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# Is mixed methods utilised in Australian career development research?

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**Is Mixed Methods Utilised in Australian Career Development Research?**

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## **Abstract**

Mixed methods research has become a substantive and growing methodological force which is growing in popularity within the human and social sciences. This paper reports the findings of a study that has systematically reviewed articles from the *Australian Journal of Career Development*, from 2004 to 2009. The aim of the study was to provide a methodological map of the career development research reported through this academic journal, and in particular the use of mixed methods research. A multistrand conversion mixed model research design was employed for the study. The results were compared to similar research conducted in related discipline areas (psychology, school psychology and vocational education and training) to place the field of career development along the Creswell and Plano Clark (2007) framework for evaluating the level of acceptance of mixed methods research within disciplines.

Cameron (2009) draws attention to the many discipline based studies which have systematically reviewed the use of mixed methods in the following areas: social and human sciences (Bryman 2008; Plano Clark 2005;); business and management research (Bazeley 2008; Cameron 2008; Hurmerinta-Peltomaki & Nummela 2006; Mingers 2003; Molina-Azorin 2007; Rocco et al. 2003); and education and evaluation research (Greene, Caracelli & Graham 1989). Creswell and Plano Clark (2007, p. 18) have concluded that “oday, we see cross-cultural international interest, interdisciplinary interest, publication possibilities, and public and private funding opportunities for mixed methods research”. An aim of this paper is to gauge the presence and acceptance of mixed methods research within the career development research community, as represented by research and literature published in the *Australian Journal of Career Development* (2004-2009). The paper provides an overview of studies that have investigated the use of mixed methods in the related fields of psychology, school psychology and vocational education and training (VET). This study replicates the methodology employed by Cameron (2009) ”who conducted a systematic review of conferences papers (2007 and 2008 Australian Vocational Education and Training Research Association (AVETRA) conferences and journal articles from the *International Journal of Training Research* (IJTR) from 2003-2008.

O’Cathain, Murphy and Nicholl (2008) have developed a set of quality criteria guidelines for reporting mixed methods studies in health services research: the Good Reporting of a Mixed Methods Study (GRAMMS). This six-item guidance framework includes prompts about the ‘success of the study, the mixed methods design, the individual qualitative and quantitative components, the integration between methods and the inferences drawn from completed studies’ (O’Cathain et al. 2008, p. 92). The GRAMMS includes the following set of quality guidelines:

1. Describe the justification for using a mixed methods approach to the research question
2. Describe the design in terms of the purpose, priority and sequence of methods
3. Describe each method in terms of sampling, data collection and analysis
4. Describe where integration has occurred, how it has occurred and who has participated in it
5. Describe any limitation of one method associated with the presence of the other method
6. Describe any insights gained from mixing or integrating methods

These are the types of quality guidelines and frameworks that need to be attended to when researchers engage in mixed methods.

This paper will briefly attend to mixed methods definitions before introducing a framework for judging discipline acceptance levels of mixed methods. An exploration of drivers and reasons for utilising mixed methods follows along with a discussion on three studies that explored the use of mixed methods in fields related to career development (psychology; school psychology and; vocational education and training). The study being reported in this paper will then be detailed in terms of methodology, findings and discussion, before making concluding remarks.

## **Definitions of Mixed Methods**

Mixed methods has been labelled in many ways and many definitions exist. Ivankova, Creswell and Stick (2006, p. 3) define mixed methods as, “A procedure for collecting analysing, and ‘mixing’” or integrating both quantitative and qualitative data at some stage of the research process within a single study for the purpose of gaining a better understanding of the research problem”. Greene (2007, p. 13) takes the view that mental models play a central role in the mixed methods movement:

The core meaning of mixing methods in social inquiry is to invite multiple mental models into the same inquiry space for purposes of respectful conversation, dialogue, and learning one from the other, toward a collective generation of better understanding of the phenomenon being studied. By definition, then, mixed methods social inquiry involves a plurality of philosophical paradigms, theoretical assumptions, methodological traditions, data gathering and analyses techniques, and personalized understandings value commitments.

Johnson, Onwuegbuzie and Turner (2007, p. 123) undertook an analysis of 19 different mixed methods definitions and decided upon the following definition:

Mixed methods research is the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the purpose of breadth of understanding or corroboration.

Many have referred to mixed methods as emerging from the quantitative – qualitative divide, the paradigm wars and the great methodological and paradigmatic debate. The mixed methods movement has strong philosophical links with the philosophy of pragmatism. Due to the limitations imposed on this paper detailed discussion on this aspect of mixed methods is not possible here however, the following are good starting points (Greene & Caracelli 2003; Maxcy 2003).

