

Not a One-Size-Fits-All Methodology: A Survey of Mixed Methods

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Abstract: Situated in a historical development of mixed methods, this paper aims to present a holistic picture of mixed methods through providing a survey of previous literature. It examines the various dimensions of mixed methods, including its definition, rationale, sampling, research designs, procedures, strengths and weaknesses, and conflicting views of using mixed methods. The paper concludes by pointing out that though mixed methods have advantages in conducting a wide range of research through capitalizing on both quantitative and qualitative methods and reducing the limitations associated with singular methods, researchers should be aware that they do not provide the best research practices and hence terminate all the debates over research methods. Researchers should never cease their efforts in seeking alternative philosophies and research methods in gaining a more complete and accurate understanding of the world, and the collaboration between the quantitative and qualitative researchers is highly recommended in this undertaking.

Keywords: Triangulation, pragmatism, “third paradigm”, strengths and weaknesses, pluralistic

1 Introduction

Some researchers have a strong preference for particular research methods, either quantitative or qualitative methods; some may be equally zealous about the two conflicting epistemologies and paradigms, and find themselves moving back and forth; and some lean toward utilizing mixed methods, but constantly experience a hard time making choices among the various instruments of the two methods, e.g., tests, surveys, observations, interviews, etc. This paper aims to present a holistic picture of mixed methods through providing an in-depth survey of previous literature.

Starting with a review of the historical development of mixed methods, it examines its various dimensions, including the definitions, rationale, sampling, research designs, steps of conducting mixed-methods research, and the strengths and weaknesses of using mixed methods. Finally, the paper points out that though mixed-methods research has significantly contributed to the construction of multifaceted research and has demonstrated viability and flexibility, it is by no means the exhaustive or the best research practice. Researchers should never cease their efforts in seeking alternative philosophies and research methods in order to gain a more complete and accurate understanding of the world.

2 Historical Development of Mixed-methods Research

The long-standing argument between qualitative and quantitative research in social science has existed since the 20th century, which can be traced back to the age of enlightenment in the 17th and 18th centuries when social science began fighting for legitimacy alongside the natural sciences (Symonds & Gorard, 2010). Quantitative methods are supported by those who think statistic-based experimental designs as the most objective and hence accurate form of research, whereas qualitative methods are held by those “more faithful to the social world” (Gergen & Gergen, 2000, p. 1027). Fundamentally, the two methods differ in epistemology, with quantitative method being developed from the positivist perspectives and quantitative method from the constructivist or postmodernist perspectives.

Rossmann and Wilson (1985) referred to those who advocate simply quantitative methods or qualitative methods as purists. Positivist purists maintain that social science inquiry should be objective, time and context free, and research should be neutral and immune from researcher idiosyncrasy (Ayer,

1959; Maxwell & Delaney, 2004; Popper, 1959). Qualitative purists contend that research is value-bound, should use rich and thick description to reflect “reality” or get close to “reality” (Denzin & Lincoln, 2005; Lincoln & Guba, 1985). Moreover, quantitative purists hold that research should be deductive with focus put on confirmation, theory and hypothesis testing, explanation, prediction, and standardized and statistical data collection and analysis, whereas qualitative purists hold that research should be inductive and characterized by discovery, exploration, theory/hypothesis generation, and narrative description. Both sets of purists view their paradigms as the ideal for research and should not be mixed because they represent a dichotomy and are fundamentally incompatible due to the competing epistemological frameworks.

Amidst the uproar of quantitative and qualitative purists mixed methods came into play in the 1950s. Though working strictly in the quantitative domain, Campbell and Fiske (1959) brought to people’s attention how different facets of a phenomenon can be identified by juxtaposing the results of multiple methods, namely, “triangulation,” a concept formalized by Webb, Campbell, Schwartz, and Sechrest (1966). Triangulation “is seen to increase validity when multiple findings either confirm or confound each other (thus reducing the chances of inappropriate generalizations)” (Symonds & Gorard, 2010). Both Denzin (1978) and Jick (1979) were the pioneers of using triangulation to study the same research questions and noted how the strength of one method could offset the weaknesses of another.

