p. 23) "While the findings cannot be generalised, the triangulated use of multiple data and the variety of foci and methods strengthen the dependability of the study findings" (p. 34)	-Deep understanding -Flexible design -Participants' voice -Psychometrics	-Deep understanding -Participants' voice -Flexible design
Gardner, S. (2010)	"Understanding that the doctoral experience is centralized within the discipline and the department (Golde, 2005) and that institutional context and culture uniquely influence the student experience (Kuh & Whitt, 1988)." (p. 61) "The three-phase sampling subsequently allowed for a better understanding of the specific issues and concerns relevant to the student at the particular time of graduate study." (p. 68) "While this study was able to lend a fuller understanding to the graduate student socialization process more research is certainly needed." (p. 77) "With these increased understandings of the socialization of graduate students, researchers, administrators, and faculty alike may be better able to assist future students in higher levels of completion, and therefore	-Deep understanding -Insight	-Deep understanding

	success, in graduate school and beyond." (p. 78)		
Gardner, S. K. (2008)	"I utilized qualitative methodology to address the research question as it allows for a greater explanation and description of the students' experiences. Qualitative methodology is also preferred when conducting exploratory studies, as it allows for the identification of unanticipated phenomena and influences" (p. 128)	-Deep understanding	-Deep understanding
Gislason, N. (2009)	"Such a study is exploratory by nature because there is no established framework for conducting school design research, and no one has systematically examined how school architecture informs teaching and learning" (p. 18) "Nevertheless, this case study represents an initial contribution to school design research, as I focus on site-specific observations rather than on design principles that can be applied on a wide scale" (p. 32)	-Contribute to field -Flexible design	-Flexible design
Harper, S. R. (2007)	"Phenomenology in qualitative research focuses on understanding and describing the lived experiences of people who have experienced a phenomenon or been exposed to a certain set of conditions (Creswell, 1998, 2007; Denzin and Lincoln, 2000). A phenomenological account gets inside the experience of a person or group of people and describes what participants have experienced, how they have experienced it, and their sense making regarding various effects relative to the phenomenon" (p. 57) "In addition to in-depth individual interviews, focus groups with particular subpopulations could also produce insightful data." (p. 66)	-Deep understanding -Insight	-Deep understanding

	"Qualitative methods can reveal aspects of student learning and development that enable institutions to be more effective and efficient" (p. 66)		
Horowitz, G. (2010)	"The semi-structured interview format allowed students to describe their goals in their own words and did not restrict their responses." (p. 219) "Lemos (2004) argued that the most effective way to find out the goals behind student behaviors is to ask students to explain both their behaviors and their goals." (p. 220 – 221) "One strength of qualitative research is the depth of information that it provides. This study provides a realistic picture, in students' own words, of what their achievement goal orientations look like." (p. 239)	-Deep understanding -Flexible design -Insight -Participants' voice	-Deep understanding -Participants' voice -Flexible design
Jett, S. T., & Delgado-Romer, E. A. (2009)	"We chose qualitative inquiry because it generally focuses on context and how participants understand their experiences" (p. 108)	-Deep understanding	-Deep understanding
Jha, V., Quinton, N. D., Bekker, H. L., & Roberts, T. E. (2009)	"Exploring the views of people from different medical schools with different types of patient involvement will be a useful next step to gaining further understanding of the potential and real impact of patients as educators." (p. 455)	-Deep understanding -Explore	-Deep understanding
Joe, J. N., Harmes, J. C., & Barry, C. L. (2008)	"Content analysis with thematic networks emerged as the most appropriate method for organizing themes and exploring meanings of text in this study (Attride-Stirling, 2001). This analytic approach draws on the aspects of commonly used qualitative approaches to investigate trends and patterns (Stemler, 2001) and develop meanings of text (e.g., argumentation theory, grounded	-Explore -Flexible design	-Flexible design