### **Levels of Discipline Acceptance**

Creswell and Plano Clark (2007) provide a checklist for evaluating the level of acceptance of mixed methods research within disciplines. They categorise three types of acceptance-levels: minimal, moderate, and major. Minimal discipline acceptance is categorised by:

- awareness of qualitative research within the discipline;
- publication of mixed method studies in discipline based journals; graduate students using mixed methods in dissertation research;
- discussion in journals about the need for mixed methods; and
- mixed methods discussed at professional conferences.

Major acceptance is characterised by:

- special issues of a journal on the use of mixed methods within the discipline;
- publication of mixed methods studies in top discipline based journals; and
- courses on mixed methods research as part of graduate research training programs

These three acceptance levels could be considered as a type of continuum for gauging acceptance-levels for specific disciplines. An example of major acceptance-levels can be found in the discipline fields of evaluation and nursing. These disciplines discuss and

utilise mixed methods extensively. Journals from the fields of family medicine and counselling psychology have published special issues on qualitative and mixed methods (Creswell & Plano Clark 2007). The *International Journal of Multiple Research Approaches* has several Special Issues on the use of mixed methods in certain disciplines (Psychology and Law and in Criminological Research; Health Sciences; Business and Management).

The field of career development has strong theoretical foundations in the discipline of psychology, some sociology and even business (Inkson 2007). Brown and Associates (2002) contend the theoretical foundations of career studies have emerged from psychologically based theories; sociologically based theories; theories rooted in logical positivism and more recently, theories based in social constructivism. Patton and Collin (2009) acknowledge the theoretically rich field of career studies and list over twelve disciplines that all have something to say about careers. They identify the following as the most influential: psychology; sociology; education and management. McMahon and Watson (2006) map the dominance of positivist quantitative methodologies in career research in the modern era and explore the recent reinvigoration within the field through the adoption of constructivist models and approaches that emphasis the study of the development of individuals in post-modern research.

Waszack and Sines (2003) along with others acknowledge the strong positivist traditions of psychology (Arcidiacono and Gregorio 2008; Hanson, Creswell, Clark, Plano, Petska & Creswell 2005; Powell, Mihalas, Onwuegbuzie, Suldo and Daley 2008; Todd, Nerlich, McKeown & Clarke 2004). They map the historical trends in the discipline of psychology from experimental methods to qualitative research and to more recent applied research utilising mixed methods. They identify several sub-disciplines within psychology that have been more open to qualitative approaches such as clinical psychology, cross-cultural psychology and comparative psychology and view the interest in constructivist approaches such as grounded theory and feminist research as assisting with this level of acceptance.

Arcidiacono and Gregorio (2008, p. 119) refer to the work of Yurevich (2007) to classify the psychological research community into different methodological categories:

- methodological indifferentists (who are indifferent to general methodological questions);
- methodological rigorists (who stick to one particular theory);
- methodological anarchists (who act in line with the credo ‘everything goes’); and
- methodological liberals (who try to fuse various paradigms in their research)

Hanson et al. (2005) note the increased popularity of qualitative research within counselling psychology, and how this is influencing researchers to expand their methodologies which, has included the use of mixed methods designs. Powell et al. (2008, p. 291) claim, “...mixed methods techniques results in richer data being collected, leading to a greater understanding of underlying phenomena”.

Halcomb, Andrew and Brannen (2009, p. 7) refer to the growing impetus towards the use of mixed methods in the field of healthcare. They posit 5 drivers towards critical analysis of methodology through:

- increased reflexivity about researcher-researched relationships;
- increased political awareness about what and who research is for;
- growing formalisation of research governance and ethics procedures;
- the availability and ease of new technologies; and
- international research collaboration.

Todd, Nerlich, McKeown and Clarke (2004) acknowledge the divide between quantitative and qualitative research methods within the traditions of psychology and how there have been minimal attempts to “bridge the gulf between the newer qualitative methods and the older, but still dominant, quantitative methods used in psychology and the social sciences (Todd et al. 2004, p. 3). The authors present ten reasons for mixing methods in psychology:

- Triangulation
- “Pick-me-up” [supplementary small study from opposing methodological tradition]
- As a prelude or pilot
- To explore different levels of the same phenomenon
- To repopulate psychology
- Better communication across and within disciplines
- Improved links between academics, practitioners and “consumers’ of psychology
- Better exploitation of methods
- In defence against a hostile audience
- Improvements in theory

Todd, Nerlich, McKeown and Clarke (2004, pp. 9-12 )

I now turn to three studies that have been undertaken to gauge the use of mixed methods in the fields of counselling psychology (Hanson et al. 2005); school psychology (Powell, Mihalas, Onwuegbuzie, Suldo and Daley 2008) and; vocational education and training (VET) (Cameron 2009).

