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DISSERTATIONS ON SOCIAL SCIENCES

8

**THE COMBINED USE  
OF QUALITATIVE AND  
QUANTITATIVE METHODS  
IN EDUCATIONAL RESEARCH**

ABSTRACT

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 **TPÜ KIRJASTUS**

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## TABLE OF CONTENTS

<b>RELATED PUBLICATIONS .....</b>	<b>4</b>
<b>INTRODUCTION .....</b>	<b>5</b>
THE FORMATION OF THE THEME FOR PRESENT STUDY.....	5
<b>OVERVIEW OF THE DISSERTATION .....</b>	<b>11</b>
THEORETICAL UNDERPINNINGS FOR THE COMBINED USE OF QUALITATIVE AND QUANTITATIVE APPROACHES.....	11
DESIGN OF THE EMPIRICAL STUDY.....	14
DATA ANALYSIS AND FINDINGS .....	15
<b>IMPLICATIONS AND CONTEXTUALISATION OF RESULTS.....</b>	<b>18</b>
CURRENT DEVELOPMENTS OF IDEAS AND PRACTICE .....	18
TYPOLOGIES AND TERMINOLOGY .....	19
JUSTIFICATIONS FOR THE USE OF COMBINED DESIGNS.....	22
IMPLICATIONS TO THE QUALITY OF RESEARCH .....	23
IMPLICATIONS FOR EDUCATION .....	26
<b>CONCLUSION .....</b>	<b>30</b>
<b>REFERENCES .....</b>	<b>33</b>
<b>KVALITATIIVSETE JA KVANTITATIIVSETE MEETODITE KOMBINEERITUD KASUTAMINE KASVATUSTEADUSLIKUS UURIMISTÖÖS .....</b>	<b>37</b>

## RELATED PUBLICATIONS

Niglas, K. (2003) Methodological Aspects of Studies with Combined Design. Paper given at ECER2003, Hamburg, 17-20 September 2003.

Niglas, K. (2003) Kvalitatiivsete ja kvantitatiivsete meetodite vahekorra sotsiaal- ja kasvatusteaduslikus uurimistöös. Sotsiaal- ja kasvatusteaduste doktorantide II teaduskonverents, Tallinn, 25.-26. aprill 2003.

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Niglas, K. (2000) Kvalitatiivsed ja kvantitatiivsed meetodid sotsiaalteadustes - Kas vastanduvad või teineteist täiendavad lähenemised? Eesti Sotsiaalteaduste I Aastakonverents. Tallinn, 24.-25. November 2000.

Niglas, K. (1999) Quantitative and Qualitative Inquiry in Educational Research: is there a paradigmatic difference between them? Paper given at ECER99, Lahti, 22-25 September 1999; *Education Line* <http://www.leeds.ac.uk/educol/>.

Niglas, K. (1999) Quantitative and Qualitative Inquiry in Educational Research: is there a paradigmatic difference between them? Masters Thesis. Cambridge University, Faculty of Education.

## INTRODUCTION

The dissertation discusses and analyses methodological problems of educational inquiry and especially the relationship between quantitative and qualitative approaches of research. Problems in the area have been of concern for a long time and have been the reason for many debates among educational researchers since the mid 19<sup>th</sup> century. During last decades, there has been a fundamental disagreement in many aspects concerning research methodology and in the principles which should underlie educational research. The critique against previously accepted ways of studying educational phenomena and the debates between the proponents of different positions have been so extensive that some authors have called this period an era of “paradigm wars” (Gage 1989, Hammersley 1992b).

On the other hand, recently, there has been serious critique of the quality of the present educational research practice, especially in Britain and the United States but in other countries as well (e.g. Atkinson & Jackson 1992, Tooley 1998, Hargreaves 1996, Gall *et al.* 1996, Davis 1996). Many authors have been worried that the lack of consensus in methodological issues and continuing “paradigm wars” may have “serious implications for the nature and function of educational research” (Hammersley 1993: xiii).

Induced by these reasons and my personal concern in the subject, I have focused my research interest on the problems of methodology in educational inquiry. I have given special attention to the ways in which quantitative and qualitative approaches are perceived and used in research practice. During my one-year study at Cambridge University from 1998 to 1999, I conducted an extensive literature review and a small-scale investigation with the aim to clarify whether quantitative and qualitative research can be and have been taken as distinct mutually exclusive paradigms, like some authors suggest (Niglas 1999a). This preliminary study should be taken as a part of my doctoral investigation as it has laid the foundation for further theoretical and empirical investigations presented in this dissertation.

In the present dissertation, I take a step further and address several vital questions concerning the combined use of quantitative and qualitative approaches in educational research. The overall purpose of my study is *to enhance and extend the existing systematic knowledge about the ways combined designs can be and are used in research practice, to explore possible justifications for a new kind of practice and to analyse the implications that might have in the context of educational research.* These purposes serve the goal *to enrich the research practice and enhance the ways in which graduate students, that is, future educators and new researchers, are prepared in the academy.* Thus, the ultimate aim of the study is *to contribute to the improvement of the quality of educational research and thereby, hopefully, educational practice.*

## THE FORMATION OF THE THEME FOR PRESENT STUDY

The paradigmatic view, advocated mainly by American methodologists like Guba, Lincoln and Smith, but widely adapted by other authors as well, propose that there are two or three competing paradigms - sets of basic beliefs (or metaphysics) - in social and educational research which the researcher follows (or should follow) (Lincoln & Guba 1985, Guba & Lincoln 1989).<sup>1</sup> On that level, a paradigm means a whole set of philosophical ideas, but what is important from the point of view of the present discussion, is that usually these paradigms are taken as tightly bound to specific ways of doing research. It has become very common in

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<sup>1</sup> See, for example, Smith 1983a and 1989, Smith & Heshusius 1986, Lincoln & Guba 1985, Guba & Lincoln 1989 and 1994.

methodological literature that a quantitative approach is described as belonging to the positivistic paradigm and a qualitative approach as belonging to the interpretive paradigm. The assumption is that particular methods follow from the general methodological positions which themselves follow from or are part of the “(meta)-theoretical positions” (Platt 1986: 502). Thus, from a paradigmatic viewpoint, to accept the complementary nature of different approaches is misleading as these methodologies are derived from fundamentally different epistemological and worldview positions and are therefore incommensurable.

The tendency to bind different epistemological positions with particular methodologies has been widely criticised in methodological literature. Since the beginning of 1980’s, several papers have been published which argue that, even if there are differences in the philosophical assumptions, quantitative and qualitative methodologies are not mutually exclusive, and even that the use of the concept of “paradigm” in educational research is not appropriate in general (see, for example, Bryman 1988, Eckeberg & Hill 1980, Hammersley 1992b, Howe 1988, McNamara 1979, Reichardt & Cook 1979). By drawing on examples of actual research practice and by conducting historical/theoretical analyses of the relevant issues, these authors have argued that a paradigmatic view of social and educational research is true neither empirically nor historically.

The most important counterarguments to the paradigmatic view given by different authors are:

- \* none of the differences between quantitative and qualitative methodologies outlined by the proponents of the paradigmatic view take the form of diametrically opposite practices but rather make up a continuous scale on which qualitative and quantitative studies are not at all simply positioned;
- \* there have been and still are a lot of qualitative researchers who quite clearly hold a realist ontological position as well as quantitative researchers whose ontological position is nearer to idealism and relativism than to realism;
- \* there are major differences in philosophical and methodological preferences within the camp of qualitative researchers as well as within the ranks of quantitative researchers, and research practice is much more complicated than that proposed by the paradigmatic view. Thus, two or three exclusive epistemological paradigms, which incompatibilists seem to have to offer, do not exhaust the “potential, or even actual, range of methodological views to be found amongst educational and social researchers” (Hammersley 1992a: 134).<sup>2</sup>

As a modest contribution to that discussion, I conducted a systematic analysis of 48 research papers in the light of different features of the basic aspects usually connected with quantitative and qualitative methodologies with the aim to clarify *whether particular studies follow clearly only one of the two broad methodological approaches or whether they combine these approaches or mix aspects from both of them in the framework of one study* (Niglas 1999a and 1999b). The sample chosen for that small-scale content analytic study was purposeful and consisted of papers published only in the British Educational Research Journal.

The results of a simple frequency and cluster analysis showed that, at least in the case of that sample, we had to reject the idea of the dichotomous nature of educational research – more than one third of all studies combined qualitative and quantitative aspects and/or features of inquiry in different phases of the study. Furthermore, the aims of the studies were not so fundamentally different for different types of studies as a paradigmatic view would suggest

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<sup>2</sup> See Reichardt & Cook 1979, Hammersley 1992a, 1992b and 1995, LeCompte 1990, Keat & Urry 1975, Howe 1988.

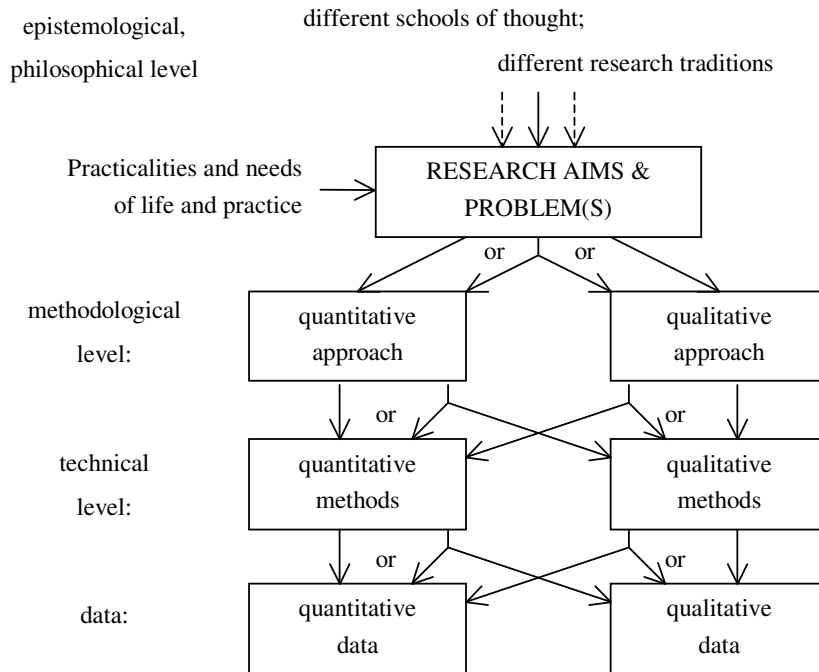
and the types of claims that the authors of the studies with qualitative, quantitative and mixed methodology made follow largely the same pattern and show no clear point where a line could be drawn separating qualitative studies from quantitative ones (op cit.).