	theory, semantic mapping). The strength of the thematic network as an analytic tool is that it allows the researcher to reduce textual data into "weblike" networks and create global linkages among basic and organizing themes more efficiently (Attride-Stirling, 2001). The process of developing meaning is thus more transparent" (p. 135)		
Kumar, K., Roberts, C., Rothnie, I., Fresne, C., & Walton, M. (2009)	"We gained a deeper understanding of participants' experiences of a highstakes, decision-making process for selection into a graduate-entry medical school" (p. 360) "However, by exploring the experiences of candidates and interviewers within a qualitative paradigm, we have gained a richer understanding of the MMI process from the perspective of those involved" (p. 365) "Furthermore, triangulation of data from multiple sources and sampling across different interview days ensured a representative sample of views, although we accept there may have been a volunteer effect, particularly in terms of interviewer participation" (p. 366)	-Deep understanding -Insight -Participants' voice	-Deep understanding -Participants' voice
Lacey, J., Cate, H., & Broadway, D. C. (2009)	"From the rich amount of data acquired and the creation of six themes directly reflecting participant opinion, 'Framework' analysis and qualitative methodology successfully unearthed participant opinion. Use of both focus groups and interviews allowed the study to benefit from the dynamics attributed to both group discussion and individual interviews" (p. 931) "the agreement between focus groups	-Psychometrics -Rich data	-Deep understanding

	and interviews in terms of content and opinion added to study reliability" (p. 931)		
Lee, T., Lee, T., & Kuo, S. (2009)	"Many studies have focused on the benefits of breastfeeding to very low birth weight babies, but very few have explored the breastfeeding experiences of their mothers." (p. 2523) "Content analysis, a systematic and objective means of describing and qualifying phenomena (Sandelowski 1995), was used in this study to analyze the data." (p. 2525)	-Explore	-Deep understanding
Lim, J. H., Dannels, S. A., & Watkins, R. (2008)	"We envision our study as pilot research exploring the possibilities of using online delivery method for doctoral student training in the future" (p. 235-236)	-Explore -Flexible design	-Deep understanding -Flexible design
Museus, S. D. (2007)	"Because researchers must be careful not to lose a holistic understanding of institutional cultures in attempting to comprehend the impact of particular cultural elements on individual and group behaviors and experiences, however, qualitative methods are especially indispensable in such efforts. Kuh and Whitt (1988) asserted that "institutional culture is so complex that even members of a particular institution have difficulty comprehending its nuances. To describe an institution's cultural properties, methods of inquiry are required that can discover core assumptions and beliefs held by faculty, students, and others and the meanings various groups give to artifacts" (p. vii). Thus, although quantitative methods are a useful means for understanding how pervasive or influential particular pre-identified cultural elements are in the behavior and experiences of	-Deep understanding -Insight	-Deep understanding

	individuals or groups across one or more institutions, they are insufficient tools for uncovering and gaining an in-depth understanding of what, how, or why various cultural properties shape individual or group actions and experiences. The qualitative research paradigm offers many tools that can be useful in assessing how college and university cultures shape the experiences of individuals within those institutions." (p. 31-32) "the qualitative assessment provided in-depth insight into the influence that institutional cultures have on the experiences of minority students at Mid-Atlantic, which would likely have remained hidden if the assessment had been limited to the administration of a quantitative culture or climate survey" (p. 36)		
Ohalete, N., Georges, J., & Doswell, W. (2010)	"Meanings generated through interpretation rely on the core rules of ethnographic methods which allow for the examination of fundamental problems of social existence particularly in those groups whose experience is that of oppression and domination." (p. 15)	-Deep understanding -Explore -Participants' voice	-Deep understanding -Participants' voice
Pifarré, M., & Cobos, R. (2009)	"Previous CSCL research revisions highlight the suitability of case study methodology to understand the complex factors influencing computer-mediated collaborative learning in educational contexts" (p. 792)	-Deep understanding -Insight	-Deep understanding
Reed, M., Harrington, R., Duggan, A., & Wood, V. A. (2010)	"A qualitative study using a phenomenological approach, to explore stroke survivors' needs and their perceptions of whether a community stroke scheme met these needs." (p. 16) "It set out to achieve increased	-Deep understanding -Explore -Flexible design -Insight	-Deep understanding -Flexible design

