



Mixed Methods Research: A New Paradigm in Educational Research

Ahmad Zandvanian¹ and Elaheh Daryapoor^{2*}

Yazd University, Yazd, Iran

* Corresponding author's Email: Daryapour2010@yahoo.com

ABSTRACT: Mixed methods are the third paradigm of educational research. Both quantitative and qualitative approaches are considered in mixed methods research. The quantitative paradigm is influenced by positivism and qualitative paradigm is under the influence of hermeneutics, critical theory, and post-structuralism, but philosophical foundation for mixed methods research is pragmatism. Therefore, educational researchers can benefit from positive features of qualitative and quantitative research. In mixed methods, researchers collect, analyze and integrate qualitative and quantitative data. Since quantitative research takes statistical methods, experimental and quasi-experimental design, therefore its findings have the power of prediction and generalization. In contrast, qualitative research findings can understand the underlying layers of social phenomenon. Therefore, the supporters of mixed methods research are trying to design research that will have both precision and depth. In data collection, researchers must decide about the values of each quantitative and qualitative approach respectively (equal or dominant) and their time order (concurrent or sequential). In data analysis stage, the researchers can use statistical techniques and descriptive - analytical methods. Then researchers can use triangulation to confirm the validity of research findings and prepare the final research report. The authors believe that educational research findings should possess three features: a) The findings must be able to be generalized to most students; b) The findings must be able to deeply study the social context and the human relations in schools; c) The findings will be able to show a significant link between educational theory and practice and also help to solve the educational problems.

Keywords: Educational Research, Quantitative & Qualitative Methods, Mixed Paradigm

Received 20 Jul, 2013
Accepted 05 Aug, 2013

ORIGINAL ARTICLE

INTRODUCTION

Research design can be categorized into three distinct groups: 1) quantitative designs, which focus on testing theory and hypothesis) qualitative designs, which focus on developing theory and generating knowledge, and 3) mixed designs which tend to combine or mix the two designs. The choice of research method depends on the type of study, the research goal and its corresponding setting. The design determines the strategy, the data collection process as well as appropriate tools for data analysis.

Following common guidelines most researchers either apply a qualitative or a quantitative methodology. Many pragmatic scholars have criticized this dichotomy as artificial and suggested for advancing scientific knowledge. Johnson (2004) found a number of major errors in educational research textbooks about the proper use of qualitative and quantitative approaches and suggest overcoming the strict separation. Consequently, they promote the use of mixed methods to combine the strengths and overcome the limitation of traditional approaches (Spitzlinger, 2010).

Mixed methods research provides strengths, which offset the weakness of both quantitative and qualitative research. This has been the historical argument for more than 30 years. Mixed methods

research provides more evidence for studying a research problem than either quantitative or qualitative research alone. Moreover, researchers are enabled to use all the tools of data collection available rather than being restricted to the types of data collection associated with quantitative or qualitative research (Cresswell & Plano Clark, 2011).

Today, mixed methods research is moving across the disciplines. Their influence is accelerating considerably especially over the past decade. The growth of mixed methods research is a result of a convergence of factors. The increment of publications on mixed methods is certainly helping to raise its popularity (Hesse-Biber, 2010).

Quantitative Paradigm

This article assumes that science has three levels. Hypotheses and scientific propositions are in first level. Theories are in second level that produces scientific propositions. Paradigms are in third level. Theories define in the framework of specific paradigm. Fien (2002) classified research paradigms in 4 category: Positivism, Interpretative, Critical theory and Post-structuralism. As it was mentioned before, quantitative paradigm is influenced by positivism. Positivism can be followed back to the work of A.

Comte and E. Durkheim, and it was expanded later by thinkers of the Vienna Circle. Positivists believed that human beings are rational individuals governed by social laws, and their behavior is learned through observation. In the world, causes produce effects under certain conditions, and prediction can be limited by the occurrence of such conditions (Iman, 1997).

In the positivist view, scientific methods can be used to study the human issues whenever they are considered as natural phenomena. Like any empirical and natural phenomena, human society is governed by general and universal laws. Thus, scientific findings of a community may be generalizable to other communities. Therefore general social and behavioral rules can be discovered.

