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INDICE

EDITORIALE 7

DOSSIER – Riflessioni sull’Università di oggi

LA DIREZIONE, <i>Premessa</i>	9
MASSIMO BALDACCI, <i>L’università della terza fase</i>	11
GIUSEPPE BERTAGNA, <i>Riforme mancate e qualità pedagogica dell’insegnamento superiore</i>	15
MASSIMILIANO FIORUCCI, <i>Accesso al sapere, Università e “società della conoscenza”</i>	25
MARIO GENNARI, <i>Università: ricerca e insegnamento</i>	31
PIERLUIGI MALAVASI, <i>Università, capitale umano, modelli organizzativi</i>	35
MARIA GRAZIA RIVA, <i>Università Oggi: polarità, scarti e problematicità</i>	43
MAURA STRIANO, <i>Università oggi: problemi aperti</i>	47

DOSSIER – Volumi recenti e categorie portanti della pedagogia

<i>Premessa</i>	51
FRANCO CAMBI, ELENA MADRUSSAN, <i>Mario Gennari, Filosofia del discorso, Genova, Il melangolo, 2018</i>	52
MARIO GENNARI, <i>Teoresi Teologica</i>	57

ARTICOLI

MIRCA BENETTON, <i>«Rodari the educationist» today, and the rights of the child</i>	63
MILENA BERNARDI, <i>Children’s literature and illustrated novels. Educating readers, literary works and visual surprises</i>	85
IRENE BIEMMI, <i>Outside the “gender cages”: men in training courses dedicated to educational and caring professions</i>	97
MICHELE CAGOL, <i>Emozioni e pedagogia. Per un primo inquadramento scientifico</i>	111
DAVIDE CAPPERUCCI, <i>Assessing Learning to Learn through Rubrics and Authentic Tasks</i>	123
RITA CASADEI, <i>Silence and time: veiled energies in education</i>	137
ROSSELLA CERTINI, <i>Illness, Narration and Healing: Women’s Perspectives</i>	147
MAURO CERUTI, ANNA LAZZARINI, <i>Anelli ricorsivi fra saperi e territori. Dalla frammentazione alla complessità</i>	157

ANTONELLA COPPI, <i>L'Arte per tutti. Artistry e creatività nella formazione per tutta la vita</i>	169
MARIA D'AMBROSIO, <i>Eroica e poetica pedagogica</i>	181
ELENA FALASCHI, <i>The epistemological challenge of the "pedagogy of talents". educating for resilience in order not to waste social capital</i>	197
DAMIANO FELINI, <i>Esperienze pionieristiche di film making scolastico al Villaggio di Corea (Livorno, 1976-'77). Storie, verifiche, riflessioni</i>	215
MASSIMILIANO FIORUCCI, <i>La pedagogia "popolare" di don Roberto Sardelli e l'esperienza della Scuola 725</i>	229
ALBERTO FORNASARI, <i>"We are the time". Expectations and requests of UNIBA students concerning the time bank of the University: an empirical research</i>	237
GIULIANO FRANCESCHINI, <i>Colto, competente o consapevole? Modelli di insegnante a confronto</i>	253
TOMMASO FRATINI, <i>Appunti sull'esclusione sociale nella disabilità</i>	271
MARCO GIOSI, <i>Maria Zambrano: scrittura di sé come confessione, tra esilio e storia</i>	285
ANNA KAISER, <i>Ai prodromi del Neuhumanismus tedesco: letteratura e pedagogia</i>	299
STEFANO LENTINI, <i>Il Sessantotto. La battaglia contro le istituzioni e la psichiatria "etico-pedagogica" di Franco Basaglia</i>	311
CHIARA LEPRI, <i>Education on Diversity. The Contribution of Early Childhood's Literature</i>	325
PAOLO LEVRERO, <i>Hänsel e Gretel: fiaba per adulti e genitori</i>	337
PAOLO LEVRERO, <i>Milani, l'ebreo. Ebraismo, cristianesimo e religiosità nell'umanesimo pedagogico milaniano</i>	343
MATTEO LOCONSOLE, <i>Laws and sexual prejudices in the Italian positivist culture: murderous mothers and the education to infanticide</i>	355
ELENA MADRUSSAN, <i>«No one else can make you change». Formazione, giovinezza, musica, a partire dal Sessantotto</i>	375
DOMENICA MAVIGLIA, <i>The Intercultural Perspective in Paulo Freire's Pedagogy of the Oppressed</i>	387
SARA MORI, CHIARA GIUNTI, MASSIMO FAGGIOLI, <i>Promuovere la partecipazione attiva e le soft skills nei corsi e-learning: dalla teoria alla pratica</i>	397
E. GLORY OKOEDION, UGO C. OKOLIE, IDONGESIT D. UDOM, <i>Perceived factors affecting students' academic performance in Nigerian Universities</i>	409
MARIANNA PICCIOLI, <i>Educational research and Mixed Methods. Research designs, application perspectives, and food for thought</i>	423
DAVID SALOMONI, <i>Women, Religion, and Education in Early Modern Italy. Some Case Studies (16th-18th c.)</i>	439
FABRIZIO MANUEL SIRIGNANO, STEFANIA MADDALENA, <i>Inteligencia colectiva, metacognición y cultura digital. Nuevos horizontes de la Pedagogía contemporánea</i>	451

RAFFAELLA C. STRONGOLI, <i>The body and corporeity in the context of environmental education with an ecological orientation</i>	465
ROBERTO TRAVAGLINI, <i>The Ethical Education for a "Humanist Revolution": Accepting and Overcoming Conflict</i>	481
MICHELE ZEDDA, <i>Note sulla pedagogia di Leopardi. La giovinezza</i>	499
MARGINALIA	
FRANCO CAMBI, <i>Sul pluralismo dei generi oggi: tra diritti e... rifiuti</i>	513
RECENSIONI	519
LIBRI E RIVISTE RICEVUTE	51
NORME REDAZIONALI PER I COLLABORATORI DELLA RIVISTA	339

Educational research and Mixed Methods. Research designs, application perspectives, and food for thought

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Abstract. Which methodology is most appropriate for educational research is a question for which many experts have provided often antithetical ideas and approaches. The mixed-methods approach has only recently appeared in the field of educational research as an alternative to the dichotomous vision that contrasts quantitative and qualitative methods. This paper will explore mixed-methods designs in an attempt to provide a framework that can facilitate its use in teaching and educational research.