	understanding of participants' lived experience of the scheme in the context of their stroke and their perceived needs, a phenomenon not easily accessed by quantitative means." (p. 22)		
Simcox, A. M., Hewison, J., Duff, A. J. A., Morton, A. M., & Conway, S. P. (2009)	"The findings extend the current knowledge in this area." (p. 323)	-Contribute to field -Deep understanding -Explore	-Deep understanding
Wright, A. N., & Tolan, J. (2009)	"Sykes (1990) argues that qualitative designs strengthen their validity when a thorough description is provided of the data collection and analysis method" (p. 144) "This important insight about causes of prejudicial behavior became grouped in the one of the many *Other* sub-theme categories." (p. 149)	-Flexible design -Insight -Psychometrics	-Flexible design
Yardley, S. J., Walshe, C. E., & Parr, A. (2009)	"The theory behind our study was that gaining the perspective of patients could be used to facilitate professional development" (p. 602) "A qualitative interview approach is an appropriate method to obtain patient perspectives" (p. 602)	-Deep understanding -Participants' voice	-Deep understanding -Participants' voice
Zayac, S., & Finch, N. (2009)	"Multiple themes pertaining to adjustment to ICD therapy are identified, which warrant further study for potential therapeutic interventions." (p. 555) "Although a vast quantitative database exists for this unique population, qualitative studies reporting the lived experiences, pertaining to actual and perceived physical and psychological adaptation to the device, remain insufficient. Qualitative research is necessary to facilitate healthcare providers with the best opportunity	-Contribute to field -Deep understanding -Participants' voice	-Deep understanding -Participants' voice

	for a tailored, proactive intervention for ICD recipients, in order to prevent adjustment and adaptation complications." (p. 555-556)		

Themes
-Deep understanding
-Participants' voice
-Flexible design

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Appendix Q

PHASE II: MIXED METHODS VALUE TABLE

Citation	Exact Text – Quotation from Article	Codes	Themes
Alcorn, S. R., Balboni, M. J., Holly, G. P., Reynolds, A., Phelps, A. C., Wright, A. A., Block, S. D., Peteet, J. R., Kachnic, L. A., Balboni, T. A. (2010)	"Our study findings can also inform the content of spiritual care interventions for further research." (p. 587)	-Contribute to field -Better understanding	-Confirm findings -Capitalize on strengths and minimize weaknesses -Better understanding
Belland, B. R. (2010)	"This study incorporated a mixed-methods approach to address different question types" (p. 287)	-Complex research questions	-Complex research questions
Benoit, C., Westfall, R., Treloar, A., Phillips, R., & Jansson, M. (2007)	"Our qualitative analyses are insufficient to fully address the links we have made between income, caregiver, birth experience and depression, as both income and depression data were gathered in the self-administered section of the survey interview, without qualitative follow-up. However, the qualitative data do support and contextualize the association between care provider, continuity of care provider, and birth satisfaction." (p. 728)	-Capitalize on strengths and minimize weaknesses	-Capitalize on strengths and minimize weaknesses
Bishop, A. G., Brownell, M. T., Klingner, J. K., Leko, M. M., & Galman, S. A. C. (2010)	"We employed a mixed-methods strategy of inquiry. We deemed this to be the most appropriate approach for helping us understand the confluence of personal attributes, preparation, and school environment of participating beginning teachers. Such a method allows for more in-depth study of factors than is possible using other approaches. This strategy of inquiry enabled us to examine teachers in context" (p. 78).	-Better understanding -Confirm findings	-Confirm findings -Better understanding

