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# THE USE OF MIXED METHODS IN VET RESEARCH

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## ABSTRACT

*Mixed methods research is an emerging third methodological movement with a growing body of trans-disciplinary literature. Some say it is a movement still in its adolescence and yet to reach its maturity (Bazeley 2008; Teddlie & Tashakkori 2009). Nonetheless, the discipline fields which are showing high levels of acceptance for mixed methods are those related to education, health and the social sciences. Prominent research methodologists/authorities from across several discipline fields are emerging and guiding the commentary and the movements' momentum, especially in Europe and the United States. This paper reports the findings of a study that has systematically reviewed papers from the 10<sup>th</sup> and 11th Annual AVETRA Conferences held in 2007 and 2008, along with journal articles published in the International Journal of Training Research from 2003-2008. The aim of the study is to provide a methodological map of the vocational education research reported at the conferences and within the journal, and in particular the use of mixed methods research in Australian based VET research. The data will be compared to similar research conducted in business and management research. Implications for research training, research capacity building and research publication are discussed with particular reference to the field of vocational education and training.*

**Keywords:** mixed methods, content analysis, VET research, postgraduate research training

## Introduction

This paper reports findings from a systematic review of conference papers from the annual AVETRA conference held in 2007 and 2008 and journal articles from the *International Journal of Training Research* (IJTR) from 2003-2008. The research provides a broad based scan of methodological use using the following paper categories: conceptual; qualitative; quantitative; and mixed methods. The study builds on previous systematic scans of methodological use within management literature that has a particular focus on mixed methods research. The paper will briefly outline the rise of mixed methods as a third

methodological movement before detailing the study and its findings. The study reviewed the research methods employed in conference papers/journal articles and concluded that the number of single method studies (78% of empirical studies) exceeded those utilising mixed methods (22% of empirical studies). The paper concludes by proposing future research in this area and by discussing the implications for building research capacity for VET researchers. In the light of these discussions specific recommendations will be made to the Association (AVETRA).

### **Mixed methods as a third methodological movement**

Mixed method research is a growing area of methodological choice for many academics and researchers from across a variety of discipline areas. The *Journal of Mixed Methods* (2006), in its call for papers defines mixed methods as ‘research in which the investigator collects, analyses, mixes, and draws inferences from both quantitative and qualitative data in a single study or a program of inquiry’. Creswell and Plano Clark (2007: 5) define mixed methods as follows:

Mixed methods research is a research design with philosophical assumptions as well as methods of inquiry. As a methodology, it involves philosophical assumptions that guide the direction of the collection and analysis of data and the mixture of qualitative and quantitative data in a single study or series of studies. Its central premise is that the use of quantitative and qualitative approaches in combination provides a better understanding of research problems than either approach alone.

Creswell and Plano Clark (2007: 14) have also mapped a brief history of mixed methods research and its evolution to date and have posited four, often overlapping, time periods in the evolution of mixed methods. These four time periods are the; Formative period (1950s - 1980s); Paradigm debate period (1970s - late 1990s); Procedural development period (late 1980s – 2000); and the Advocacy as a separate design period (2000+). It is interesting to note the language that has been expressed around this evolution of mixed methods. For example Buchanan & Bryman (2007: 486) in reference to organisational research, conclude that:

The paradigm wars of the 1980s have thus turned to paradigm soup, and organisational research today reflects the paradigm diversity of the social sciences in general. It is not surprising that this epistemological eclecticism has involved the development of novel terminology; innovative research methods; non traditional forms of evidence; and fresh approaches to conceptualization, analysis, and theory building.

Tashakkori and Teddlie call mixed methods the 'third methodological movement' (2003: ix) whilst Johnson and Onwuegbuzie (2004: 14) state very clearly that mixed methods research is a 'research paradigm whose time has come'. Mingers (2003) refers to the ceasefire of the paradigm wars being announced while Cameron and Miller (2007) use the metaphor of the phoenix to illustrate the emergence of mixed methods as the third methodological movement, arising from the ashes of the paradigm wars.

