

THE USE OF MIXED METHODS AS REFLECTED IN TWO EMINENT SOUTH AFRICAN EDUCATIONAL RESEARCH JOURNALS

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ABSTRACT

The epistemological and ontological orientations relevant for this research are positivism, interpretivism and pragmatism. These paradigms of inquiry are associated with quantitatively oriented research traditions, qualitatively oriented research traditions and mixed methods research respectively. Researchers who use mixed methods build on the strengths of quantitative and qualitative methods and minimize their weaknesses. Since educational research is primarily evidence-based, the aim of the study was to explore the extent to which mixed methods research was reflected in two eminent South African educational research journals during the 11 year period, 2000 to 2010. To this end 1392 articles were analysed. Of the research articles published in the two journals, 17.8% and 15.1% respectively reported on the use of mixed methods. Quantitative methods dominated between 2000 and 2002, followed by a paradigm war in 2003 to 2007, and mainly qualitative methods from 2008 onwards. Mixed methods research was mostly used in the educational domains of didactics (inclusive of curriculum studies), management and social studies. The most dominant themes investigated in these fields were related to curricula and the NQF/OBE, transformation, staff diversity, e-learning and other teaching methods. The need to develop mixed methods research in all branches of social research in South Africa is indicated.

Keywords: educational research, mixed methods, qualitative research, quantitative research

1. INTRODUCTION

The effective provision of education depends on valid and reliable data as the basis for education policy and planning. Such much-needed data are provided by educational research, which can best be conceptualised as “evidence-based enquiry” (McMillan & Schumacher, 2010:4). Such enquiry is conducted in positivist, post-positivist, interpretative, constructivist, transformative or pragmatic paradigms, using qualitative, quantitative, or mixed method approaches in basic, applied, evaluation or action research functions (McMillan & Schumacher, 2010:1). This array of research approaches and functions is indicative of the need for ensuring the collection of relevant, information-rich evidence in the interest of quality education. According to Creswell and Garrett (2008:322-323, 329), education researchers are open and prone to experiment with various and new approaches, and are actually at the forefront of the so-called “third movement”, namely the advancement of mixed methods research. Using a mixed methods approach rests on the

assumption that better understanding concerning the research questions can be reached when the strengths of quantitative and qualitative research are combined.

Waghid (2000) already suggested the need for mixed methods educational research in South Africa more than a decade ago by arguing that the qualitative-quantitative dichotomy could be transcended: “Quantitative research methodology grounded in positivist theory should not simply be dismissed for qualitative, interpretive educational research. These approaches to educational research should be seen as complementary to the broader social discourse of educational research” (Waghid, 2000:25).

In this vein an article entitled 'A cross-disciplinary examination of the prevalence of mixed methods in educational research: 1995-2005' (Truscott, Swars, Smith, Thornton-Reid, Zhao, Dooley, Williams, Hart & Mathews, 2009) struck a chord. We decided to replicate the USA study on a small scale, with the aim to explore the incidence of research articles that reported on the use of mixed methods, as reflected in two eminent South African education journals during 2000 to 2010. To this end, the remainder of the article explains the conceptual framework of the study; highlights key literature findings; describes the data collection; and gives details of the results and conclusions of the study.

2. CONCEPTUAL FRAMEWORK

Combining quantitative and qualitative methods has been a controversial issue with many researchers that ask the basic question if we should combine methods. This is due to the fact that the methods are based on seemingly contradictory paradigms (Creswell, Clark, Gutman & Hanson, 2003:186; Symonds & Gorard, 2010:123). In view of the evidence-based nature of educational research, the most important epistemological and ontological paradigms relevant to this research, are positivism, constructivism/interpretivism and pragmatism. These paradigms of inquiry are (mostly) associated with quantitatively oriented research traditions, qualitatively oriented research traditions and mixed methods research respectively.