According to positivists, there is no distinction between the research methods in physical and biological sciences and social sciences. In addition, Edward Thorndike with positivist view in psychology extracted three rules which included: law of effect, exercise and readiness (Lefrancois, 2000).

Therefore, Gutek (1997) explained that only the synthetic propositions are significant because they are a posteriori and can be confirmed or rejected by experimental data and observation.

Overall, the following features and assumptions for quantitative research can be derived from literature (Bhola, 1997; Blaikie, 2000):

A. The world is regular and humans have the ability to search and identify it using their experience and senses.

B. Fact is separated from value. Research is a value-free process, so the researchers' role in research (inquiry) is a detached observer.

C. Statistical methods, experimental and quasi-experimental designs and also random sampling should be used.

D. The aim of the research is exploration and explanation and research findings should be predictable and generalizable.

E. The results are repeatable, objective and refutable.

F. Quantitative research leads to universal and comprehensive theories (Macro Theories).

G. Since there is a linear relation among system variables, controlling and prediction is possible.

In summary, one can say that the benefits of positivism (quantitative paradigm) are as follows:

a) It brought about a clear definition and defined boundaries for humanities (psychology, sociology, etc.)

b) It specialized the process of research in humanities.

c) It creates a common language for exchanging opinions and experiences among scientists.

d) There are certain criteria to evaluate all phases of a scientific study.

In contrast, the disadvantages of a positivistic paradigm are:

a) Exclusion of the works in areas of religion, art, philosophy and literature, from the span of science.

b) Physical and biological discourse dominated over discourse of the humanities.

c) According to Piaget, positivism wants to create firm and final boundaries for science while the horizons of science are open and unlimited (Kardan, 1996).

d) According to Piaget, positivism is a kind of epistemology which ignores the active role of researcher or gives little value to them during the observation (Kardan, 1996).

e) A researchers' research activity in the quantitative paradigm will only lead to create the research findings but it does not lead to the development of research methodologies' domain.

f) In the stage of data collection, the researcher can get some help from other people or even mail the questionnaires (instruments). In other words, it is possible for the researcher not to play any significant role in collecting the data, but data collection is still done.

Some modifications, however, were made to the assumptions of positivism in response to vast criticisms. This modified version is now referred to as post positivism. Guba and Lincoln use the term of post positivism to refer to a type of research that is grounded in positivist epistemology but that has been modified in response to criticisms of its assumptions (Gall et al. 2006).

Qualitative Paradigm

Qualitative Paradigm has its roots in hermeneutics, critical theory, postmodernism, and post-structuralism. C.H. Edson argues that qualitative inquiry is a form of 'moral discourse', an attempt to 'understand ourselves in relation to the larger world'. That larger world includes both the past and the present, and historical study is a way to reveal the relation. M. Greene's believed qualitative research is an effort to comprehend not only the modes of cultural arrangements but the ways in which those arrangements are experienced by individuals, in order to provoke intelligibility and involve one personally and intersubjectively in conscious pursuits of meaning. For qualitative researchers, life is not a dress rehearsal; it is the real thing (Sherman and Webb, 2005).

Qualitative research methods which has been used in anthropology and ethnography (Malinowski, Margaret Mead, etc.), gradually entered the fields of

sociology, psychology, education and similar fields (Bazargan, 2007).

Sadooghi (2008) maintains that qualitative research entail systematic collection, organization, and interpretation of the findings of interviews and observations, and it is used to investigate meanings that are hidden in the psychological and social phenomena, in the way that human beings experience them naturally.

Creswell (2005) classified the types of qualitative research designs in to 6 categories: a) narrative method; b) phenomenology; c) grounded theory; d) ethnography; e) case study; f) action- research. Bazargan (2009) also added focus group to these categories.

In the qualitative paradigm, it is assumed that a social fact is created by human action. Each person has a perception of fact and understands the truth in a special way and understanding the truth is influenced by social-cultural context that people live in. Social and behavioral phenomena are multilayered and one can't achieve an acceptable recognition of them by quantitative research methods merely.

