

REFLECTIONS ON RESEARCH WITH MIXED METHODS

REFLEXIONES EN TORNO A LA INVESTIGACIÓN CON MÉTODOS MIXTOS

REFLEXÃO SOBRE PESQUISA COM MÉTODOS MISTOS

María Cruz Sánchez-Gomez¹
María Victoria Martín-Cilleros²
Patrícia Sá³
António Pedro Costa⁴

How to cite this article: Sánchez-Gomez MC, Martín-Cilleros MV, Sá P, Costa AP. Reflections on research with mixed methods. Rev baiana enferm. 2019;34:e31851.

Objective: this study presents a theoretical reflection based on the experience of the authors as researchers and professors of curricular units of research methodologies. **Method:** theoretical-philosophical reflection. **Results:** the dichotomy between qualitative and quantitative approaches originated the discussion on the need to think about the possibility of combining these methods aiming to answer the new and complex research problems currently facing us. This discussion was transformed into a dispute that some authors nicknamed “Science War”, due to the methodological and epistemological challenges of this combination, which, in its turn, originated the Mixed Methods. The proposed reflection focuses on some of the main issues that arise in the scope of the current discussions between researchers and reflecting/translating some of their concerns.

Descriptors: Mixed Methods. Research Methodologies. Qualitative and Quantitative Research.

Objetivo: se presenta una reflexión teórica basada en la experiencia de los autores como investigadores y docentes de unidades curriculares de Metodologías de Investigación. Método: reflexión teórica-filosófica. Resultados: la dicotomía entre los enfoques cualitativos y cuantitativos dio lugar a la discusión sobre la necesidad de pensar en la posibilidad de combinar estos métodos con el objetivo de responder a los nuevos y complejos problemas de investigación con los que actualmente nos enfrentamos. Esta discusión se transformó en una disputa que algunos autores apodaron “Science War”, debido a los desafíos metodológicos y epistemológicos de esta combinación que, por su vez, dio origen a los Métodos Mixtos (Mixed Methods). La reflexión que se propone se centra en algunas de las principales cuestiones que surgen en el ámbito de las actuales discusiones entre investigadores y reflejan/traducen algunas de las inquietudes de los mismos.

Descritores: Métodos Mixtos. Metodologías de Investigación. Investigación cualitativa y cuantitativa.

¹ PhD and Licentiate in Education Sciences from the Universidad de Salamanca and MSc in Logopedia from the Universidad Pontificia de Salamanca. University Professor. Director at the Departamento de Didáctica, Organización y Métodos de Investigación. Salamanca, Spain.

² PhD and Licentiate in Psychology from the Universidad de Salamanca. Professora Contratada. Departamento de Didáctica, Organización y Métodos de Investigación. Salamanca, Spain.

³ Researcher, Universidade de Aveiro, Departamento de Educacion y Psicologia, Campus Universitário de Santiago, Aveiro, Portugal.

⁴ PhD in Educational Multimedia from the Universidade de Aveiro. Researcher at the Centro de Investigação em Didática e Tecnologia na Formação de Professores of the Departamento de Educação e Psicologia, Universidade de Aveiro, Aveiro, Portugal. apcosta@ua.pt; pcosta@ludomedia.pt.

Objetivo: este estudo apresenta uma reflexão teórica com base na experiência dos autores como pesquisadores e professores de unidades curriculares de metodologias de pesquisa. Método: reflexão teórico-filosófico. Resultados: a dicotomia entre as abordagens qualitativas e quantitativas deu origem à discussão sobre a necessidade de pensar sobre a possibilidade de combinar estes métodos com o objetivo de dar resposta aos novos e complexos problemas de investigação que atualmente estão voltados para nós. Esta discussão foi transformada em uma disputa que alguns autores apelidaram de “Guerra Ciência”, devido aos desafios epistemológicos e metodológicos desta combinação, que, por sua vez, deram origem aos métodos mistos (Métodos mistos). A reflexão que se propõe se concentra em algumas das principais questões que se colocam no âmbito dos atuais debates entre pesquisadores e refletir/traduzido algumas das preocupações dos mesmos.

Descritores: Métodos Mistos. Metodologias de Pesquisa. Pesquisa Qualitativa e Quantitativa.