The approaches differ in their basic beliefs. In positivism the aim is to explain human behaviour so as to predict and control behaviour. This is done by determining the relationships between measured variables, for example by means of an experimental design during which hypotheses are tested. Research methods are designed to maximise precision, reliability and validity to determine a single reality (an 'objective' truth). The researcher plays a detached role and generalisations are context-free. The analysis and presentation of data rely heavily on numerical data and statistical analysis, hence it is known as quantitative research (Guba & Lincoln, 2005:193-196; McMillan & Schumacher, 2012:12).

In a constructivist/interpretivist approach conceptions of knowledge and reality tend to depict the social world as a plurality of realities that are continuously created by people. Thus, the research aims to understand a social situation from the participants' perspective. The researcher is immersed in the social situation and findings are applicable to identified contexts. Research methods are flexible and may change during the research. One example is an ethnography study (Guba & Lincoln, 2005:193-196; McMillan & Schumacher, 2012:12).

Mixed methods research is a design that works out of an empowerment, critical theory paradigm (Denzin, 2010:420). As such, it is seen as 'pragmatic'. Among others, the characteristics of a pragmatic approach include that it offers a middle ground between philosophical dogmatism; recognises the importance of the physical as well as the social and psychological world; views knowledge as constructed *and* based on the reality of the lived world; endorses eclecticism and pluralism; views human inquiry as analogous to scientific inquiry; views current truth as tentative and changing over time; prefers action to philosophising; takes a value-oriented approach and endorses practical theory (Johnson & Onwuegbuzie, 2010:18). Accordingly, Cherryholmes (1992 in Creswell *et al.*, 2003:186) states that "researchers should be concerned with applications, with what works, and with solutions to problems".

In a pragmatic approach to more fully understand many social and educational problems, mixed methods designs provide for the collection and analysis of both quantitative and qualitative data (Delpont & Fouché, 2011:438). Mixed methods studies reflect "a convergence of philosophy, viewpoints, traditions, methods and conclusions" (McMillan & Schumacher, 2012:396). The aim is to pragmatically enhance research problems, and to enrich the answers to those problems.

In view of our research aim, the next section highlights the history, advantages and challenges of using mixed methods.

3. LITERATURE REVIEW ON THE USE OF MIXED METHODS

As indicated, quantitative and qualitative methods are based on seemingly conflicting paradigms that gave rise to the so-called 'paradigm wars' (Creswell, Clark, Gutman & Hanson, 2003:186; Symonds & Gorard, 2010:123). According to Denscombe (2008:271) and Denzin (2010:419-422), the history of the wars was as follows. The positivist paradigm that is linked to quantitative research was dominant in the 1950s to mid-1970s. This was followed by a stage in which the constructivist/interpretivist paradigm was dominant from the 1970s up to the 1990s. Thereafter mixed methods research emerged. Mixed methods research moved beyond the above mentioned debate to become known as a third methodological movement (Bazeley,

2009:206; Tashakkori & Teddlie, 2003), research design (Creswell *et al.*, 2003:166), paradigm (Denscombe, 2008:271; Symonds & Gorard, 2010:124), perspective (Dellinger & Leach, 2007:309) or approach (Denscombe, 2008:270). Thus mixed methods research emerged as the “methodological champion of peace within the paradigm war” (Symonds & Gorard, 2010:123).

As already mentioned, researchers that use mixed methods build on the strengths of quantitative and qualitative methods and minimise their weaknesses. Although some research questions require *either* a quantitative or a qualitative approach, many can best be answered by using both methods. “This compatibility is determined through theoretical consistency of the plan of action and the means by which one achieves the plan” (Truscott *et al.*, 2009:318).

The advantages of using mixed methods are seemingly manifold. For example, mixed methods research enables researchers to generate and verify theory in the same study (Tashakkori & Teddlie, 2003:15). To this end, it allows researchers to study large samples and obtain results that may be generalised to a population, while also examining in depth particular cases. Thus, mixed methods provide more comprehensive data than mono methods; compensate for the limitations of using single methods; permit study of the process as well as the outcomes of investigations; allow for research of different types of and complex questions; and enhance the credibility of the findings (Bergman, 2010:172; Bryman, 2007:9; Creswell & Plano Clark, 2007:5; McMillan & Schumacher, 2010: 397). Bazeley (2009: 204) maintains that to *not* use mixed methods “results in lost potential and possibly in misleading conclusions”.