My results supported the argument that it is the concrete research problem or aim rather than the philosophical position which determines the design (or overall strategy) of the study whereby, depending on the nature and complexity of the problem, the design can be either qualitative or quantitative or a combination of both (Hammersley 1992b, Bryman 1988). In addition, within each strategy there is a possibility either to use data-gathering techniques usually associated with the same approach or to combine the techniques of both types. And finally, there is a possibility to use both quantitative and qualitative data within each study regardless of the overall strategy of a piece of research or the concrete data-gathering techniques. Figure 1 illustrates the complexity of the actual research practice.

However, my intention is not to argue that there is no influence of philosophical framework to research practice at all. Figure 2 presents a scheme, which, in a reasonably simplified way, attempts to summarise the relationships between different philosophical schools of thought and methodological traditions as I see them, on the basis of the argumentation presented in my master's thesis (Niglas 1999a). While composing this scheme, I was inspired by the classification of qualitative research presented by Renata Tesch (1990).<sup>3</sup>

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<sup>3</sup> See Niglas (2001b) for further discussion on the development and details of this scheme.



**Figure 1.** The levels of research in practice (adapted from Niglas 1999a)

On the scheme, there are two main dimensions: from left to right runs the quantitative-qualitative continuum and from top and bottom to the centre the philosophy-methodology continuum. If one starts from the philosophical level or paradigms (if one likes to use this term better), one can see that, unlike the proponents of the paradigmatic view, I see there an overlap and mutual influence between different traditions. When we (imaginably) fold the scheme, the overlap between the paradigms at the upper and lower edge of the paper becomes perceptible as well. If it has been quite common to talk about two big paradigms only: positivism and something which denies positivism (however differently authors name this new paradigm); today even radical proponents of the paradigmatic view extend their lists of paradigms to four. As it can be seen, I have used six different terms on that level, but it is an obvious simplification as there are many smaller traditions which can not be fitted very easily into the given six “paradigms”.<sup>4</sup> Besides philosophical schools, there are some important disciplines, like anthropology and linguistics, which have had a remarkable influence on social scientific and educational research.

The circle of terms below the philosophical level illustrates the change in the main focus and research interest along the continuum of paradigms. From that level downward, it was my intention to follow with different disciplines and research traditions step by step to more concrete methods for doing research and analysing data; however, this scheme can only embrace the highest of the methodological levels – that is different strategies of research. More concrete methodological aspects, like different methods for data gathering and analysis, can not be fitted in because of several practical reasons. It is important to notice that the closer we move to the level of concrete methodology the more and more mixed the influence of philosophical schools of thought is, which on the other hand means that the same methods can be used in various research traditions and philosophical frameworks.

<sup>4</sup> For the sake of metaphoric and clear presentation of my ideas, I have had to make several other simplifications as well, which I hope is normal and common to any schematic presentation.



From left to right runs the quantitative-qualitative continuum which has its roots in the methodology of natural sciences and blends with the arts at the other end. Most importantly, in the present context, there is an area in the middle of this continuum where both quantitative and qualitative approaches are accepted and seen as useful, serving thereby as a convenient space for combined designs as well. Thus, while arguing in favour of the combined use of qualitative and quantitative methods, I apprehend that there are philosophical frameworks where only one type of method can satisfy the preconditions set for an empirical inquiry and thereby fulfil the relevant aims (see the ends of the continuum on Figure 2). However, most of the methods are not tightly bound to any particular philosophical “paradigm” and are therefore not incompatible.

Following from the aforecited discussion, my tentative conclusion is that, at least on the level of research practice, the move has been made towards peaceful coexistence, suggesting that if not now then in the near future, qualitative and quantitative approaches to educational inquiry are not taken by most researchers as mutually exclusive and competing paradigms but rather as approaches which are useful in different ways and therefore have the potential to complement each other.

However, the shift from the paradigmatic difference to complementary methods is not as unproblematic and desirable as it may appear. Hammersley (1995) has criticised methodological eclecticism, where the primary concern is *fitness for purpose*, for several reasons. First, he argues that to look at quantitative and qualitative methodologies as simply different techniques which should be combined in order to cancel out their respective weaknesses is to neglect the “different methodological arguments associated with qualitative and quantitative methods” as well as to confine the possibilities of either methods. Secondly, according to Hammersley (1995: 7), this is to neglect the “heterogeneity and internal inconsistency within two rather artificial categories”. Hence, having reached the conclusion that, at least in research practice, quantitative and qualitative methodologies seem not to be taken as incommensurable paradigms, and that they are combined at various levels of inquiry, new important methodological questions arise.

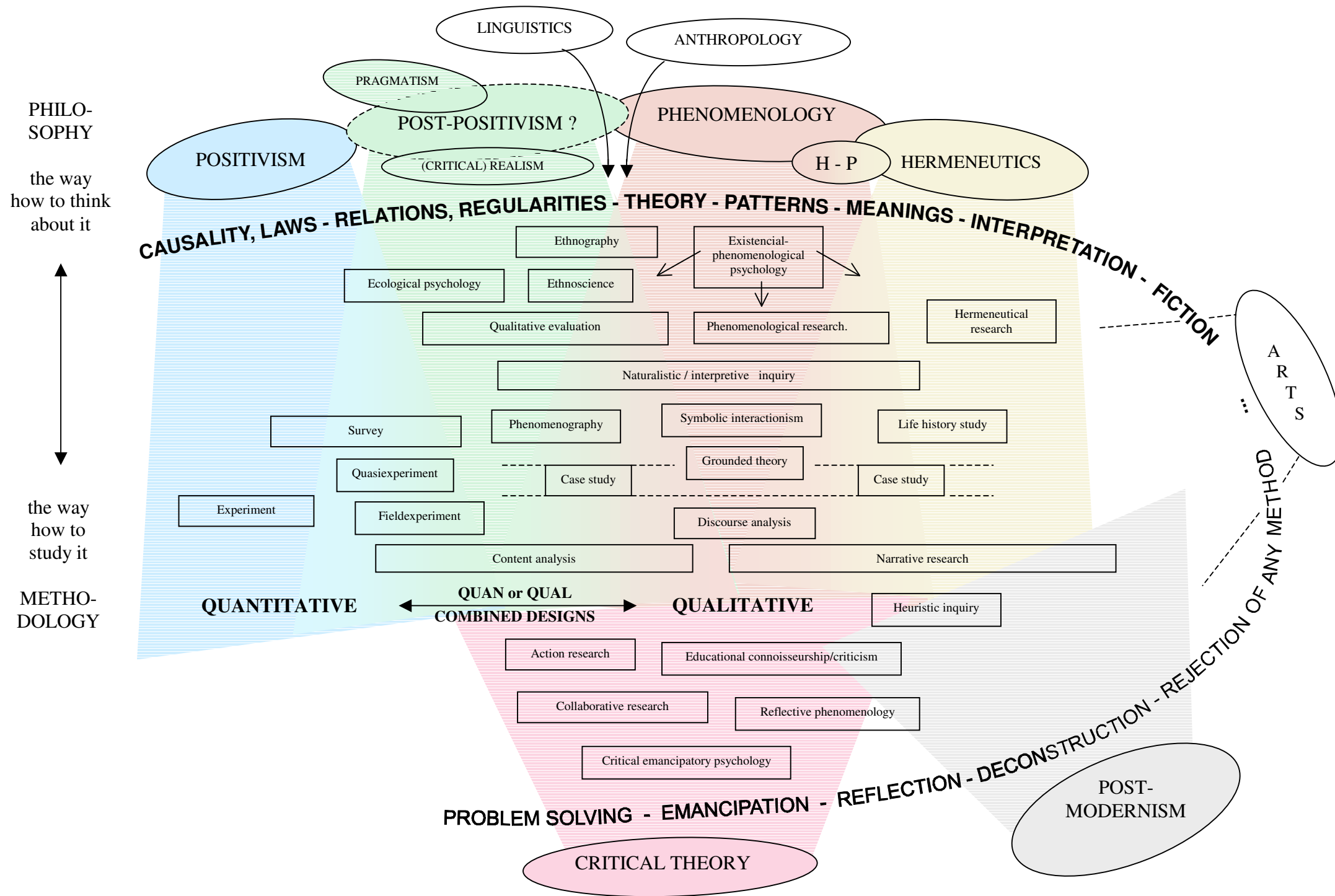


Figure 2. Relationship between philosophy and methodology in social science and educational research (adapted from Niglas 2001a and 2001b)

## OVERVIEW OF THE DISSERTATION

### THEORETICAL UNDERPINNINGS FOR THE COMBINED USE OF QUALITATIVE AND QUANTITATIVE APPROACHES.

Chapter one of the dissertation gives a short overview of the evolution of ideas how quantitative and qualitative approaches can be combined in social science and educational research to advance our knowledge about important aspects of life. It shows that the idea to use multiple methods in the framework of one study was proposed already in the middle of the past century by influential methodologists like Campbell, Stanley and others (see Campbell 1957, Campbell & Fiske 1959, Campbell & Stanley 1963). Soon the idea was taken further, suggesting that the combination of quantitative and qualitative research, which were seen by many methodologists as incommensurable opposites, is not only feasible and beneficial in solving our puzzles but can solve some problems the “pure designs” can not overcome (see, for example, Brannen 1992, Datta 1994, Patton 1990, Cresswell 1995, Tashakkori & Teddlie 1998). Relying mainly on examples from research practice, different authors have listed various reasons for a combined use of quantitative and qualitative aspects in a single study (see, for example, Bryman 1988, Greene *et al.* 1989).

More recently, attempts to chart the area by developing taxonomies for studies combining quantitative and qualitative research in different ways have been made (see, for example, Patton 1980, Brewer and Hunter 1989, Cresswell 1995, Tashakkori & Teddlie 1998). What we can learn from these different sources is that, as in any developing area, there is a lack of terminological and even conceptual clarity and coherence: we can find many different labels for the same ideas; at the same time, authors use the same terms in different meanings.

