Mevlana International Journal of Education (MIJE)
Vol. 3(2), pp. 112-122, 1 August, 2013
Available online at http://mije.mevlana.edu.tr/
http://dx.doi.org/10.13054/mije.13.35.3.2

Demystifying Mixed Methods Research Design: A Review of the Literature

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Article history
Received:
31.05.2013

Received in revised form:
08.07.2013

Accepted:
09.07.2013

Key words:
Mixed methods research, quantitative and qualitative research, research methods, research designs, research approaches, mixed research

Mixed methods research evolved in response to the observed limitations of both quantitative and qualitative designs and is a more complex method. The purpose of this paper was to examine mixed methods research in an attempt to demystify the design thereby allowing those less familiar with its design an opportunity to utilize it in future research. A review of the literature revealed that it has been gaining acceptance among researchers, researchers have begun using mixed methods research, it has the potential to offer more robust research, researchers are encouraged to outline clearly the reason(s) for using mixed methods design, and it is a more complex research design. Mixed methods research has become a valid alternative to either quantitative or qualitative research designs. It offers richer insights into the phenomenon being studied and allows the capture of information that might be missed by utilizing only one research design, enhances the body of knowledge, and generates more questions of interest for future studies that can handle a wider range of research questions because the researcher is not limited to one research design. Researchers will need to be knowledgeable in quantitative, qualitative, and mixed methods designs.

Introduction

Research in the first half of the 21st century was largely quantitative. Qualitative design evolved around the 1970s, in part, in objection to the hegemony of the quantitative convention (Lund, 2012). Quantitative and qualitative research designs, until recently, have been utilized independently of each other in educational research. Moreover, there has been a continuous debate between quantitative and qualitative approaches. Frequently these debates have been contentious. Quantitative researchers have been referred to as positivists and qualitative researchers have been referred to as hermeneutists. Furthermore, quantitative researchers have often claimed that qualitative research was difficult to generalize, interpret, and duplicate. On the other hand, qualitative researchers have claimed quantitative researchers utilized immaterial hypotheses and shallow descriptions. One basic difference between these two approaches is that the goal of quantitative research is to propose a hypothesis to be accepted or rejected while the goal of qualitative research is to produce a hypothesis (Cronholm, & Hjalmarsson, 2011). Typically it is accepted that a greater depth of understanding of the study is generally gained by qualitative research than by quantitative

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research, while better objectivity and generalizability is obtained by quantitative research (Lund).

Mixed methods research (MMR), established around 2000 (Lund, 2012) and also referred to as the "third methodological movement" (Venkatesh, Brown, & Bala, 2013, p. 22), has become increasingly accepted by researchers. MMR, defined as a method of both quantitative and qualitative designs in the same research study, evolved in response to the observed limitations of both quantitative and qualitative designs. The purpose of this paper was to examine MMR in an attempt to demystify the design thereby allowing those less familiar with its design an opportunity to utilize it in future research studies.

A review of the literature presents a compilation of research, peer-reviewed journals, non-peer reviewed journals, and books on MMR. The academic databases used were from the online library of Texas A&M University-Commerce and included, but were not limited to, Academic Search Premier, EBSCO, Education Research Complete, Eric, ProQuest, and Sage Publications. The key descriptive term used for this research was mixed methods research.

MMR is becoming a legitimate research choice for either quantitative or qualitative research designs. Mixing quantitative and qualitative methods is gaining acceptance among the research community. Mixing the methods can compliment each other, offer richer insights, and result in more questions of interest for future studies. The intent for mixing quantitative and qualitative research designs is to maintain the strengths and ameliorate the weaknesses in both designs (Creswell, 2012; Gall, Gall, & Borg, 2007; Greenwood, & Terry, 2012; Salehi & Golafshani, 2010; Truscott, Swars, Smith, Thornton-Reid, XZhao, Dooley, Williams, Hart, & Matthews, 2010; Venkatesh et al., 2013).

Introduction to Mixed Methods Design

It is thought that the combination of quantitative and qualitative methods presents a more enhanced insight into the research problem(s) and question(s) than using one of the methods independently (Creswell, 2012; Frels & Onwuegbuzie, 2013; Hong & Espelage, 2011). If MMR is used, however, the researcher(s) must have a working knowledge of both quantitative and qualitative methods designs to combine effectively the methods. Hence, MMR is more advanced, time-consuming, extensive, and may necessitate the use of a research team (Creswell, 2012).