The above-mentioned advantages of using mixed methods research have led to a rapid increase in its use (Bryman, 2007:8; Creswell *et al.*, 2003:163; Denscombe, 2008:270; McMillan & Schumacher, 2010:395, 396). This has facilitated the launching of the first volume of the *Journal of Mixed Methods* in 2007. The use of mixed methods is further strengthened by the fact that it is advocated by numerous prominent researchers that include Creswell, Tashakkori, Johnson, Onwuegbuzie, Greene, Teddlie and Morgan (Denscombe, 2008:270). Symonds and Gorard (2010:121) confirm that “mixed methods are fast becoming a common research approach in the social sciences”. It has emerged as a “research movement with a recognized name and distinct identity” (Denscombe, 2008:270).

In spite of its significant advantages, the use of mixed methods by researchers may be influenced by its associated difficulties. Denscombe (2008:272) as well as Creswell and Garrett (2008:324-326) have confirmed that many variations and inconsistencies can be found in the mixed methods literature. The noted disadvantages of using mixed methods generally seem to relate to

the fact that it may be more challenging for researchers. For example, they need to be skilled in both approaches; mixed methods research requires more extensive data collection and thus more time and resources; and it is more difficult to write reports and form conclusions than with mono methods research (McMillan & Schumacher, 2010: 397).

Mixed methods research is further complicated by the abundance of diverse views on mixed methods research presented in publications. For example, Symonds and Gorard (2010:134) warn against mixed methods becoming a “prescriptive force“. In contrast to the view that there are only three options for doing research, they argue that the division of research into quantitative and qualitative (and thus mixed methods) approaches is artificial when in fact the boundaries between the different forms of research are blurred. Gorard (in Symonds & Gorard, 2010:133) states: “Mixing methods is wrong, not because methods should be kept separate but because they should not have been divided at the outset“. Bergman (2010:173) also contends that although the term *paradigm* has often been used to differentiate between quantitative and qualitative research on epistemological, ontological and axiological grounds,

... it is difficult to sustain these differences because qualitative and quantitative analysis techniques do not necessitate a particular view of the nature of reality, privilege a specific research theme and how to research it, or determine the truth value of data or the relationship between researchers and the research subject.

The field is further complicated by the fact that not all authors use the same terminology in reference to mixed methods. Some studies refer to 'mixed methodology', 'multiple methods', 'multi-method', 'multiple methodology', 'blended research', 'triangulation studies', 'hybrid' or 'integrative research' (McMillan & Schumacher, 2010:396). Various definitions are also offered. Two definitions for mixed methods research that we found useful are: Research “in which the investigator collects and analyzes data, integrates the findings, and draws inferences using both qualitative and quantitative approaches or methods in a single study or a program of inquiry” (Tashakkori & Creswell, 2007:4); and research “in which a researcher ... combines elements of qualitative and quantitative research approaches (e.g. use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and collaboration.” (Johnson, Onwuegbuzie & Turner, 2007:123). Basically, all mixed methods research involves integrating conclusions that are drawn from both quantitative and qualitative data (Bazeley, 2009:204).

Bazeley (2009:203) notes that there is conflicting advice on how and when to mix methods. While some authors state that it is desirable to combine elements of quantitative and qualitative research at all stages of the research project, others recommend that the phases should be kept separately prior to

combining the elements at the conclusions stage. Although such mixing of qualitative and quantitative methods is sometimes called 'triangulation', the term may also refer to the use of different *qualitative* methods to enhance validity of findings (Flick, 1992). Thus, authors differ in their use of terminology.