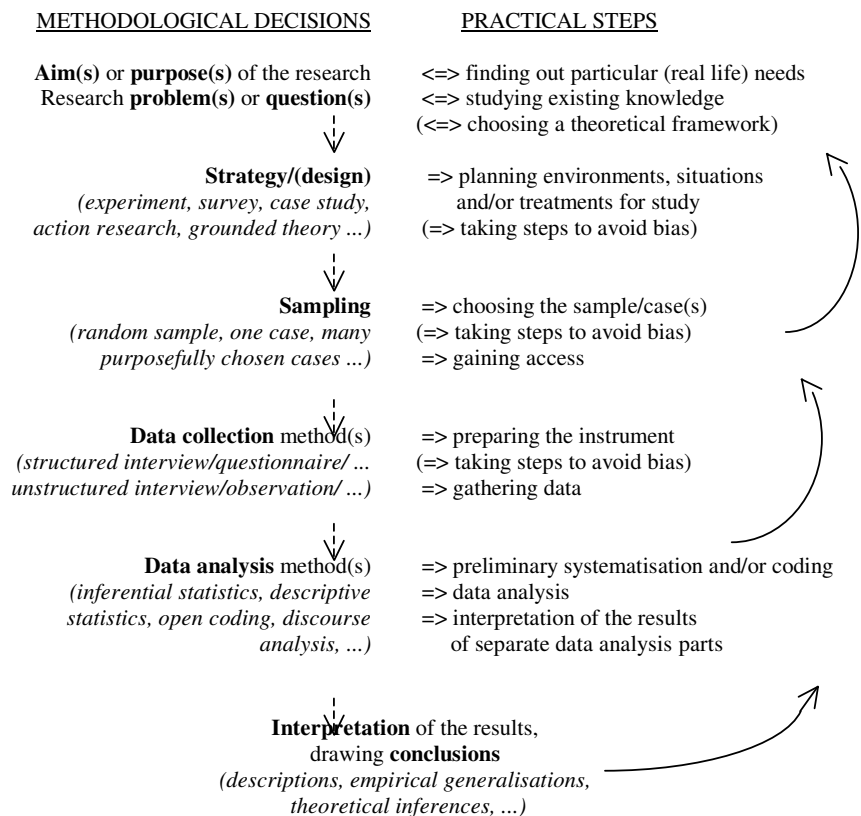
**Table 1.** Classifications of studies by their ways of using/combining quantitative and qualitative approaches and respective labels used by various authors

Proposed classification:	pure designs <i>purely quantitative or purely qualitative designs (may involve the use of several data sources and/or data-gathering instruments from the same approach).</i>	combined designs	
		multimethod designs <i>designs where both quantitative and qualitative approaches are used, but they remain relatively independent until the interpretation stage.</i>	mixed designs <i>designs where elements of quantitative and qualitative approach are combined in various ways within different phases of the study.</i>
Tashakkori & Teddlie 1998	monomethod studies	mixed method studies	mixed model studies
Brewer & Hunter 1989	monomethod studies	multimethod studies	composite method studies
Cresswell 1995	quantitative study; qualitative study	two-phase design; dominant-less dominant design	mixed-methodology design
Mark & Shotland 1987	quantitative study; qualitative study	triangulation*; bracketing model*; complementary multiplism	
Bryman 1988	quantitative study; qualitative study	ten different ways of integration	methodological hybrids
Patton 1980	quantitative study; qualitative study	triangulation	mixed-methodology design
* These models can be used within the purely quantitative or qualitative studies as well.			

In Table 1, I have compared the classifications of studies that different authors have proposed. Studying their definitions of given categories, it becomes clear that in spite of different labels,

there are considerable similarities between classifications. Although there is no one-to-one correspondence it seems feasible to organise classifications into three columns, so that categories in each column are conceptually close to one another.<sup>5</sup> Thus, I think that the broad classification of studies into three categories is useful and the definitions given by Tashakkori and Teddlie (1998) are conceptually reasonable. What seems a little questionable, is their choice of labels for these categories. Therefore, in the first row of Table 1, I have proposed new labels and short definitions for the three broad categories of research designs.

For better and more detailed descriptions of different possibilities of combining quantitative and qualitative approaches, this broad classification needs to be divided into subcategories. As in case of mixed designs, the elements of divergent approaches can occur at different phases of the inquiry, it is essential for any classification that we divide the empirical study into methodological stages. For my own teaching purposes, I have developed the model given in Figure 3. For the present discussion, it is important to notice that, in my view, decisions made on earlier steps influence the decisions one can take on the later steps, but there is no one-to-one relationship between methods available at different stages. This means that there is a possibility of combining quantitative and qualitative elements at any of the described stages of research.



**Figure 3.** Methodological decisions to be made and steps to be taken in the process of an empirical research study

If we promote the idea that the combined designs are accepted in the research practice we have to provide a set of criteria according to which one could evaluate the quality of a

<sup>5</sup> Dotted lines separating the columns in Table 2 highlight the lack of one-to-one correspondence between categories proposed by different authors.

particular piece of research. However narrow or broad a meaning we adopt for the term “validity” in different research contexts, there is a common notion of correctness and truth value of the research as well as (trust)worthiness of the results connected to it. In that overall meaning, most of researchers and research methodologists accept that the validity does matter though some of them prefer to avoid the term itself or substitute it due to several reasons.

In the light of the quantitative-qualitative debate, stressing the dichotomous nature of educational research, several methodologists have suggested entirely divergent lists of standards and criteria for quantitative and qualitative research (e.g. Erickson 1986, Lincoln & Guba 1985). The closest to my own views on research and validity as well as the most useful starting point in the context of evaluating studies using various combined designs is the position developed by Eisenhart and Howe (1992). A crucial feature of their position is their distinction between *general* and *design-specific* standards of validity. I share their thrust that

“all educational research is subject to the same general criteria of validity even though quite distinct and specialised criteria are required to conduct and evaluate specific kinds of research studies” (*op. cit.*: 644).

Eisenhart and Howe clearly deny the dichotomous and opposite nature of quantitative and qualitative methods and suggest that characterising all educational research studies in terms of the general concept of an argument leads rather straightforwardly to a general approach to validity that accommodates both “quantitative” and “qualitative” research designs. Given that assumption, they list five general standards for the conduct of educational research that should cut across all forms of educational research. These general standards require that research studies be

- \* *cogently developed* which means that there should be a fit between research questions, methodological aspects, and inferences drawn from data;
- \* *competently produced* which means that data collection and analysis techniques must be competently and effectively applied;
- \* *coherent with respect to previous work*;
- \* *important and ethical*;
- \* *comprehensive* which means that there should be a balance between technical and theoretical quality, the scientific and practical value and importance of the study, the risks involved, as well as the alertness to the knowledge from outside the particular tradition within which the author is working.

These five general standards are interrelated and form a unitary construct of validity, which should encompass but not to dictate the specific standards and norms of particular research designs. Thus, *design-specific standards* are subsumed by the general standards and articulate the particular underlying assumptions, principles, methodological issues and skills that are associated with divergent designs.

While general standards of validity form a unitary holistic construct and should be relatively stable over time, it has to be recognised that design-specific standards necessarily undergo revision and reconceptualization as a result of continuous accumulation of new theoretical and practical knowledge (Howe & Eisenhart 1990). It is obvious that for new emerging designs or strategies these standards and criteria have to be developed in order to be accepted by the research community as valid ways of conducting research.

Having analysed the relevant literature (see, for example, Newman and Benz 1998, Tashakkori and Teddlie 1998), it can be concluded that the theoretical framework for

establishing validity standards and criteria for multimethod and mixed designs is still under development. The most prevalent and useful approach seems to be to proceed from a set of general criteria which stresses the coherence of research questions and the different methodological aspects of a study, and thereafter focus rather on the assumptions and criteria connected with the chosen strategy(ies) and sampling/selection method(s) than on the two sets of criteria usually perceived as diametrically opposite and holistic in both instances.

An extensive literature review, presented in the dissertation, demonstrates that there is a considerable amount of work done for clarifying the issues concerning different aspects of combining divergent methodologies. Still, there is a need for further research to clarify several important issues related to the use of combined designs in research practice. If multimethod designs have been accepted for some time and have got more attention in the methodological literature, the area of mixed designs remains largely unstudied.

## DESIGN OF THE EMPIRICAL STUDY

Proceeding from the overall objective and having regard to understudied areas, which pertain to the use of combined designs, an empirical investigation was undertaken to analyse studies using various multimethod and mixed designs with the aim to clarify several important (methodological) issues listed in Table 2.

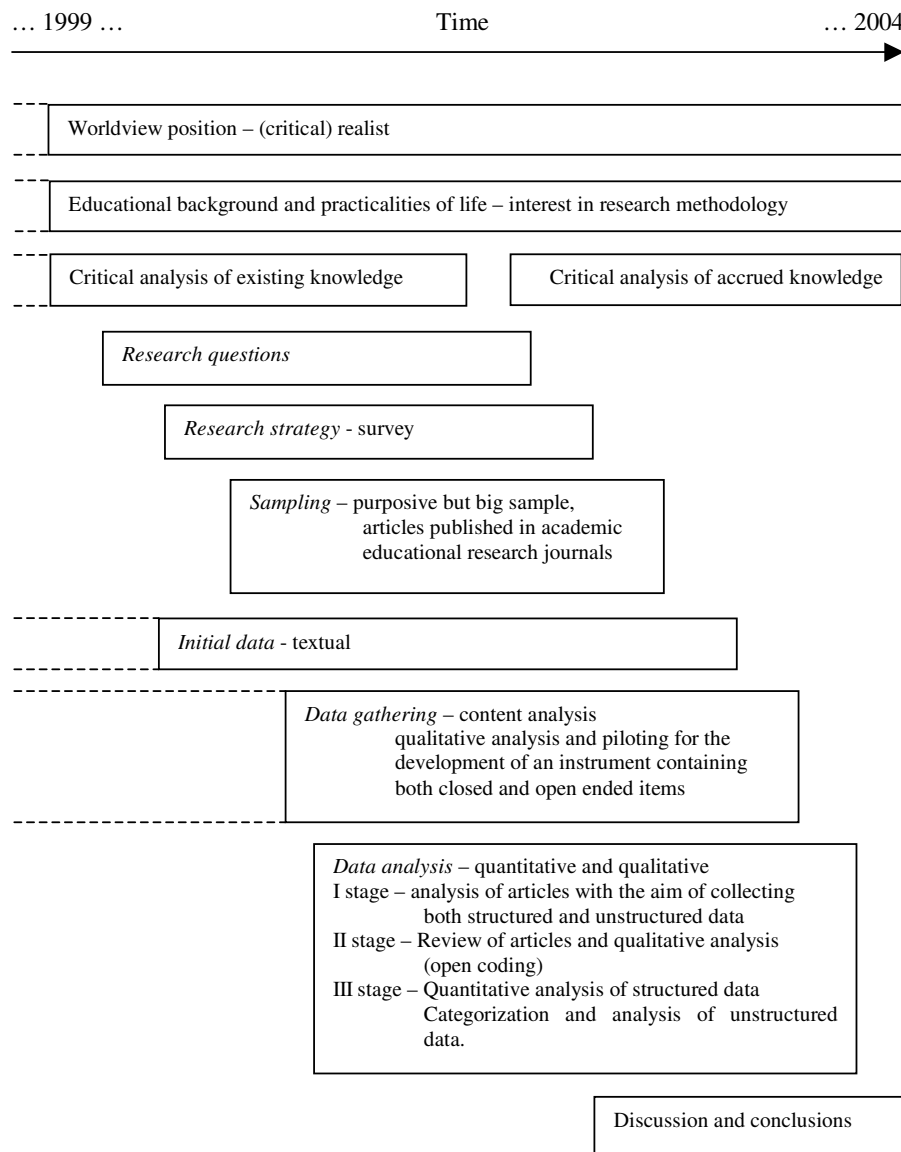
**Table 2.** Guiding research questions for the empirical part of the study

<i>I</i>	How have quantitative and qualitative elements been related? What kind of combined designs have been used? What is the level of integration between qualitative and quantitative aspects of studies?
<i>II</i>	Why have the authors chosen to prefer multimethod or mixed design to monomethod approach? Do they offer a rationale for their choice? What is the purpose of combining different approaches? Whether and how are the research objectives related to the chosen design?
<i>III</i>	What are the complications that the use of different combined designs brings about?
<i>IV</i>	How do design characteristics influence the inferences and conclusions the authors draw?