Purposes of Mixed Methods Design

Venkatesh et al., (2013) presented seven purposes for MMR. The seven purposes are: complementarity, completeness, developmental, expansion, corroboration/confirmation, compensation, and diversity. The purposes are described as follows:

(1) Complementarity - to obtain mutual viewpoints about similar experiences or associations.
(2) Completeness - to ensure total representation of experiences or associations is attained.
(3) Developmental - to build questions from one method that materialize from the implications of a prior method or one method presents hypotheses to be tested in a subsequent method.
(4) Expansion - to clarify or elaborate on the knowledge gained from a prior method.
(5) Corroboration/Confirmation - to evaluate the trustworthiness of inferences gained from one method.

(6) Compensation - to counter the weaknesses of one method by employing the other.
(7) Diversity - to obtain opposing viewpoints of the same experiences or associations (Venkatesh et al., 2013).

Types of Mixed Methods Design

Various approaches of MMR have been advanced in the literature as efforts have been made to classify them. Six types of MMR commonly used in educational research include: a) convergent parallel, to simultaneously collect, merge, and use both quantitative and qualitative data; b) explanatory sequential, to first gather quantitative data and second to gather qualitative data to enhance on the quantitative findings, c) exploratory sequential, to first collect qualitative data to investigate a phenomenon and second gather quantitative data to explain the qualitative findings; d) embedded, to gather quantitative and qualitative data at the same time while one's design purpose is to support the findings of the other design; e) transformative, to use either the convergent, explanatory, exploratory, or embedded design types while including the design types within an evolving context (a possible change in perspective); and f) multiphase, to examine a subject or issue through a number of studies (Creswell, 2012).

Levels of Mixed Methods Research Design

MMR became prevalent after the term was introduced, even though mixing quantitative and qualitative methods designs was not a new research practice. However, this prevalence is particularly true for MMR at the "primary empirical study level" (Heyvaert, Maes, & Onghena, 2011, p. 13). In other words, researchers gather both quantitative and qualitative data from research participants when carrying out primary level mixed methods studies and merges the two types of data. On the other hand, researchers carry out orderly analysis utilizing standards of MMR on a "synthesis level mixed methods study" (p. 13). Data involved in a MMR synthesis include the findings from published quantitative, qualitative, and mixed methods primary level articles.

Fewer researchers have experience with MMR synthesis than MMR at the primary empirical study level. The limited amount of published MMR synthesis and the number of researchers experienced with the MMR synthesis methodology results in a minimum number of experts. This makes it problematic for researchers to follow when looking for best practices. However, there are many advantages for conducting a MMR synthesis. Most important is the possibility of enhanced understanding of a phenomenon being studied by combining quantitative and qualitative primary level findings and the two distinct research methods. Research can result in complementary findings and stronger results by combining quantitative and qualitative methods in a single synthesis. According to the authors Heyvaert et al. (2011) the combination of quantitative and qualitative methods designs has potential at both levels and researchers are encouraged to utilize both.

Characteristics of Mixed Methods Design

MMR can be characterized from other designs according to the following: a) they offer a rationale for the design, researchers provide the reader with a justification for the use of both quantitative and qualitative designs; b) they include gathering quantitative and qualitative data, researchers clearly communicate that both quantitative and qualitative data was used in the study; c) they consider priority, the researchers indicate which method design data carries more emphasis; d) they consider sequence, the researcher explains the data gathering order (sequential or concurrent) for the reader; e) they match the data analysis to a

specific design type, this can be difficult because researchers are not limited to convergent, explanatory, exploratory, or embedded design types; and f) they diagram the procedures used in the study, researchers provide the reader with some type of visual of the procedures used (Creswell, 2012).

Strengths of Mixed Methods Design

Some strengths of MMR design include: a) they point out that words, photos, and narratives can be used to add meaning to numbers while numbers can add precision to words, photos, and narratives; b) they can handle a wider range of research questions because the researcher is not limited to one research design; c) they can present a more robust conclusion; d) they offer enhanced validity through triangulation (cross validation); e) they can add insight and understanding that might be missed when only a single research design is used; and f) they can increase the capability to generalize the results compared to using only qualitative study designs (Cronholm, & Hjalmarsson, 2011).

Weaknesses of Mixed Methods Design

Some weaknesses of MMR include: a) they can be difficult for a single researcher especially when the two designs are best used concurrently, in this case the study might require a research team; b) they can be more time consuming and expensive when concurrency is involved; c) they require that the researcher(s) learn multiple methods to combine them knowledgeably, defend the use of multiple methods, utilized them professionally, etc.; and d) they are not without conflict because methodological purists maintain that researchers should work within either a quantitative or a qualitative research design never mixing the two designs in a single study (Cronholm, & Hjalmarsson, 2011).