In recognition of the different options, McMillan and Schumacher (2010:399) indicate three ways of conducting mixed methods research. In *sequential explanatory* research a survey could be followed by interviews to explain the research results. In *sequential exploratory* research, qualitative questions are asked first to generate information that is used in the quantitative section of the research. *Concurrent triangulation* allows for triangulation of the findings by collecting quantitative and qualitative data simultaneously. To these designs, Creswell *et al.*, (2003:179) add *sequential transformative*, *concurrent nested* and *concurrent transformative*. According to the authors, the different types of designs are distinguished by four criteria, namely: the implementation of quantitative or qualitative methods; the priority that is given to each; the stage of integration; and whether a theoretical perspective is present. Thus, mixed methods designs vary in terms of their sequence, the weights carried by each form of data, and *where* the integration of quantitative and qualitative research occurs. Designs also vary according to their purpose expansion, complementarity, development, initiation or triangulation (Greene, Caracelli & Graham, 1989).

The different mixed methods designs may be based on different paradigms. For example, a sequential explanatory design may be based on post-positivism, while triangulation may use several paradigms as framework. For this reason, Creswell *et al.* (2003) recommend that researchers be explicit about their paradigms.

Validity in mixed methods research is also complicated by dissimilar views and several authors stated that the issue has not been resolved (Creswell & Plano Clark, 2007; Dellinger & Leech, 2007). For example, the last-mentioned authors (pg 309, 315, 322) point out that the number and meaning of the available terms to describe whether research results, their interpretation, and their use are valid can be confusing. They therefore recommend the development of a single validation framework for mixed methods research to unify thinking in this area. Onwuegbuzie and Johnson (2006, in Creswell & Garrett, 2008:325) also prefer the term, 'legitimacy' rather than 'validity' in reference to mixed methods research.

Because of its difficulties, Bryman (2007:10-20) has noted a tendency that in mixed methods articles, quantitative and qualitative findings are often not well integrated. Interviews with mixed methods authors revealed several reasons for this. Mixed methods researchers emphasised different findings for different audiences; preferred either quantitative *or* qualitative methods; structured the research projects in such a way that integration was difficult;

completed one component of the research sooner than the other; were more skilled in the one approach than the other; found one data set to be more interesting than the other; had practical difficulties in bridging ontological divides; were influenced by the fact that some journals preferred one approach to the other; and had problems to find good examples of mixed methods research articles. Lack of integration of findings may also be related to poor sampling decisions since sampling strategies are more complex for mixed methods than for mono method studies (Collins, Onwuegbuzie & Jiao, 2006:85).

Against the conceptual framework and a study of the strengths and complexities of mixed mode research, our research was an exploratory, small scale study aimed at determining the incidence of research articles that reported on the use of mixed methods, as reflected in two eminent South African education journals during the period 2000 to 2010. The remainder of the article explains the research design and data collection, the results and a discussion thereof, and the conclusions.

4. RESEARCH DESIGN AND METHOD

In accordance with the Truscott *et al.* (2010) study, the specific research questions of this study were:

- How many mixed methods in comparison to other research methods articles were published in two South African education journals over a period of 11 years (2000 to 2010)?
- How did the number of mixed methods research articles vary by journal, by year, and by educational domain?
- Which themes within the most popular educational domains were studied by means of mixed methods?
- What does the above-mentioned imply?

We selected two South African education journals of international repute. Both journals are distinguished by their existence for more than 30 years, they enjoy stable editorship, are indexed in several international data bases, and both are linked to prominent academic associations (and their annual conferences) in Education. Based on our personal exposure to, and experience with these journals, we thought ourselves on safe ground to purposely select them for our research. Our considered assumption was that the research articles that are published in these journals would give a fairly good idea of the kinds of research designs that South African researchers in Education implement. Since we were primarily interested in the data, and wished to avoid any ill-considered comparison of the two journals, we saw no

purpose in revealing the identity of the two selected journals. The journals are simply referred to as Journal A and Journal B.