Bryman, A. (2007).	"A particular discourse that reflects the traditional view, whereby mixed-method research is viewed as only appropriate when research questions warrant it, was uncovered. In addition, a universalistic discourse which sees mixed method research as more generally superior, was also uncovered." (p. 5)	-Complex research questions	-Complex research questions
Carr, E. (2008).	"This paper connects quantitative and qualitative data, drawing on two research studies, to give greater understanding to the management of pain." (p. 124)	-Better understanding	-Better understanding
Clark, V. L. P., Garrett, A. L., Leslie-Pelecky, D. L. (2010)	"Researchers' use of mixed methods to address complex research questions across diverse disciplines is growing in prevalence and acceptance" (p. 155) "Thus, we included both types of data to develop a more complete understanding of the participants' perceptions" (p. 159)	-Complex research questions -Better understanding -Confirm findings	-Confirm findings -Complex research questions -Better understanding
Curry, K. T., & Hanson, W. E. (2010)	"To answer these questions, we used a sequential explanatory mixed methods design (Creswell & Plano Clark, 2007; Hanson, Creswell, Plano Clark, Petska, & Creswell, 2005). This design, according to Greene, Caracelli, and Graham (1989), serves the purpose of *complementarity,* which "seeks elaboration, illustration, clarification of results from one method with the results of the other method" (p. 259). In other words, the data collected in the quantitative phase may not provide the complete picture of test feedback training and practice, so the sequential explanatory mixed methods design was employed to "increase the interpretability, meaningfulness, and validity of the constructs and inquiry by both	-Complete picture -Contribute to field -Better understanding -Explore -Rich data -Psychometrics	-Confirm findings -Capitalize on strengths and minimize weaknesses -Better understanding

	capitalizing and counteracting inherent biases in methods and other sources" (Greene et al., 1989, p. 259). However, as with qualitative research in general, the goal for the qualitative phase of the study is credibility and not generalization (p. 327).		
Dunning, H., Williams, A., Abonyi, S., & Crooks, V. (2008).	"The main goal of triangulation is to confirm a study's results by using qualitative and quantitative methods. A mixed method approach, however, goes beyond the initial goal of triangulation (confirmation of results using different methods or data sets), using multiple methods to also gain a better understanding (comprehension) of results, discover new perspectives, or develop new measurement tools." (p. 147) "Thus, there are two broad goals of using mixed methods-confirmation and comprehension of results." (p. 147) "The integration of both types of data could lead to a more in-depth conceptual understanding of a particular phenomenon." (p. 147) "The second goal of mixed methods is comprehension, which brings together qualitative and quantitative research approaches to provide a more comprehensive and detailed understanding of the phenomenon under study and/or explain certain anomalies in the data." (p. 147) "One benefit is to increase a researcher's confidence in the data and findings. Such comparisons may also provide an opportunity to revisit existing theories or better understand the phenomenon under study." (p. 147)	-Confidence -Confirm findings -Contribute to field -Better understanding	-Confirm findings -Better understanding

Fuentes, C. M. (2008).	"This study fills important gaps in the current domestic violence literature by not only verifying increased risk for STIs, including HIV/AIDS, among abused women but also by employing a mixed-method approach in order to delineate the specific pathways by which this risk is generated." (p. 1600)	-Better understanding -Complete picture -Confirm findings	-Confirm findings -Better understanding
Gibbins, J., McCoubrie, R., Maher, J., Wee, B., & Forbes, K. (2010)	"A mixed methods approach using a questionnaire based on two previous surveys and interviews to explore the views and experiences of coordinators of palliative care in different UK medical schools was employed to enable a deeper understanding of the teaching that takes place" (p. 300) "Previous studies have used questionnaires to report the content of undergraduate palliative care teaching, revealing a lack of consistency in what medical students were taught (1996–2001). We therefore added a qualitative approach to provide a deeper understanding of the courses and to explore what coordinators are really trying to achieve for medical students" (p. 303)	-Better understanding -Explore	-Capitalize on strengths and minimize weaknesses -Better understanding
Greene, J. (2008).	"A mixed methods way of thinking is an orientation toward social inquiry that actively invites us to participate in dialogue about multiple ways of seeing and hearing, multiple ways of making sense of the social world, and multiple standpoints on what is important and to be valued and cherished." (p. 20)	-Capitalize on strengths and minimize weaknesses -Complete picture -Confirm findings	-Confirm findings -Capitalize on strengths and minimize weaknesses
Hodgkin, S. (2008).	"Despite past reluctance of feminists to embrace quantitative methods, the big picture accompanied by the personal story can bring both depth and texture to a study." (p. 296)	-Complex research questions -Confirm findings -Rich data	-Confirm findings -Complex research questions -Better