Chapter two of the dissertation describes the design of the empirical inquiry. The first section grounds the chosen survey strategy, the purposive sample of studies with a combined design and content analytical approach on the given research questions. It also draws attention to the ways that qualitative and quantitative aspects are integrated within this inquiry forming a combined, though mainly quantitative, design for the empirical part of the study. Further, the issues of instrument development and sampling are discussed in detail, and finally, some information concerning the reliability and validity of the empirical study is presented.

Figure 4 presents an overview of the design for the present study. Basically, in all methodological stages, there is some degree of integration between quantitative and qualitative aspects. For example, Krathwohl (1993: 30) describes survey research as a “true swing point in the continuum” of quantitative and qualitative research. The purposive sample is usually connected with a qualitative approach; however, the size of the sample makes it close to representative samples usually characteristic of quantitative studies. Moreover,

initially textual data is analysed using both qualitative and quantitative methods. Thus, it can be seen that the overall design of the present study is mixed although predominantly quantitative.



**Figure 4.** The design of the present inquiry as developed in the course of the study

## DATA ANALYSIS AND FINDINGS

In chapter three of the dissertation, the methods for data analysis are in turn delineated with an interpretation of the results of the data analysis. The logic and choice of methods for data analysis must inevitably ensue from the research questions set up for a particular study. Therefore, technically, the first task in this chapter is to look for emerging classifications of combined designs and thereafter delve into methodological features of each abstract type of

combined designs to be able to draw parallels with the existing knowledge and to explore unstudied areas.

Substantial data analysis in this inquiry can be divided into three broad stages. At the first stage, articles were read thoroughly and analysed with the help of the research instrument. In addition to the structured data, unstructured information in the form of keywords and comments was collected by the means of intensive memo writing. At the second stage, which was first planned mainly for data entry, articles were shortly reviewed and an initial classification of studies emerged on the basis of a qualitative analysis of both structured and unstructured data. At the third stage, computer aided data analysis was performed, first on the basis of structured data by the means of various statistical techniques, and thereafter, on the basis of unstructured data by the means of open coding and categorisation.

Thus, the third chapter begins with a presentation of two different classifications for combined designs, both emerging from empirical data. Table 3 shows the results of preliminary classification. It can be seen that, almost in a quarter of the studies, the most characteristic way of combination was considered to be a quantitative analysis of initially qualitative data. Some systematic quantitative representation of qualitative data was present in more than half of the studies in the sample. As the use of different types of data within the framework of one study was very common and an expected way of combination, it was deliberately not designated as the main distinctive feature of any study. However, it becomes clear that more than 40% of the studies with combined designs in the sample have used only one type of data, thus using the combination of quantitative and qualitative approaches at other levels of design.

There is quite an even proportion of experimental, survey and case studies in the sample, showing that, within all most common research strategies, the possibilities of a combined use of different approaches have been utilised. On the other hand, only few articles clearly stated the use of the results of a preliminary qualitative study as a tool for the development of a structured instrument for a further study, mainly a survey questionnaire.

**Table 3.** Results of the qualitative overview

Ways of combination	As a main feature		As used	
	Count	Percent	Count	Percent
(quasi-)experiment with a qualitative component	23	16%	42	29%
survey with a qualitative component	23	16%	40	28%
qualitative study for the development of an instrument	5	3%	7	5%
case study with a quantitative component	16	11%	47	33%
action research with a quantitative component	12	8%	16	11%
qualitative data - quantitative analysis	34	24%	76	53%
mixed instrument	11	8%	33	22%
both types of data			85	56%
multiple ways of mixing*	16	11%	26	18%
not mixed within the levels	4	3%	6	4%
<b>Total</b>	<b>144</b>	<b>100%</b>		



Eight variables categorising methodological aspects of studies formed a basis for further classification of studies. Although there are many statistical procedures available for the classification of objects, the methods of cluster analysis were considered particularly suitable as the classification had to emerge from data and was not known beforehand for the objects belonging to the sample.

On the basis of main statistical parameters as well as interpretability a cluster model with 8 clusters was accepted as the best possible way to classify the studies by their methodological design characteristics. Table 4 lists the final cluster centres for eight groups and suggests short descriptions for emerging clusters. It can be seen that there are three big clusters, hypothetically representing the more common types of combined designs, and five smaller clusters, hypothetically representing the less common ways of combining quantitative and qualitative approaches.

Further analysis of different methodological features of the studied sample is largely based on that classification. The main methodological features of interest during the analysis are the level of integration between qualitative and quantitative aspects in various combined designs, purposes for the use of combined designs and the relationship between the aims of the inquiry and the chosen type of combined design. Finally, the ways the authors validate and justify their use of a combined design are analysed and some potential problems outlined.

**Table 4.** Final cluster centers for a cluster model with 8 clusters\*

Cluster number	Cluster description	Cluster size	Design characteristics							
			Strategy (mixed)	Strategy	Sampling (mixed)	Sampling	Data gathering methods (mixed)	Data gathering methods	Data recording and reporting	Data analysis methods
1	Studies with mainly QL strategy and mainly QN data handling	7	0,0	3,9	0,0	4,4	0,4	1,6	1,9	1,1
2	QN studies with nonrandom sample and little use of QL data	8	0,0	1,0	0,1	2,4	0,5	2,1	3,0	2,3
3	Two subdesigns - mainly QN (surveys)	32	0,8	2,9	0,8	2,9	0,9	2,5	2,9	2,3
4	QL studies with QL data and mainly QN analysis	12	0,0	3,8	0,1	4,9	0,0	5,0	2,8	1,6
5	Mixed design studies with mainly QL data	30	0,4	2,7	0,4	3,0	0,5	4,4	3,0	3,5
6	QN studies with initially QL data	9	0,0	1,0	0,0	1,0	0,3	4,2	2,9	1,8
7	QL studies with little use of QN data and numeric reporting	33	0,0	5,0	0,1	4,7	0,7	4,0	3,1	3,8
8	Hybrid strategy studies with mainly QL data	11	0,1	2,8	0,0	5,0	0,6	3,9	3,2	3,7

\* for 5 main variables, ordinary scales varied from 1 (QN) to 5 (QL)

\* for 3 additional variables, binary scales were 1 (QN & QL both used); 0 (only one method used)

## IMPLICATIONS AND CONTEXTUALISATION OF RESULTS

The fourth chapter of the dissertation, which is reprinted here in full, comprises the results from the theoretical overview and the empirical analysis. As the ideas in the field of combined research designs have significantly developed during the past few years, the last chapter discusses the results of the present study in the framework of the newest viewpoints of leading writers on “mixed methods”.<sup>6</sup>

## CURRENT DEVELOPMENTS OF IDEAS AND PRACTICE

The methodology of educational research has been in constant development during the past few decades. The “paradigm shift” from positivist-quantitative to interpretivist-qualitative ways of doing research has been advocated by many writers and methodologists as the most desired goal, especially in the field of educational research. Finland, for example, is one of the countries where this shift has been very rapid and where today “almost all master theses are based on interpretive-qualitative approaches” (Lauriala, 2003). While there are many researchers who are pleased with and proud of these developments, there are others who also see the problems connected with the dominance of one methodological approach over the other, no matter whether the superior position is given to qualitative or quantitative methodology (Professor Tapio Vaherva, personal communication, January 15, 2002; Professor Hannele Niemi, personal communication, October 24, 2003).

The discourse and contention of the present dissertation is based on the conviction that the practice of educational research benefits from both broad methodological approaches and can be enhanced if qualitative and quantitative methods will be taken as complementary ways of studying educational phenomena and not as mutually exclusive paradigms. That is not to deny the influence of the researcher’s ontological and epistemological beliefs on his or her practice nor to advocate that methodologically everything goes as far as it serves certain (noble) aims, but to argue that “one’s worldview and the theoretical lens affect the questions posed. Other aspects of the research should follow from the research questions” and be in concordance with one another (van Heter & Stevens 2000).

During the last six years, the time I have worked on the present dissertation, the development of the field has been very rapid. While in 1997, the “paradigm wars” were going on rarily, inflated by the ideas presented by Guba and Lincoln in the *Handbook of qualitative research* published in 1994, and only a few writers were advocating and grounding the combined use of qualitative and quantitative methods (see, for example, Brannen 1992, Bryman 1992, Greene *et al.* 1989), in 2003 the *voluminous Handbook of mixed methods in social and behavioural research* was published, preceded by a smaller-scale book on mixed methodology by Tashakkori and Teddlie in 1998.

In the preface to the *Handbook of mixed methods*, Tashakkori and Teddlie (2003: x) voice their belief that “the mixed methods research has evolved to a point where it is a separate methodological orientation with its own worldview, vocabulary, and techniques” and that “mixed methods designs will be the dominant methodological tools in social and behavioural sciences during the 21<sup>st</sup> century”. They see mixed methods as “the third methodological movement” and fit it into the framework of the “pragmatist paradigm” (Tashakkori & Teddlie 2003c: 679).

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<sup>6</sup> The combined use of qualitative and quantitative approaches has been introduced under the label “mixed methods” in the handbook published in 2003 (edited by Tashakkori and Teddlie).

While I thoroughly appreciate the attempt to elaborate and to unify the understanding of the combined use of qualitative and quantitative approaches, I have been criticising this kind of paradigmatic view on mixed methods.<sup>7</sup> However, as the *Handbook of mixed methods* draws together the diverse theoretical and methodological viewpoints on the combined use of qualitative and quantitative methodologies, some other positions rise to the fore as well. For example, Greene and Caracelli (2003; Chapter 3 of the Handbook) and Creswell *et al.* (2003b; Chapter 8 of the Handbook) argue against the dominance of one paradigm over another, which is more in line with my view of quantitative and qualitative methodologies as a continuum. On the other hand, the idea of pragmatism as the paradigm for mixed methods research is challenged by Miller who argues that “mixed methods could be defended adequately, ..., from a (minimal) realist position”, which I find to be the closest to my worldview (2003: 425; Chapter 15 of the Handbook).

Thus, I welcome the multiplicity of the views presented in the *Handbook* although it brings with it one seemingly unfortunate effect: while the editors set the aim for the *Handbook* to achieve greater consistency across the terms and definitions in the field of mixed methods, the multiplicity of terms has definitely increased for most readers, as the Handbook covers different fields of social research and brings together a lot of different authors with their preferred terminology and ways of organising the field. Although such an effect is obviously unavoidable in any field which is in its early development, I will shortly come back to this issue in the following section.