To ensure an adequate sample, we purposefully selected all published articles (excluding editorials and book reviews), over the specified period of more than a decade for content analysis. The aim was to determine the incidence of mixed methods research.

In all journals we identified research articles with explicitly stated research questions or aims, and clearly defined methods sections. Articles that were based on literature reviews were excluded from the next level of analysis. In the next level, each research article was coded only once as belonging to a specific domain. The domains were:

- Mathematics and the natural sciences (including physics/chemistry, geography, engineering, environmental education [EE]);
- Social studies (including literacy, languages, psychology and sociology);
- Management (including transformation, quality assurance, policy studies, staff development, performance evaluation);
- Didactics or curriculum studies (including outcomes-based education [OBE] or the National Qualifications Framework [NQF] and related issues such as notional learning hours);
- An “Other” category provided for articles on research *per se*, philosophy, inclusive education and history of education, among others.

Articles that were cross-disciplinary were coded once according to their main gist. For example, '*The use of visual aids in first-year science textbooks*' was coded as a 'didactics' and not as a 'science' article.

All research articles were also coded for being qualitative/quantitative or mixed methods. In accordance with the Truscott *et al.* (2010) study, research methods were seen as procedures used to gather and analyse data. Research designs provided the rationale for data collection. Qualitative designs included ethnographies, case studies, grounded theory studies, and phenomenologies. Examples of qualitative methods were interviews, focus groups, observation, document analysis and open-ended questionnaires. Qualitative data analysis was identified by the naming of categories, sub-categories or themes through qualitative methods. Examples of quantitative methods were questionnaires and tests while surveys, experimental designs and quasi-experimental designs were quantitative designs. Quantitative data

analysis methods included the use of frequencies and percentages, correlations and ANOVAs, among others.

The identification of articles as mixed methods occurred at the level of research methods and analysis. If an article reported on the use of both qualitative and quantitative methods in accordance with the above guidelines, either simultaneously or sequentially, we considered it mixed methods. There was one exception. If a *qualitative* study reported the findings using descriptive statistics to indicate frequency of interview responses, this was not identified as quantitative and could not be used as indication of mixed methods.

Validity and reliability were ensured as follows. Because of the fact that the selected articles were over an 11 year time span, this constituted a valid data pool of 1392 articles (511 in Journal A and 881 in Journal B). Internal validity was further established through the use of specific criteria explicating qualitative or quantitative indicators and used by both authors for coding a study as mixed methods. Inter-rater reliability was established early in the study when all 133 articles that were published in 2000 (58 articles in four editions of Journal A and 75 articles in three editions of Journal B) were independently judged and 100% consensus built. At the end of the coding, a random sample of articles was once again selected and consensus was negotiated.

5. RESULTS

In this section, we provide the answers to the first three of our four research questions, namely: (1) How many mixed methods in comparison to other research methods articles were published in two South African education journals over a period of 11 years (2000–2010)? (2) How did the number of mixed methods research articles vary by journal, by year, and by educational domain? (3) Which themes within the most popular educational domains were studied by means of mixed methods?

Table 1 shows the frequency of mixed methods articles published in Journal A and Journal B during the relevant time period.

Year	No of articles published in Journal A	No of research articles in Journal A	No of mixed methods articles in Journal A	No of articles published in Journal B	No of research articles in Journal B	No of mixed methods articles in Journal B
2000	58	36	6	75	37	8
2001	61	41	10	74	45	6
2002	53	41	8	75	35	10
2003	54	36	2	75	42	10
2004	49	40	8	75	40	6
2005	44	38	7	102	62	8
2006	43	37	7	81	38	6
2007	42	35	6	103	66	6
2008	36	30	5	79	54	7
2009	32	27	5	70	49	4
2010	39	37	7	77	41	6
Total	511	398 = 78% of articles published	71 = 17.8% of research articles	881	509 = 58% of articles published	77= 15.1% of research articles

According to Table 1, of the 511 articles that were published in Journal A during the 11 years, 78% (398) were research articles; and of these, 17.8% (71) were mixed methods articles. Regarding Journal B, of the 881 articles published, 58% (509) were research articles, and of the research articles, 15.1% (77) were based on mixed methods research.