Science is a socio-cultural product. Thus the qualitative researcher must have a holistic perspective to cultural, historical and social dimensions of phenomena and attempt to view the world from people's perspective (Gadamer's fusion of horizons). So the researcher must spend considerable time on collecting data and make use of interviews, dialogues and long-term observations as much of possible.

The purpose of qualitative researcher is understanding facts (interpretive) in order to break the construction of fact and find out the hidden knowledge - power relationships (post structuralism), and provide the conditions for changing the unequal power relationships between the rich and the poor (postmodernism). Finally, the researcher has to assess impact of research (impact assessment). Therefore after description and understanding the reality, the qualitative researcher must provide the context of change in order to create more equal conditions. Hence, the researchers should play different roles in the process of research. (Empathetic observer, mediator of languages, reflective partner and dialogue facilitator) (Flick, 2004).

In general, qualitative research has the following assumptions and features:

Human phenomenon is accompanied by specific mentality (subjectivity) and identifying human action is not possible without knowing the mentality.

Values motivate the human being and understanding human behavior without knowing the values are not possible. So the researcher can't have a neutral position while researching.

Criteria and standards for assessing qualitative research are different from standards for assessing quantitative research. Eisner, for example, has mentioned ten distinctions between qualitative and quantitative research (Mehrmohamadi, 2007).

Guba and Lincoln (1985) have provided four criteria for evaluating qualitative research including credibility, transferability, dependability and conformability, that replace internal validity, external validity, reliability and objectivity respectively (Sadooghi, 2008).

The natural - social environment is chaotic, so it is impossible to control, predict, and generalize the findings.

In qualitative research, there is a possibility for making local and micro theories.

Many of the existing theories are influenced by cultural- social and religious conditions, and they can't be extended (generalized). Fowler's stages of faith development is a good example. Within the Christian tradition, Fowler (1981) has endeavored to demonstrate the way in which faith develops and he outlines six stages (Jarvis, 2006). Thus it is clear that such a theory is not suitable for understanding the development of Muslim faith or other religions and those local theories are needed.

While a Meta discourse does not exist (Meta narrative), different discourses can be expressed (cognitive pluralism) (Eisner, 1994). Therefore, according to otherness consideration principle, different discourses can also engage in dialogue with each other (Bagheri, 1996).

Language is a reflection of the culture, so without understanding the language, it is impossible to understand the social and educational phenomena.

Qualitative research can extend the frontiers of knowledge and also can expand the qualitative research methodology.

So qualitative researchers are advised to do qualitative research, by taking the following notes in to consideration:

Use various forms of data (long term observations, in-depth interviews and note taking)

For data collection, carry out sufficient field study.

Choose an appropriate location for data collection.

Continue sampling to reach theoretical and empirical saturation.

Since research's report is descriptive - analytical, try to follow a logical sequence. The arguments should be credible and persuasive.

Research findings should be consistent with current scientific theories (Bazargan, 2009).

However, there are two disadvantages in qualitative research which worth being mentioned as the final point about qualitative research:

There isn't a comprehensive criteria for evaluating qualitative research yet.

It is difficult to compare the results of different studies.

Mixed Methods Paradigm

In education and social and behavioral research, mixed methods research is described as the third methodological paradigm, alongside the traditional qualitative and quantitative paradigms. Mixed methods research involves both quantitative and qualitative methodologies. While quantitative method includes numerical values and measurement which help researchers to describe, predict, explain and determine social patterns, qualitative method deals with interpretation and exploration which guide the researchers towards understanding and changing social phenomena. The combination of these two methods is a foundation for developing mixed methods research which has been called as an "evolution of research methodology" (Creswell and Garrett, 2008). This combination allows integration of data collection and analysis techniques of both quantitative and qualitative methods in either a parallel or a sequential form (Salehi and Golafshani, 2010). This idea was a reflection of Multiple Operational-ism perspective. Their reasoning was that in an assessment process, use of multiple research methods make sure the researcher that the existing incompatibility in researches, was the special specification of the phenomenon under study, and the result is not in a specific method (Mobini Dehkordi, 2011). Describes, mixed method seeks better, more comprehensive understanding of educational phenomena. In a good mixed methods study, difference is constitutive and fundamentally generative. Greene believes in practice, mixed method educational inquiry includes multiple and diverse methods for gathering, analyzing and representing educational phenomena, within a framework that intentionally engages with different ways of knowing and valuing that different methods embody. According to Johnson and Onwuegbuzie (2004) mixed method research is trying to legitimate the use of multiple approaches in answering research questions, instead of restricting researcher's choices, and suggest that researchers should have a consolidated approach to methods of research.