Keywords. Mixed Methods – educational research – mixed-methods designs – qualitative methods – quantitative methods

1. Introduction

The complexity of educational action and a pedagogical approach make research, especially in education, particularly delicate and closely correlated to the contextual variables in which it occurs¹. This does not mean that it should not be rigorous, nor must move in multiple directions. Quite the contrary, a high degree of rigor is needed, whether the research is theoretical, historical, or empirical². If it is true that «scientific laws are hypothetically probabilistic»³, it is also true that, in education, relationships with the same type of character may be confirmed⁴. Thus, scientificity resides not so much in the research subjects as in the processes implemented to investigate such a complex subject as education.

Why is educational research carried out?

The research activities seek to shed light on a given educational situation, spatially, temporally, and culturally located, in order to have a comprehensive understanding of the situation, taking into account its uniqueness and specificity (idiographic research), or to extrapolate from that situation more general rules and laws, applicable also to contexts and situations different from those in which they were produced (nomothetic research)⁵. Research is carried out because

¹ Cfr. L. Mortari, *Cultura della ricerca pedagogica. Prospettive epistemologiche*, Roma, Carocci, 2007.

² Cfr. *Ibidem*.

³ P. Lucisano, A. Salerni, *Metodologia della ricerca in educazione e formazione*, Roma, Carocci, 2002, p. 32.

⁴ Cfr. *Ibidem*.

⁵ R. Trincherò, *Manuale di ricerca educativa*, Milano, Franco Angeli, 2002, p. 21.

of the «desire to understand educational phenomena in order to make educational decisions whose effectiveness, broadly speaking, is more probable»⁶.

R. Trinchero and P. Lucisano have provided a functionally exhaustive answer to the question posed. Indeed, educational research following their line of thought is useful, perhaps indispensable, for making choices with some foundation in validity, based on a rigorous understanding of a certain phenomenon. The approach adopted may only be a choice regarding the educational event to be investigated. Being «the reality of the problem and of the possible solutions to function as a criterion for the choice of approaches»⁷, it is considered appropriate to work with a multiplicity of approaches, always referable however to scientificity. It is no coincidence that the current debate concerning these issues speaks of a true mixed approach or of what is termed an eclectic approach that legitimizes using any methodological combination on condition that scientificity are respected and significant results are obtained⁸.

2. The presuppositions of educational research

It is undeniable that in the simple attempt to provide an indispensable reason for educational research, the need to face some paradigmatic questions has emerged, namely those of that «more complex conceptual organizational chart comprised of ontological, gnoseological, epistemological, ethical, and political presuppositions»⁹.

Ontological presuppositions refer to the nature of the situation being explored, while the gnoseological ones question the nature of knowledge¹⁰. These assumptions are found in the beliefs of the researcher who may consider reality a fact that exists as an objective or objectified condition, thus separated from the observer investigating it or as a result of its perception in an ecological perspective¹¹. These two visions fall into individual research perspectives. One is the «naive realist»¹² research perspective of a researcher who believes that reality can be investigated deterministically. The other is the «critical realist»¹³ research perspective of a researcher who considers the knowledge of an imperfect, probabilistic situation and the ecological strand of the researcher who considers knowledge of reality as the product of our perception and mental image created on the interpretation of facts¹⁴. This last strand is further articulated into phenomenological, critical, and participatory orientations.

Epistemological presuppositions seek ways to achieve knowledge¹⁵ and are closely

⁶ P. Lucisano, A. Salerni, *Metodologia della ricerca in educazione e formazione*, cit., p.18.

⁷ Ivi, p. 78.

⁸ Cfr. M. Pellerey, *La scelta del metodo di ricerca. Riflessioni orientative*, in «Giornale Italiano della Ricerca Educativa», 2011, 4(7), pp. 107-111.

⁹ L. Mortari, *Cultura della ricerca pedagogica. Prospettive epistemologiche*, cit., pp. 20-21.

¹⁰ Cfr. *Ibidem*.

¹¹ Cfr. R. Trinchero, *Manuale di ricerca educativa*, cit.; Mortari L., *Cultura della ricerca pedagogica. Prospettive epistemologiche*, cit.

¹² R. Trinchero, *Manuale di ricerca educativa*, cit., p. 26.

¹³ *Ibidem*.

¹⁴ Cfr. *Ibidem*.

¹⁵ Cfr. L. Mortari, *Cultura della ricerca pedagogica. Prospettive epistemologiche*, cit.

related to the researcher's ontological and gnoseological beliefs. For the naive realist, research results can only be true in that reality and researcher are independent entities. The critical realist does not look for deterministic truths but

trends and regularities in the observed phenomena that may suggest the existence of certain structural provisions that govern this reality. [...] The spatial, temporal, and cultural contexts in which the research is conducted are important, given that the same tendential validities, in different contexts, could give different manifestations or none at all¹⁶.