Introduction

The term Mixed Methodology was first used by the researchers Tashakkori and Teddlie⁽¹⁾. Although the review of 19 definitions by other authors⁽²⁾ found no relational similarities, such irregularity will be seen over time, by this methodology, as inappropriate by some researchers.

As documented in a rich and growing research literature on Mixed Methodology and by the Journal of Mixed Methods Research, mixed methods (MM) differ from other methodological approaches by the rigorous quality adherence in research methods, which leads to the integration of qualitative and quantitative methods in the analysis and findings, dissemination phases, giving access to knowledge and understanding beyond that provided by the use of quantitative or qualitative methods only⁽³⁾. Defining the characteristics of the MM is a topic of great relevance to the members of the Mixed Methods International Research Association (MMIRA) and other researchers, especially in the academic, professional and formal educational context at the graduate and postgraduate levels.

Despite the disagreement and simplistic objection to consider the MM as the combination of qualitative and quantitative methods, the authors⁽⁴⁾ support the establishment of minimum criteria that allow recognizing the identity of MM and back their distinction. With the indication of two basic criteria that meet the MM: 1) require more than a theoretical

and/or paradigmatic framework, method, methodology; 2) integration between the different methods and results.

Method

Based on the authors' experience as researchers and professors in Research methodology, and supported by the scientific literature, this study presents a philosophical theoretical reflection on the emergency, positioning and future guidelines of mixed methods.

Results and Discussion

The evolution and the search for new methods that allow for a more thorough exploration, and in coherence with the new research interests, contexts and technological support, have allowed the consolidation of the MM, reaching an increasingly robust positioning in different areas of knowledge⁽⁵⁾. Addressing their origins and development will allow the researcher to know the relevance of their use.

How Mixed Methods Appear

The beginning of the century were characterized by the traditional methodological confrontation. If in the second half there was an alternation of dominant paradigm and efforts to criticize the opposite position, “At the end of the twentieth century, there is a slow remission of confrontation, with fleeting irruptions of

complementarity”^(6:28). The 21st century began with a third orientation that had been developing for decades, called pragmatic approach^(7:23) “that advocates for mixed or hybrid methods and models (pluralism and compatibility); researcher/ phenomenon/ participants relations are determined in function of each particular study and context; rejects dichotomy between conventional dualisms and is oriented in the action rather than in the philosophical discussion”.

This new favorable context has been possible mainly due to a series of events that have enabled the increase of the mixed designs. Among those events, there are the publication in the British Educational Research Journal⁽²⁰⁰³⁾ of a monograph on educational research with 8 articles (4 mixed); the publication of the book of Tashakkori and Teddlie, *Mixed Methodology: Combining Qualitative and Quantitative Approaches*, in 1998, which resulted in a rapid expansion in the acceptance of mixed models, so that, in 2003, in the first edition of the *Handbook of Mixed Methods in Social Research and Behavior*, these authors described those methods as “a clear third methodological model”^(8:24). Other contributions to the development of mixed methods are the creation of the *Journal of Mixed Methods Research (JMMR)*⁽²⁰⁰⁷⁾, which began to use⁽⁷⁾ qualitative methods to develop quantitative measures, quantitative methods to reinforce qualitative findings; qualitative methods to explain qualitative findings, equivalent quantitative and qualitative methods; and the notable increased number of works with and on mixed models⁽²⁰⁰⁸⁻²⁰¹⁵⁾, among which those of John Patton, Jennifer Greene, Richard Grinnell, Charles Teddlie stand out, as well as the relevant works of some authors^(9,10,11).

The facilitated evolution of mixed models results from the increasing diversion of radical methodological practices and the constant increase of scientific production, as well as of the close relationship between subjects and science. With the recognition and application of both perspectives, new and varied QUAL/QUAN instruments emerge to promote and create hardware and software⁽⁶⁾.

How Mixed Methods Work

The mixed models have their own methodological features⁽¹²⁾. Some researchers⁽¹³⁾ define them as a research project with the philosophical presuppositions and patented research methods, supported by the idea that the use of combined quantitative and qualitative approaches provides a better understanding of research problems than any isolated approach.