Since quantitative research takes statistical methods, experimental and quasi-experimental designs and advanced software such as SPSS, AMOS and LISREL in to consideration, so its findings have predictability and generalization. In addition, qualitative research findings, in contrast, can understand the underlying layers of social

phenomenon. So supporters of mixed method research are trying to design research that will have both precision and depth together.

The philosophical foundation for mixed methods is pragmatism, which aims to provide that it is a beneficial and scientific way of problem solving. Therefore, educational researchers can benefit from positive features of qualitative and quantitative research. Philosophy of pragmatism argues that one approach or mixture of approaches must be used that work the best in a real world situation. What works is what is useful and should be used, regardless of any philosophical or paradigmatic assumptions. Pragmatists argue that the specific research question is more important than either the method of data collection or the philosophy underlying the method. Therefore, it is justifiable to combine quantitative and qualitative methods in a single study (Andrew and Halcomb, 2007; Johnson and Onwuegbuzie, 2004).

In general, quantitative and qualitative data can be combined in three ways:

- Merging two sets of data simultaneously;
- Linking two sets of data with building one based on another (with two phase approach);
- Embedding two sets of data inside each other (with combination approach) (Mobini Dehkordi, 2011).

There are two major types of mixed method approaches: mixed model and mixed method. In mixed model approach, quantitative and qualitative approaches are mixed within or across the stages of the research process. Mixed model approach has two types:

- Within-stage: quantitative and qualitative approaches are mixed within one or more of the stages of the evaluation/ research.
- Across- stage: quantitative and qualitative approaches are mixed across at least two of the stages of the research.

But in mixed method design, a qualitative phase and a quantitative phase are included in the overall study. In data collection, researchers must decide about the values of each quantitative and qualitative paradigm respectively (equal or dominant) and their time order (concurrent or sequential). In data analysis stage, the researchers can use statistical techniques (quantitative data) and descriptive - analytical methods (qualitative data), and Then they can make use of triangulation method to confirm the validity of research findings and to prepare the final report of research (Bazargan, 2007, 2009).

The nature and use of triangle depends upon the outcomes of the results, whether that be convergent, which qualitative and quantitative findings represent the same results; complementary, which quantitative and qualitative results can be used to supplement

each other and; divergent, which combination of these results provides different findings (Ostlund et al., 2011).

Greene, (2005) list five specific reasons that researcher should consider using mixed methods (cited by Hesse- Biber, 2010).

a) **Triangulation:** Triangulation or more specifically, methods triangulation refers to the use of more than one method while studying the same research questions in order to examine the same dimension of a research problem.

b) **Complementary:** Complementary allows the researcher to understand the research problem completely and to clarify a given research results. This is accomplished by using both quantitative and qualitative data.

c) **Development:** Mixed methods often cause the development of a research project, whereby the results from one method, help develop the other method.

d) **Initiation:** A study`s findings may raise questions that will require clarification, thus initiating a new study.

e) **Expansion:** Expansion is intended to extend the range of the inquiry. Producing detailed findings allows researcher to continuously employ different and mixed methods in their research questions.

Thus, we can clearly see the positive power of using mixed methods to complement one`s research findings. Quantitative information which is delivered in a hard data format is dependent on statistical analyses and standardized tests of reliability and validity. Qualitative data add full understanding of research results and allows the researchers to explore the abnormalities within the data. Working with both methods gives many researchers a cross- check on their research results. Qualitative data clarify the meaning of the statistical results by adding an

explanation (description) to quantitative research findings (Hesse- Biber, 2010).