For the researcher who follows ecological presuppositions that takes on a relativist outlook, reality can only be interpreted by searching for the meanings attributed by the subjects to the phenomena under investigation¹⁷. Specifically, a phenomenological orientation leads the researcher to adopt a transcendental eidetic approach. In other words, the genesis of the phenomena will not be addressed but only their directly observable and describable, or hermeneutic, effect, leading the researcher to shift his focus from describing the phenomenon to searching for the meaning that the experience takes on for the subjects involved in the research¹⁸. With a critical approach, an ecological orientation leads the researcher to view the situation being investigated as a problem requiring a solution. A critical awareness of the social and cultural conditions influencing the phenomena is developed in order to reveal the forms of subjugating power found also in educational contexts in a transformative perspective and promoting emancipatory improvement strategies¹⁹. Finally, an ecological orientation with a participatory approach presupposes that the research is developed through cooperation between the researcher and the people involved in the research who, together, acquire the techniques and knowledge²⁰.

The ethical and political assumptions ask the researcher axiological questions regarding their responsibility and what the reasonable and appropriate research to be conducted is²¹. Above all, the question of values in our area of interest cannot be ignored, so the researcher cannot overlook the fact that the players in educational action and pedagogical approach are people «whose personal growth and empowerment are always priority goals»²².

These presuppositions are followed by one last general question on methodology, understood as thoughts on method and techniques, i.e., the set of codified processes and structures made available for research also in the educational field, which the researcher adopts for his own assumptions. Indeed, there are many scholars who deal with the question of educational research methodology²³. All agree in identifying a guiding structure that can be attributed to a series of steps that relate to a recursive, circular model²⁴:

¹⁶ R. Trincherò, *Manuale di ricerca educativa*, cit., pp. 26-27.

¹⁷ Cfr. *Ibidem*.

¹⁸ Cfr. L. Mortari, *Cultura della ricerca pedagogica. Prospettive epistemologiche*, cit.

¹⁹ Cfr. *Ibidem*.

²⁰ Cfr. *Ibidem*.

²¹ Cfr. *Ibidem*.

²² R. Trincherò, *Manuale di ricerca educativa*, cit., p. 26.

²³ In the Italian context we can see the studies of Luigina Mortari, Susanna Mantovani, Benedetto Vertecchi, Gaetano Domenici, Pietro Lucisano, Roberto Trincherò, Davide Capperucci and Fabio Dovigo.

²⁴ Cfr. J. Dewey, *Come pensiamo*, Firenze, La Nuova Italia, 1973.

- problem selection and the definition of hypotheses or objectives;
- research-design formulation;
- tool selection, construction, and development;
- data collection;
- data encoding and analysis; and
- interpretation and communication of the results.

Lastly, P. Lucisano has focused on such macro-context issues as the institutional and regulatory environment, policy guidelines disproportionate to the contexts, and resources that can draw on the specific research and available time.

Knowing the institutional and regulatory context allows the researcher to identify the levels of responsibility to be investigated and «to make clear which relations have solutions to the problems he/she intends to address»²⁵.

Understanding the policy guidelines helps to identify the implicit goals underlying some decisions conveyed by the regulatory framework, effectively representing constraint or opportunity factors for the researcher who must be aware of also being part of this system. «To think that we cannot be conditioned by these guidelines is just as naive and can give rise to extremisms or of prejudicial criticism that would make the researcher lose a sense of reality»²⁶. In relation to this sensitive issue, Lucisano has given the scientific community the responsibility to monitor the political guidelines and ensure that they do not affect the spaces for basic free research.

The last two issues, resources and time, pose constraints that the researcher must face when designing his own research and which must respond to feasibility principles. Having said this, however, one cannot fail to consider the fact that the question of resources «forces us to deal with funding mechanisms and the powers that determine the flow of resources to the various research sectors»²⁷. Consider that the indicator, expressing the percentage of research and development investments related to GDP (Gross Domestic Product), is one of the key structural indicators in the Europe 2020 strategy. The 2020 goal the European Union has set itself is to invest 3% of its GDP in research and development, requesting Italy to contribute to reaching this target with an investment of 1.53% on the grounds that Italy, according to the latest EUROSTAT data from 2015, allocates only 1.33% of its GDP to research and development, compared to the European average of 2.03% or to those countries, such as Austria, Denmark and Sweden, that have already reached or exceeded the European average target with research and innovation investments exceeding 3%²⁸.

To formulate the research design, some elements must be considered, such as:

- the factors, understood as any element affecting a system or a product of the system;
- the variables, i.e., any entity that can assume multiple values, also called modalities assumed by the variable;
- the techniques or referential procedure for the set of well-defined logical steps useful in obtaining a result of the given premises;

²⁵ P. Lucisano, A. Salerni, *Metodologia della ricerca in educazione e formazione*, cit., p. 78.

²⁶ Ivi, p. 79.

²⁷ Ivi, p. 80.

²⁸ Cfr. Source EUROSTAT, <http://ec.europa.eu/eurostat/data/database>, last consultation 29/05/2018.

- the physical or virtual tools used as part of a technique;
- the method, understood as that set of techniques and principles that guide its application; and
- strategies, or the set of techniques and principles guiding the application, chosen on the basis of the objective²⁹.

3. The mixed-methods approach

We now would like to call attention to the research designs known as mixed methods. To understand the development process of this approach to research, more space would be needed than would be possible to use in this context, so I will limit myself to providing a concise definition of the technique and a more detailed picture of the description of the types of designs.