		-Better understanding	understanding
Hoffman, B., & Nadelson, L. (2010)	We used a concurrent triangulation mixed-method design which is useful for researcher(s) who, ‘‘want to directly compare and contrast quantitative statistical results with qualitative findings or to validate and expand quantitative results with qualitative data’ (p. 249) Methodologically, quantitative and qualitative results were equally weighted to obtain complementary data using the convergence model (Creswell and Plano Clark 2007) with the intention of integrating results to inform plausible conclusions. (p. 250)	-Confirm findings -Complete picture -Capitalize on strengths and minimize weaknesses	-Confirm findings -Capitalize on strengths and minimize weaknesses
Jaén, C. R., Crabtree. B. F., Palmer, R. F., Ferrer, R. L., Nutting, R. A., Miller, W. L., Stewart, E. E., Wood, R., Davila, M., & Stange, K. C. (2010)	“A multimethod approach is challenging, but feasible and vital to understanding the process and outcome of a practice development process.” (p. 9) “We hope that the articles in this supplement and elsewhere15 show the added value of a multimethod evaluation by an independent team in telling a more complete version of the complex, context-dependent story that a transformative practice change process involves.” (p. 18)	-Complete picture -Better understanding -Confirm findings	-Confirm findings -Better understanding
Jang, E., McDougall, D. E., Pollon, D., Herbert, M., & Russell, P. (2008).	“Although mixed methods research has been widely accepted as a legitimate research inquiry approach, leading mixed methods scholars pinpoint a lack of integration of the findings from qualitative and quantitative strands of data as a significant deficiency in mixed methods research practice.” (p. 241) “The purpose of this article was to illustrate mixed methods data analytic strategies that purposefully integrate the findings from qualitative and	-Complete picture -Complex research questions -Confidence -Confirm findings	-Confirm findings -Complex research questions

	quantitative strands of data from the research on school improvement in schools facing challenging circumstances." (p. 241)		
Kraska, P. B., Bussard, C. R., & Brent, J. J. (2009)	Armed with an in-depth understanding of the inner-workings, nomenclature, and operations of the underground steroid marketplace, the authors then attempted to collect quantitative data that would assist in placing these micro-level findings within the larger steroid marketplace (p. 164 – 165) Ethnographic field research is a valuable tool for collecting ground-level qualitative data that help us to develop an empathetic understanding (Weber's Verstehen) of research subjects' behaviors, activities, rationales, and motivations. Several findings are worth highlighting (p. 174) The initial qualitative study exposed an important local phenomenon that raised the question of whether it indicated a larger societal phenomenon—something traditional ethnographies have difficulty addressing. (p. 176)	-Contribute to field -Better understanding	-Capitalize on strengths and minimize weaknesses -Better understanding
Kristensen, E., Nielsen, D., Jensen, L., Vaarst, M., & Enevoldsen, C. (2008).	"By integrating quantitative and qualitative research methods in a mixed methods research approach, the researchers will improve their understanding of this potential bias of the observed data and farms, which will enable them to obtain more useful results of quantitative analyses." (p. 1) "We believe that an appropriate and well-reflected integration of different scientific methods may contribute significantly to the understanding of any data potentially influenced by	- Capitalize on strengths and minimize weaknesses -Better understanding -Rich data -Confirm findings	-Confirm findings -Capitalize on strengths and minimize weaknesses -Better understanding

	human action." (p. 5)		
Lai, G., & Calandra, B. (2010)	"The goal of mixed methods research is not to replace either quantitative or qualitative research but rather to draw from the strengths and minimize the weaknesses of both in single research studies and across studies (Johnson and Onwuegbuzie 2004; Onwuegbuzie and Leech 2004)." (p. 424) "An explanatory mixed methods design was appropriate for this study, which aimed to not only examine whether the integrated computer-based scaffolds could enhance preservice teachers' reflective thinking capability in their online journal writing, but also explain how and why this may have occurred." (p. 424)	-Capitalize on strengths and minimize weaknesses -Complex research questions -Confirm findings	-Confirm findings -Capitalize on strengths and minimize weaknesses -Complex research questions
Lipman, E. L., Kenny, M., Jack, S., Cameron, R. Secord, M., Byrne, C. (2010)	The utility of complementary information provided by qualitative and quantitative methods in understanding program impact, as well as the need for broader assistance is noted (p. 1) We added a qualitative component to our study of high-risk mothers to further understand the benefits and limitations of our community-based group program. (p. 2) This type of qualitative approach is used to provide a comprehensive summary of facts and events, using the 'everyday' language of the participants, and is commonly used by researchers who require answers to questions about specific events or phenomena (p. 2) The qualitative research method and comments made by the mothers supplement and augment our	-Confidence -Better understanding -Confirm findings	-Confirm findings -Better understanding