The Hanson et al. (2005) study researched mixed methods studies in the following psychology journals between 1986 and 2000:

- *Counselling Psychology Quarterly*;
- *Counselor Education and Supervision*;
- *Journal of Counseling and Development*;
- *Journal of Counseling Psychology*;
- *Professional Psychology: Research and Practice*;
- *Psychotherapy: Theory, Research, Training, Practice*; and
- *The Counseling Psychologist*.

The search strategy for the study by Hanson et al. identified 22 mixed methods studies. These mixed methods investigations targeted a range of topics of interest to the field (e.g., individual counseling, vocational/career, training/supervision). Over one quarter of these (n=6) were classified as being related to the topic of vocational/career.

Powell, Mihalas, Onwuegbuzie, Suldo and Daley (2008) undertook an analysis of empirical studies published in the four leading school psychology journals between 2001 and 2005:

- *Journal of School Psychology*;
- *Psychology in the Schools*;
- *School Psychology Quarterly*; and
- *School Psychology Review*.

Powell et al. (2008) found that most empirical studies were monomethod (between 80-89%) and of these the vast majority were quantitative. Mixed methods represented 13.7% of these studies and only 1.37% (n=6) were purely qualitative. Powell et al. (2008, p. 300) found:

Of the 438 total empirical articles published in these journals across the 5 years, 60 (i.e., 13.7%) were classified as representing some form of mixed methods research. ...Of studies using mixed methods, 56.67% were partially mixed, and 43.33% were fully mixed. More studies used a sequential design (61.67%) than a concurrent design (38.33%). Finally, 76.67% of mixed methods designs were dominant toward a specific method; 44 of these 46 studies (95.65%) placed emphasis on the quantitative component, whereas only 2 studies were primarily qualitative in nature.

Cameron (2009) conducted a systematic review of publications from the Australian VET research community. The data sources included conferences papers from the 2007 and 2008 Australian Vocational Education and Training Research Association (AVETRA) conferences and journal articles from the *International Journal of Training Research* (IJTR) from 2003-2008. The study concluded that the number of monomethod studies (78% of empirical studies) exceeded those utilising mixed methods (22% of empirical studies). Cameron (2009, pp. 7-8) found:

Qualitative papers represented just under half (48%) of all papers/articles followed by conceptual papers (30%). Mixed methods represented 15% and quantitative papers represented 7%. Papers were categorised as either conceptual or empirical (qualitative, quantitative and mixed methods). This process identified a total of 106 papers/articles with an empirical research design. Of these empirical studies 23 (22%) utilised a mixed method.

Table 1 provides a summary of these three studies in terms of data sources and time coverage.

**<INSERT TABLE 1 HERE>**



A common complaint and criticism of mixed methods is that it does not explicitly state the use of mixed methods designs and techniques. Powell et al. (2008, p. 305) conclude that:

...researchers may be using mixed methods designs more frequently than is reported in the literature (i.e., 13.7%). This underreporting of mixed methods studies stems from the fact that school psychology researchers do not always make it clear that they are conducting mixed methods research. In fact, of the 60 studies that we classified as being mixed, in no case did the researcher(s) explicitly label their study as representing mixed methods research.

Cameron (in press) also found similar issues in the VET field and refers to a considerable lack of knowledge of a growing body of mixed methods literature (including theoretical developments, research designs, typologies, terminologies, notations and quality criteria) by those employing a mix of qualitative and quantitative methods. Cameron (in press) warns:

There is a growing danger that those who utilise mixed methods without at least acknowledging this body of work will be found deficient. This deficiency is applicable to research students, novice researchers and established researchers alike. Superficial treatment of mixed methods whilst claiming to utilise mixed methods will not be something that is tolerated in the future. This has direct implications for building the research capacity of VET based researchers and points to the need for specific mixed methods research training and the inclusion of mixed methods in higher degree research training curricula.