Mixed methods have been introduced «with the expectation of becoming a third way in social sciences as regards the quantity-quality dichotomy by contemplating the integration of different approaches and, with them, diverse analytical methods, not as simply their sum but as an integrated, integral approach to the situation being studied»³⁰ considering the need for their systemic integration as a functional modality for exploring complex phenomena. L. Mortari further underscores that «the pragmatic principle guiding the mixed methods theory is to increase the investigative force and to avoid the weaknesses of individual approaches»³¹.

As stressed by A. La Marca, this new research perspective appears to respond better to this new realism³² where the ultimate goal of achieving significant results and responding to the situation of the phenomenon under investigation enables any integration of different models to be accepted, resulting in what is also termed an eclectic approach³³.

Many authors have codified various mixed-methods research designs³⁴ and the process leading to the recognition of this methodological approach to socio-educational research has been lengthy. Various studies have focused on standardizing these research

²⁹ Cfr. R. Trinchero, *Manuale di ricerca educativa*, cit.

³⁰ E. Amaturio, G. Punziano, *I Mixed Methods nella ricerca sociale*, Roma, Carocci, 2016, p. 15.

³¹ L. Mortari, *La ricerca empirica in educazione: questioni aperte*, in «Studi sulla Formazione/Open Journal of Education», 12(1-2), 2009, pp. 33-46, p. 40.

³² Cfr. A. La Marca, *Nuovo realismo e metodi di ricerca misti*, in «Journal of Educational, Cultural and Psychological Studies (ECPS Journal)», 1(9), 2014, 397-416.

³³ Cfr. M. Pellerey, *La scelta del metodo di ricerca. Riflessioni orientative*, cit.

³⁴ Cfr. J.W. Creswell, V.L. Plano Clark, *Designing and conducting mixed methods research*, Sage, Thousand Oaks (CA), 2011; J.C. Greene, *Mixing Methods in Social Inquiry*, San Francisco, Jossey-Bass, 2007; J.C. Greene, V.J. Caracelli, W.F. Graham, *Towards a Conceptual Framework for Mixed-method Evaluation Designs*, in «Education, Evaluation and Policy Analysis», II, 1989, pp. 255-274; R.B. Johnson, A.J. Onwuegbuzie, *Mixed Methods Research. A Research Paradigm Whose Time Has Come*, in «Educational Research», 33(7), 2004, pp. 14-26; D.L. Morgan, *Practical Strategies for Combining Qualitative and Quantitative Methods. Applications to Health Research*, in «Qualitative Health Research», 8(3), 1998, pp. 362-376; J.M. Morse, *Approaches to Qualitative-quantitative Methodological Triangulation*, in «Nursing Research», 40, 1991, pp. 120-123; J.M. Morse, L. Niehaus, *Mixed Method Design. Principles and Procedures*, Left Coast Press, Walnut Creek (CA), 2009; C. Teddlie, A. Tashakkori, *The Foundations of Mixed Methods Research. Integrating Quantitative and Qualitative Techniques in the Social and Behavioral Sciences*, Sage, Thousand Oaks (CA), 2009.

designs in order to organize and simplify complex phenomena for cognitive, organizational, and communicative purposes³⁵.

Proceeding chronologically, the first classification of the mixed-methods research designs has been attributed to the work of J.C. Greene, V.J. Caracelli, and W.F. Graham who put forward an initial typological distinction of research objectives with respect to the study's general purpose. Triangulation has proved useful in confirming and finding analogies and correlations between results obtained using different methods. The complementarity method validates, describes, and clarifies the results obtained through the use of another method. Development uses the results obtained with one method to implement the other. Initiation reformulates the research questions or the results obtained using the other method's principles and models. Expansion's main objective is to extend the scale and variables being investigated by using diverse methods³⁶.

Subsequently, it was again V.J. Caracelli and J.C. Greene who introduced the continuity aspect of integrating the two different research models to their previous ones, distinguishing between component designs that keep separate the use of the two models or integrated designs in which the two models are integrated with each other at different phases of the study³⁷.

One of the most significant studies is by J.V. Creswell, whose work prompted the now widely recognized standardization. His study is based on a time orientation and a mixed-research design implementation sequence, identifying three different design types. The sequential strategy uses a method to elaborate, explore, and instruct the succeeding phase in which the other method is used. The simultaneous strategy integrates the two methods only at the time of the overall analysis of data collected, analyzed, and interpreted according to the principles of each of the methods conducted in parallel. The transformation strategy uses a general perspective, derived from a previously defined theoretical framework and able to address the research design arising from both qualitative and quantitative data³⁸.

R. B. Johnson and A.J. Onwuegbuzie³⁹ have expanded earlier studies by A. Tashakkori and C. Teddlie⁴⁰, arriving at a distinction between a mixed-model design and a mixed-methods design. In mixed-model designs, the two approaches, both qualitative and quantitative, appear to be integrated both in the same phase of the research design and between different phases, whereas integration can occur in even a single phase in mixed-methods designs⁴¹. Instead, A. Bryman's work on the reasons for the decision to

³⁵ E. Amaturò, G. Punziano, *I Mixed Methods nella ricerca sociale*, cit.

³⁶ Cfr. J.C. Greene, V.J. Caracelli, W.F. Graham, *Towards a Conceptual Framework for Mixed-method Evaluation Designs*, cit.

³⁷ Cfr. V.J. Caracelli, J.C. Greene, *Crafting Mixed-Method Evaluation Design*, in «New Directions for Evaluation», 74, 1997, pp. 19-32.

³⁸ Cfr. J.V. Creswell, *Research Design. Qualitative, Quantitative and Mixed Methods Approaches*, London, Sage, 2003.

³⁹ Cfr. R.B. Johnson, A.J. Onwuegbuzie, *Mixed Methods Research. A Research Paradigm Whose Time Has Come*, cit.