Seeing triangulation as having methodological superiority over single methods, during the 1980s, many researchers began to accept that both paradigms were legitimate and useful for providing different perspectives on the same topic and can be combined in a single study (Greene, 2008), some even viewed that the combination provided a better understanding of research problems than either method alone (Creswell & Plano Clark, 2007). In Rossman and Wilson’s term (1985), those researchers were pragmatists.

Pragmatism as the philosophical foundation for mixed methods gradually emerged as an alternative to the traditional dualisms—positivism and constructivism. In pragmatists’ view, researchers should employ whatever research method or methods that work best to solve the research questions. Instead of relying on deductive reasoning and general premises to reach specific conclusions, or inductive approaches that seek general conclusions based on specific premises, pragmatism allows for a more flexible abductive approach (Wheeldon, 2010). Pragmatists agree that there is a single real “truth” and in the meantime acknowledge that individuals have their own unique interpretations of the “truth” (Morgan, 2007). What educational researchers should aim for is not replacing either of the methods but drawing from the strengths and minimizing the weaknesses of each. Based on the complexity of emerging research problems and the acknowledgement of multiple ways of knowing the world, the nature of research, and value stances, mixed methods are embraced by many researchers as a “third paradigm” (Johnson & Onwuegbuzie, 2004; Tashakkori & Teddlie, 2003), and have the potential to become “the dominant methodological tools in the social and behavioral sciences during the 21st century” as Tashakkori and Teddlie (2003) proposed.

3 An Overview of Mixed Methods

3.1 Definitions of Mixed Methods

Mixed-methods research involves the use of both quantitative methods and qualitative methods in a single study (Fraenkel & Wallen, 2008), providing a variety of choices, options, and approaches to understanding a phenomenon. By synthesizing a wide range of perspectives, Johnson, Onwuegbuzie, and Turner (2007) concluded the definition of mixed methods as follows:

Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purpose of breadth and depth of understanding and corroboration. (Johnson et al., p. 118)

Another definition given by Creswell and Plano Clark (2007) is almost identical:

Mixed methods are a research design with philosophical assumptions as well as methods of inquiry. As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis of data and 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)

The two types of methods, quantitative and qualitative, supply different types of information with quantitative data tell “what” and qualitative data tell “why,” both useful and important for understanding the research question at hand. If qualitative research is anchored at one pole and quantitative research at the other pole, mixed methods cover the whole middle area of the continuum, and the research design is associated with the degree of mixture which may occupy the continuum from mono-method to fully mixed methods.

3.2 Rationale for Mixed Methods

Greene, Caracelli, and Gragam (1989) listed five major justifications for conducting mixed methods research:

(a) triangulation (seeking convergence and corroboration of results from different methods and designs studying the same phenomenon); (b) complementarity (seeking elaboration, enhancement, illustration, and clarification of the results from one method with results from the other method); (c) initiation (discovering paradoxes and contradictions that lead to a re-framing of the research question); (d) development (using the findings from one method to help inform the other method); and (e) expansion (seeking to expand the breadth and range of research by using different methods for different inquiry components).

Greene and Caracelli (1997) updated the justification by simplifying as follows: (a) to test the consistency of findings obtained through different instruments; (b) to clarify and build on the results of one method with another; and (c) to show how the results from one method shape subsequent methods or research decisions. In conclusion, advocates argue that through combining one method featuring in numerical analysis, robust measurement, and testing, and the other featuring in discovering the depth of human experience and perspectives, mixed methods can provide a more complete understanding of research questions than does the use of either method alone.

3.3 Sampling

Qualitative methods typically use purposive sampling in a very small number to gain a considerable amount of detailed, in-depth information that large-size samples would not. For quantitative methods, the samples to be surveyed must be representative of a larger population to render results generalizable and the size is usually much larger than in qualitative methods. In the combination of the two methods, researchers must make decisions before beginning the study with regard to sampling which may include the size of two samples involved, whether to use the same participants or completely different, what are the sources for samples for each method, and how to make sample selection for each method.