Placing the research objective and question in the foreground is particularly relevant because it emphasizes a specific feature of the MM, the critical and/or transforming research purpose. One can find evidence that mixed models constitute a methodology in publications such as *The Best Practices for Mixed Methods Research in the Health Sciences Report*.

Las Typologies Of The Mixed Methods

From authors as Greene, Caracelli and Graham⁽¹⁴⁾, who tried to classify for the first time the designs used in the different studies, many other authors⁽¹⁵⁻¹⁷⁾ have raised classifications of mixed methods designs within an inclusive framework. The plurality of statements is enhanced by the existence of a multitude of categories or taxonomies of designs in MM, made by different authors, and by the myriad of research purposes and questions that may arise.

These same authors⁽¹⁵⁻¹⁷⁾ explored the classifications of the MM organized in an unfinished image, based on the primary studies⁽¹⁴⁾ that organized their design in an attempt to be applied in the various studies. This plurality of demonstrations affects the unlimited increase in typologies and/or taxonomies of MM projects, as an infinite variety of research purposes and questions arise.

Regarding the different MM projects, researchers⁽⁴⁾ agreed that the MM research projects can be infinitely variable, and that one must learn about the emerging methodological frameworks and apply MM to these new contexts. One of these new trends is the project to resolve complex tasks

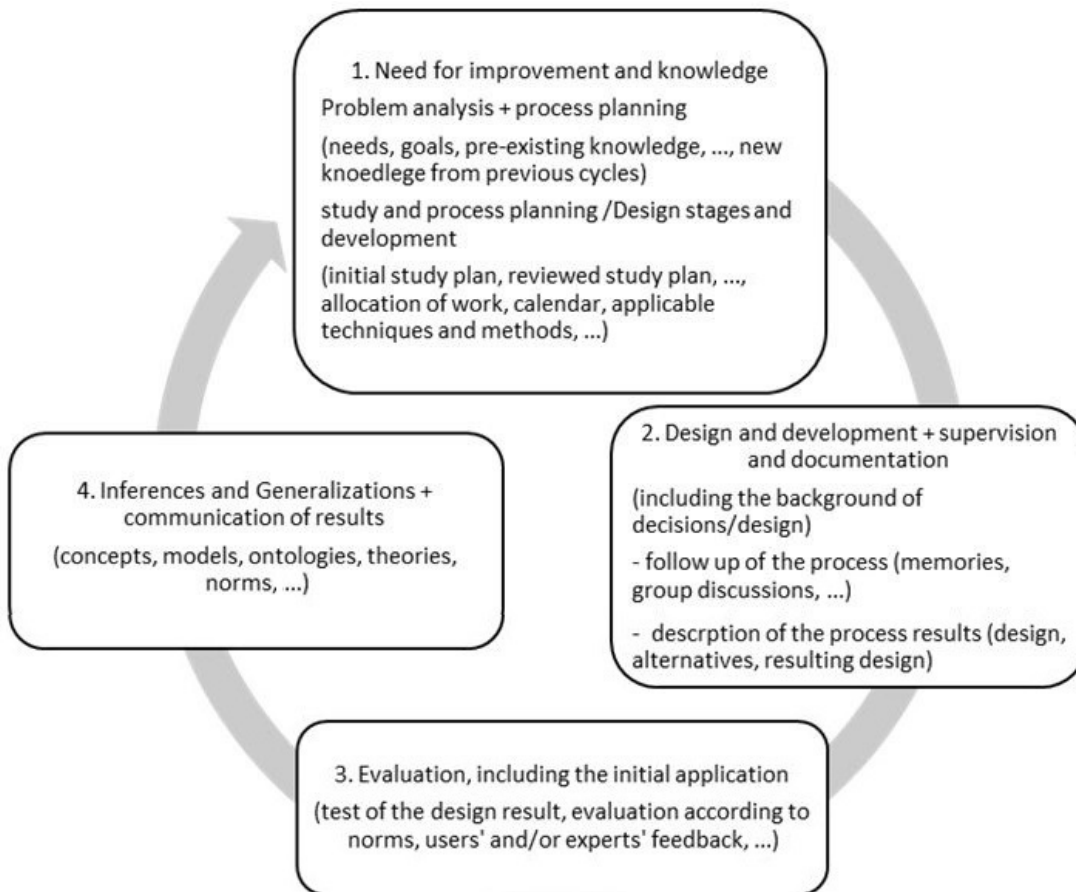
faced by professionals from different areas in their practices⁽¹⁸⁾. The projects incorporate innovation and development, looking for solutions that best meet the needs of the changing environments.

