

Conference Theme: Reflecting back...lessons for the future?

A METHODOLOGICAL SCAN OF NCVER FUNDED RESEARCH 1992-2010

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ABSTRACT

The National Council for Vocational Education Research (NCVER) is a not-for-profit company owned by state, territory and federal ministers responsible for training which has been funding VET research in Australia since 1992. The aim of the study is to provide a retrospective methodological map of government funded VET research as reported by NCVER for a nineteen year period (1992-2010). The aim of the study is not to judge research usage or impact but to investigate possible trends over time in respect to research quality and levels of methodological innovation and rigor. The methodology employed to conduct this study has been content analysis of qualitative secondary data publically available online through the NCVER webpage. The sample includes research report descriptions of NCVER funded research projects (managed research projects and in house research projects) conducted from between 1992 to 2010 (n=332). Data collected from the research project descriptions includes basic identifying demographic information on authors (number, gender, affiliations), research theme, along with data on research design, research methods, data sources, sampling and sequencing. The preliminary findings will be discussed within the context of recent research on the increasing use of mixed methods and interdisciplinary teams in commissioned research in the US and UK. The paper concludes with some insights and thoughts on VET based research methodologies and approaches for the future.

Keywords: mixed methods; qualitative research; quantitative research; content analysis, VET research, NCVER research

Introduction

The National Centre for Vocational Education Research (NCVER) is a not-for-profit company owned by state, territory and federal ministers responsible for training with a Board of Directors who represent state, territory, and Commonwealth governments, industry, unions, and training authorities. NCVER's stated aim and vision is:

It is a professional and independent body responsible for collecting, managing, analysing, evaluating and communicating research and statistics about vocational education and training (VET) nationally. NCVER's vision is to contribute to improvement in Australian's education and training system by ensuring that policy and practice are based on sound evidence. Its mission is to be Australia's leading provider of high-quality, independent information on vocational education and training to governments, the education sector, industry, and the community (<http://www.ncver.edu.au/>).

NCVER's operations are broad and cover six main areas of activity however the focus of this research is in a specific research activity area: the coordination and management of the National VET Research and Evaluation (NVETRE) program and the NCVER in house research program. The NVETRE program provides funding annually for VET research and commissions research based upon the research priorities agreed to by the Ministerial Council for Tertiary Education and Employment. The inhouse projects are developed and conducted by NCVER's research staff and are funded by NCVER after approval from the NCVER Board.

In terms of VET policy the Department of Education, Employment and Workplace Relations (DEEWR), formerly DEST, creates national training strategies to meet long term objectives of vocational education and training (VET) in Australia. Three national strategies have set the direction for the development of VET in Australia for the period being reported through this research:

- Shaping our Future (2004-2010)
- A Bridge to the Future (1998-2003)
- Towards a Skilled Australia (1994-1998).

NCVER's research activities are focused around five main themes: *students and individuals; teaching and learning; industry and employers; the VET system* and; *VET in context*. All five main themes have a set of sub themes. The initial aim of this study is to conduct a scan of the research methods utilised in NCVER funded research from 1992-2010 within these five thematic areas and to calculate prevalence rates under four broad methodological categories: quantitative (QUANT); qualitative (QUAL); mixed methods (MM) or; other. The study will then progress to more qualitative analysis of individual research projects conducted within these categories to gauge the quality and levels of methodological innovation being undertaken. This paper reports the preliminary findings from the initial methodological scan and presents data from the analysis of the majority of level 2 themes for two of the five main research themes: *Students and individuals* and *Teaching and learning*. The methodology employed is content/document analysis of research project summary descriptions available on the NCVER website. A major aim of the research is to determine whether mixed methods approaches are being funded in Australian VET based research and to determine the level of acceptance and adoption of mixed methods in this discipline in Australia. This will then be compared to other similar studies conducted in the UK and US in government funded health related research. This will provide wider international and disciplinary perspectives on the acceptance and prevalence of mixed methods across government commissioned and funded research.

The research questions posited for the research are:

RQ1: What are the funding inputs and publication outputs for research projects across the five main research themes of NCVER from 1992 to 2010?

RQ2: What are the prevalence rates for monomethod and mixed methods research approaches in NCVER funded research from 1992 to 2010?

RQ3: What are the basic demographics and frequency of repeat funding of principal researchers for NCVET funded research projects funded from 1992 to 2010?

RQ4: Does the NCVET funded research identified as using mixed methods meet mixed methods quality criteria?