Several authorities have been emerging as mixed methodologist researchers and theorists (Greene and Caracelli 1997; Mingers and Gill 1997; Bazeley 2003; Creswell 2003; Tashakkori and Teddlie 2003; Mertens 2005; Brewer and Hunter 2006; Creswell and Plano Clark 2007; Bergman 2008; Bryman 2008). The interest in mixed methods has seen the recent emergence of several publications including academic journals, chapters within research texts (Nagy Hesse-Biber and Leavy 2008; McMillan & Schumacher 2006) and research texts themselves that are dedicated to mixed methods. The most comprehensive publication of mixed methods to date has been the edited *Handbook of Mixed Methods in Social and Behavioural Research* (Tashakkori & Teddlie 2003). In January 2007 the first issue of the *Journal of Mixed Methods Research* was published and this was followed by the first issue of the *International Journal of Multiple Research Approaches* in October 2007. In 2009 a new online journal, *The International Journal of Mixed Methods in Applied Business and Policy Research* will publish its first issue. A very practical guide to the design and conduct of mixed methods research was published last year (Creswell and Plano Clark 2007) along with other texts focused solely on mixed methods (Todd, Nerlich, McKeown & Clark 2004; Greene 2007; Bergman 2008; Teddlie & Tashakkori 2008; Cameron & Miller *forthcoming*; Andrews & Halcomb 2009).

Mixed methods research as a third methodological movement is developing and evolving with recent studies of the use of mixed methods in the fields of counselling (Hanson, Creswell, Clark, Petska & Creswell 2005), qualitative research conducted in Switzerland (Eberle & Elliker 2005), social and human sciences (Plano Clark 2005), the social sciences (Bryman 2008); and business research (Mingers 2003; Rocco et al 2003; Hurmerinta-Peltomaki & Nummela 2006; Molina-Azorin 2007; Bazeley 2008; Cameron 2008) and evaluation research (Greene, Caracelli & Graham 1989) providing empirical evidence of the extent of utilisation of mixed methods in contemporary research. Creswell and Plano Clark have concluded that 'today, we see cross-cultural international interest, interdisciplinary interest, publication possibilities, and public and private funding opportunities for mixed methods research' (2007: 18). An aim of this paper is to gauge the presence and acceptance of mixed methods research within the VET based research community, as represented by two AVETRA conferences and the AVETRA journal.

### **Studies investigating the use of mixed methods across discipline fields**

There is a small but growing body of research that is researching the incidents and usage of mixed methods across discipline fields. These studies not only look at the use of mixed methods but also the levels of integration between the quantitative and qualitative methods. A large study by Bryman (2008), of published social science journal articles from 1994-2003 that utilized mixed methods, found just under half of the articles that used mixed methods did so by presenting the qualitative and quantitative data in parallel and only 18% of the articles genuinely integrated the two sets of findings. The studies by Hurmerinta-Peltomaki and Nummela (2006) and Cameron (2008) found similar findings. These two similar pieces of research have directly informed the study reported in this paper. Both studies aim to discover the extent and current role mixed methods plays in the business/management fields through a process of systematic review of empirical studies. The study undertaken by Hurmerinta-Peltomaki and Nummela (2006) involved the review of articles from four major journals in international business during the time span of 2000 to 2003. The second study involved a methodological scan of the Australian and New Zealand Academy of Management (ANZAM) conference papers from the annual ANZAM conference held in 2007 (Cameron 2008).