3.4 Types of Mixed-methods Design

There are many ways in which different research methods can be combined in social research (Spratt, Walker, & Robinson, 2004). Studies employing mixed methods may be conducted in a variety of ways. Fraenkel and Wallen (2008) summarized three major types of mixed-methods design:

(a) the exploratory design (using a qualitative method to explore a phenomenon of interest or to identify important themes, discovering underlying variables, and then using a quantitative method to find the relationships among the variables to validate or extend the qualitative findings), (b) the explanatory design (starting off with a quantitative method and proceeding to a qualitative method to explain and refine the previous quantitative findings), and (c) the triangulation design (conducting both quantitative and qualitative methods to study the same phenomenon to determine if the two converge upon a single understanding of the research problem being investigated).

Though the typology of mixed methods designs varies among researchers, the fundamental principles are similar to each other. Creswell and Plano Clark’s categorization of four major types of mixed methods designs—triangulation design, embedded design, explanatory design, and exploratory design—

actually corresponds with this one (Creswell & Plano Clark, 2007). Researchers may add qualitative observations and interviews to a closed-ended survey as a way to discuss directly the issues under investigation and tap into participants' perspectives to deeper understanding and avoid the potential problems with the survey design or administration. Or they may supplement qualitative inquiry with a large-scale survey on a randomly selected sample from the population of interest to improve generalizability or capture the themes important yet might have been lost in the previous qualitative component. If findings are corroborated across different methods then greater confidence can be held in the conclusions; if the findings conflict then the researcher will be in a better position to arrive at more expanded understanding of research problems.

Once a researcher determines that mixed methods would offer the best potential for an answer to the research questions, there are some decisions to be made before developing whatever types of mixed methods research design: (a) whether to mix qualitative and quantitative methods within or across the stages of research; (b) whether to give quantitative and qualitative components of a mixed study equal status or to give one paradigm the dominant status; and (c) whether to conduct the qualitative and quantitative components sequentially or concurrently. Decisions regarding these concerns and others revolving how best to design a mixed-methods study would depend on the nature of the research being conducted.

The criteria for a good mixed-methods study, according to Fraenkel and Wallen (2008) are: (a) The mixture or combination should either complement each other or address different sub-questions related to the larger research question addressed by the study; and (b) The following parameters should be given full thought—internal validity and generalizability as used in quantitative method, and credibility and transferability as used in qualitative method. In general, the possibilities of a mixed-methods research design are very large and researchers should be creative and not be limited by the confines of the literature. Nevertheless, there is a tenet guiding all mixed methods research, that is, whatever research designs to create, researchers should eye for answering their research questions effectively.

3.5 Steps in Conducting Mixed-methods Research

Fraenkel and Wallen (2008) concluded the following steps in conducting mixed-methods research: (a) develop a clear rationale for doing a mixed-methods study; (b) develop research questions for both the qualitative and quantitative methods; (c) decide if a mixed-methods study is feasible; (d) determine the mixed-methods design most appropriate to the research question or questions; (e) collect and analyze the data; and (f) write up the results in a manner consistent with the design being used. Similar to this five-step process, Johnson and Onwuegbuzie (2004) developed one comprising eight steps: (a) determine the research questions; (b) determine whether a mixed design is appropriate; (c) select a research design; (d) collect the data; (e) analyze the data; (f) interpret the data; (g) legitimate the data; and (h) draw conclusions and write the final report.

Rather than sequential, these steps are cyclical, recursive, and interactional. Though practicing researchers may find various elaborations on how to conduct mixed-methods research, the basic logic is almost along the same line and differs slightly. Depending on specific research studies, researchers can flexibly make use of these steps in the order that has the greatest potential to answer their research questions.