	quantitative study data. (p. 8)		
McCallum, C. A. (2010)	"The 3 sources of data—transcribed interviews, document data, and survey results—were analyzed using a constant-comparative method to develop themes and patterns, which provided for meaningful interpretation of the community needs regarding access to physical therapy services" (p. 738)	-Better understanding -Rich data -Confirm findings	-Confirm findings -Better understanding
Morell, L., & Tan, R. (2009).	"This study provides examples of how evidence gathered to investigate different aspects of validity can be used to inform and contribute to the overall validity argument." (p. 260) "…a mixed methods approach to this study was used to capture and maximize both quantitative and qualitative data types." (p. 260) "A mixed methods approach for the study was necessary because no single data source could provide the range of data necessary to address the research questions. From the conception of the study to reporting study results, the mixed methods approach was used to provide the framework for planning, conducting, organizing, analyzing, and reporting the research findings." (p. 260)	-Capitalize on strengths and minimize weaknesses -Complex research questions -Psychometrics	-Capitalize on strengths and minimize weaknesses -Complex research questions
Morgenthaler, C., & Hauri-Bill, R. (2007).	"The authors show how qualitative and quantitative methods can be combined in a 'mixed methods' research model to provide a multifaceted view of family religion and rituals." (p. 77) "Together the complementary approaches also broaden the scope of the study of family prayers." (p. 77) "Combining approaches and results is not just the sum of quantitative and qualitative research, but leads to	-Capitalize on strengths and minimize weaknesses -Complete picture -Complex research questions -Better understanding	-Capitalize on strengths and minimize weaknesses -Complex research questions

	something new, a third way of understanding the patterned ritual and religious creativity of families." (p. 97) "Together they open up ways to a deeper understanding of family rituals and religion as both creative and patterned." (p. 97)		
Muñoz, M. (2009)	"This study utilized mixed methods for data collection both qualitative and quantitative. Crotty (2004) noted, ''Research can be qualitative or quantitative, or both qualitative and quantitative, without this being problematic in anyway'' (p. 15). Both methods complemented each other and provided a more comprehensive view of the subject. Whereas Patton (1987) reports an increase in the use of both methods, he notes that the two approaches ''are not mutually exclusive, strategies for research'' (p. 156) "To thoroughly address the research questions, it was necessary to understand the experience of the Latinas who negotiated the path to the presidency. Consideration of the institutional context was crucial to arrive at a picture of the influences that formed personal narratives. The use of qualitative research was appropriate for this study because the voices and stories of Latina presidents are critical to gaining insight into their experiences" (p. 156)	-Complex research questions -Better understanding -Rich data -Confirm findings	-Confirm findings -Complex research questions -Better understanding
O'Cathain, A., Murphy, E., & Nicholl, J. (2007).	"Its use is driven by pragmatism rather than principle, motivated by the perceived deficit of quantitative methods alone to address the complexity of research in health care, as well as other more strategic gains." (p. 1)	-Capitalize on strengths and minimize weaknesses -Complete picture -Complex	-Capitalize on strengths and minimize weaknesses -Complex research questions