Ethical Issues in Mixed Methods Design

The ethical considerations that pertain to the quantitative and qualitative methods designs also pertain to MMR because MMR is a combination of the two designs. For example, quantitative studies require researchers to obtain permission, protect anonymity, avoid disruption of sites, and communicate the purpose(s) of the study accurately while qualitative studies require researchers to communicate the purpose(s) of the study accurately, avoid deceptive practices, respect the study population, respond to potential power concerns, and confidentiality. All of these ethical issues are also ethical issues for MMR (Creswell, 2012).

Steps in Conducting Mixed Methods Design

The general order of MMR includes: a) decide if a mixed methods study in viable, b) determine the justification of combining methods, c) plan the data gathering procedure(s), d) develop the questions, e) collect the data, f) analyze the data, and g) write the report accordingly. These step are not set in stone but can be used as a guide for conducting MMR (Creswell, 2012).

Evaluating Mixed Methods Design

MMR needs to follow the accepted form for both quantitative and qualitative research designs. Additionally there are some considerations for evaluating MMR such as: clear justification for using mixed methods is apparent, utilize both quantitative and qualitative collection and analysis of the data, overtly combine the two sets of data, structure the study

according to acceptable MMR practices, offer a visual of the procedure(s), and communicate that the study is a MMR study (Creswell, 2012).

Validating Mixed Methods Design

In essence, validating in MMR is evaluating the quality of findings of the data. The evaluation of validity—legitimation or quality criteria—is the most important step in all research studies according to Benge, Onwuegbuzie, and Robbins (2012). It is more important than determining the value of the research question(s), the sample size or sampling format, the appropriateness of the research design, the data collection, or the data analysis. If the findings or explanation of the findings lack validity then the study itself is useless. Hence, research is limited by the validity of the study and therefore it is recommended that researchers conducting MMR evaluate the findings from the individual quantitative and qualitative research steps as well as from the overall MMR perspective.

Researchers are advised to provide an overt discussion and assessment of how the findings have been integrated from both quantitative and qualitative designs and the quality of the integration. This discussion will provide readers with an understanding of whether the inferences are in harmony with the research objectives and whether they make a contribution to the body of knowledge. Furthermore, it is recommended that researchers include in the discussion any potential threats to validity that might surface during data collection and analysis. Researchers need to address what actions were taken to overcome or reduce these threats. Discussing any potential threats should enhance the quality of MMR (Venkatesh et al., 2013).

A Review of the Literature on Mixed Methods Design

Over the past three decades much has been written about the phenomenon of bullying since the first article appeared in 1977 (Hong and Espelage, 2011). However, much is still unknown about this phenomenon which is partly credited to the types of research methods that have been employed. The majority of researchers on bullying have traditionally used quantitative methods to generate statistical findings from large samples. For example, only seven research studies utilized a qualitative approach while 12 studies utilized MMR out of a total of 75 empirical studies conducted on bullying between the years of 2000 and 2004. This over-dependence on quantitative studies, according to Hong and Espelage, has unfortunately limited information garnered for future research. Qualitative studies completed on bullying have focused on expanding the personal experiences of bullies and victims. For this purpose, individual and focus group interviews with smaller sample sizes have been utilized only recently. Considering the advantages of combining quantitative and qualitative research methods, an increasing number of researchers have begun employing MMR.

A number of literature reviews on bullying behavior in schools have been published in national and international journals. These reviews have improved the awareness of bullying even though they were not mixed methods studies. One reason for this is that various methods have been used to study bullying behavior (either through surveys and observational methods). Differences between quantitative and qualitative MMR take place at two stages. First, is the difference between the types of data. For example, quantitative data are typically gathered through surveys or other measurement procedures while qualitative data are gathered through interviews, focus groups, and observations. Also, quantitative and qualitative research method designs are introduced as two totally different research designs. The three main purposes for mixing quantitative and qualitative methods designs include: a) triangulation or

cross validation; b) complementarity or mutual viewpoints; and c) development or building on. Thus, MMR potentially produces more enhanced understandings than utilizing either quantitative or qualitative methods designs independently. Therefore, it is believed by the researchers (Hong & Espelage, 2011) that MMR is necessary to fully comprehend bullying behavior.