3.6 The Strengths and Weaknesses of Mixed Methods

Rooted in democratic values—acceptance, tolerance, and understanding of difference (Greene, 2005), mixed methods welcome all legitimate methodological traditions and facilitate methodological diversity, serving as leverage on the multiple strands of the methodological battle. It can help confirm and cross-validate the relationships discovered to exist between variables, through comparing quantitative and qualitative methods to see if they converge on a single interpretation of a phenomenon. If they do not, the relationship can be further clarified, explained, and explored in depth. Moreover, mixed methods can obtain more information and insight through the use of both methods than if a purely quantitative or qualitative method is used. Capitalizing on the strengths of each method and offsetting their weaknesses, mixed methods are more likely to provide a more comprehensive and thorough understanding of research questions, and to go beyond the limitations of a single method. In addition, mixed methods can

help improve communication among researchers from different research paradigms as they advance knowledge.

Another strength of mixed methods research is that it has witnessed a widespread application in program evaluation in education field. The most simplistic example may be it can help gather test score data along with data on other valued educational outcome (like learners' motivation and perspectives). As Greene (2005) noted, different methods are differentially well suited for different evaluation interests, and mixed methods offer greater possibilities than a single method for responding to multiple stakeholders.

Despite so many strengths, mixed-methods research also has its own weaknesses. For example, researchers need expertise in both research methods to undertake a study well which takes considerable time to develop. Moreover, it is time-consuming and expensive for a single researcher to carry out mixed methods. The weaknesses of mixed methods encourage multiple researchers with differing areas of expertise to work as a team so as to lessen the weakness and maximize the strengths.

4 Conflicting Views on Mixed Methods

While the credit of mixed methods for legitimating a pluralistic approach to the conduct of research is widely acknowledged, a set of researchers question its validity and are opposed to it, blaming it for reinforcing the binary positioning of qualitative and quantitative paradigms rather than free researchers from these restrictions. They argue that posited within the framework of quantitative and qualitative methods, mixed-methods endorse the categorical nature of the quantitative and qualitative methods and are logically restricted by their definitions (Symonds & Gorard, 2010).

As commonly observed, a manifest phenomenon exists in current research institutions and becomes an increasing tendency: Students are only taught three basic research methods—quantitative, qualitative, and mixed methods, and are bought into the idea that mixed-methods designs are the most effective. Accordingly, graduates from educational institutions are left with the impression that they have to pledge allegiance to one research school of thought among the three to render their research valid. Therefore, it is legitimate to worry that conceptualizing methodology as a categorical entity is problematic as by nature it defines boundaries which perceptions and activities are encouraged not to cross, and restricts the potential blossoming of alternative philosophies and methodologies.

The opponents of mixed methods contend that researchers should step beyond the paradigmatic boundaries of quantitative and qualitative methods by removing their philosophical and methodological labels to promote real creative research efforts. Symonds and Gorard (2010) even posited a core design typology underlying research structures and processes to encourage creative thinking around alternatives to the three purported paradigms of quantitative, qualitative, and mixed methods, and encourage new and innovative research designs to emerge.

5 Conclusion

Despite the limitations of the current mixed methods, it must be noted that as the third methodological movement, it has made substantial progress in incorporating the strengths of both quantitative and qualitative methods and reducing the limitations associated with singular methods. However, potentially attractive as mixed methods are, researchers should be aware that mixed-methods research does not provide the best practices or perfect solutions to research and hence terminates all the debates over research methods; different methods are more or less appropriate under different circumstances. It is the researchers' task to make decisions regarding which method or combination of methods to use in a specific study. No matter what research methods to adopt, the guiding principle should always be which offers the best opportunities for answering the research questions at hand.

Additionally, the adoption of mixed methods requires considerable time, energy, resources, and expertise in both of the methods, and therefore, collaboration between researchers with different expertise is encouraged to address research questions more effectively. Last but not least, researchers should be mindful that mixed methods cannot become the barrier to challenging them to consider the research methods in a way that are not specified by the quantitative, qualitative, or mixed-methods. As the "philosophical debates will not end as a result of pragmatism" (Johnson & Onwuegbuzie, 2004), the

area of research methods will continue to grow, and I believe the trend of development will be towards a more pluralistic and compatibilist approach rather than incompatibilist.