## **TYPOLOGIES AND TERMINOLOGY**

The first task for the empirical part of the present study was to analyse the actual use of combined designs and to filter out common ways quantitative and qualitative approaches are merged within different research projects in the field of education. Therefore, the purposive sample of 15 academic educational research journals was chosen and 1156 latest articles reviewed. From those reports, 145 studies (13% of all articles and 19% of empirical studies) were classified as having a combined design and included into the final sample for a thorough analysis. However, only one third of the authors had somehow stressed their combined use of qualitative and quantitative methods. Although these figures may slightly overestimate the actual proportion of educational studies using combined designs, as the journals where only one approach was prevalent were not included into the sample, these results are in concordance with those gained by Lazaraton (2000) in the field of language learning and by Rocco *et al.* (2003) who reviewed studies from four specific fields of educational research and concluded that while the combined designs are used in actual research practice, the awareness of mixed methods and related literature is very low.

To answer the questions *how quantitative and qualitative elements have been related?* and *what kind of combined designs have been used?*, two different analytical approaches were used. In both cases, the classification was distilled from data and not led by any proposed taxonomies.

The initial classification based on open coding and descriptive statistics based on structured data showed that:

- \* A combined use of qualitative and quantitative aspects was implemented within all most common designs: surveys, case studies, (quasi)experiments and action research studies.

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<sup>7</sup> See, for example, Section 1.2 of the dissertation.

- \* Not all the studies (only about 60%) which were classified as having a combined design were using two types of initial data (quantitative and qualitative).
- \* Within half of the studies, initially qualitative data was transformed into a form allowing a quantitative analysis and/or numerical presentation of the results, indicating that it is not uncommon to present some quantitative results within otherwise qualitative studies.
- \* Only few studies had a design where the combination of qualitative and quantitative aspects and/or methods was not implemented within the same methodological stages. Both, qualitative and quantitative methods were most commonly used at the stage of data recording and reporting (in the case of approximately 90% of the studies)
- \* About 30% of the studies were using two or more sub-designs, which is characteristic of multimethod designs, while the remaining 70% of the studies used some form of mixed designs.

A finer classification based on structured data and cluster analysis suggested a typology with 8 clusters of different combined designs. Emerged categories overlap to some extent with taxonomies proposed by different authors described in Section 1.3 of the dissertation, but at the same time, some differences remain, mainly due to the fact that the taxonomies proposed are differentiating a lower number of methodological stages than considered useful in the framework of the present study, but also because the actual practice is often fuzzier than the models, meaning that the combination of qualitative and quantitative aspects may be implemented in several ways within a particular research project.

The plurality of the various ways of categorising combined designs seems to be even fostered by the new *Handbook of mixed methods* (Tashakkori & Teddlie 2003b). To summarise, just some aspects of this tendency (*op. cit.*: 32):

- \* there is a growing number of typologies of mixed methods research designs;
- \* none of these typologies is exhaustive;
- \* typologies vary by the criteria that are used to distinguish among the research designs;
- \* in some cases, the researcher may have to develop a new mixed methods design because none of the existing designs is best for his or her research project.

This plurality, on the one hand, and the attempts to build more and more exhaustive typologies on the other hand, have an expected effect on the terminology in the field: it gets very specific and complicated but remains ambiguous at the same time.<sup>8</sup> Leading authors who have converged to compile the *Handbook of mixed methods* have seemingly agreed to use the label “mixed methods” as an umbrella term for all the different designs where qualitative and quantitative aspects are combined in a way or another. This label is used in the title of the book, as well as in the titles of most of the contributions. However, on the other hand, “mixed method design” is described as one specific type of combined designs (alongside with “multimethod designs”), which further breaks up into “mixed method research” and “mixed model research” (Tashakkori & Teddlie 2003c: 683). Thus, the term “mixed method” is used at least at three different levels of typology while there still does not seem to be final agreement between different authors on whether a study to be classified as “a mixed

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<sup>8</sup> For example, the Glossary of the *Handbook* (Tashakkori & Teddlie eds. 2003: 711-712) contains at least 10 partly overlapping labels for (different but partly overlapping) combined designs, whereby for most terms, several partly overlapping definitions are given (eg mixed methods, mixed methods design, mixed model design, multimethods design, multiple methods design, multistrand design, monostrand design, etc.).

method(s) study” has to involve data-collection and analysis methods from both approaches (qualitative and quantitative) or is it not compulsory.

Therefore, I prefer to hold on to the broad classification I have proposed earlier and use the term “combined designs” (or alternatively “mixed designs”) as an umbrella term for all research approaches where qualitative and quantitative aspects have been combined in a way or another.<sup>9</sup>

The analysis of structured data in the present study suggested that it is useful to differentiate at least three methodological stages, in addition to the purposes/questions and inferences, while classifying studies by their methodological approach. The stages that constitute the design of a study would then be:

- \* Research purposes and questions
- \* Strategy and sampling
- \* Data collection (or type of initial data)
- \* Data analysis (including data recording and reporting)
- \* Inferences and claims<sup>10</sup>

From there, three main types of combined designs evolve:

- \* studies with two or more sub-designs where both qualitative and quantitative strategies and sampling techniques are used (*multimethod designs*; could also be called *multistrand mixed designs*);
- \* studies with one overall strategy and both types of data (*mixed designs*; could also be called *monostrand mixed method designs*);
- \* studies with one overall strategy and data or data analysis methods from the other approach (*mixed designs*; could also be called *monostrand mixed model designs*).<sup>11</sup>

Adding two types of pure designs to this classification, we will get the following broad typology:

- I. Pure designs
  1. Monostrand pure designs
  2. Multistrand pure designs
- II. Combined designs (or mixed designs)
  3. Multistrand mixed designs
  4. Monostrand mixed method designs
  5. Monostrand mixed model designs

It was confirmed by the results of an analysis that, in actual research practice, researchers may decide to use more than one way of combining qualitative and quantitative aspects within a

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<sup>9</sup> See Table 1.

<sup>10</sup> Tashakkori & Teddlie (2003c: 684-691) operate with four stages: purpose/question, data collection, data analysis and inference. At the same time, they use the term “research method” as something different from data collection or analysis procedures in the text. They do not give any definition for “a research method”, so it can only be speculated that it covers what I have called research strategy and sampling methods. However, it remains unclear whether these “research methods” are placed under the label “purpose/question” or “data collection”.

<sup>11</sup> The terms “monostrand” and “multistrand” are used by Maxwell & Loomis (2003) and Tashakkori and Teddlie (2003c).

single study. For example, in several studies with a multimethod design, the sub-design(s) were mixed as well. Thus, all the three main types can be further divided into finer groups of combined designs until all logically possible variations are described. However, it does not seem to be a useful way to continue as the number of possible variations is relatively high, and I assume that there is a common logic for subgroups of similar combined designs and, therefore, no need for separate criteria for all possible subtypes of combined designs.

## JUSTIFICATIONS FOR THE USE OF COMBINED DESIGNS

One aim set for the empirical part of the present study was to explore possible justifications for a new kind of practice, to analyse *whether the authors offer a rationale for their use of combined design?, what is the purpose of combining different approaches?, and whether and how the research objectives are related to the chosen design?.* The related results are presented in detail in Section 3.5 of the dissertation and could be summarised as follows:

- \* Explicit rationale for the use of a combined design was given only in a minority of the studies, yet in about 2/3 of the studies, it was possible to identify at least some formulation of intended purpose. This result concurs with the findings presented by Rocco *et al.* (2003: 611) who reviewed 17 mixed method studies in education and concluded that “little explicit discussion of research design, decision making or theoretical support for design components was observed”.
- \* The analysis confirmed the suitability of the conceptualisation of “mixed-method purposes” proposed by Greene *et al.* (1989). However, some differences on the frequencies of the five purposes were observed compared to the original study.
- \* The most typical purpose for a combined design was *complementarity* (used in more than half of the studies of the sample), followed by *expansion* (used in about one third of the studies of the sample). *Triangulation* in its original meaning was used only seldom, and somewhat surprisingly, seeing the popularity of the term, it was not mentioned in more than 20% of the studies either.
- \* There was a correspondence between mixed-method purposes and the chosen design. *Complementarity* was the purpose within the designs where both types of data were collected, while it can happen either within the overall strategy (monostrand mixed method designs) or in the framework of different sub-designs (multistrand mixed designs). *Expansion* was usually the purpose for studies with independent sub-designs (multistrand mixed designs).

It is essential to understand that mixed-method purposes are different from research purposes or aims and that the former is obviously influenced by the latter. In spite of the fact that, in about half of the studies, the aims of research were described in a quite a loose manner, the empirical results demonstrated that there are clear connections between the aims of research and the chosen design.

According to Töttö's (2000), the classification of research aims into four types of research questions, for most studies of the sample, the aims predetermine the combined nature of the design as about 85% of the studies had set up questions leading to a qualitative approach as well as questions leading to a quantitative approach.

However, the quadripartite classification of research questions can not be good enough a predictor for the suitable design for any particular research project. Newman *et al.* (2003: 168) argue that, instead of looking at research *questions*, it is useful to look at research

*purposes* as “without a clear understanding of the purpose behind the questions”, we are “inhibited when identifying the most appropriate methods to investigate those questions”.

A qualitative analysis based on open coding and a categorisation of research aims lead to a similar realisation. Especially important are the research purposes, determining the overall strategy and sampling method(s) for a particular research project. For example, the aim to promote or change a practice often leads to an action research type of study where qualitative aspects are in dominance, but some quantitative data may be used to inform the decisions. Evaluation as a purpose; on the other hand, is more related with designs where the samples are relatively small and not random but data are mainly quantitative.

It is interesting to notice that the typology of research purposes presented by Newman *et al.* (2003), as well as the typology of research aims empirically emerged in the present study, have nine categories. A comparison of these typologies of research purposes shows a considerable overlap although the basis for creating these typologies has been slightly different and neither of the typologies is exhaustive for diverse reasons.

## **IMPLICATIONS TO THE QUALITY OF RESEARCH**

The most scorching but at the same time the most challenging question about the use of combined designs is the influence and implications that the new kind of practice might have in the context of the perceived rigour of educational research. A comprehensive treatment of related matters is way beyond the scope of the present dissertation. However, for the framework, I have sought to examine quality issues of studies with combined designs in Section 1.4 of the dissertation and, using this framework, some further aspects of validation matters will be summarised below.

First, it has to be mentioned that the authors of the reviewed articles did not report any particular problems that could have been clearly caused by the combined nature of the design. An exception here might be a mismatch between qualitative and quantitative data which was mentioned in some cases. However, it was not regarded as a problem by the authors but rather as an advantage of this type of studies. On the other hand, researchers often used the same means for validation as in pure-design studies. The only specific combined-design validation method which was used, though only in minority of studies, was triangulation.

Earlier the list of five general standards proposed by Eisenhart and Howe (1992) for evaluating the quality of educational research was introduced. By these criteria, any studies, no matter what their methodological approach is, have to be:

- \* cogently developed;
- \* competently produced;
- \* coherent with respect to previous work;
- \* important and ethical; and
- \* comprehensive.