Currently, one of the design models most used in MM is the cyclic model suggested by Mertens⁽¹⁵⁾. The stages within each cycle come with their own objectives, thus requiring and adapting to the need to collect quantitative and qualitative data to learn, justify and prove designs (Figure 1). One should make an effort to combine

creativity, professional skills and knowledge of quantitative and qualitative research methods.

The cycles presented in the model are used when the research includes the search for solutions, instead of testing an existing solution. Thus, it begins with the idea of necessary improvement and flows through cycles of planning, design, evaluation, inference, and dissemination. The potential of these designs is the understanding of the research process through the information provided by the different methods in each cycle.

Figure 1. Design stages of Mertens' Cyclic Model⁽¹⁵⁾



Source: Created by the authors.

How To Decide Qual Versus Quan Proportions

As a conclusion to the reflections of the MMIRA on this topic, some questions not necessarily can be categorized as quantitative, qualitative

or MM^(19:103-4). Obviously, any research question should potentially be searchable, but the key is to discover how. Writing initial questions that “dictate” the methods that will be used to answer them may be daring, as they can engender a conceptual “tunnel vision”, preventing the

researcher from seeing alternative approaches and data that can contribute to answering the question.

Therefore, the authors argue that the questions do not necessarily assume methods, although some methods may be more appropriate than others to answer certain types of questions. Furthermore, as the investigation progresses, questions can be modified in response to the ongoing analysis.

A particular project allows the construction of a project determined by the researcher, that is, “equivalence project of mixed state and projects of dominant mixed state”⁽¹¹⁾, classified as follows:

- Concurrent (simultaneously): both methods are applied in parallel or simultaneously (analyzing the quantitative and qualitative data collected at more or less the same time).
- Sequential: qualitative or quantitative data are collected and analyzed in a first phase, and then data are collected and analyzed from another method. Generally, when seeking to explore a collective in its context, firstly, qualitative data are acquired in order to improve the study for a subsequent larger sample, in order to establish generalizations to the population⁽¹⁴⁾.
- Of integration: data are converted for their analysis, in which a data type is transformed into another (qualitative into quantitative data or vice versa), subsequently analyzing both data sets under QUAL and QUAN analysis^(17,20).

Projection of mixed methods

MM researches have expanded in recent decades with abundant publications^(19,103). The launch of the JMMR and the establishment of the MMIRA provide glimpses of a promising development for MM between the years 2016 and 2020. The conclusions drawn up by the working teams are grouped into five topics:

- Definition, profile and history of Mixed Methods.
- Objectives, Research Questions, Design and Technological Advances.
- Social Justice and the responsibility of the researcher.
- Teaching of Mixed Methods.
- MMIRA, profession and professional development.

The development of research questions and the alignment of these questions with an appropriate design is a fruitful area in the investigation of MM⁽¹⁹⁾. In addition, technological advances associated with applications in research are also matters of growing interest. To address these challenges, the MMIRA recommends for the coming years:

- Promote discussion on the classification of designs, without rigidly imposing a particular typology, such as delineating and defining the dimensions in which they vary. They bet on a reciprocal link between questions and designs where the research questions are formed by methods. One should explore how to integrate both quantitative and qualitative methods and provide or promote the training to do so.
- Encourage researchers to think more flexibly and expand their methodological repertoire to include the investigation of MM.
- New digital tools to expand the repertoire of research methods, by providing web surveys software, helping to establish connections between parts of a design, as metadata that allow connecting different sets of archived data. The MMIRA must play an important role in fostering the adoption and adaptation considered of information technologies on the part of mixed methods researchers (workshops

on web sites, conferences, etc ...). Consider the possibility of making the “technological facilities” part of its major programs and regional conferences. The stream might include a forum with the title “what we need”, inviting the software creators, provided that users could specify what software features they need to facilitate projects of mixed methods.