		research questions	
Owen-Smith, A., Sterk, C., McCarty, R., Hankerson-Dyson, D., & DiClemente, R. (2010)	This mixed-methods study used the Exploratory Design–Instrument Development model, a combining of qualitative and quantitative approaches for the purpose of developing and/or refining a measurement tool. (p. 570)	-Confirm findings -Psychometrics	-Confirm findings
Pommier, J., Guével, M. R., & Jourdan, D. (2010)	Using more than one method within a research project produces a more complete picture of the phenomena being studied (p. 3) The literature shows that MM research (1) provides strengths that offset the weaknesses of both quantitative and qualitative research; (2) provides more comprehensive evidence for studying a research problem than either quantitative or qualitative research alone; (3) helps answer questions that cannot be answered by qualitative or quantitative approaches alone; (4) encourages researchers to collaborate; (5) encourages the use of multiple worldviews or paradigms; (6) and is 'practical' in the sense that the researcher is free to use all possible methods to address a research problem (p. 3)	-Capitalize on strengths and minimize weaknesses -Complete picture -Complex research questions -Better understanding -Confirm findings	-Confirm findings -Capitalize on strengths and minimize weaknesses -Complex research questions -Better understanding
Powell, H., Mihalas, S., Onwuegbuzie, A., Suldo, S., & Daley, C. (2008).	"We demonstrate how using mixed methods techniques results in richer data being collected, leading to a greater understanding of underlying phenomena." (p. 291)	-Better understanding -Rich data	-Better understanding
Schaeuble, K., Haglund, K., & Vukovich, M. (2010)	"The intent of this study was to explore adolescents' preferences for provider interactions and their perceptions of how those interactions contributed to, or detracted from, the quality of their health care." (p. 208)	-Better understanding -Explore -Rich data -Confirm findings	-Confirm findings -Better understanding
Tashakkori, A., & Creswell, J.	"…emerged from a strong belief espoused by 'micro-demographers'	-Confirm findings	-Confirm findings

(2008).	(led by Jack Caldwell) that demographic phenomena (birth, death, marriage, migration) were better understood with grounded insights coupled with statistical techniques that attempted to discern patterns from large-scale census data. This has now been extended by Axinn and Pearce (2006) into a full-length exposition on the value of mixing-methods data collection in the social sciences." (p. 4)	-Better understanding -Confidence	-Better understanding
Viadero, D. (2005).	"Yet while it seems common sensical that combining different research strategies could yield more complete answers." (paragraph 6)	-Confirm findings -Better understanding	-Confirm findings -Better understanding
Vitale, D., Armenakis, A., & Feild, H. S. (2008).	"Whereas attaching only two open-ended questions to a structured, closed-ended survey may seem perfunctory to some, it would be a mistake to overlook the diagnostic value of obtaining organization members' personal observations of their organization's respective 'strengths' and 'weaknesses.' The responses to the open-ended questions are useful to change practitioners as an analytical tool to help explain the diagnostic findings of the quantitative survey instrument and as tangible first-person perceptions that, when presented appropriately to the organization's leadership, may bolster the persuasiveness of the results presented." (p. 92)	-Capitalize on strengths and minimize weaknesses -Complete picture -Rich data -Confirm findings	-Confirm findings -Capitalize on strengths and minimize weaknesses
Wall, R., Devine-Wright, P., & Mill, G. (2008).	"It also illustrates the value of mixed methods in terms of increased confidence in findings." (p. 63) "This underlines the value of a mixed method approach to the study, with increased confidence in consistent findings obtained by two quite different methods of data collection and analysis." (p. 83)	-Confidence -Confirm findings	-Confirm findings

Yount, K. M., & Gittelsohn, J. (2008).	"These gaps in the available data, and the explanatory value of understanding care seeking within a population, require instruments and interviewing methods that improve the accuracy and completeness of such data." (p. 24)	-Capitalize on strengths and minimize weaknesses -Confidence -Confirm findings	-Confirm findings -Capitalize on strengths and minimize weaknesses

Themes

-Confirm findings
-Capitalize on strengths and minimize weaknesses
-Complex research questions
-Better understanding

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Appendix R

PHASE III: QUANTITATIVE VALUE SURVEY

Value Instrument

Please answer the following items based on the passage you just read. Select the best response.

Item	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
I think the methodology is sufficient to address the study's purpose.	O	O	O	O	O
I have a clear understanding of the methodology the researcher chose.	O	O	O	O	O
The chosen methodology provides readers with a deeper understanding of the findings.	O	O	O	O	O
I have a clear understanding of what the researcher did.	O	O	O	O	O
I think more evidence could have been provided.	O	O	O	O	O
I am confident in the interpretation of the results.	O	O	O	O	O
I have a clear understanding of what the researcher found.	O	O	O	O	O
This methodology explored students' experiences in their statistics course.	O	O	O	O	O
I would have a better understanding of the findings with a different method.	O	O	O	O	O
I would have a better understanding of the findings if more information about the methodology was provided.	O	O	O	O	O
The results are useful.	O	O	O	O	O
This is a strong methodological study.	O	O	O	O	O