The Hurmerinta-Peltomaki and Nummela (2006) study focused on articles within the following four international business journals between 2000 to 2003: 1) *International Business Review* (IBR), 2) *Journal of International Business Studies* (JIBS), 3) *Journal of World Business* (JWB), 4) *Management International Review* (MIR). The articles were classified under four main categories: conceptual articles; qualitative studies; quantitative studies; and mixed method studies. The researchers screened 484 articles and found 394 articles contained empirical research designs (qualitative, quantitative and mixed method). The study found that 68 (17 %) of the 394 empirical studies utilised a mixed method. These 68 studies were then further categorised/coded according to a classification tool inspired by mixed methods typologies designed by Creswell (2003) and Tashakkori and Teddlie (1998). The classification tool developed is a two-by-two matrix (see Figure 1). Both the classifications and codes used by the Hurmerinta-Peltomaki and Nummela (2006) study have been replicated in the study being reported in this paper and are detailed in the methodology section of this paper. The authors focused on the extent of mixed methods in international business (IB) research and the potential of mixed methods to add value. The authors state that ‘International business is a multi-faceted area of research, crossing national, cultural, organisational and personal boundaries, and inspiring complicated research questions’ (2006: 440). They argue that narrow methodological approaches would reveal only a small piece of the reality within this complex field. The same could be said for VET research which deals with many levels of analysis, a wide range of contexts, issues, stakeholders and diverse student groups.

The second study by Cameron (2008) reports findings from a systematic review of refereed conference papers (n=281) from the annual ANZAM conference held in 2007. The research provides a broad based scan of methodological use using the same categories employed in the Hurmerinta-Peltomaki and Nummela (2006) study: conceptual; qualitative; quantitative; and mixed methods. The study reviewed the research methods employed in papers from each of the 16 conference themes and concluded that the number of single method studies (86% of empirical studies) exceeded those utilising mixed methods (14% of empirical studies). Quantitative papers represented just under one third of the papers (32%), followed by conceptual papers (30%). Qualitative papers represented 28% of the papers and mixed methods represented 10%. Papers were categorised as either conceptual or empirical (qualitative, quantitative and mixed methods). This process identified a total of 197 papers with an empirical research design. Of these empirical studies 28 (14%) utilised a mixed

method. The majority of mixed method type papers were in the classification (n=22 or 78%) that analyzed qualitative data qualitatively and analysed quantitative data quantitatively. The paper concludes by proposing future research in this area and by discussing the implications for future management research training and publication.

Rocco, Bliss, Gallagher and Perez-Prado (2003: 27) call for research courses that specifically deal with instruction on how to mix qualitative and quantitative methods in the stages of research design. They also call for appropriate journals to encourage the inclusion of such discussions in research. Studies that utilise mixed methods approaches may face problems in being published due to dominant paradigmatic views expressed within discipline fields (Welch & Welch 2004; Hurmerinta-Peltomaki and Nummela 2006). Some journals explicitly exclude certain methodological approaches, whereas others imply methodological preferences.

Creswell and Plano Clark (2007: 179) 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 fields 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).

In consideration of these issues, the present study sought to investigate the use of mixed methods research within VET based research as represented by two recent AVETRA Conferences and articles in a journal that publishes VET based research. In particular, the following research questions were posited:

*RQ1: What is the frequency of use of mixed methods within VET based research?*

*RQ2: What forms of mixed methods research within VET based research are most common?*

*RQ3: What evidence exists to gauge the level of acceptance of mixed methods research within VET based research?*

## **Methodology**

The methodology employed in this research is a systematic review and involved the content analysis of conference papers from the 10<sup>th</sup> and 11th Annual AVETRA Conferences held in 2007 and 2008, along with journal articles published in the *International Journal of Training Research* from 2003-2008. The research analyses qualitative data both qualitatively and quantitatively. Due to the limitations imposed on conference paper length only the quantitative data analysis will be presented. The qualitative data analysis will be presented in a submission to the IJTR, along with the quantitative data analysis. The sample includes 49 journal articles and 103 conference papers. Conference papers that were refereed constituted 56 (54%) of the conference papers and non refereed papers represented 47 (46%) of the conference papers (n=103). Papers were reviewed using a coding system and sheet. Data was collected from each conference paper and journal article and included demographic data, research approach/design, methods used and mixed method design type, if applicable.