References

1. Ayer, A. J. (1959). *Logical positivism*. New York: The Free Press.
2. Campbell, D. T., & Fiske, D. W. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, 56(2), 81-105.
3. Creswell, J., & Plano Clark, V. L. (2007). *Designing and conducting mixed methods research*. Thousand Oaks, CA: Sage.
4. Denzin, N. K. (1978). The logic of naturalistic inquiry. In N. K. Denzin (Ed.), *Sociological methods: A sourcebook*. New York: McGraw-Hill.
5. Denzin, N. K., & Lincoln, Y. S. (Eds.). (2005). *The SAGE handbook of qualitative research*. Thousand Oaks, CA: Sage.
6. Fraenkel, J. R., & Wallen, N. E. (2008). *How to design and evaluate research in education*. (7th ed.). Boston: McGraw-Hill.
7. Gergen, M., & Gergen, K. (2000). Qualitative inquiry, tensions and transformations. In N. K. Denzin, & Y. S. Lincoln (Eds.), *The landscape of qualitative research: Theories and issues* (pp. 1025-1046). Thousand Oaks, CA: Sage.
8. Greene, J. C. (2005). The generative potential of mixed methods inquiry. *International Journal of Research and Method in Education*, 28(2), 207-211.
9. Greene, J. C. (2008). Is mixed methods social inquiry a distinctive methodology? *Journal of Mixed Methods Research*, 2(1), 7-22.
10. Greene, J. C., & Caracelli, V. J. (1997). Defining and describing the paradigm issue in mixed method evaluation. In J. C. Greene & V. J. Caracelli (Eds.), *Advances in mixed-method evaluation: The challenges and benefits of integrating diverse paradigms* (New Directions for Evaluation, No. 74, pp. 5-17). San Francisco: Jossey-Bass.
11. Greene, J. C., Caracelli, V. J., & Gragam, W. F. (1989). Toward a conceptual framework for mixed method evaluation designs. *Educational Evaluation and Policy Analysis*, 11(3), 255-274.
12. Jick, T. D. (1979). Mixing qualitative and quantitative methods: Triangulation in action. *Administrative Science Quarterly*, 24, 602-611.
13. Johnson, R. B., & Onwuegbuzie, A. J. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, 33(7), 14-26.
14. Johnson, R. B., Onwuegbuzie, A. J., & Tuner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, 1(2), 112-133.
15. Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.
16. Maxwell, J. A., & Delaney, J. D. (2004). *Designing experiments and analyzing data*. Mahwah, NJ: Lawrence Erlbaum.
17. Morgan, D. L. (2007). Paradigms lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. *Journal of Mixed Methods Research*, 1(1), 48-76.
18. Popper, K. R. (1959). *The logic of scientific discovery*. New York: Routledge.
19. Rossman, G. B., & Wilson, B. L. (1985). Number and words: Combining quantitative and qualitative methods in a single large-scale evaluation study. *Evaluation Review*, 9(5), 627-643.
20. Spratt, C., Walker, R., & Robinson, B. (2004). Module A5: Mixed research methods. Commonwealth of Learning [Online]. Retrieved from <http://www.col.org/SiteCollectionDocuments/A5.pdf>.
21. Symonds, J. E., & Gorard, S. (2010). Death of mixed methods? Or the rebirth of research as a craft. *Evaluation & Research in Education*, 23(2), 121-136.
22. Tashakkori, A., & Teddlie, C. (Eds.) (2003). *Handbook of mixed methods in social and behavioral research*. Thousand Oaks, CA: Sage.
23. Webb, E., Campbell, D., Schwartz, R., & Sechrest, L. (1966). *Unobtrusive measures*. Chicago, IL: Rand McNally.
24. Wheeldon, J. (2010). Mapping mixed methods research: Methods, measures, and meaning. *Journal of Mixed Methods Research*, 4(2), 87-102.