In 1998 the Office for Standards in Education (OfSTED) undertook a review of educational research in the Britain. This study categorised educational research from four highly ranked journals (n=264). In an analysis of a sub sample of 41 empirical articles the study found four major themes, the second of these themes being problems with methodology. 'This largely focused on problems arising from the conduct of qualitative research, which made up a large proportion of the empirical work surveyed. In particular, the issues of triangulation (or the lack of it) and sampling bias were noted. Other issues concerning methodology arose around the presentation of research, including the lack of reporting of sample size and method of sample selection' (Tooley & Darby 1998, pp.5-6).

Smith (2004) undertook an analysis of National Research and Evaluation Committee (NREC) research projects managed by NCVET between 1997-2000 and found that qualitative research dominated. Non empirical work (reviews of literature and research and new analysis of existing data sets) also featured strongly in the NREC program 1997-2000. Smith (2004, p. 208) noted 'increasingly important in NREC research has been the use of mixed methodologies'. Cameron (2010) investigated the use and quality of mixed methods research in Australian VET based research and concluded:

The fact that mixed method studies represented 15% of all papers/articles and 22% of all empirical papers/articles indicates that the broader field of VET based research, as represented by two conferences and journal, is utilising mixed methods. It would seem that mixed methods is beginning to be discussed and utilised within these academic publications and forums (Cameron 2010, p. 37).

This study will complement the research undertaken by Smith (2004) and Cameron (2010) and provide a fuller picture of the methodologies employed and in particular the prevalence of mixed methods in NCVET funded research. Plano Clark (2010) acknowledges how important an indicator of the adoption and acceptance of mixed methods this type of research will be when she states:

The importance of funding for research occurs through allocating resources, setting research priorities, and conveying norms for research within disciplinary and cultural contexts. As such, funding mechanisms play an important role in research because they directly influence the questions that researchers study as well as the methods used (Plano Clark 2010, p. 428).

Commissioned and funded research in UK and US

Creswell (2010, p. 63) noted that research funding could be viewed as a stimulus as well as an inhibitor of the use and adoption of mixed methods. Creswell takes the former view and noted that in the US the National Institutes of Health developed guidelines for combined qualitative and quantitative research in 1999 and have held workshops on mixed methods

research in 2004. He also noted that the US National Science Foundation held a workshop on the scientific foundations of qualitative research which included several papers on mixed methods in 2003. The American Educational Research Association has had a Special Interest group (SIG) for mixed methods for the past five years. In the UK the Economic and Social Research Council (ESRC) has funded mixed methods workshops and the Australian and New Zealand Academy of Management (ANZAM) will be launching its new mixed methods SIG in 2011.

The adoption and use of mixed methods within funded health services projects in the UK has been undertaken by O'Cathain, Murphy & Nicholl (2007a, 2007b). They found that 30% of these projects utilised mixed methods. Plano Clark (2010) undertook a study of the trends in US health related projects funded by the National Institutes of Health and similar US federal agencies. Plano Clark (2010) analysed 226 abstracts between 1997- 2008 on the Computer Retrieval of Information on Scientific Projects (CRISP) database which is provided by the US National Institutes of Health, the primary federal funding agency for health related research in the US. She did not find the high rates of mixed methods studies as did O'Cathain et al (2007a, 2007b) in the UK. The rate for explicitly stated mixed methods studies was 5% with a trend towards increasing rates of mixed methods studies. She paid particular attention to funded mixed methods studies and gave the following rationale for such a study:

Funding issues are important to study to both learn about the process of successfully obtaining funding and to reflect on and critique the role of funding mechanisms in the conduct of mixed methods research. The purpose of this investigation is to examine recent trends in the use of mixed methods within federally funded research projects in the United States, specifically in the area of health-related research. Information about the prevalence of funded mixed methods projects is essential for considering the current level of adoption for mixed methods research as well as about the general adoption process for emergent research methods (Plano Clark 2010, p. 429).

Both the UK based and US based studies indicate an increasing trend towards the use of mixed methods in government commissioned and funded health research. This mirrors the research on Australian based VET research undertaken by Smith (2004) and Cameron (2010) and has direct implications for those wishing to apply for future NCVET funded research.