⁴⁰ Cfr. A. Tashakkori, C. Teddlie, *Mixed Methodology. Combining the Qualitative and Quantitative Approaches*, Thousand Oaks (CA), Sages, 1998.

⁴¹ Cfr. R.B. Johnson, A.J. Onwuegbuzie, *Mixed Methods Research. A Research Paradigm Whose Time Has Come*, cit.

choose a mixed-research design has identified sixteen different multi-strategy types⁴².

Lastly, C. Teddlie and A. Tashakkori have identified five reasons why studies dedicated to the description of various mixed-methods types are particularly useful:

- the types are tools that help to plan research designs and to combine correctly the various data collection and processing methods;
- the types facilitate the use of a common language still not fully defined as regards mixed methods;
- the types define a research field's structure when addressing the general design and not individual data collection and processing strategies;
- the types favor the legitimization of a field by reinforcing the different mixed-methods research designs adopted; and
- the types become useful pedagogical guides as they encourage the introduction of beginners into the field of mixed-methods research.

However, the two authors have also highlighted in their conclusions the difficulty in being able to fully outline all the possible types of mixed-methods research designs with reference to their structural complexity and variability, emerging from researchers' experiences and not previously codified and subsequently adopted⁴³.

4. Mixed-methods designs

This is the reason that has led to various attempts to codify mixed-methods designs. G. Guest has focused his attention and thinking on a specific level in the mixed process, the interface point between various types of qualitative and quantitative data. The variables identified relate to the connection's timing, i.e., if the different types of data are presented sequentially or simultaneously; the interface's intended purpose is to clarify whether the data will be used to inform, explain, or triangulate the various data acquired; whether the purpose of the research is exploratory, empirical, or theoretical; the number of interface points useful for identifying the degree of integration of qualitative and quantitative data that may thus see a partial integration as a total integration; and the predominance of quantitative and qualitative data or their relative equidetectability. The author has identified the key points to be kept in mind: the connection's timing and its integration target, with these two points being essential to carrying out correctly a mixed-methods research project as well as to also anticipating that some particularly complex designs may need their own category, which Guest has called 'compound mixed-methods designs'⁴⁴.

This digression lacks the classification that seems to be particularly useful to the mixed-research design definitions by J.W. Creswell and by V.L. Plano Clark⁴⁵, «generally indicated as [being] the simplest, clearest, and most useful in providing basic concepts for a better understanding of similarities, rather than differences, between the existing

⁴² Cfr. A. Bryman, *The Research Question in Social Research. What Is Its Role?*, in «International Journal of Social Research Methodology», 10(1), 2007, pp. 5-20.

⁴³ Cfr. Teddlie, A. Tashakkori, *The Foundations of Mixed Methods Research*, cit.

⁴⁴ Cfr. G. Guest, *Describing Mixed Methods Research. An Alternative to Typologies*, in «Journal of Mixed Methods Research», 7(2), 2013, pp. 174-151.

⁴⁵ Cfr. J.W. Creswell, V.L. Plano Clark, *Designing and conducting mixed methods research*, cit.

types»⁴⁶. Their codifying of the models is the result of adopting some classification criteria: the integration point of the two models, qualitative and quantitative; one model's relevance to the other; and the presence of the two models in the same or successive phases. By applying these criteria, there emerge:

the parallel or triangular convergent design (Figure 1) involves the simultaneous use of the quantitative and qualitative methods, considered equidetectable and two parallel lines of research. The two methods will be integrated only during the comprehensive interpretation of the data obtained from the two lines, hitherto used separately in their analysis. This type of design can be further divided into:

- convergent triangulation, in which the data interpretation phase uses the results of two parallel studies to confirm and support with greater relevance the results obtained;
 - triangulation with data transformation involving the transformation of the quantitative data into qualitative data and vice versa during the interpretation phase;
 - triangulation with validation of the qualitative data involving an in-depth analysis of the quantitative data;
 - multilevel triangulation in which the two different models are applied to an examination of different levels in the same study;

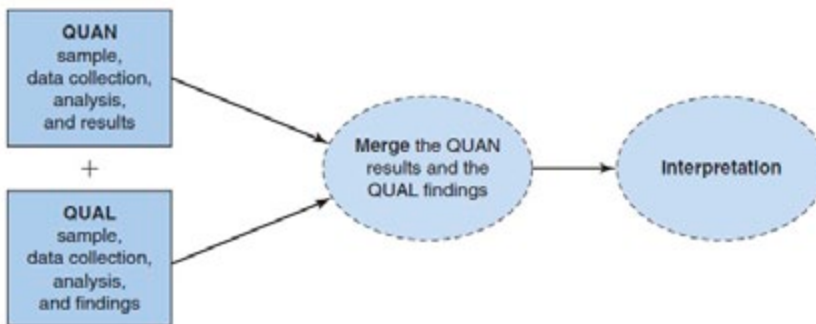


Figure 1 – Triangular or converging parallel design⁴⁷

- the explanatory sequential design (Figure 2) sees the two methods as one being successive to the other. In fact, after an initial quantitative phase, follow-up and a second qualitative phase are planned based on the results of the quantitative phase. The quantitative results are therefore useful for proceeding with formulating questions, performing sampling, or having the data on which to base the subsequent qualitative phase. In this case, the quantitative study is to be given priority, as its results will be better clarified and detailed by the second method's results.

⁴⁶ E. Amaturò, G. Punziano, *I Mixed Methods nella ricerca sociale*, cit., p. 116.

⁴⁷ V.L. Plano Clark, J.W. Creswell, *Understanding Research. A Consumer's Guide*, Pearson Higher Ed, 2nd ed., 2014, p. 392.