Similarly Hanson et al. (2005) found that despite the array of mixed methods books, research text chapters and journal articles that can be found in applied psychology there appears to be an absence of mixed methods research designs. They attribute this to a number of key factors: historical dominance of quantitative and experimental research methods in psychology; difficulties in learning and applying skill sets for both types of methods and; a lack of attention given to methodologically diverse approaches in graduate education and training.

### **Research aim, purpose and questions**

Teddlie and Tashakkori (2009) refer to an approach to framing research questions in a mixed methods study that involves proposing an overarching mixed research question and then expanding on this through separate sub-questions that are either qualitative or quantitative. This has been the approach taken in this study. As a result the following overarching research question and research sub-questions were posited:

#### *Overarching research question*

*RQ1: What evidence exists to gauge the use and quality of mixed methods research within career development research?*

### Quantitative sub-questions

*RQ2: What is the frequency of use of mixed methods within career development research?*

*RQ3: What levels of integration of data collection and analysis is being achieved in career development research?*

### Qualitative sub-questions

*RQ4: Do those utilising mixed methods in career development research explicitly state a rationale or purpose for undertaking mixed methods?*

*RQ5: Do those utilising mixed methods in career development research utilise a mixed methods typology or research design?*

## **Methodology**

### **Data collection and sample**

The data collection method employed in this research is a systematic review involving the content analysis of journal articles. The research analysed qualitative data both qualitatively and quantitatively. The sampling technique utilised was purposive or judgemental sampling whereby, specialised informed inputs on the particular topic area is vital to the research at hand (Neuman 2006).

The sample includes journal articles published in the *Australian Journal of Career Development* for a six year period from 2004 to 2009. The *Australian Journal of Career Development* is published three times per year and the sample includes 99 journal articles.

### **Research design**

As with the Cameron (2009) study, a multistrand conversion mixed model research design has been chosen for this research project:

In this type of design multiple approach questions are asked. One type of data is collected and analyzed and is then transformed to another data type (qualitized/quantitized) and analyzed accordingly. Two types of inferences are made on the basis of each set of results and are pulled together at the end to generate meta-inferences...This design is different from the previous one [multistrand conversion mixed method] in that it is also mixed in the conceptualization stage (e.g., questions) as well as in the inference stage. (Tashakkori & Teddlie 2003, p. 689)

Figure 1 provides a visual depiction of the multistrand conversion mixed model research design. The data utilised is qualitative secondary data and has been quantitized through answering the quantitative research sub-questions in the first strand. The mixed methods data identified in the first strand is then analysed qualitatively in the second strand through answering the qualitative research sub-questions. Inferences are obtained

for both strands of data collection and analysis and a final meta-inference is achieved that addresses the overarching research question.

**<INSERT FIGURE 1 HERE>**

The rationale for choosing a mixed methods approach stems from the need to establish the frequency of mixed methods within the sample but to also examine the quality of these mixed method studies. This has allowed for a more in depth analysis and discussion on several quality issues that are currently being discussed in the contemporary mixed methods literature.

### **Quantitative Data Analysis**

Papers were reviewed using a coding system replicated from the Hurmerinta-Peltomaki and Nummela (2006) study. The categories for research paper type included: conceptual; quantitative; qualitative; and mixed method. Coding decisions for what constituted each paper type followed the protocol outlined by Hurmerinta-Peltomaki and Nummela (2006). Conceptual papers included general themes, literature reviews and conceptual/analytical papers without empirical data. Some papers reported on an empirical study/ies that the author/s had not conducted themselves, and these were also included in the conceptual paper category. Quantitative articles were judged to be so if they were in numerical form and analysis was based only on this data. Qualitative articles were considered to be those with data mainly in textual form and where the data was analysed by employing qualitative techniques. Mixed method studies were categorised as such if the same researcher/s was involved in both qualitative and quantitative phases. The use of mixed methods need to be expressed within the article, or at least the reader needed to be able to infer it.

Further analysis of those articles considered to be mixed methods followed. Each of the identified mixed method articles were evaluated according to the classification tool designed by the Hurmerinta-Peltomaki and Nummela (2006, p. 446) study and depicted in Figure 2. The classification involves labelling a study with one letter (A or C), two letters (AB, AC, AD, BC, BD, CD), three letters (ABC, ABD, ACD, BCD) or four letters (ABCD). Please note that the types A and D were not included as these do not represent a mixed method study. Descriptions of these classifications are listed in Table 4. Numerical codes for each article were analysed through the SPSS statistical software.