Figure 1 illustrates the total number of research articles and mixed methods articles during the relevant period.

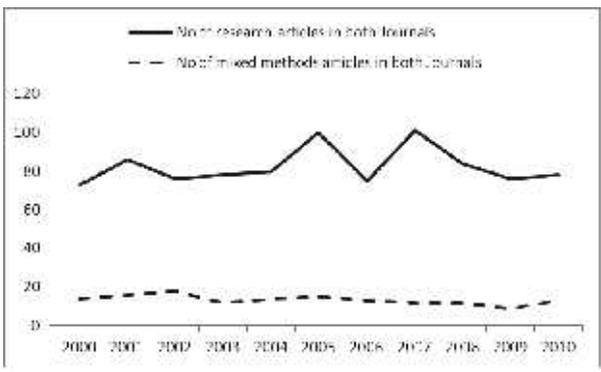


Figure 1: The total number of research and mixed methods articles published in Journal A and Journal B from 2000 to 2010.

Figure 1 illustrates a relatively constant use of mixed methods in educational research over the 11 year period. Maximum popularity was in 2002 with a decline in 2003. However, 2010 showed a slight increase which may continue in line with international trends.

In addressing the question of which methods researchers used most to collect data, **Table 2** indicates the frequency of mixed methods, qualitative, quantitative and theoretical articles published in the two journals during the 11 year period.

Year	Journal A Mixed methods	Journal A Qualitative	Journal A Quantitative	Journal A Theoretical	Journal B Mixed methods	Journal B Qualitative	Journal B Quantitative	Journal B Theoretical
2000	6	14	16	22	8	13	16	38
2001	10	14	17	20	6	18	21	29
2002	8	15	18	12	10	11	14	40
2003	2	21	13	18	10	15	17	33
2004	8	16	16	9	6	19	15	35
2005	7	19	12	6	8	28	26	40
2006	7	13	17	6	6	16	16	43
2007	6	14	15	7	6	30	30	37
2008	5	15	10	6	7	27	20	25
2009	5	12	10	5	4	23	22	21
2010	7	22	8	2	6	20	15	31
Total	71	175	152	113	77	220	212	372

Regarding Journal A: Of the 511 articles published, 113 (22%) were theoretical articles and 78% (398) were research articles, as indicated (see Tables 1 and 2). Table 2 shows that, of the 398 research articles, 17.8% (71) described mixed methods; 44% (175) were based on qualitative data collection methods, and 38.2% (152) were grounded in quantitative research. Journal B illustrated a similar trend as follows: of the 509 research articles, 15.1% (77) were based on mixed methods; 43.2% (220) described qualitative data collection methods, and 41.7% (212) were based on quantitative research (see Table 1 and 2).

If one observes the trends over time in Table 2, the following is evident: quantitative research dominated the scene from 2000 to 2002 for both journals. This was followed by an interim period from 2003 to 2007 during which articles displayed no particular prevalence of research approach.

However, from 2008 onwards, qualitative research methods were mostly used to collect data. Mixed methods research has never been the principal research paradigm.

Figure 2 depicts the research approach tendencies in the total number of empirical articles published in the two journals in the period 2000 to 2010.

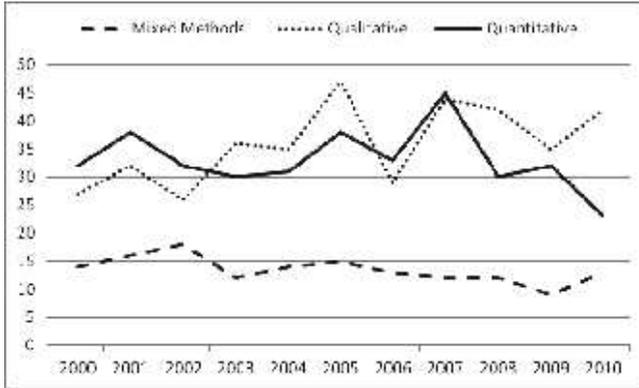


Figure 2: Research approach tendencies reflected in the total number of empirical articles published in Journal A and Journal B from 2000 to 2010.