Collins, Onwuegbuzie, and Sutton (2006), presented 13 distinct steps for implementation of mixed methods research:

- A.** determining the goal of the study
- B.** formulating the research objective(s),
- C.** determining the research/mixing rationale,
- D.** determining the research/mixing purpose,
- E.** determining the research question(s),
- F.** selecting the sampling design
- G.** selecting the mixed methods research design,
- H.** collecting the data,
- I.** analyzing the data,
- J.** validating/legitimizing the data,
- K.** interpreting the data,
- L.** writing the mixed methods research report
- M.** reformulating the research questions (cited by Onwuegbuzie and Leech, 2006).

Hanson et al (2005) categorized options related to mix methods data collection procedures. Also they presented a comprehensive typology for classifying mixed methods research designs, namely: sequential explanatory, sequential exploratory, sequential transformative, concurrent triangulation, concurrent nested, concurrent transformative.

At the end of this section, the authors of this article propose a three dimensional model for applying mixed paradigms (see figure 1). In first dimension, research designs are used to study viewpoints of volunteers (within inquiry with emphasis on describing current situation). In the second dimension, research designs are used to study viewpoints of protests (against the inquiry with emphasis on understanding unequal situation). In the third dimension, researcher intends to change the current situation and make a better and more equal situation (upon inquiry).

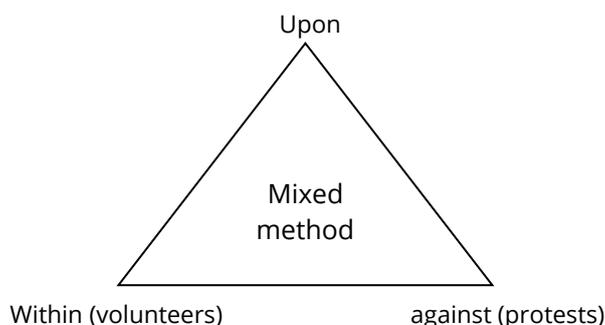


Figure1. Mixed paradigm model suggested by Zandvanian & Daryapoor

Therefore, in quantitative research, researcher with accepting one of the current paradigms in social sciences, designs the research questions (hypotheses) and then will be confirm or deny it. Meanwhile, in the

qualitative research, researcher believes that current paradigms did not respond to all issues, then; he/she is trying to offer theory for different groups with techniques like grounded theory. Finally, the

researcher makes incorporate the volunteers and protests views in mixed method research.

DISCUSSION

In this article, the authors suggest that educational research findings should have three features: a) The findings can be generalized to most students (quantitative research feature); b) The findings will be able to deeply study the social context and human relations in school and classroom (attribute of qualitative research); c) The findings will be able to show strong and significant link between educational theory and practice and they will also help solve the educational problems (Pragmatically feature). Simply put, there is a reciprocal relationship between theory and practice, and practice should be based on theory. In the words of Ellias and Merriam: "Theory without practice leads to an empty idealism, and action without philosophical reflection leads to mindless activism" (cited by White and Brockett, 1987). So, all researches should adhere to this reciprocal relation in practice.