MMR is gaining acceptance among researchers according to Hong and Espelage (2011). The different design options impact the overall body of knowledge. For example, MMR can potentially enhance study validity beyond quantitative or qualitative research studies, provide greater insights, challenge researchers through divergent or contradictory findings, encourage researchers to alter research questions and hypotheses, and conceivably fill in the gaps ultimately enhancing the literature.

MMR is generally unknown to researchers in the behavioral science field, according to Lopez-Fernandez and Molina-Azorin (2011). Nevertheless, MMR has the potential to offer more robust research. When considering utilizing MMR, researchers are encouraged to openly outline the main purposes of using MMR; bear in mind that even though MMR might be initially proposed for a specific study, new characteristics or features could emerge as the research advances resulting in MMR modifications; be imaginative rather than restricting existing designs; consider creating new designs appropriate for the research questions being considered; remember that MMR typologies could be improved; and remain aware of the extent MMR is accepted and used by colleagues in the various disciplines.

Frels and Onwuegbuzie (2013) maintained that mixing quantitative and qualitative methods designs is not new for those working in the field of counseling. Assessments in counseling, for example, require the evaluation of multiple forms of data and counselors typically use quantitative and qualitative evaluations as part of the profession, whether researcher or practitioner. Only 171 (3.84%) MMR articles, however, were identified out of a total of 4,457 articles in 15 American Counseling Association (ACA) division-affiliated journals between 1998 and 2007. This finding occurred in spite of the overall growth of MMR in the literature. Moreover, MMR has demonstrated usefulness for dealing with concurrent quantitative-based questions (dealing with rates, relationships, and cause-and-effect relationships) and qualitative-based questions (leading to the examination of processes, experiences, and perceptions). One reason for this, as presented by the researchers, might be because of a lack of training. Other reasons might include erroneous personal beliefs of either quantitative based research or qualitative-based research that prevents mixing the methods.

Frels and Onwuegbuzie (2013) recommended more rigor in the data collection process such as utilizing mixed methods interviews. Researchers are encouraged to enhance quantitative instruments integrated with qualitative open-ended questions. The gathering of quantitative data during qualitative interviews offers researchers more in-depth opportunities to evaluate interviewees' statements and responses. This practice would offer the field of counseling the best of both research methods.

Bartholomew and Brown (2012) set out to ask how MMR is utilized in culture-specific psychological research (complexity of psychologies within cultures) since its growth in accepted research. Even though MMR offers opportunities for adding to the body of knowledge, conducting MMR has its challenges. Mixing two data sets, for example, can be difficult. Gathering MMR data sets frequently requires lengthier, multiple-data collection steps. Moreover, researchers are not always trained in MMR traditions. Examining 12 articles of culturally driven MMR international studies suggested that researchers should remain:

current on the forms of research designs available, informed on the MMR literature, knowledgeable about quantitative and qualitative instrument designs, accepting of the idea that MMR provides opportunities to compensate for other design shortcomings, proficient in qualitative methods, and able to identify specific qualitative methodology utilized in research.

Gambrel and Butler (2013) maintained that MMR can potentially enhance the marriage and family therapy (MFT) field. However, MMR is underutilized presently. The authors examined the Journal of Marriage and Family editorial annual report for 2007–2008. Findings demonstrated that of 110 submitted research articles less than 5% were MMR studies. There is a need for concrete research for marriage and family therapists and integrating quantitative and qualitative research designs and methods, such as MMR, can help make the MFT field competitive. MFT researchers are encouraged to consider taking advantage of this new design.

MMR is becoming increasingly utilized by nurse researchers. Conducting only quantitative or qualitative research may not result in as robust findings and interpretations of the findings for the care given in nephrology nursing. As a result, there has been a steady increase in the number of MMR articles submitted for publication in nursing journals. Researcher nurses are encouraged to consider MMR for future studies to add to the body of knowledge focusing on the intricacies in the field (Hayes, Bonner, & Douglas, 2013).

MMR can potentially enhance the research in nursing and health science due to the difficulty of the field. Mixing quantitative and qualitative designs, nevertheless, remains a topic of debate. Additionally, MMR requires rigor with design and interpretation of MMR. Octlund, Kidd, Wengstrom, and Rowa-Dewar, (2011) examined a total of 168 studies from the United States, United Kingdom, and Canada. The authors found that parallel data analysis (analyses are compared or consolidated after the full analysis), sequential data analysis (data are analyzed in a specific order to inform rather than be integrated), and concurrent data analysis (each data set is combined during the analysis to provide an interpretation from both data sets) were used. A small number of these studies indicated the purposes for using MMR. Researchers are encouraged to provide clarity with the approaches in the reporting to improve transparency of MMR which is notoriously challenging. The use of triangulation can help with the mixing of quantitative and qualitative findings and also help researchers with the interpretation of the results. This procedure can offer improved understanding between theory and empirical findings, challenge theoretical assumptions, and develop new theories.