Methodology

The approach adopted for this study will be exploratory utilising an embedded mixed methods research design (Creswell & Plano Clark, 2007, p.67). This design is used when one data set provides a supportive, secondary role in a study based primarily on the other data type. 'The premises of this design are that a single data set is not sufficient, that different questions need to be answered, and that each type of question requires different types of data. Researchers use this design when they need to include qualitative or quantitative data to answer a research question within a largely quantitative or qualitative study' (Creswell & Plano Clark, 2007, p. 67). This study has quantified secondary qualitative data to produce descriptive statistics to answer RQs 1-3. This will be complemented by qualitative analysis of those research projects identified as utilising mixed methods, against mixed methods research quality criteria in an attempt to answer RQ 4. The method employed in this stage of the research involved content/document analysis of publically available secondary data

sources. These data sources were accessed through the NCVER web site and included: web page content; NCVER corporate publications; NCVER funded publications including research reports and conference papers and; descriptions of research projects published on the NCVER web site. The content analysis involved categorising each research project as either: quantitative (QUANT); qualitative (QUAL); mixed methods (MMR) or; other. Quantitative research is that which uses one or more quantitative data collection methods and analysis techniques and where the data is in numerical form. Qualitative research is that which uses one or more qualitative data collection methods and analysis techniques with data mainly in textual form. Mixed methods research is that which uses a combination of quantitative and qualitative data collection methods and analysis techniques. The category of other represents an array of approaches ranging from literature reviews, conceptual developments and new analysis of existing secondary data sets. Data was also collected on the principal researchers and includes basic demographic data such as: gender; organisational affiliation and; location of the research. Coding was undertaken manually and managed through excel spreadsheets. The more detailed qualitative analysis of identified mixed methods research projects yet to be undertaken will utilise Nvivo software to conduct descriptive and topic coding centred upon the quality of the research using quality criteria developed from within the mixed methods research community.

Preliminary Findings and Discussion

The NCVER categories its research funding programs under five key themes: *Students and Individuals*; *Teaching and Learning*; *Industry and employers*; *VET system* and; *VET in context*. All five themes have what will be referred to as level 2 themes. Figure 1 provides a visual depiction of the quantity of research projects funded under each of the five themes from 1992-2010.

Figure 1: NCVET research funding 1992-2010 as per research theme

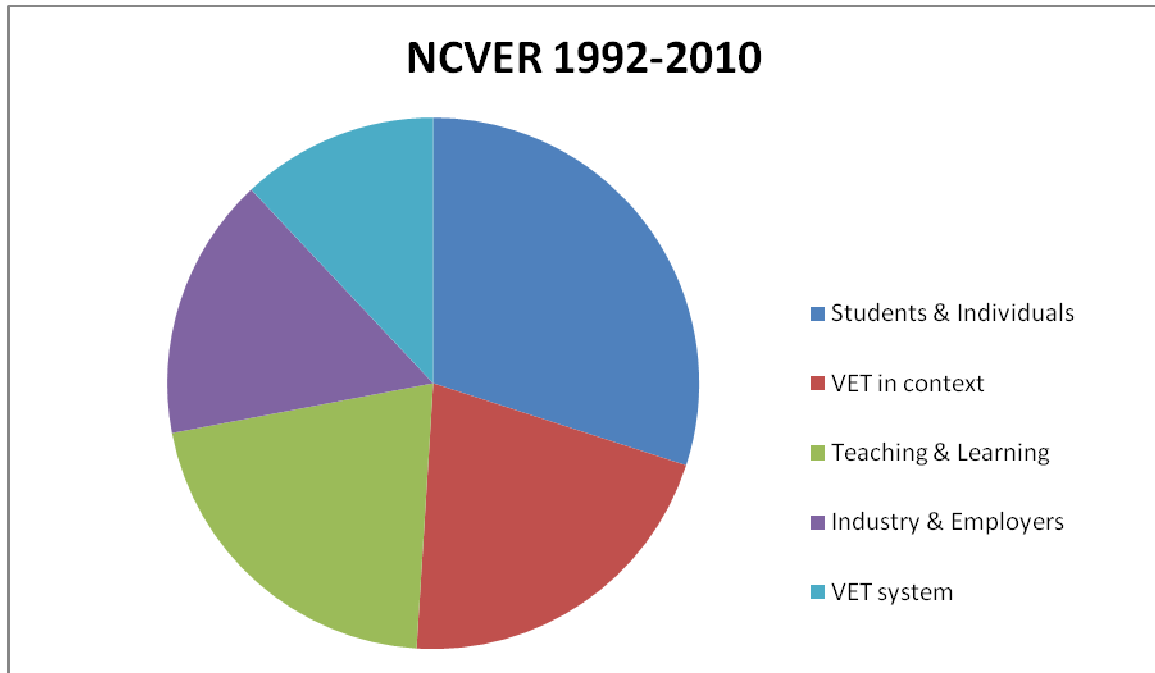


Figure 2 provides a visual representation of the sum of the number of projects funded under each research theme and the number of publications produced under each theme. The publications for the *Students and individuals* theme is the highest.