REFERENCES

- Andrew, Sh. & Halcomb, E. (2006). Mixed methods research is an effective method of enquiry for community health. *Contemporary Nurse: a Journal for the Australian Nursing Profession*, 23(2), 145-153.
- Bagheri, Kh. (1996). Education at the view of post-modernism. *Journal of Psychology and Education*, 2(1-4), 63-84. (By Persian).
- Bazargan, A. (2009). An introduction to qualitative and mixed methods research. Tehran. Didar Press (by Persian).
- Bazargan, A. (2007). Mixed methods research design: A preferable approach in educational inquiries. *Journal of Psychology and Education*, 37(3): 101-119.
- Bhola, H. S. (1997). *Evaluating Literacy for Development Projects, Programs and Campaigns*. Translated by Abili to Persian.
- Blaikie, N.W.H. (2000). *Designing social research: the logic of anticipation*. Polity Press. Blackwell. Translated by Chavooshan to Persian.
- Creswell, j. & Garrett, A. L. (2008). The movement of mixed methods research and the role of educators. *South African Journal of Education*, 28:321-333.
- Creswell, J. (2005). *Educational Research: planning, conducting and evaluating quantitative and qualitative research*. Upper-Saddle River, N.J. Merrill.
- Cresswell, J. & Plano Clark, V. (2011). *Designing and conducting mixed methods research* (second edition). USA: SAGE publication. From: www.googlebooks.com.
- Eisner, E. (1994). *The Educational Imagination, On the Design and Evaluation of School Programs* (3rd Edition). Macmillan College Publishing Company.
- Fien, J. (2002). Advancing sustainability in higher education: issue and opportunities for research. *Higher education Policy*, 15:143-152.
- Flick, U. (2004). *An Introduction to Qualitative Research*. Translated by Jamshidian and others to Persian.
- Gall, M., Borg, W. & Gall, J. (2006). *Educational Research: An Introduction*. Translated by Nasr and others to Persian.
- Gutek, G. (1997). *Philosophical and Ideological Perspectives on Education*. Translated by Pakseresht to Persian.
- Greene, J. (2005). The generative potential of mixed methods inquiry. *International Journal of Research & Method in Education*, 28 (2): 207-211.
- Hanson, W., Creswell, J., Klark, V., Petska, K. & Creswell, D. (2005). Mixed Methods Research Designs in Counseling Psychology. *Journal of Counseling Psychology*, 52 (2):224-235.
- Hesse- Biber, S.N. (2010). *Mixed methods research: Merging theory with practice*, USA: Guilford press. From: www.googlebooks.com.
- Iman, M.T. (1997). An investigation of sociological methodologies. *Journal of Social Sciences & Humanities*, 12 (2): 29-64.
- Jarvis, P. (2006). *Towards a Comprehensive Theory of Human Learning, Lifelong Learning and the Learning Society*, 1, Routledge Publishing.
- Johnson, B. & Onwuegbuzie, A. (2004). Mixed methods research: A research paradigm whose time has come. *Educational Researcher*, 33 (7): 14-26.
- Kardan, A.M. (1996). Jean Piaget, Philosophy and Philosophy of Education. *Journal of Psychology and Education*, 2 (1-4): 3-14.
- Mehrmohamadi, M. (2007). Investigation of methodological preferences of educational researchers in Iran. *Review Quarterly Journal of Educational Innovations*, 21:77-108.
- Lefrancois, G.R. (2000). *Theories of human learning*. Translated by Yahya Seyed Mohammadi (2010). Fifth Edition, Tehran: Ravan.
- Mobini Dehkordi, A. (2011). Introducing the models and designs in mixed method research. *Journal of Rahbord*, 20 (60):217- 234. (By Persian).
- Onwuegbuzie, A. & Leech, N. (2006). Linking Research Questions to Mixed Methods Data Analysis Procedures, the *Qualitative Report*, 11(3): 474-498. From <http://www.nova.edu/ssss/QR/QR11-3/onwuegbuzie.pdf>.

- Ostlund, U., Kidd, L., Wengstrom, Y. & Rowa- Dewar, N. (2011). Combining qualitative and quantitative research within mixed method research designs: A methodological review. *International Journal of Nursing Studies*, 48: 369-383.
- Sadooghi, M. (2008). Special standards for evaluating of qualitative research. *Methodology and Social Sciences and Humanities Journal*, 14 (56): 55-72.
- Salehi, K. & Golafshani, N. (2010). Using mixed methods in research studies: An opportunity with its challenges. *International Journal of Multiple research Approaches*, 4: 186-191.
- Sherman, R. Webb, R. (2005). *Qualitative Research in Education: Focus and Methods*, Routledge Publishing.
- Spitzlinger, R. (2010). Mixed method research- Qualitative comparative analysis. Seminar paper. From: www.googlebooks.com.
- White, B., Brockett, R. (1987). Putting philosophy in to practice. *Journal of Extension*, 25 (2): 193-208.