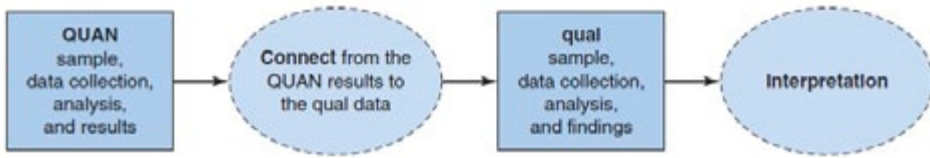


Figure 2 – Explanatory sequential design⁴⁸

Again in this case, the authors have highlighted an internal subdivision:
- a follow-up explanatory model in which qualitative data are used to clarify and explore the quantitative data;
- a model for selecting participants in which quantitative data are used to select the participants of a subsequent qualitative follow-up study;

- the exploratory sequential design (Figure 3) poses the two methods successively where the qualitative phase precedes the quantitative one. The results of the qualitative phase serve to better define research questions and variables in the quantitative phase. This design is particularly suitable for elucidating an unclear frame of reference, better exploring a little-known theory or phenomenon, or defining questions or variables used to develop tools for the quantitative phase. These different aims give us two models:
- a model for developing tools in which the results of the qualitative exploration of a phenomenon are used to construct a quantitative tool that will be used for its measurement;
- a model for developing taxonomies in which the qualitative phase is necessary to elaborate emerging theories, a taxonomy or classification that must subsequently be tested by a quantitative phase;

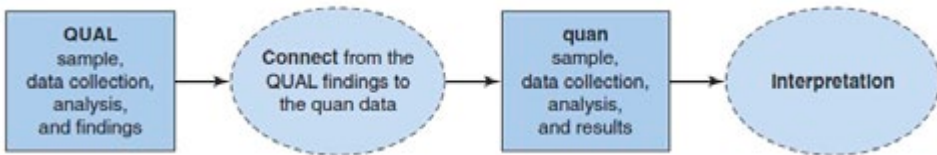


Figure 3 – Sequential exploratory design⁴⁹

- the integrated or nested design (Figure 4) combines the research design of one method by placing it inside a different, larger method. We will thus have a qualitative design within a larger quantitative design and vice versa. The secondary study is used to strengthen the main one and can be carried out simultaneously or sequentially to the main study. The two designs will be conducted separately but the data will be integrated when interpreting the obtained results⁵⁰.

⁴⁸ Ivi, p. 395.

⁴⁹ Ivi, p. 398.

⁵⁰ Cfr. J.W. Creswell, V.L. Plano Clark, *Designing and conducting mixed methods research*, cit.

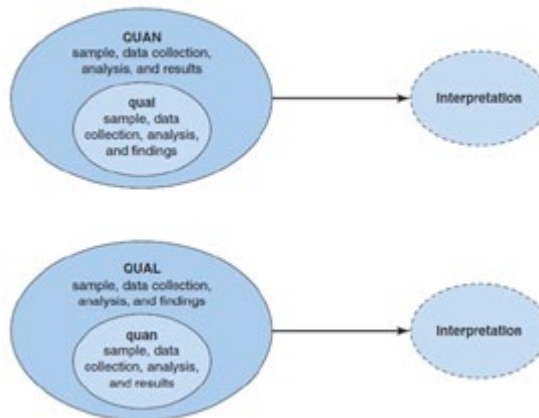


Figure 4 – Integrated or nested design⁵¹

In literature, reference is usually made to some examples of the use of individual designs pertaining to specific studies, some of which are distant from educational research. These will be joined by others considered exemplary in our field of interest.

For parallel or triangular convergent design, Wittink, Barg, and Galloche's model research must be mentioned; it studied the confluences between doctors' evaluations and patients in relation to the depressive states of the latter⁵². In the educational field, reference may also be made to the study conducted by Hossler and Vesper that was designed to examine the significant factors for the scholastic success of students attending college. This parallel convergent study showed that the students' scholastic success was determined by such important factors as financial commitment, parental expectations, as well as an understanding of the college's costs⁵³.

A classic application in the use of explanatory sequential design is Ivankova and Stick's work to study the factors influential in the persistence of study by students in advanced training courses⁵⁴. Another example in the educational field is Kushman's in which two types of teacher commitment – one organizational, the other aimed at student learning – were studied⁵⁵.

Lastly, Myers and Oetzel used an exploratory sequential design to identify the socialization dynamics of new employees in their companies⁵⁶. Likewise, Brady and O'Regan evaluated and analyzed a mentoring program and the related implementation process⁵⁷.

⁵¹ Ivi, p. 400.

⁵² Cfr. M.N. Wittink, F. Barg, J.J. Gallo, *Unwritten rules of talking to doctors about depression: Integrating qualitative and quantitative methods*, in «Annals of Family Medicine», 4, 2006, pp. 302-309.

⁵³ Cfr. D. Hossler, N. Vesper, *An exploratory study of the factors associated with parental savings for postsecondary education*, in «Journal of Higher Education», 64(2), 1993, pp. 140-165.

⁵⁴ Cfr. N.V. Ivankova, S. Stick, *Students' persistence in a distributed doctoral program in educational leadership in higher education. A mixed methods study*, in «Research in Higher Education», 48(1), 2007 pp. 93-135.

⁵⁵ Cfr. J.W. Kushman, *The organizational dynamics of teacher workplace*, in «Educational Administration Quarterly», 28(1), 1992, pp. 5-42.