Comprehensiveness and ethical matters might be the reasons for choosing a combined design for the study as they stress the balance between the value and the importance of the study, and the (ethical) risks involved, as well as the alertness to the knowledge from different research traditions. Combining qualitative and quantitative approaches within one research project may help to make the results valuable for different audiences and to avoid certain ethical risks. However, this clause also stresses the balance between technical and theoretical quality, which may be a problem, especially in the case of studies with combined designs.

According to the results of the empirical study, an explicit rationale for the use of a combined design was given only in a minority of the studies and references to related literature were quite rare. This deficiency comes to light even more strongly in the finding that there is often a lack of information about data analysis procedures, especially so in the case of a qualitative analysis which leaves the basis of results unclear for the reader (see also Rocco *et al.* 2003: 611). Thus, trustworthiness of the results of the studies using some form of combined design could be significantly enhanced by a more elaborated contemplation and reporting of reasons and purposes for a particular methodological approach, as well as the concrete methods used for data analysis. To justify the use of any chosen mixed method or model design, the discussion why a particular application was chosen and how it works in a given research situation is necessary (Miller 2003: 450).

The requirement for studies to be competently produced seems not to imply any distinctive criteria for combined-design studies compared to pure-design studies as concrete data collection and data analysis methods used within the framework of the studies with combined designs are also used within the framework of the studies with pure designs. However, some questions may be raised, which could cause additional problems in the case of studies using combined design. Most importantly, it concerns the question of the competency of a researcher to exploit methods from different methodological approaches, and if several researchers with different backgrounds are involved in the project, their ability to understand each other and accommodate each other's expertise within the framework of a mixed-design study. Secondly, there is a need for more integrative data analysis methods which would allow combining qualitative and quantitative data before the stage of interpretation. Some aspects related to these issues will be discussed in the following sections.

Lastly but most importantly, the call for cogency and accordance has to be analysed in the context of studies with a combined design. The fit between research purposes and questions, methodological aspects, and inferences drawn on the basis of data is obviously of crucial importance, but can be seen as violated by combining qualitative and quantitative aspects within one research project. Therefore, an attempt was made, in the empirical analysis of research reports, to monitor *how do design characteristics influence the inferences and conclusions the authors draw?*. However, the present analysis allows only for a preliminary glance at related matters and serves mainly as a basis for raising more focussed questions. It has to be mentioned and retained throughout the discussion that the quality and accordance of particular claims and inferences asserted in the reports was not evaluated.

The results show that the pattern of claims is indeed connected with the type of design, so that numerical descriptions are more common to designs where quantitative aspects are prevalent and non-numerical descriptions are more common to designs where qualitative aspects predominate. On the other hand, quasi-numerical descriptions proceed from quantitative as well as from qualitative data and/or analysis and are common to all emerged types of combined designs. Inversely, generalisations and inferences were relatively rare, no matter what type of combined design was used, whereby they were mainly introduced in the framework of conclusions and were often given in the form of recommendations. Thus, there is a certain consistence here between the purposes and the claims of the studies in the present sample: most studies are of exploratory or descriptive nature, and mostly descriptive claims are exhibited.

On the assumption of competent use of all particular methods within the overall design, the question of cogency of the design recedes to the question of accordance between the research purposes and questions, the research methods chosen at various methodological stages, and the inferences drawn. It is relatively easy to manifest the validity of descriptive claims on the basis of the competent use of data-collection and analysis techniques, whatever the design of



the study is. However, if the purposes of a particular research project go beyond simple descriptions of the studied sample or cases assuming generalisations, causal statements, practical decisions which could help to improve certain practises, etc., the choice of a proper research strategy and sampling methods becomes essential. The choice of a strategy and the sampling principles; on the other hand, puts some constraints on the choice of data analysis techniques and/or has some significant implications on the ways the results can be interpreted. Most importantly, the question of the use and interpretation of the tests for statistical significance arises here. The analysis of empirical data in the present study yielded 8 clusters or types of mixed designs. The discord between sampling and data analysis methods is a potential problem for the first cluster where quantitative analysis and statistical significance tests are used in the framework of a mainly qualitative strategy and sampling.<sup>12</sup> In the following, some potential problems within the biggest emerged clusters will be elicited.

The third is the only cluster, where most of the studies have multiple clearly separate sub-designs – it consists mainly of surveys with a small-scale qualitative follow-up study. The main concern here appears to be in the fact that the data and therefore the inferences result from two different sampling schemes and premises. The advocated advantage of this type of design, where the quantitative part presumably gives the generalizability and the qualitative part the depth for the results, may not become evident in a particular study. The results show that, in about half of this type of studies, generalisations on the integrated basis of qualitative and quantitative approaches have been proposed, and in about one fourth of the studies, the basis for some claims does not become clear from the text. Thus, in the case of this type of design, one has to contemplate carefully *whether qualitative results are really generalizable even to the big sample used for a survey analysis, not to mention a population?* Additional concern would be to reflect *how the lenses received from quantitative results affect the design, and thereby, the results of the qualitative part of the study?*

The seventh cluster consists mainly of studies where the combination of qualitative and quantitative approaches is implemented only on the level of data in an otherwise qualitative design. The use of some quantitative data and/or the categorisation of initially qualitative data, so that simple descriptive statistics can be used, is not new practice within case studies and action research projects as research questions often take an interest in both qualitative and quantitative aspects of the studied case or practice. However, if quantitative data analysis methods are not carefully considered in the light of the premises of the used research strategy and sampling methods, the inferences drawn may easily be in dissonance with the methodological aspects and also with the research questions. The empirical results of the present study show that, within this type of a combined design, inferential statistics are usually not applied though in some cases the inferences surpass the studied case(s) and/or situation(s). Another critical point to consider here is the accordance between different types of data: *can qualitative and quantitative data really capture the same phenomena, or should they be used to describe different facets of the studied case(s)?; how to integrate different types of data so that the overall picture would be improved and not befuddled?; how to solve a situation in which qualitative and quantitative data turn out to be inconsistent?, etc.*

The studies in the fifth cluster exhibit more complicated mixed designs than in the previously analysed clusters. As here, studies often implement two sub-designs as well as different types of data within one or more mixed model sub-designs, all the potential problems outlined above must be taken into consideration here too. However, some additional questions arise, as here, the important feature of the design is the quantification of initially qualitative data.<sup>13</sup> Thus, one could argue that *the richness of initially qualitative data will be vastly reduced by quantification*, and ask *whether this is consistent with the purposes and the aims of research?; and if yes, is this kind of practice worthwhile?.* Not discrediting nor underestimating the

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<sup>12</sup> It is also a potential problem for the second cluster but to a lesser extent as there the research strategy is quantitative though sampling techniques may be nonrandom.

<sup>13</sup> This is also an important feature for clusters 4 and 6.

importance of classification and quantitative analysis of initially qualitative data in accordance with the research purposes, I argue that to increase the potential and the standing of this type of combined designs, the question *how to integrate the quantified information and the qualitative analysis of initially qualitative data?* should be addressed and elaborated.

Looking at the question of worthiness and the quality of studies with combined designs compared to studies with pure qualitative or quantitative designs more widely, the integration of qualitative and quantitative approaches within different types of mixed method and mixed model designs seems to be the key issue. The empirical results of the present study demonstrate that while combined designs were used, the status of qualitative and quantitative approaches within a study was still rather unequal in most cases, and even if conceptualised in an integrated way, the actual integration of qualitative and quantitative methods and results did often only appear at the stage of interpretation.

In the newly published *Handbook of Mixed Methods* (Tashakkori & Teddlie eds. 2003), the issues of integration are discussed and special sampling, data collection and data analysis strategies for studies combining qualitative and quantitative aspects are introduced in the extensive section on “methodological and analytical issues for mixed methods research”. However, as the field is only in its early development, the need for further elaboration on these issues is tacit.

## IMPLICATIONS FOR EDUCATION

In this final section, I will shortly tackle the issue of teaching research methods in a context where qualitative and quantitative approaches are not only seen as valid and useful ways of studying educational phenomena, but it is assumed that, in some cases, combined design may be the best choice for a particular research project, as argued thorough the present dissertation. The current practice by which research courses are often either qualitative or quantitative, and even if taught in a single course, in a sequential manner and with no attempt to draw parallels between the two arguably polar approaches, is not pertinent.<sup>14</sup>

The problems of teaching “mixed methods research” courses have recently been examined with considerable consistency by Tashakkori & Teddlie (2003a, 2003c). In addition, Creswell *et al.* (2003a) have surveyed 11 current practitioners who taught mixed methods courses or workshops to describe pedagogical approaches that instructors might teach and students might learn in mixed methods courses. My intention here is not to review these articles but to propose an alternative answer to the questions raised by Tashakkori and Teddlie (2003c: 693) which require further elucidation:

- \* In what sequence should courses from three methodological movements [QUAL, QUAN and mixed methods] be presented in graduate school?
- \* How many courses are required to be trilingual (i.e., minimally literate in the QUAL, QUAN, and mixed research languages)?
- \* What sort of projects should a mixed methods research course include, and what activities should students conduct?

As I have argued earlier in this dissertation, I do not feel comfortable with the classification of research methodology into two nor into three clearly separate methodological paradigms or movements, instead I prefer to look at methodology as a qualitative-quantitative continuum.

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<sup>14</sup> There are some new generation textbooks available where qualitative and quantitative approaches are given more or less equal space and where some discussion on combined designs is included (see, for example, Krathwohl 1993, Bryman 2001, McMillan & Schumacher 2001, Creswell 2002, Creswell 2003).

This has an important influence on my view on the organisation of research methods courses. Indeed, the first question will become rather pointless as I reject the idea that there should be different courses for qualitative, quantitative and mixed methods research. I argue that the first research methods course taken by graduate students should give an overall framework and overview of different approaches to study educational or social phenomena, and I do agree with Tashakkori and Teddlie (2003c: 695) that it should “develop an understanding of the similarities between the two orientations”, but I am reluctant to call or see this course as a “mixed methods course” as in my view, it should not focus straightaway and only on introducing the features of combined designs or mixed methods studies.

Furthermore, the empirical research, which has been the focus of the present dissertation is only one way to meet the divergent needs that the educational practice brings up. Non-empirical theoretical studies have had an important role and place in educational research for a long time, which is supported by the fact that most journals in the field include papers which are not based on empirical research. In addition, lately there has been a move towards the acceptance of the principles of design science as a useful means of advancing our understanding in the field of education (Edelson 2002). The *design research* approach is specially promising in advancing the ideas in the field of e-learning, but also in more traditional areas of educational sciences.