**<INSERT FIGURE 2 HERE>**

### **Analysis**

The full qualitative analysis involved a content analysis of the mixed method articles identified in the quantitative analysis by utilising qualitative analysis techniques. The thematic focus of the qualitative analysis was derived from the literature on quality in mixed methods research and identified in the research sub-questions: mixed methods research design; mixed methods rationale; data presentation and sequencing; and data analysis integration. The four identified mixed methods articles underwent a full qualitative data analysis is presented in Table 5.

## Results

### Strand 1: Quantitative Analysis

The data collected in the systematic review included some basic demographics of the authors. Of the 99 journal articles reviewed, 51.5% (n=51) had a male first author and 48.5% (n=48) of the articles had a female first author. Data on the number of authors for each article was also collected for: single authorship; two authors and; articles with three or more authors. Single and two author articles both represented 39.4% (n=39) of the total number of articles. Those articles with three or more authors represented 21.2% (n=21) of the total number of articles reviewed.

The most frequent type of article was conceptual (35.4%), followed by quantitative articles (32.3%) and qualitative articles (27.3%). Mixed methods articles represented 4% (n=4) of the total number of papers. If the empirical articles (non conceptual) are examined then quantitative articles represent just over half of the articles (51%) followed by qualitative articles (43%) and mixed methods at 6%. Table 2 provides details of the frequencies and distribution of the articles across the 6 year period.

**<INSERT TABLE 2 HERE>**

Data was also collected on research design and data collection methods. Only 24.2% (n=24) of the papers explicitly stated a research design. Data collection methods employed were also analysed and some studies utilised more than one data collection method. The frequencies for these data collection methods are presented in Table 3.

**<INSERT TABLE 3 HERE>**

Table 4 plots the frequencies of the identified mixed methods papers across a classification system for mixed methods studies. Three of the four mixed method articles were classified in the AD classification. This classification analyses qualitative data qualitatively and analyses quantitative data quantitatively.

**<INSERT TABLE 4 HERE>**

It was only possible to categorise three of the four mixed methods articles via this classification system as the Cameron (2009) article did not present data but rather the resulting model developed from the research. A classification system could not therefore be ascertained for this identified mixed method article.

***RQ2: What is the frequency of use of mixed methods within career development research?***

The use of mixed methods in the field of career development, as represented by this sample is relatively small at 4% of all articles and 6% of empirical articles. When compared with the studies discussed in the literature review there is a marked difference in the frequency of mixed methods. The Powell et al. (2008) study which focused on school psychology found mixed methods represented 13.7% (n=60) of all empirical articles in the study (n=438). Cameron (2009) found mixed methods represented 15% (n=23) of all papers (n=152) and 22% of all empirical papers (n=106) in her VET field study. The Hanson et al. (2005) psychology field study found 22 mixed methods articles (total number of journal articles searched not provided by authors).

***RQ3: What levels of integration of data collection and analysis is being achieved in career development research?***

Due to the limited number of mixed methods articles identified in the study it is difficult to make any substantiated claims or answers to this research question. However, it can be said that three of the four mixed method articles were all classified as AD. The AD classification of mixed method research study is that which uses qualitative data analysed qualitatively and quantitative data analysed quantitatively. Nonetheless, this data points to an over reliance of mixed methods research types which maintain the quantitative qualitative divide and the non use of more integrated mixed method designs. This is an area requiring further inquiry.

The qualitative analysis undertaken does shed additional insights into this aspect of the research. For example the Maree and Molepo (2004) study was very complex and involved a variety of diverse methods and a control group who were administered three questionnaires. The experimental group completed individual informal workbooks and a self-knowledge questionnaire. Both groups completed collages and lifelines and teachers undertook observations, parents and caregivers wrote biographies and students wrote autobiographies. In addition to all of this group work was also conducted. The sequencing and integration of data was not presented in the article however limitations on what could be reported would have been limited by article length.

**Strand 2: Qualitative Analysis**

The qualitative content analysis (Krippendorff 2004) of the four identified mixed method studies has been summarised in Table 5. Each article was analysed in terms of content related to research design; rationale for undertaking a mixed methods study; the types of methods utilised; the sequencing and priority of these; and the data presented.

**<INSERT TABLE 5 HERE>**

***RQ4: Do those utilising mixed methods in career development research explicitly state a rationale or purpose for undertaking mixed methods?***

The qualitative content analysis revealed that two of the four articles identified as mixed methods provided a rationale for the mixed method approach. Maree and Molepo (2004) provide reasons from using a combination of qualitative and quantitative methods

in the abstract and the research design section of the article as did McIlveen, Patton and Hoare (2008). Cameron (2009) explicitly described the mixed method research design employed but did not explain the rationale behind this methodological choice and Sainty (2008) did not provide a methodological rationale for the methods utilised in her research.