Item	Strongly Disagree	Disagree	Neither Disagree or Agree	Agree	Strongly Agree
Nothing could be done to improve this study.	O	O	O	O	O
Having a large number of participants is important.	O	O	O	O	O
This study would be stronger with a different method.	O	O	O	O	O
I have a deeper understanding of the study after reading the results.	O	O	O	O	O
This study's methodology provides me with a better understanding of student's perceptions of their statistics course.	O	O	O	O	O
The study's methodology did not influence the findings.	O	O	O	O	O
Results were impacted by the researcher's previous beliefs about the study.	O	O	O	O	O
Knowing how much the researcher was involved in the study would impact my view of the importance of the findings.	O	O	O	O	O
This methodology is the best for ensuring the results are not influenced by the researcher.	O	O	O	O	O
The sample is sufficient for the conclusions that were drawn.	O	O	O	O	O
Participant selection was appropriate for this methodology.	O	O	O	O	O
This methodology is sufficient to generalize to other college students enrolled in statistics.	O	O	O	O	O
After reading the results I have a clear understanding of what the participants were reporting.	O	O	O	O	O
There is sufficient evidence for the interpretations drawn.	O	O	O	O	O
The chosen methodology is appropriate based on the study's purpose.	O	O	O	O	O
The research design is the best design for what the study wanted to address.	O	O	O	O	O

My understanding of this study was impacted by the chosen methodology.	O	O	O	O	O
The involvement of the researcher impacted the study's results.	O	O	O	O	O
I would have a better understanding of the results had the researcher provided more evidence.	O	O	O	O	O
Selection of the participants was appropriate based on the study's purpose.	O	O	O	O	O
I think another methodology would better address the study's purpose.	O	O	O	O	O
The study's design is optimal for readers having a deeper understanding.	O	O	O	O	O
The design is appropriate for this study.	O	O	O	O	O
The chosen methodology provides readers with a better understanding of the findings.	O	O	O	O	O
The findings from this study are reliable because of the chosen methodology.	O	O	O	O	O
Having the participants' voice throughout the results are important to me.	O	O	O	O	O
This study had the participants' voice in the results.	O	O	O	O	O

How old are you? →
What is your gender? → M F
What is your ethnicity? Caucasian, non-Hispanic African-American Asian-American Latino-American Native-American Other
How long have you been a graduate student? →
What is your department? →
What is your program area? →
Roughly how many research projects have you been involved in while you have been a graduate student?

How many qualitative studies have you been involved with?
How many quantitative studies have you been involved with?
How many mixed methods studies have you been involved with?
Part of my dissertation is to conduct a focus group to further understand how graduate students evaluate a study and how that study's methodology plays a role in the evaluation. I was wondering if you would mind taking about 30 minutes out of your crazy schedule to participate in a focus group. If you are willing to participate please provide your name and email address below so I can contact you. If you agree to participate I promise I will provide some snacks and treats :) If you would prefer not to participate in a focus group no stress, your help thus far is extremely helpful. If you don't want to participate please click "submit" below to proceed to the next page. First Name: _____ Last Name: _____ Email Address: _____

Thank You!

Thank you for taking my survey. Your response is very important to me. If you have any questions please email me at courtney.haines@huskers.unl.edu

Appendix S

TIMELINE

Month	Action(s)
April	Phase I data collection (end of the month) Begin Phase II
May	Analyze Phase I data Continue Phase II Write passages for Phase III Analyze Phase II
June	Finish passages for Phase III Finalize instruments for Phase III
July	Phase III quantitative data collection
August	Phase III quantitative data collection
September	Begin analyzing Phase III data for preliminary findings
October	Phase III quantitative data collection
November	Analyze Phase III data
December	Begin drafting Phase III focus group protocol
January	Conduct Phase III focus groups
February	Analyze Phase III qualitative interviews
March	Work on remaining chapters
April	Finalize dissertation
May	Defend
June	Make any necessary edits
July	Complete necessary graduation paperwork
August	Graduation