Methodologically sound MMR can enhance the understanding of health services according to Wisdom, Cavaleri, Onwuegbuzie, & Green, (2012). The authors investigated the frequency of MMR in published health services research from 1,651 articles published from 2003 to 2007 in premiere health service academic journals. Results revealed that there were 47 (2.85%) MMR articles, 1, 502 (90.98%) quantitative articles, and 102 (6.18%) qualitative articles of the total examined. Results demonstrated that very little published health services research articles utilize MMR.

Health policy writers currently have a greater number and variety of systematic reviews available. MMR in systematic reviews is on the rise. However, these studies present challenges to the review methods. For example, the researcher's rationale for utilizing MMR may not correspond with how the research methods were combined in practice. Hence, the study data fails to speak to the research question(s). Additionally there are problems with reporting findings, such as: the role, the sequence of various data collection methods, and the integration of analysis and findings. According to Atkins, Launiala, Kagaha, & Smith (2012),

nevertheless, MMR has the potential to offer important contributions to health research.

Truscott et al. (2010) studied MMR articles published in 11 leading English-language international and United States national educational research journals from 1995 to 2005. A total of 2,381 studies were revaluated by the researchers in the following four educational disciplines: literacy, mathematics, social studies, and science. Of the articles studied, only 332 (14%) were MMR, which indicates that MMR is not a dominant method for educational research.

The authors (Truscott et al., 2010) maintained that just using quantitative and qualitative methods designs in the same study does not improve research without careful combination, justification, and explanation. This addresses issues of validity. MMR is purposeful and more than the result of mixing quantitative and qualitative methods designs. Researchers are advised to study research for the reported justifications to utilize MMR to gain insight to the frequency and spirit of MMR.

In a study conducted by Ngulube (2012) exploring the use of MMR in articles published in library and information science (LIS) journals in Sub-Saharan Africa (SSA) from 2004 to 2008, the findings showed that the use of MMR by LIS researchers in SSA was not the trend. One reason why might be that it is very unusual to locate researchers proficient in both quantitative and qualitative research methods. It makes sense that researchers with a qualitative orientation team with researchers with a quantitative orientation to research the same phenomenon. This combination provides potential to enhance the depth of data gathered. Therefore, according to the author, specialists working together from both schools of thought could improve understanding of the overall research process. This in turn could help to promote MMR research in SSA.

The findings of a study conducted by Ross and Onwuegbuzie (2010) revealed the prominence of MMR in mathematical education. One third of all empirical articles published in the Journal for Research in Mathematics Education (JRME) between 1999 and 2008 utilized MMR. In addition, *JRME* had higher percentages of mixed methods usage in published empirical articles than did the American Educational Research Journal (AERJ) for 8 of the 10 years examined. MMR provides opportunities for enhancement in the body of knowledge.

Early in the use of MMR, Chinese scholars have been utilizing MMR through mixing quantitative and qualitative designs. Experienced researchers in MMR have also advised less experienced researchers with understanding MMR. Even though more and more researchers have utilized MMR in China, only health science, social science, and education has adopted this design. It will take additional time for more disciplines to accept MMR. Zhou & Creswell (2012) suggested that Chinese researchers should: work with other experienced MMR researchers in how to conduct MMR; take advantage of training available in data analysis; communicate with experienced researchers to update their knowledge of research methodology; and attend more annual international conferences to improve academic communications.

MMR provides researchers with opportunities to quantify variables and to explain, inform, and validate the findings in a research study. For evaluation studies, MMR presents opportunities to understand questions of "how much" and "why." While MMR has value in research and teaching, researchers are cautioned against advocating MMR as better than either quantitative or qualitative research designs. Even though it is worth working to improve the research design, researchers should avoid the idea that MMR is the best approach and

therefore should be used exclusively. MMR is one of many research methods available to researchers (Barnes, 2012).

Palliative care can benefit from the use of MMR with the ongoing assessment and advancement of complication interventions utilized in the practice. MMR offers better understanding of interventions. However, MMR should not be viewed as a sole solution because it can be costly and bring unique data collection, integration of analysis, and dissemination challenges. MMR in palliative care should ultimately benefit through the use of accepted protocols and employing experienced researchers with knowledge of the design (Farquhar, Ewing, & Booth, 2011).