***RQ5: Do those utilising mixed methods in career development research utilise a mixed methods typology or research design?***

Two of the identified mixed method articles utilised a mixed methods research design. McIlveen, Patton and Hoare (2008) used a concurrent nested mixed method and Cameron (2009) employed a sequential mixed model design. Although Maree and Molepo (2004) mention 'research design' they did not refer to an actual design and Sainty (2008) did not refer to research design in her paper. This paper was classified as mixed methods as the researcher could infer that mixed methods had been used. This study confirms issues that have appeared in the other studies referred to in this paper in terms of aspects of quality and reporting of mixed methods studies.

To this end Hanson et al. (2005) make a series of recommendations for researchers that can compliment the GRAMMS guidelines outlined earlier: consider theoretical/paradigmatic issues; pay attention to design and implementation issues; become familiar with the analysis and integration strategies used in mixed methods studies; work in teams of researchers with both quantitative and qualitative expertise; use the phrase *mixed methods* in titles of their studies; explicitly state a rationale for using mixed methods in the introduction; specify a research design in the methodology section; have candid conversations about the legitimacy and viability of mixed methods research.

## **Discussion**

### **Overarching Research Question**

***RQ1: What evidence exists to gauge the use and quality of mixed methods research within career development research?***

The findings of the research indicate that mixed methods research represents 4% of all the articles and 6% of empirical articles from this sample. When compared to similar studies undertaken in related fields (psychology; school psychology and vocational education and training) the findings indicate a relatively low usage of mixed methods with quantitative approaches dominating at 51% of empirical articles. In terms of the Creswell and Plano Clark (2007) framework for evaluating the level of acceptance of mixed methods research within disciplines, this study would seem to indicate a very low acceptance rate that could not be considered at the minimal acceptance level as per the framework. It is hoped this paper will add to the dialogue of possibilities for increasing the acceptance level of mixed methods research within the career development research field and argues for research training in mixed methods.

### **Limitations**

A limitation of this study derives from a comparing the study findings against studies which are in related disciplines and do not align across data collection time periods. In terms of the Cameron (2009) study, comparing journal articles with conference papers is also a limitation. These are two very different kinds of academic publications and are subject to differing levels of review processes. It must also be noted that limitations

exist in making generalisations from the current sample to the broader field of career development. A measure to combat this limitation would be to engage in a more wide spread systematic analysis of other leading discipline journals. Future research is planned to rectify this limitation and expand the scope of the research with the following journals: *Journal of Career Development*; *Career Development International*; *The Career Development Quarterly*; and *Journal of Career Assessment*.

Researchers that utilise a mixed methods approach need to describe any limitation of one method associated with the presence of the other method (O’Cathain 2008). This study is based on a multistrand conversion design which provides greater insights of the phenomenon being studied through analysing the data both qualitatively and quantitatively. A monomethod approach would not have provided the insights that the mixed method approach employed here has.

Another issue which arises from this research and confirms similar findings in other such studies is the need for researchers who utilise mixed methods to adhere to the quality guidelines and frameworks that exist and to explicitly refer and reference the growing body of mixed methods literature that exists. These findings add to the dialogue that advocates methodological rigour and multidisciplinary methodological innovation. Henwood (2004) has been prepared to introduce and address difficult quandaries and challenges into the psychology agenda and makes the following statement, “it may be more comfortable to remain cocooned within a singular and insular package of past practices. But this is less likely to equip researchers with the powers of reflection and practical ways of working they need to evaluate their own work and that of others outside a narrow disciplinary frame” (Henwood 2004, p. 53).

Cameron (in press), in reference to researchers in the field of vocational education and training, takes this position further by arguing a need for methodological trilingualism for those researchers wishing to engage in mixed methods research. Methodological trilingualism means training and proficiency in qualitative and quantitative data collection methods but also with the theoretical and methodological frameworks and practices of the mixed methodologies:

...they need to be not only methodologically bilingual (Teddle & Tashakkori 2003, p. 45), but methodologically trilingual. Mixed methods researchers need to transition themselves methodologically from the rudimentary notion of triangulation to methodological trilingualism.