Figure 2 illustrates particularly that while both mixed methods and qualitative articles increased, qualitative research is still a clear winner. In contrast, quantitative research articles have decreased rapidly from maximum popularity in 2007.

Since the educational domain or discipline could influence choice of data collection method, the mixed methods research articles were further analysed with regard to this variable. Tables 3 and 4 illustrate how the number of mixed methods research articles varied by journal, by year and by educational domain.

	Maths, Sciences, EE	Social studies	Management	Didactics Curriculum	Other	Total
2000	2	0	1	5	0	8
2001	1	0	0	3	2	6
2002	0	1	3	4	2	10
2003	2	0	0	8	0	10
2004	1	2	2	0	1	6
2005	1	1	1	4	1	8
2006	1	2	0	3	0	6
2007	1	2	2	1	0	6
2008	0	0	1	6	0	7
2009	0	0	0	2	2	4
2010	0	0	1	3	0	4
Total	9	8	11	39	8	75

	Maths, Sciences, EE	Social studies	Management	Didactics Curriculum	Other	Total
2000	1	2	2	1	0	6
2001	3	1	4	1	1	10
2002	1	2	1	4	0	8
2003	0	1	0	1	0	2
2004	1	1	3	3	0	8
2005	1	2	1	3	0	7
2006	1	1	3	1	1	7
2007	0	2	1	3	0	6
2008	0	1	0	4	0	5
2009	0	0	2	3	0	5
2010	3	0	1	3	0	7
Total	11	13	18	27	2	71

According to Tables 3 and 4, Journal A saw the highest frequency (10) of mixed methods articles in 2001 and thereafter (8 per year) in 2002 and 2004. Since 2005 the frequency has remained more or less constant between 5 to 7 articles. With regard to Journal B, the picture is similar in the sense that the highest frequencies (10 per year) were also a few years ago in 2002 and 2003. However, there has not been an increase in mixed methods publications in Journal B over the past few years, rather the contrary. Tables 3 and 4 also show that most mixed methods publications in the two journals were in the fields of Didactics (inclusive of curriculum studies), Management and Social studies, in that order (respectively 27, 18 and 13 in Journal A; and 39, 11 and 8 in Journal B).

Le Grange (2009:1118), after analysing articles that had been published in Journal B over a period of five years, found that certain themes featured prominently in publications and that these themes influenced *how* the studies were framed methodologically. In view of this, we analysed our data within the educational domains of management, social studies and didactics to identify the most popular themes for mixed methods research. Table 5 depicts the results.

	Language	Assessment	E-learning	NQF and OBE	Quality assurance	Transformation	Policy issues	Staff diversity	Curricula and programme content	Teaching methods	Total
Jour. A	4	6	3	8	3	8	1	7	11	7	58
Jour. B	1	1	12	2	4	3	1	12	8	11	55

Table 5 illustrates that mixed methods articles published in Journal A mostly had *curricula* or *programmes* as theme (11 articles); and thereafter *transformation* and the *NQF/OBE* (8 articles), and finally *staff diversity* (7 articles). In the case of Journal B, the most popular themes for mixed methods research were as follows: *e-learning* and *staff diversity* (both 12 articles), *teaching methods* (11 articles) and *curricula/programmes* (8 articles).

6. DISCUSSION OF RESULTS

Our fourth and last research question was: What do our findings imply?