Data codes were developed from the literature review and replicated aspects of other research. For example, the data codes for paper types and the mixed method matrix from the Hurmerinta-Peltomaki and Nummela (2006) study was employed and specific codes for mixed method typologies was replicated from the Cameron (2008) 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 the Hurmerinta-Peltomaki and Nummela (2006) study. 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 papers were judged to be so if they were in numerical form and analysis was

based only on this data. Qualitative papers 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 paper, or at least the reader needed to be able to infer it.

Further analysis of those papers considered to be mixed methods followed. Each of the 23 mixed method studies were evaluated according to the classification tool designed by the Hurmerinta-Peltomaki and Nummela (2006: 446) study and depicted in Figure 1. 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. The classification tool for the mixed methods studies is depicted by Figure 1. Descriptions of these classifications are listed in Table 3.

**Figure 1 Classification Tool or Mixed Methods Studies**

		<b>Data Analysis</b>	
		Qualitative	Quantitative
<b>Data Collection</b>	Qualitative	<b>A</b>	<b>B</b>
	Quantitative	<b>C</b>	<b>D</b>

Source: Hurmerinta-Peltomaki and Nummela (2006: 446)

Numerical codes for each paper were entered into the SPSS statistical package. It must be noted that limitations exist in attempting to compare different forms of academic literature. Refereed and non refereed conference papers and journal articles are all very different in terms of length, review processes and academic rigour. Future research is anticipated for VET conference papers, journal articles and national VET research projects to combat this limitation and expand the scope of the research.

The current study reported in this paper is a mixed method study. Qualitative data has been analysed quantitatively and is reported in this paper. Under the classification tool display in Figure 1 this study is an AB study where qualitative data is analysed qualitatively and quantitatively. What is not reported in this paper is the qualitative analysis of the qualitative data due to the limitations placed upon conference paper length. This aspect of the study will involve a content analysis of the 23 mixed method papers/articles identified in the quantitative analysis utilising qualitative analysis techniques. Themes identified in the qualitative analysis methodology of the Bryman (2008) study will be used as a guide, however the approach will be exploratory and will allow for themes to emerge.

## Findings and discussion

The quantitative data analysis employed utilised descriptive and univariate statistics. Table 1 depicts the frequency distribution of research paper types for both conferences and the journal articles.

**Table 1 Data sets for the study**

<b>Data Source</b>	<b>2003</b>	<b>2004</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>TOTAL</b>
<b>AVETRA 2007</b>					49		49
<b>AVETRA 2007</b>						54	54
<b>IJTR 2003- 2008</b>	11	10	9	8	8	3	49
<b>TOTAL</b>	11	10	9	8	57	57	152

Table 2 displays the data sets from the study. These data sets are broken down into paper type, year of publication and data sources.

**Table 2 Frequency and distribution of paper types**

<b>Data source</b>	<b>Conceptual</b>	<b>QUAN</b>	<b>QUAL</b>	<i>Mixed Methods</i>	<b>Total</b>
IJTR 2003	3	1	6	0	10
IJTR 2004	6	2	1	1	10
IJTR 2005	6	1	2	0	9
IJTR 2006	4	0	4	0	8
IJTR 2007	2	0	4	2	8
IJTR 2008	1	0	2	1	4
<b>IJTR Sub-Total</b>	<b>22</b> <b>(45%)</b>	<b>4</b> <b>(8%)</b>	<b>19</b> <b>(39%)</b>	<b>4</b> <b>(8%)</b>	<b>49</b> <b>(100%)</b>
AVETRA Conference 2007	12 (24.5%)	2 (4%)	26 (53%)	9 (18.5%)	49 (100%)
AVETRA Conference 2008	12 (22%)	4 (8%)	28 (52%)	10 (18%)	54 (100%)
<b>TOTALS</b>	<b>46</b> <b>(30%)</b>	<b>10</b> <b>(7%)</b>	<b>73</b> <b>(48%)</b>	<b>23</b> <b>(15%)</b>	<b>152</b> <b>(100%)</b>

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. From Table 2 it can be concluded that the number of single method studies exceeded those utilising mixed methods.