In reference to career studies, Patton and Collin (2009, p. 52) argue for greater multidisciplinary and state despite the, “potential for multidisciplinary, scholars have pursued questions about career from within their own disciplinary theoretical and methodological bases and worked in disciplinary isolation”. Waszack and Sines (2003, p. 574) argue the “challenge is to (re)socialize researchers to believe in the equal value of both paradigms, to understand the strengths and weaknesses of each for specific research questions and situations, and to have the wisdom to know what is appropriate and when.”

It is hoped this study has added some insights to discussions on the use and quality of mixed methods within the career studies research community and the need for research training in mixed methods, especially at postgraduate level. The paper also foreshadows more extensive future research on the use and quality of mixed methods across the field.

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**Table 1: Summary of data sources of the three studies**

STUDY	DATA SOURCES	1986-1999	2000	01	02	03	04	05	06	07	08
Hanson et al. 2005	7 Psychology Journals										
Powell et al. 2008	4 School Psychology Journals										
Cameron 2009	2007 AVETRA Conf.										
	2008 AVETRA Conf.										
	IJTR Journal										

**Table 2: Frequency and distribution of journal articles**

Data source	Conceptual	QUAN	QUAL	Mixed Method	Total
2004	10	7	3	1	21
2005	6	7	5	0	18
2006	6	5	4	0	15
2007	4	5	6	0	15
2008	3	5	6	2	16
2009	6	3	4	1	14
<b>TOTALS</b>	<b>35</b> (35.4%)	<b>32</b> (32.3%)	<b>27</b> (27.3%)	<b>4</b> (4%)	<b>99</b> (100%)
<b>Empirical Articles</b>		<b>32</b>	<b>27</b>	<b>4</b>	<b>63</b>
<b>TOTALS</b>		<b>(51%)</b>	<b>(43%)</b>	<b>(6%)</b>	<b>(100%)</b>

**Table 3: Frequency of data collection methods**

Data collection method	Frequency
Survey/Questionnaire	41
Interviews	16
Case studies	6
Focus groups	5
Other	4
Observation	3
Grounded theory	2
Ethnography	1

**Table 4: Mixed methods studies according to data collection and analysis classification**

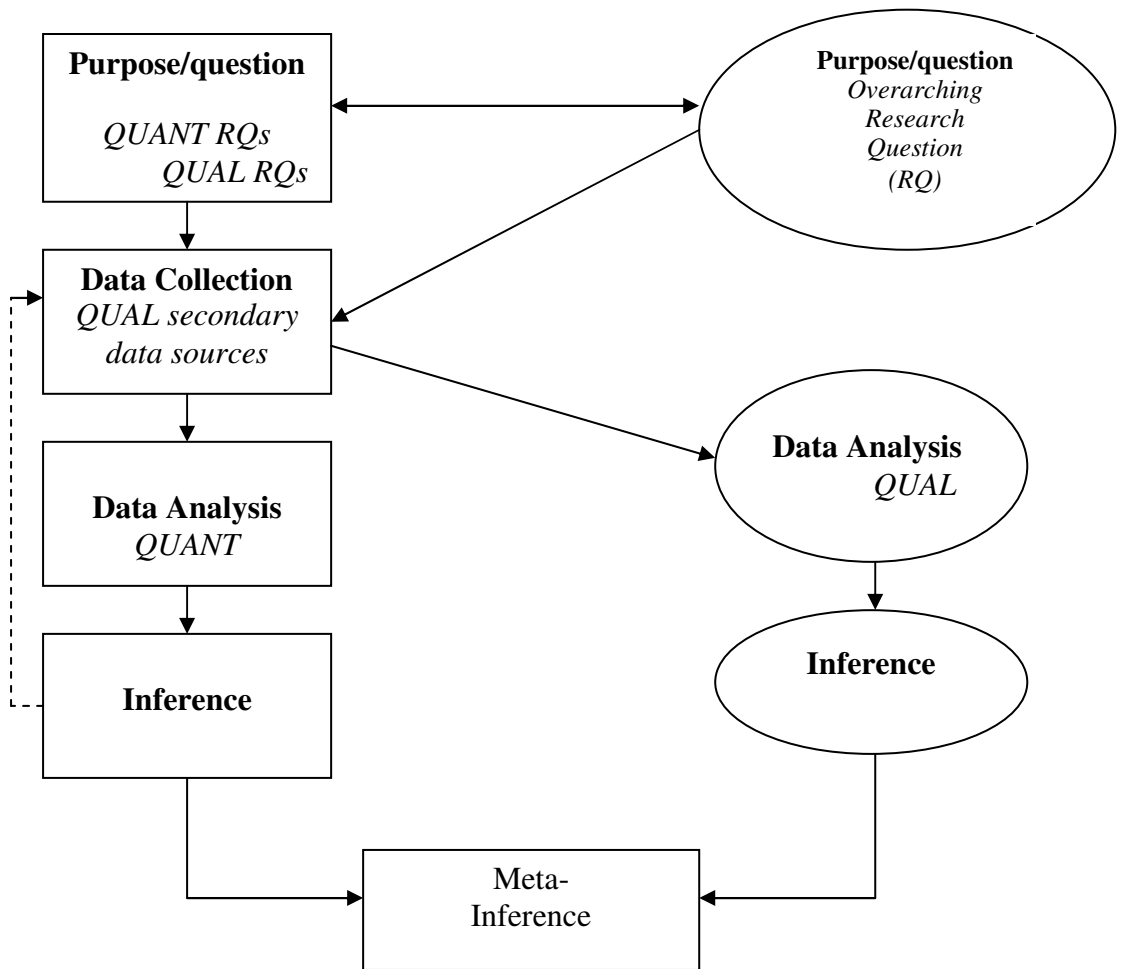
Code	Description	Number of Studies in the Analysis
B	Qualitative data analyzed quantitatively	0
C	Quantitative data analyzed qualitatively	0
AB	Qualitative data analyzed qualitatively and quantitatively	0
AC	Qualitative and quantitative data, both analyzed qualitatively	0
AD	Qualitative data analyzed qualitatively, quantitative data analysed quantitatively	3
BC	Qualitative data analyzed quantitatively, quantitative data analysed qualitatively	0
BD	Qualitative and quantitative data, both analyzed quantitatively	0
CD	Quantitative data analyzed qualitatively and quantitatively	0
ABC	Qualitative and quantitative data, both analyzed qualitatively, qualitative data also analysed qualitatively	0
ABD	Qualitative and quantitative data, both analyzed quantitatively, qualitative data also analysed qualitatively	0
ACD	Qualitative and quantitative data, both analyzed qualitatively, quantitative data also analysed quantitatively	0
BCD	Qualitative and quantitative data, both analyzed quantitatively, quantitative data also analysed qualitatively	0
ABCD	Qualitative and quantitative data, both analyzed concurrently with qualitative and quantitative research methods	0
TOTAL		3