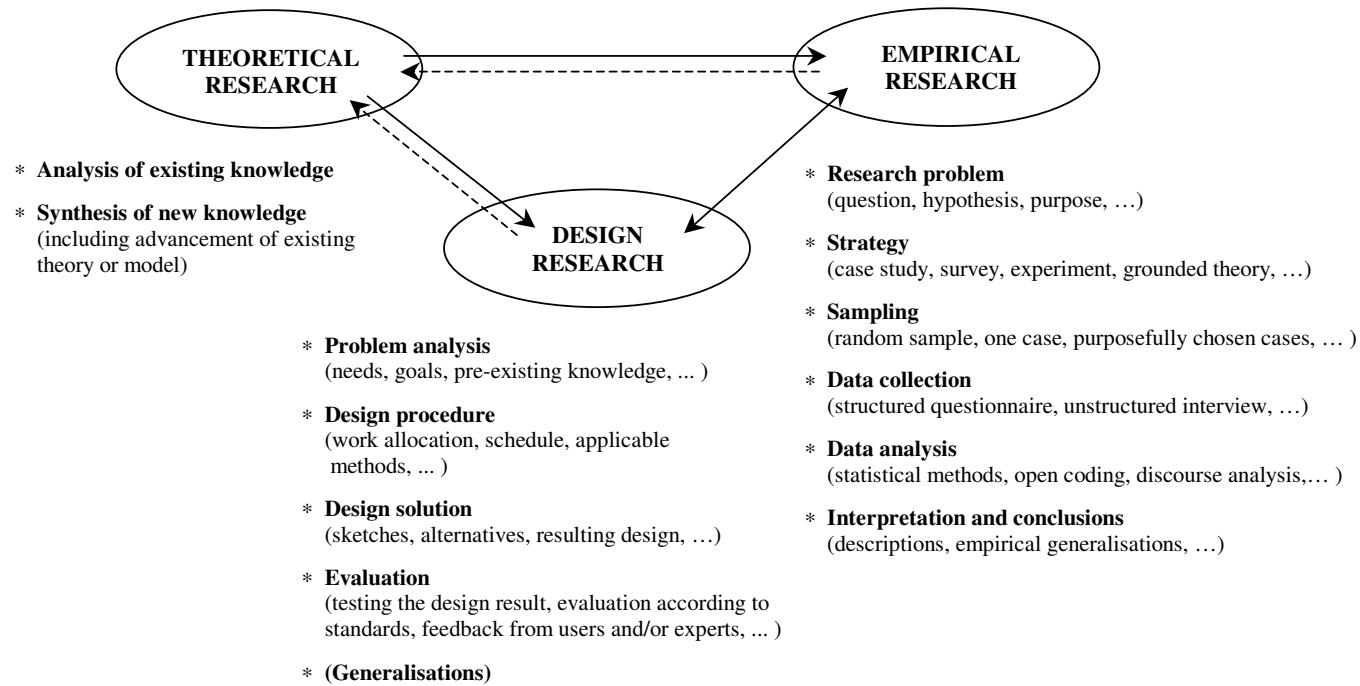
Though it is obviously impossible and not reasonable to avoid the terms *qualitative* and *quantitative research* or *pure* and *combined designs*, I would rather start the first research methods course by presenting the relationships between the three broad research types: theoretical, empirical and design research (see Figure 5).<sup>15</sup> Depending on the interests and the needs of students, the rest of the course can focus either on one of these types only or offer an overview of each.

The course (or a part of the course) introducing the methods for empirical inquiry would then introduce the methodological stages of an empirical study as described on Figure 5, emphasising the wide variety of choices at every stage on the one hand, and the coherence between the chosen methodological aspects on the other. Keeping close to this model it would then be feasible not to structure the course(s) into two or three parts as qualitative methods, quantitative methods and mixed methods, but to build the course on explaining the logic of different research strategies (or designs) like survey, experiment, case study, ethnography, action research, etc. Indeed, it should be pointed out that while certain strategies are traditionally predominantly either qualitative or quantitative, the design for particular study can be combined either by integrating two sub-designs with different strategies into one research project, or by integrating divergent methodological aspects within one overall strategy. The recent textbook by John W. Creswell (2002) is excellently supporting this kind of approach to research methods courses.<sup>16</sup>

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<sup>15</sup> It is essential that empirical as well as design research studies elaborate on at least some relevant theoretical ideas. On the other hand, design studies often include a small-scale empirical investigation, for example at the stage of evaluation or problem analysis. Furthermore, there are certain research designs, like evaluation and action research studies, which are more or less on the borderline of empirical and design research.

<sup>16</sup> There are some other textbooks that are also to some extent consistent with this kind of integrated approach (see Järvinen 2001, Bryman 2001, Krathwohl 1993)



**Figure 5.** Three types of research for studying educational phenomena

The question about the number of courses needed to become fluent in understanding or conducting the variety of methodological aspects of different types of empirical research studies is indeed an unanswerable one, as pointed out by Tashakkori & Teddlie (2003c: 695). I tend to believe that even at best (meaning a situation in which there is a relatively big amount of time assigned for research methods courses), the students can only get an overall framework and understanding of different research methods. To become trilingual or fluent in the use of a wider range of methods takes considerable motivation, independent reading and practical experience.

However, we can help the students to achieve at least the minimal overall literacy in research methods necessary to make their further independent learning effective. For that, I propose we should increase integration between different methodology courses and increase the time spent on reading and commenting actual pieces of research in the field related to students' interest. In addition, the value of small-scale research projects carried out during the methods course and/or integrating theoretical studies with the design process of students' dissertation project must be acknowledged.

It is not realistic nor desirable to assume that one lecturer can or should cover all the aspects of research methodology in depth with great expertise, but it is essential that all the courses, which we are able to deliver within the constraints of the curriculum, would be based on and led by this overall model for empirical research. Thus, I suggest that, indeed, we should offer, after one or two introductory integrative methods courses, several more specific (compulsory or elective) courses which focus on some aspects of either qualitative, quantitative or combined approaches, but these courses should be taught in a way that students can easily fit the pieces of specific information and knowledge into the overall scheme of methodological aspects of research design. This minimal requirement seems to be neglected far too often; and therefore, even the students who have taken several courses on research methodology exhibit confusion about the basic concepts of research and experience difficulties in designing their own research projects.

## CONCLUSION

Following the critique of the quality and utility of educational research, which is often connected to methodological issues and especially to the ongoing debates on the relationship between qualitative and quantitative approaches of research, this study set the aim to contribute to the potential improvement of the quality of educational research by elaborating on several topical questions of methodology and thereby suggesting ways to enrich the research practice in the field of education but also by proposing ideas to enhance the ways in which graduate students, that is, future educators and new researchers are prepared in the academy

The preliminary study focused on the debates (the so-called “paradigm wars”) on the proposed divergencies between quantitative and qualitative methodologies. It elaborated on the historical aspects and disclosed the reasons for the paradigmatic confrontation between qualitative and quantitative approaches. However, an analysis of various texts on methodological issues and a small-scale empirical investigation suggested that the dichotomous nature of educational research advocated by the proponents of the paradigmatic view, is not characteristic of the actual research practice, nor should it be taken as an ideal to be achieved. Thus, the main argument from the preliminary study was that although there are theoretical or philosophical frameworks where only quantitative or qualitative methodology meets the needs and/or the requirements for an empirical inquiry, the quantitative and qualitative methodologies themselves are not mutually exclusive and incompatible paradigms. Moreover, it was claimed that it is the concrete research problem or aim rather than the philosophical position that determines the design of a study, whereby, depending on the nature and the complexity of the problem, the design can be either qualitative, quantitative or a combination of both.

The more concrete aims for the main study, presented in this dissertation, grow out of the overall purpose for the inquiry and the results of the preliminary study. As the field of combined designs (also called “mixed methods research”) is relatively new and still in development, the aim to enhance and extend the existing systematic knowledge about the ways combined designs can be and are used in research practice, to explore possible justifications for a new kind of practice and to analyse the implications that might have in the context of educational research was set.

To be able to provide a solid and integral contribution, an extensive analysis of the existing theoretical knowledge and relevant empirical results as well as an original empirical inquiry was conducted. The numerous results of the empirical part of the study are described in detail in Chapter 3 of the dissertation and summarised in Chapter 4. In overall, the analysis indicates that both, multimethod designs, where qualitative and quantitative methods are used within different sub-designs of the same research project, and a mixed designs, where qualitative and quantitative aspects are combined on various methodological levels in the framework of a single research strategy, are used. Using a combined design does not have to mean that both qualitative and quantitative data are collected though very often both qualitative and quantitative ways of data recording and reporting are used while a combined design is employed. The level of integration between qualitative and quantitative aspects remains relatively modest in most cases, especially the integration of different types of data at the stage of analysis. However, at the stage of interpretation, more extensive integration can be observed.

Explicit rationale for the use of combined design was given only in a minority of articles, where, in some cases, the authors stated the use of a pure design, usually qualitative, but

according to the definitions utilised in the present study, the inquiry was classified as having a combined design. The most typical purpose for a combined design was complementarity followed by expansion. Triangulation, development and initiation were rarely recorded as a purpose for the combined use of qualitative and quantitative methods. The comparative analysis of eight emerged clusters (that is, types of combined designs) indicates the relationship between mixed-method purposes and the chosen type of combined design.

Although a synthesis of new ideas has occurred in all stages of the study, the last chapter integrates the emerged theoretical ideas with empirical results and relates the results of the present inquiry to the latest developments in the field. It also broaches the implications of the results for the research practice and for the ways in which the methodology of educational research could be introduced to a new generation of educators and educational researchers, providing thereby an added value to the study undertaken.

It can be concluded that the aims set for the study are fulfilled. A systematic overview of topical questions related to the relationship between and the combined use of qualitative and quantitative methods in educational research supplemented by the results of two empirical surveys ground the main merits of the present investigation:

- \* elucidation and clarification of complex methodological issues in the field of educational research;
- \* regulation and harmonisation of related terminology;
- \* systematisation of the classification of combined designs;
- \* providing a framework for the use of combined designs by emphasising the role of research purposes and aims on choosing a suitable design for a particular study and by eliciting the possible justifications and purposes for the combined use of qualitative and quantitative approaches;
- \* underlying the importance of coherence of the research design and indicating some potential inconsistencies of different combined designs.

These results, if espoused by educational researchers, editors, reviewers and academic staff of universities, should enable:

- \* to perceive the possibilities and the value of the combined use of qualitative and quantitative methods better;
- \* to enrich the methodology of educational research;
- \* to ground the choice of research methods better;
- \* to rear new generation of educators and educational researchers who are less exclusive and intolerant of different methodological approaches but more informed of the overall standards and criteria for conducting and evaluating a piece of educational research.

Although the present study attained its objective, it has several limitations which have been reported in relevant chapters. First of all, it has to be reminded that the scope of the inquiry is limited to the Anglo-American context, both concerning the overview of theoretical ideas and the empirical part of the study. As the topic under study is dependent on the social, cultural and historical background, a further investigation is needed before any attempt to transfer the results into other contexts can be justified. Indeed, comparative studies would also be of great interest and of potential value for the English-speaking and English-publishing educational research community.