First of all, we found a striking resemblance to the initial impetus for our research, namely the Truscott *et al* (2010) study, in which it was found that 14% of the research articles were mixed methods studies. Given the reported trend towards mixing methods, as discussed earlier, this low figure for the USA is rather surprising. Yet, we found comparable percentage levels, as indicated

in Table 1: For Journal A, 17.8% of the research articles published in 2000 to 2010 were based on mixed methods, and for Journal B this figure was 15.1%. Thus, our data on South African educational research seem to be in line with the USA investigation, although the South African publications are more recent, and imply that statements about “a trend towards mixed methods research” should be made with care. From our investigation, albeit on a small scale, such a trend is not really discernable. Regarding research developments, Denscombe (2008) has explained how quantitative research was dominant from the 1950s to the mid 1970s, followed by qualitative research approaches until the 1990s, when mixed methods research began to surface. However, South African educational research (illustrated by Table 2) seemed to be dominated still by quantitative methods from 2000 to 2002, followed by an interim period of a “paradigm war” from 2003 to 2007 during which qualitative research challenged quantitative approaches. Qualitative research “won the war” as evidenced by publications from 2008 onwards. There is no evidence yet that mixed methods research in South Africa has emerged as the “methodological champion” of this war (Symonds & Gorard, 2010:123).

Secondly, our research findings imply, and actually indicate, a clear relationship between “burning issues” (in terms of relevance and/or complexity) and the use of mixed methods to investigate these. Earlier on, we indicated how the mixed methods research approach is embedded in the pragmatic research paradigm, which is characterised *inter alia* by a view of knowledge as constructed *and* based on the reality of the lived world; the endorsement of eclecticism *and* pluralism; the views that human inquiry is analogous to scientific inquiry, and that current truth is tentative and changing over time; furthermore it prefers action to philosophising, and endorses practical theory. In this vein, research grapples pragmatically with the complicated issues and needs in societies, as pointed out by Cresswell and Garrett (2008:322). The articles published in Journal B in an earlier time period than our study, were mostly related to challenges associated with the democratisation of education, and to being competitive in a global economy (Le Grange, 2009). Our study found that the themes of mixed methods research published were related to curricula and the NQF/OBE, transformation, staff diversity, e-learning and other teaching methods. This is in line with the fact that mixed methods designs work out of an empowerment, critical theory paradigm, as stated by Denzin (2010:420). During the time that many of these articles were published, school and university curricula were transformed to OBE and teachers and lecturers needed to be empowered to have control over how to address curricular issues as prescribed by the NQF. At the same time higher education institutions were transformed in line with employment equity needs. Such social justice and human rights issues are particularly well-suited for research by means of *transformative* mixed methods designs, according to Mertens (2010). This partly explains why mixed methods research was used in the above instances. Yet, in view of the

complexity and huge challenges in the provision of quality education in South Africa, one would expect a considerably higher margin of mixed methods research articles in the journals which we studied. We propose that educational researchers either shun complex issues, or apply one-sided methodologies to complex issues. The role of publication pressure in this regard should not be under-estimated.

7. CONCLUSION

There are distinct advantages for social sciences researchers in using mixed methods. Researchers that use mixed methods can generalise their findings while at the same time gain in-depth understanding of the issues they investigate. Such advantages have led to a considerable growth of mixed methods research internationally. However, notwithstanding indications that education researchers often take the lead with new methods (as mentioned earlier), it seems from our preliminary findings that South African researchers do not widely implement mixed methods research. Most articles in the field of education published during the relevant period reported on qualitative methods to collect and interpret empirical data. A smaller group considers themselves as quantitative researchers only.

Although the lack of enthusiasm for mixed methods research in Education may be related to the complexities of this type of research, it may also indicate the need for better understanding of its advantages. Conferences on mixed methods research may be a start. Researchers need to understand the theoretical perspectives that ground the decisions used for mixed methods, since mixed methods research is more than simply combining qualitative and quantitative methods in one study. Future research should also examine studies for the reported theoretical frameworks that guided research design decisions. Our study probably represents a first step towards increased attention to quality mixed methods educational research in South Africa. Importantly, our research may also stimulate similar research in other branches of the social sciences in South Africa, since considerations of increased quality in research (e.g. through mixed methods research), are largely generic.

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