- Researchers⁽¹⁶⁾ claim that, with the methodological and technological skills, one can answer the research questions through new forms. One of the main strengths of the MM investigation is its emphasis on creativity and flexibility. Researchers need to be prepared to be flexible, rather than following a script.

Thus, we can state that mixed approaches allow:

- Performing comparative analyses and developing deeper and interpretative study aspects.
- A complementarity of sources and data (triangulation), obtaining deeper and better information than that obtained with only one of the other approaches.

Taking into account the above, the research problem will determine the method of investigation, thus opening the door to the use of multiple methods in social research. There is, therefore, a wide range of possible techniques of information gathering and analysis⁽²¹⁾. The use of multiple research methods diversifies the modes of approximation, discovery and justification regarding the attention aspect or dimension of the studied subject. The mixed methods research plays a key role to provide a holistic and comprehensive view of the studied reality^(22:27-8).

Finally, it is worth mentioning the benefits evidenced by several contemporary authors^(8,11,23-6), such as: QUAN_QUAL corroboration by triangulation; application of the method to elucidate the results in a complementary manner

based on the other; holism, to know the whole to understand its parties; the use of the results of a method in the development of other processes; presentation of the events found, innovation; expansion of knowledge; the limitations of a method can be solved by the other, the plurality of the conceptions of an object/problem and assurance and reliability of results.

Conclusion

There is still a long way in the development and deepening on mixed methods. Each time, more proposals appear, reflected in doctoral theses, research projects and publications, classifying them in mixed projects in general, containing, in their composition, both quantitative and qualitative methods, which guide the structuring and the progress of the studies.

As reflected in different types of designs, according to the QUAN or QUAL proportions, a broad training is necessary, requiring deepening, not falling into the simplicity of courses on existing research methods. In line with their status of different methodological approach, the syllabuses on research methodology in graduate and postgraduate programs should provide a formal education in qualitative research (those without it into their curricula) and mixed methods, along with traditional quantitative research approaches.

The researchers must explore and apply the available methods to better understand the complexity of the problems, as well as the various factors involved in the scientific area to contrast and advance the knowledge. In view of the specificities of those problems, there is need for an in-depth and improved data analysis, helped by the different methodological contributions. Definitely, the research that uses mixed methods plays an essential role in its planned approach between quantitative and qualitative using multiple sources.

Collaborations:

1 – conception, design, analysis and interpretation of data: María Cruz Sánchez-Gomez,

María Victoria Martín-Cilleros, Patricia Sá y António Pedro Costa;

2 – writing of the article and relevant critical review of the intellectual content: María Cruz Sánchez-Gomez, María Victoria Martín-Cilleros, Patricia Sá y António Pedro Costa;

3 – final approval of the version to be published: María Cruz Sánchez-Gomez, María Victoria Martín-Cilleros y António Pedro Costa