The distribution of paper types for the two sets of AVETRA conference papers is not dissimilar, however the distribution of paper types for the IJTR is different from the conference papers. The most frequent paper type for both sets of conference papers is qualitative, at just over half the total papers. This is followed by conceptual papers at just

under a quarter. Mixed methods comes in at 18% followed by quantitative papers at 4% and 8% respectively. For the journal articles the most frequent article type is conceptual (45%), followed by qualitative articles (39%). Mixed methods and quantitative article types are equal third on 4%.

Table 3 plots the frequencies of the identified mixed methods papers across a classification system for mixed methods studies. The large majority of mixed method type papers were in the AD classification (n=17). This classification analyzes qualitative data qualitatively and analyses quantitative data quantitatively.

**Table 3 Mixed methods studies according to classification**

<b>Code</b>	<b>Description</b>	<b>Number of Studies in the Analysis</b>
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	1
AD	Qualitative data analyzed qualitatively, quantitative data analysed quantitatively	17
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	1
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
<b>TOTAL</b>		<b>19</b>

Only 19 of the 23 mixed methods papers could be classified. Four of these papers did not present the other type of data and did not describe how the other set of data would be analysed. For example, one paper described the quantitative and qualitative data collection methods, presented the data analysis and findings for the quantitative data but did not present the qualitative data and did not explain the data analysis techniques employed on the qualitative data. Therefore a judgement on the classification of the paper could not be made.

## **Conclusion**

The reported findings address each of the three research questions identified at the conclusion of the literature review. Each of these questions is addressed in turn before overall conclusions are drawn.

Research Question 1 asked: *What is the frequency of use of mixed methods within VET based research?*

The findings of the research indicate that mixed methods research represents 15% of all the papers/articles and 22% of all the empirical refereed conference papers. The findings of the research indicate that there are slight differences between the frequency of mixed methods papers in VET based research as compared to publications in International Business and across management fields. For the VET based research mixed methods was more frequently utilised in AVETRA conference papers than in published articles in the IJTR. Qualitative studies are the most frequently utilised research approach in the AVETRA conferences analysed and conceptual papers are most frequent within the IJTR 2003-2008. Quantitative methods are the least frequent for the conference papers and equally least frequent with mixed methods in the IJTR articles. This result may provide partial evidence to answer the third research question.

Research Question 2 asked: *What forms of mixed methods research within VET based research are most common?*

The findings of the research indicate that the most popular form of mixed methods research is the AD classification. Just under three quarters (n=17 or 74%) of the mixed methods studies utilised this form of mixed method research. The AD classification of mixed method research study is that which uses qualitative data analyzed qualitatively and quantitative data analysed quantitatively. When these figures are compared with the Hurmerinta-Peltomaki and Nummela (2006) study and the Cameron (2008) study, there are slight differences. Special note must be made when comparing these three studies. All three studies collected data during different time periods; collected data from different forms of published literature and; collected data from different discipline fields. 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. How can this be addressed? Is this a result of a lack of training in mixed methods or the politics of paradigms, or both? Perhaps it reflects the recent emergence of mixed methods as a third methodological movement and trends over time may give a better indication of the maturity of the movement as reflected in its future utilisation in VET based research.

Research Question 3 asked: *What evidence exists to gauge the level of acceptance of mixed methods research within VET based research?*

The data from this study thus far provides some evidence to answer this question. The fact that mixed method studies represented 15% of all papers/articles indicates that the broader field of VET based research, as represented by two AVETRA conferences and the AVETRA journal, is utilising mixed methods. It would seem that mixed methods is beginning to be discussed in these forums. Further evidence needs to be collected to allow for a more comprehensive response to the research question posed. Is the broader VET based research field, as represented by AVETRA publications, at the minimal acceptance end of the continuum of mixed method acceptance proposed by Creswell and Plano Clark (2007)? What implications does this have for future VET based research, research training and publication? What could AVETRA be doing to encourage a wider acceptance level of mixed methods research?

It is hoped that this paper will begin a dialogue of possibilities for increasing the acceptance level of mixed methods research within VET based research.

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