⁵⁶ Cfr. K.K. Myers, J.G. Oetzel, *Exploring the dimensions of organizational assimilation. Creating and validating a measure*, in «Communication Quarterly», 51(4), 2003, pp. 438-457.

⁵⁷ Cfr. B. Brady, C. O'Regan, *Meeting the challenge of doing an RCT evaluation of youth mentoring in Ireland. A journey in mixed methods*, in «Journal of Mixed Methods Research», 3, 2009, pp. 265-280.

These different classification types (Figure 5) must be considered flexible reference points and not rigid processes to be carefully followed. Indeed, A.J. Onwuegbuzie and A.J. Leech consider that the same research objective leads a researcher to formulate questions that will address the choice of techniques and models in a logically causal way⁵⁸.

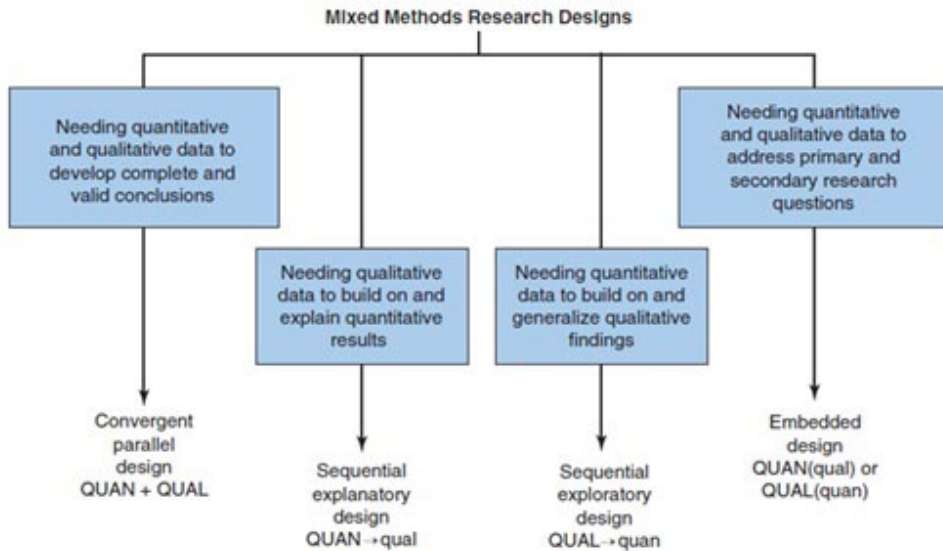


Figure 5 – Representation of the four research mixed methods⁵⁹

In an attempt to draw greater attention to the characteristics of the different, variously classified research designs, as previously described, a synoptic framework developed by J.W. Creswell and by V.L. Plano Clark (Figure 6) is particularly effective, with the authors highlighting its utilization purpose and characteristics for each mixed-methods design⁶⁰.

⁵⁸ Cfr. A.J. Onwuegbuzie, A.J. Leech, *Linking Research Questions to Mixed Methods Data Analysis Procedures*, in «The Qualitative Report», II(3), 2006, pp. 474-498.

⁵⁹ Ivi, p. 392.

⁶⁰ Cfr. V.L. Plano Clark, J.W. Creswell, *Understanding Research. A Consumer's Guide*, cit.

Mixed Methods Design Name	Design Intent	Typical Characteristics
Convergent parallel	<ul style="list-style-type: none"> To develop a complete and valid understanding 	<ul style="list-style-type: none"> Concurrent timing Equal priority Merging the quantitative results and qualitative findings during analysis and/or interpretation
Sequential explanatory	<ul style="list-style-type: none"> To explain the mechanisms or reasons behind quantitative results 	<ul style="list-style-type: none"> Sequential timing Unequal priority Connecting from the quantitative results to shape the qualitative data collection
Sequential exploratory	<ul style="list-style-type: none"> To test or generalize qualitative findings 	<ul style="list-style-type: none"> Sequential timing Unequal priority Connecting from the qualitative findings to shape the quantitative data collection
Embedded experiment	<ul style="list-style-type: none"> To enhance a quantitative experimental study by including a secondary qualitative component to explore the procedures or process of the experiment 	<ul style="list-style-type: none"> Concurrent or sequential timing Quantitative priority Embedding a qualitative component into a quantitative experimental design
Embedded case study	<ul style="list-style-type: none"> To enhance a qualitative case study by including a secondary quantitative component to enrich the interpretation of the case 	<ul style="list-style-type: none"> Concurrent or sequential timing Qualitative priority Embedding a quantitative component into a qualitative case study design
Concurrent conversion	<ul style="list-style-type: none"> To identify quantitative relationships among variables that include at least one variable that is a quantification of qualitative findings 	<ul style="list-style-type: none"> Concurrent timing Quantitative priority Converting qualitative findings into a new quantitative variable and analyzing that new variable statistically with other quantitative data
Concurrent multilevel	<ul style="list-style-type: none"> To examine multiple levels (e.g., students, teachers, principals, and districts) 	<ul style="list-style-type: none"> Concurrent timing Equal or unequal priority Merging the quantitative results and qualitative findings from each level during analysis and/or interpretation
Multiphase	<ul style="list-style-type: none"> To conduct a program of studies aimed at achieving an overall objective such as developing and evaluating a program 	<ul style="list-style-type: none"> Concurrent and sequential timing Varies for each study in the program Connecting from each study to inform the later steps of the program development
Transformative	<ul style="list-style-type: none"> To conduct research that empowers individuals and advocates for social justice 	<ul style="list-style-type: none"> Concurrent or sequential timing Equal or unequal priority Embedding a mixed methods design in a social justice framework, which shapes all the design decisions

Figure 6 – Overview of the purpose and characteristics of nine different mixed-methods designs ⁶¹

In order to use a mixed-methodological approach, good quantitative and qualitative research skills are needed. Moreover, the choice of how to connect the two methods must be made in advance so as not to encounter considerable difficulties in the data analysis and interpretation phase. Considering the need to use mixed or versatile methods, supported also in this work, regarding the complexity of educational activity and the pedagogical approach, it is essential to know the advantages and limitations of this methodological approach. The researcher who decides to adopt this point of view will be required to explain the reasons for the choices made so as to also encourage the

⁶¹ Ivi, p. 391.

development of an ever greater awareness of the research with a view to meta-reflection and self-improvement. To this end, V.L. Plano Clark and J.W. Creswell have suggested using an evaluation scale to analyze a mixed-methods study (Figure 7) that could be used as a guide in planning the research design.