Secondly, while the development of methodological ideas is traced through a lengthy period of time, the empirical study takes a snapshot of the latest practice of educational research and is limited to the reports published in academic journals. There is a potential for further studies to better illustrate the implications that the development of the theoretical thought in social and educational sciences has had for research practice through time. An analysis of practitioners' narrative accounts, opening up their sources of methodological choices, the logic of reasoning and the perceived meanings would give additional value to the understanding of the broader context and the reasons for certain methodological practices at given periods of time.

The most burning practical question about the combined use of qualitative and quantitative approaches is its influence on the quality of educational research. Combined designs are introduced in the present study as potential means to enrich the methodology of educational research and thereby advance the field of education. However, the presented analysis gives only a preliminary glance at the potential problems concerning the cogency and the coherence of different combined designs. Thus, further research is needed to elaborate issues concerning quality matters and to answer several important questions raised during the discussion of results. Furthermore, a comparative analysis of the quality of studies with pure and combined designs would be of important practical significance and value.

Finally, there is an ongoing need for further elaboration on strategies to increase the integration of qualitative and quantitative aspects at various methodological levels within different types of combined designs.



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# KVALITATIIVSETE JA KVANTITATIIVSETE MEETODITE KOMBINEERITUD KASUTAMINE KASVATUSTEADUSLIKUS UURIMISTÖÖS

## Kokkuvõte

Käesolev uurimus käsitleb kvalitatiivsete ja kvantitatiivsete uurimismeetodite vahetõrka kasvatusteaduses. See problemaatika on Eesti kontekstis aktualiseerunud viimase kümne aasta jooksul, kuigi maailma mastaabis on kasvatusteaduste ning laiemalt sotsiaalteaduste metodoloogilised probleemid olnud tuliste vaidluste objektiks juba pikemat aega (vt nt Guba & Lincoln 1989, Smith 1983a, Howe 1988). Tihti seostatakse kvalitatiivsete ja kvantitatiivsete meetodite pooldajate vaidluste algust hermeneutilise lähenemisviisi esilekerkimisega ning Thomas Kuhni paradigmat kontseptsiooni ülekandmisega sotsiaalteaduste konteksti 60ndate aastate lõpul – 70ndate algul. Järgnenud perioodi on ingliskeelses metodoloogilises kirjanduses piltlikult nimetatud ka paradigmat sõjaks (*paradigm wars*, vt nt Gage 1989, Hammersley 1992b).

Jätkuvad vaidlused ning erimeelsused metodoloogilistes küsimustes ühelt poolt ja kasvatusteaduslike uurimuste kvaliteeti ning praktilist väärtust kritiseerivad jõulised avaldused teiselt poolt on ajendanud süstemaatiliselt uurima mitmeid kasvatusteadusliku uurimistöö aktuaalseid metodoloogilisi probleeme, et seeläbi kaasa aidata uurimispraktika rikastamisele ning tõsta eelmainitud uurimistöö väärtust.

Väitekirja toetub autori aastatel 1998–1999 Cambridge Ülikoolis läbi viidud uurimusele (Niglas 1999a), mis keskendus kvalitatiivsete ja kvantitatiivsete meetodite paradigmaatilise vastandamise küsimustele. Erinevate teoreetiliste ning metodoloogiat käsitlevate kirjutiste analüüs ja väiksemahuline empiiriline uurimus näitasid, et kvalitatiivsete ja kvantitatiivsete meetodite vahetõrka on nii eilses kui tänases uurimistegelikkuses tunduvalt komplitseeritum kui paradigmaatiline vaateviis seda eeldab. Nii ei ole praktikast lähtuvalt õige pidada kvantitatiivset ja kvalitatiivset meetodit vastandlikuks ning ühismõõdetu lähenemiseks. Seega, seades eesmärgiks parandada kasvatusteadusliku uurimuse kvaliteeti, tuleks kvalitatiivsete ja kvantitatiivsete meetodite erinevuste rõhutamise asemel rääkida paljudest uurimisstrateegiast, mida omavahel võrreldes leiame nii sarnaseid kui erinevaid jooni. Lähtuvalt uurimisprobleemi iseloomust ning keerukusest võib uuringus kasutatav meetodika seejuures olla kas kvalitatiivne, kvantitatiivne või kombinatsioon mõlemast.

Väitekirjas võetakse eelduseks, et kvalitatiivsete ja kvantitatiivsete meetodite kombineeritud rakendamisel on potentsiaalne lisaväärtus võrreldes nn puhaste uuringudisainide kasutamisega, kuid samas tõdetakse, et erinevate kombineeritud uuringudisainidega seotud küsimusi pole seni piisavalt käsitletud ega teadvustatud. Sellisel alusel püstitatakse väitekirja põhiuuringu üldiseks eesmärgiks süstematiseerida ning rikastada olemasolevat teadmiste baasi kombineeritud uuringudisainide kasutamist puudutavates küsimustes, uurida, mis on uut tüüpi metodoloogilise lähenemise eeldused, põhjendused ja eesmärgid ning milliseid võimalikke uuringu kvaliteediga seonduvaid probleeme selline praktika endaga kaasa võib tuua.

Põhiuuringus ühendatakse kvalitatiivsete ja kvantitatiivsete meetodite kombineeritud kasutamisega seonduv teoreetiline teadmine (I ptk) ja valdkonna mõjukate autorite uusimad seisukohad (vt Tashakkori & Teddlie eds. 2003) läbiviidud empiirilise uurimuse (II ja III ptk) tulemustega. Empiirilise uurimuse valimiks on eesmärgistatud, kuid suhteliselt suur ja esinduslik väljavõte ingliskeelsetes akadeemilistes kasvatusteaduslikes ajakirjades publit-

seeritud artikleid, mis kajastavad kombineeritud disaini rakendanud uuringute tulemusi. Artiklite meta-analüüs keskendub kasutatud uurimismetoodika aspektidele eesmärgiga selgitada välja levinumad kvalitatiivsete ja kvantitatiivsete meetodite kombineerimise viisid ning analüüsida kombineeritud uuringudisainide kasutust.

Uurimuse empiirilise osa tulemused on üksikasjalikult kirjeldatud kolmanda peatüki alapunktides ning esitatud kokkuvõtlikult neljandas peatükis. Konkreetsete üksiktulemuste mõistmiseks vajaminevate detailide suur hulk lubab siinkohal välja tuua vaid kõige üldisemad tulemused ja järeldused.

Analüüsi käigus selgus, et kasvatusteaduslikes uurimustes rakendatakse nii uuringudisaine, kus kvalitatiivsed ja kvantitatiivsed meetodid on kasutusel ühe uuringu erinevates terviklikes allosades, kui ka selliseid disaine, kus kvalitatiivseid ja kvantitatiivseid aspekte kombineeritakse uuringu erinevatel etappidel.

Kaht tüüpi algandmete kasutamine on küll kombineeritud disainiga uurimuste puhul tüüpiline, kuid sugugi mitte kohustuslik omadus. Samas võis suuremas osas analüüsitud artiklitest kohata kõrvuti nii andmete kokkuvõtu ja esitamise kvalitatiivseid kui ka kvantitatiivseid viise. Kvalitatiivsete ja kvantitatiivsete aspektide integreeritus erinevates kombineeritud disainiga uuringutes on enamasti suhteliselt madal, seda eriti andmeanalüüsi etapil. Seevastu tulemuste interpreteerimise etapil võib täheldada märgatavalt suuremat integreeritust. Kvalitatiivseid ja kvantitatiivseid aspekte integreerivate (analüüsi)strateegiatega väljatöötamine võikski antud valdkonnas olla üks edasise uurimistöö tähtsaid suundi.

Selgesõnaline põhjendus kombineeritud uuringudisaini kasutamiseks oli toodud vaid vähestes analüüsitud artiklites. Samas on valimis ka selliseid uurimusi, mis autorite järgi on kas kvantitatiivse või kvalitatiivse disainiga, kuid mis väitekirjas kasutatud klassifikatsiooni kohaselt kuuluvad kombineeritud disainiga uuringute kategooriasse.<sup>17</sup> Kõige tüüpilisem otstarve kvalitatiivsete ja kvantitatiivsete meetodite kombineerimiseks oli komplementaarsus ehk teineteise täiendamine, millele järgnes ekspansioon ehk uuringu haarde laiendamine. Tunduvalt harvemini oli kvalitatiivse ja kvantitatiivse lähenemise kombinatsioonil eesmärgiks triangulatsioon, uuringu (instrumentariumi) arendus ning uute probleemide ja küsimuste leidmine. Analüüsi käigus esile kerkinud kaheksa erineva kombineeritud disainitüübi võrdlus näitas, et konkreetse disaini valik on seotud nii uurimuse eesmärkidega kui ka kvalitatiivsete ja kvantitatiivsete aspektide kombineerimise otstarbega.

Antud uuringu käigus on uute ideede ning teadmuse süntees lisaks empiirilisele osale toimunud ka teoreetilise materjali analüüsil (I ptk). Neljas peatükk integreerib tekkinud teoreetilised ideed empiiriliste tulemustega ning suhestab uurimuse järeldused valdkonna uusimate arengutega. Samuti tuuakse siin esile tulemuste võimalik tähendus kasvatusteaduslikule uurimispraktikale ning pakutakse tulemustest lähtudes välja uuenduslikke ideid uurimismetoodika õpetamiseks tulevastele haridustegelastele ning kasvatusteadlastele.

Uuringu käigus läbi viidud kvalitatiivsete ja kvantitatiivsete meetodite vahekorra ning nende kombineeritud kasutusega seotud küsimuste süstemaatilise analüüsi ja kahe empiirilise uurimuse tulemusena on:

- \* selgitatud ja lahti mõtestatud mitmed kasvatusteaduste keerukad metodoloogilised küsimused;
- \* reguleeritud ja ühtlustatud vastavat terminoloogiat;

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<sup>17</sup> Enamasti postuleeritakse siiski kvalitatiivset disaini.

- \* süstematiseeritud kombineeritud uuringudisainide klassifikatsiooni;
- \* välja pakutud raamistik kvalitatiivsete ja kvantitatiivsete meetodite kombineeritud kasutamiseks, rõhutades uurimisküsimuste ja -eesmärkide rolli uuringudisaini valikul ning selgitades võimalikke põhjendusi ning eesmärke erinevate kombineeritud uuringudisainide kasutamiseks;
- \* tähtsustatud kooskõla uuringu erinevate etappide vahel ning viidatud mõnedele potentsiaalsetele vigadele kombineeritud uuringudisainide kasutamisel.

Saadud tulemused loovad metodoloogilise aluse kvalitatiivsete ja kvantitatiivsete uurimismeetodite kombineeritud kasutamiseks kasvatusteaduslikus uurimistöös, mistõttu peaksid huvi pakkuma nii teadlastele kui ka kraadiõppuritele ja uurimismeetodite õppejõududele.