References

1. Tashakkori A, Teddlie C. *The Sage Handbook of Mixed Methods in Social and Behavioral Research*. 2.a ed. Thousand Oaks, CA: Sage; 2010.
2. Johnson RB, Onwuegbuzie AJ, Turner IA. Toward a definition of mixed methods research. *J Mix Methods Res*. 2007;1(2):112-33.
3. Maxwell J, Chmiel M, Rogers S. *Designing integration in mixed method and multi-method research*. New York: Oxford University Press; 2015.
4. Bowleg L, Fielding N, Maxwell J, Molina-Azorin JF. *The Future of Mixed Methods: A Five Year Projection to 2020*. MMIRA; 2016.
5. Martín-Cilleros MV, Sánchez-Gómez MC. Análisis cualitativo de tópicos vinculados a la calidad de vida en personas con discapacidad. *Ciência Saúde Coletiva*. 2016;21:2365–2374.
6. Sánchez-Gómez, MC. Metodología de investigación en pedagogía social (Avance cualitativo y modelos mixtos)/Research methodology in social pedagogy (qualitative progress and mixed models)/Metodologia de investigação em pedagogia social (enfoque qualitativo e modelos mistos). *Pedagogia Social*, 2015;25:21-34.
7. Sánchez-Gómez, MC. La dicotomía cualitativo-cuantitativo: posibilidades de integración y modelos mixtos. *Rev. Campo Abierto* 2015; 11-30
8. Tashakkori, A., & Teddlie, C. (Eds.). *Handbook of Mixed Methods in social and behavioural research*. Thousand Oaks, CA: Sage; 2003.
9. Morse JM. *The oxford handbook of mixed and multimethod project*. New York: Oxford; 2015. Chapter 2, Issues in qualitatively-driven mixed-method designs: Walking through a mixed-method project; p. 206-22.
10. Sánchez Gómez MC. Metodología de investigación en Pedagogía Social (Avance Cualitativo y Modelos Mixtos). *Pedagog Soc Rev Interuniv [Internet]*. 2015 [citado 11 de enero de 2019];(26). Disponible en: <http://www.redalyc.org/resumen.oa?id=135043653001>
11. Hernández Sampieri R, Fernández Collado C, Baptista Lucio P. *Metodología de la investigación*. 6.a ed. México: McGraw-Hill; 2014.
12. Bergman MM. The good, the bad, and the ugly in mixed methods research and design. *Mix Methods Res*. 2011;5:271-5.
13. Creswell JW, Plano Clark VL. *Designing and conducting mixed methods research*. 2.a ed. Thousand Oaks, CA.: Sage; 2011.
14. Greene JC, Caracelli VJ, Graham WF. Toward a conceptual framework for mixed-method evaluation designs. *Educ Eval Policy Anal*. 1989;11(3):255-74.
15. Mertens DM. Mixed methods and wicked problems. *J Mix Methods Res*. 2015;9(1):3-6.
16. Morse JM, Niehaus L. *Mixed method design: Principles and procedures*. Walnut Creek, CA, USA: Left Coast Press Inc; 2009.
17. Teddlie C, Tashakkori A. *Foundations of Mixed Methods Research: Integrating Quantitative and Qualitative Approaches in the Social and Behavioral Sciences*. 2009.
18. Simonsen J, Bærenholdt JO, Büscher M, Scheuer JD. *Design research: synergies from interdisciplinary perspectives*. London; New York: Routledge; 2010.
19. Sánchez-Gómez MC, Rodrigues AI, Costa AP. Desde los métodos cualitativos hacia los modelos mixtos: tendencia actual de investigación en ciencias sociales. *RISTI - Rev Ibérica Sist E Tecnol Informação*. 2018;(28):ix-xii.
20. Bazeley P. *Handbook of mixed methods research for the social and behavioral sciences*. 2nd ed California: Sage; 2010. Chapter 18, Computer-assisted integration of mixed methods data sources and analyses; 431-67.
21. Martín-García AV, Sánchez Gómez MC. Modelo predictivo de la intención de adopción de Blended learning en profesores universitarios. *Univ Psychol*. 2014;13(2):601-14.
22. Martín García AV, Sánchez-Gómez MC, Gutiérrez Pérez B. Ejemplificación de metodología mixta para el análisis del uso de entornos blended learning en docentes universitarios. *RISTI*, 2019,33:16-31.

23. Pawson R. The science of evaluation. Thousand Oaks, CA: Sage; 2013.
24. Bazeley P. Writing up multimethod and mixed methods research for diverse audiences. 2015.
25. Sánchez-Gómez MC, Martín-Cilleros MV, Costa AP, García Peñalvo FJ. Posicionamiento de la investigación en Ciencias Sociales. RISTI-Revista Ibérica de Sistemas e Tecnologias de Informação. 2018; 28:102-13.
26. Anguera MT, Portell Vidal M, Chacón-Moscoso S, Sanduvete Chaves, S. Indirect observation in everyday contexts: Concepts and methodological guidelines within a mixed methods framework. *Frontiers in Psychology*. 2018; 13(9) doi: 10.3389/fpsyg.2018.00013.

Received: May 21, 2019

Approved: December 26, 2019

Published: May 11, 2020



The *Revista Baiana de Enfermagem* use the Creative Commons license – Attribution -NonCommercial 4.0 International.
<https://creativecommons.org/licenses/by-nc/4.0/>

This article is an Open Access distributed under the terms of the Creative Commons (CC BY-NC). This license lets others remix, adapt and create upon your work to non-commercial use, and although new works must give its due credit and can not be for comercial purposes, the users do not have to license such derivative works under the same terms.