**Table 5: Mixed Methods Articles**

ARTICLE	Research Design & Rationale	Methods & Sequence	Data Presented
<b>Maree and Molepo (2004)</b>	<b>Design and Rationale:</b> The overall research design involves a combination of quantitative and qualitative methods. As a part of the qualitative methods, the authors chose an interpretative approach, implying that the aim was to understand the results epistemologically; nonetheless accepting that researchers' perceptions of reality not only vary, but differ greatly (2004, p. 50). 'our research in Limpopo demonstrates the need for multiple approaches to the collection of comprehensive data'	Intervention: Control group and experimental group:  3 Questionnaires (QUANT) <i>Rothwell-Miller Interest Blank (RMIB)</i> <i>South African Vocational Interest Inventory (SAVII)</i> <i>Career Development Questionnaire (CDQ)</i>  Collages; observation; biographies; autobiographies; group work (QUAL)	QUANT data did not yield meaningful results.  Data from one of the QUAL methods presented

	(2004, p. 47)		
<b>Sainty (2008)</b>	<b>Design:</b> not stated <b>Rationale:</b> not stated	Questionnaire (Quant) ↓ Semi-structured interviews (QUAL)	Data from both presented  QUANT data minimized due to small sample size
<b>McIlveen, Patton and Hoare (2008)</b>	<b>Design:</b> Concurrent nested mixed method. Predominantly qualitative, mixed method design  <b>Rationale:</b> 'Capture the unique experience of the clients' (p53) Supplementation (p 54)	Interview (QUAL) ↓ Questionnaire (Quant)	Both sets of data presented separately
<b>Cameron (2009)</b>	<b>Design:</b> Sequential mixed model design  <b>Rationale:</b> not stated	Survey (QUANT) ↓ Focus groups (Qual) ↓ Mixed evaluation (QUANT/QUAL)	Data not presented. Resulting model presented.

**Figure 1: Multistrand conversion mixed model design**



**Figure 2: Classification Tool or Mixed Methods Studies**

		Data Analysis	
		Qualitative	Quantitative
Data Collection	Qualitative		
	Quantitative		

Source: Adapted from Hurmerinta-Peltomaki and Nummela (2006)

## **AUTHOR**

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## **Theory and Practice**