In summary, the purposes, characteristics, and structure of MMR will likely continue to be debated. A review of the literature revealed the following major points:

- MMR is gaining acceptance among researchers (Barnes, 2012; Bartholomew & Brown, 2012; Farquhar, Ewing, & Booth, 2011; Frels & Onwuegbuzie, 2013; Hayes, Bonner, & Douglas, 2013; Hong and Espelage, 2011; Octlund, Kidd, Wengstrom, & Rowa-Dewar, 2011; Ross & Onwuegbuzie, 2010; Truscott, Swars, Smith, Thornton-Reid, XZhao, Dooley, Williams, Hart, and Matthews, 2010; Zhou & Creswell, 2012)
- An increasing number of researchers have begun employing a MMR (Barnes, 2012; Bartholomew & Brown, 2012; Frels & Onwuegbuzie, 2013; Hayes, Bonner, & Douglas, 2013; Hong & Espelage, 2011; Octlund, Kidd, Wengstrom,& Rowa-Dewar, 2011; Zhou & Creswell, 2012).
- MMR has the potential to offer more robust research (Barnes, 2012**;** Bartholomew & Brown, 2012; Farquhar, Ewing, & Booth, 2011; Gambrel & Butler, 2013; Hayes, Bonner, & Douglas, 2013; Hong & Espelage, 2011; Lopez-Fernandez & Molina-Azorin, 2011; Ngulube, 2012; Octlund, Kidd, Wengstrom, & Rowa-Dewar, 2011; Truscott, Swars, Smith, Thornton-Reid, XZhao, Dooley, Williams, Hart, & Matthews, 2010; Wisdom, Cavaleri, Onwuegbuzie, & Green, 2012; Zhou & Creswell, 2012).
- Researchers are encouraged to clearly outline the reason(s) for using MMR (Barnes, 2012; Bartholomew & Brown, 2012; Farquhar, Ewing, & Booth, 2011; Frels & Onwuegbuzie, 2013; Lopez-Fernandez & Molina-Azorin, 2011; Octlund, Kidd, Wengstrom, & Rowa-Dewar, 2011; Truscott, Swars, Smith, Thornton-Reid, XZhao, Dooley, Williams, Hart, & Matthews, 2010; Wisdom, Cavaleri, Onwuegbuzie, & Green, (2012) .
- MMR is more complex and requires researchers to be knowledgeable about the design (Bartholomew & Brown, 2012; Farquhar, Ewing, & Booth, 2011; Lopez-Fernandez & Molina-Azorin, 2011; Octlund, Kidd, Wengstrom,& Rowa-Dewar, 2011; Truscott, Swars, Smith, Thornton-Reid, XZhao, Dooley, Williams, Hart, & Matthews, 2010; Wisdom, Cavaleri, Onwuegbuzie, & Green, 2012; Zhou & Creswell, 2012).

MMR has become a valid alternative to either quantitative or qualitative research designs and is becoming appealing to researchers. Moreover, mixing methods can compliment each other, offer richer insights, and result in more questions of interest for future studies. The objective for combining quantitative and qualitative research designs is to preserve the strengths and reduce the weaknesses in both quantitative and qualitative designs (Creswell, 2012; Gall, Gall, & Borg, 2007; Greenwood, & Terry, 2012; Salehi & Golafshani, 2010; Truscott, Swars, Smith, Thornton-Reid, XZhao, Dooley, Williams, Hart, & Matthews, 2010; Venkatesh et al., 2013).

Implications

Implication for increasing the use of MMR in academic research studies includes: produce richer insights into the phenomenon being studied than what might be missed by utilizing only one research design, enhance the body of knowledge and present a more robust conclusion, and generate more questions of interest for future studies that can handle a wider range of research questions because the researcher is not limited to one research design. Further implications suggest that researchers will need to be more knowledgeable in both quantitative and qualitative methods. In addition, they will need to become experienced in MMR because: it can be difficult for a single researcher especially when the two designs are best used concurrently; it can require a research team; it can be more time consuming; and it can be more expensive when concurrency is involved requiring a team of researchers.

Recommendations for Futher Research

It is recommended that additional studies be conducted on MMR to verify the results of this study. It is also recommend that individual quantitative, qualitative, and mixed methods studies be completed to compare the results of each to determine if MMR proved more robust conclusions. In addition, longitudinal studies could be conducted to monitor the progress of MMR.

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