Quality Criteria	Quality Rating				Your Evidence and/or Reasoning
	0 = Poor	1 = Fair	2 = Good	3 = Excellent	
The Key Elements					
1. The rationale for needing mixed methods is appropriate and justified.					
2. The choice of the mixed methods design is appropriate and justified.					
3. The quantitative methods are of good quality based on the standards of quantitative research.					
4. The qualitative methods are of good quality based on the standards of qualitative research.					
5. The quantitative and qualitative components of the study are meaningfully mixed.					
General Evaluation					
6. The study used a rigorous application of mixed methods research.					
7. The use of mixed methods produced a good understanding of the research purpose.					
Overall Quality 0-10 = Low Quality 11-16 = Adequate Quality 17-21 = High Quality	Total Score =			My Overall Assessment is	

Figure 7 – Evaluation scale for the analysis of a mixed-methods study⁶²

5. Concluding thoughts

We have seen that mixed-methods designs have great value in allowing the researcher to be left free to use quantitative tools and approaches together with qualitative ones. However, we have also said that a mixed-methods design needs to be very carefully planned so as to identify the integration points and means of these two approaches often considered opposites. Finally, this approach does not provide an interpretation of the retrieved data before the entire research process, as set out by its design, has been completed. In fact, during the individual phases of the research process, the data results obtained can be provided but not their interpretation, which can only take place by integrating the results obtained in the various phases with the different approaches and tools adopted.

Among the designs presented, it seems relevant to underscore the importance of the triangular or parallel convergent design process as it highlights how triangulation «could

⁶² Ivi, p. 406.

neutralize or limit the persistently very high risk of subjectivity»⁶³. R. Trinchero also believes that the triangulation processes of methods, researchers, theories, and sources render sound and reliable knowledge that permits shared objectifiable results to be achieved⁶⁴.

Among the possible applications, let us also point out that the recent turning-point in evidence-based education appears to consider Mixed Methods approaches effective, especially in the field of special education, as long as they are conducted rigorously⁶⁵. Furthermore, this approach seems to be particularly successful in confirming results from the various models and methods used to investigate the same phenomenon; preparing and expanding the results of one method by using a different method; identifying inconsistencies in the research-question formulation; developing the results achieved with one method by using another method; and expanding the breadth of research on a given subject by utilizing assorted methods⁶⁶.

Thus, the Mixed Methods approach has many strong points. Nonetheless, it is also appropriate to highlight its most critical points, like the undeniable difficulty of conducting research, especially if the managing group lacks strong qualitative and quantitative methodological skills; the use of resources and longer time frames relative to the adoption of a single research method; and the relatively limited nature of studies conducted using this approach, especially in Italy⁶⁷.

Indeed, the use of Mixed Methods is expanding, as demonstrated by the impact factor of 3,524 reached by the *Journal of Mixed Methods Research* (JMMR). Founded in 2007, the journal collects international publications related to this research approach being used in human science and specifically to expanding its usage in this area. Moreover, a series of searches can be carried out using the bibliographic database ERIC of the Institute of Education Sciences, established in 1966. In fact, using 'mixed methods' as the search term for hits only in ERIC plus ticking the filters 'Peer reviewed only' and 'Full text available on ERIC', results in 2,967 hits. Of these, 2,132 are described as Mixed Methods studies; 2,079 are research reports within the fields of education sciences and education performed using this methodology.

The increased awareness of this approach in our country is further confirmed by querying Google Scholar using the search string 'mixed methods educational research', limiting it to Italian-only content, and eliminating patents and citations. This results in 1,010 hits, of which 447 are entries with a date range from 2015 to the present.

We do not know if this process can truly be considered a third approach to research and to what extent its use can be further expanded. However, it is certain that the possibility of combining individual studies corresponding to the individual mixed-methods designs described above allows the researcher to carry out complex research through what G. Guest calls 'compound mixed-methods designs'.

⁶³ L. Cottini, A. Morganti, *Evidence-Based Education e pedagogia speciale. Principi e modelli per l'inclusione*, Carocci, Roma, 2015a, p. 158.

⁶⁴ Cfr. R. Trinchero, *Manuale di ricerca educativa*, cit.

⁶⁵ L. Cottini, A. Morganti, *Evidence-Based Education e pedagogia speciale. Principi e modelli per l'inclusione*, cit., p. 158; L. Cottini, A. Morganti, *Quale ricerca per una pedagogia speciale dell'inclusione*, in «Form@re-Open Journal per la formazione in rete», 15(3), 2015b, pp. 116-128.

⁶⁶ Cfr. J.C. Greene, V.J. Caracelli, *Advances in mixed-method evaluation. The challenges and benefits of integrating diverse paradigms*, San Francisco, Jossey-Bass, 1997.

⁶⁷ Cfr. E. Amato, G. Punziano, *I Mixed Methods nella ricerca sociale*, cit.

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