Figure 2: Project and publication frequencies from the five research themes 1992-2010

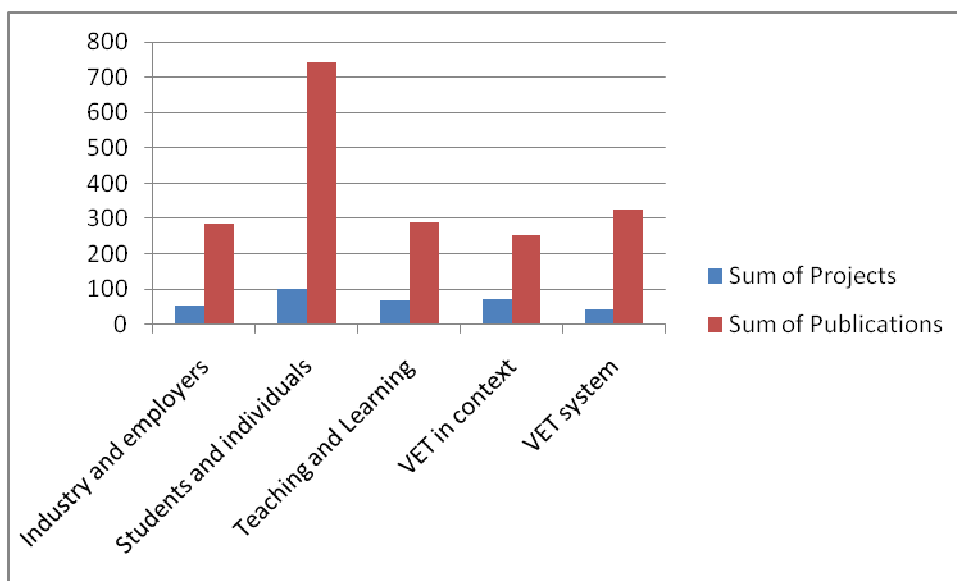


Table 1 provides frequencies for the number of funded research projects under each research theme for the period from 1992-2010. The average number of publications per research

projects has been calculated. Average publication rates for the *VET system* and the *Students and individuals* themes are the highest. This may have implications for research dissemination and adoption.

Table 1: Total NCVET research projects funded 1992-2010

Research Themes	Number of Projects	%	Number of Publications	%	Average pubs. to projects
Students and individuals	99	30	743	39	7.5
VET in context	71	21	254	14	3.5
Teaching and learning	68	21	288	15	4.2
Industry and employers	53	16	285	15	5.3
VET system	41	12	324	17	7.9
TOTAL	332	100%	1894	100%	

As can be seen from Table 1 the theme with the most funded research projects is *Students and individuals* followed by *VET in Context* and *Teaching and learning*. The largest percentage of publications is attached to the theme with the most funded projects (*Students and individuals*) however, the average rate of publications to projects is the highest for the theme with the least number of funded projects, *VET system*, followed by the theme with the most funded projects, *Students and individuals*.

The following five tables (Tables 2-6) provide descriptive statistics on funding under each main themes level 2 themes. Table 2 provides a breakdown of the number of research projects funded under the *Students and individual* theme. The Level 2 theme with the highest number of research projects is *Learner groups* followed by *Careers and pathways*. The number of publications produced under the learner groups level 2 theme is substantial.

Table 2: Theme: Students and individuals

Level 2 theme	Projects	Publications
Learner groups	58	420
Careers and pathways	19	189
Student achievements and outcomes	15	105
General	7	29
TOTAL	99	743

Table 3 provides a breakdown of the number of research projects funded under the *VET in context* theme. The Level 2 theme with the highest number of research projects is *Economic aspects of VET* followed by *Social issues*.

Table 3: Theme: VET in Context

Level 2 theme	Projects	Publications
Economic aspects of VET	18	42
Social issues	13	29
Cross sectoral issues	9	33
Regional issues	9	24
International aspects of VET	6	45
General	6	17
Contribution to innovation	4	13
Work changes	2	36
Lifelong learning	2	13
Environmental issues	2	2
TOTAL	71	254

The socio economic aspects of VET in context has been the most funded of the level 2 themes however the publications are highest for International aspects of VET.

Table 4 provides a breakdown of the number of research projects funded under the *Teaching and learning* theme. The Level 2 theme with the highest number of research projects is *Literacy and numeracy* followed by *Learning*.

Table 4: Theme: Teaching and learning

Level 2 theme	Projects	Publications
Literacy numeracy	29	47
Learning	10	33
VET practitioners	9	43
Teaching and learning delivery	7	59
Student assessment	6	22
General	3	20
Generic skills	2	26
Quality of teaching and learning	1	22
Competency based training	1	16
TOTAL	68	288

Although the Literacy numeracy level 2 theme has been funded the most the highest publications are attached to the teaching and learning level 2 theme.

Table 5 provides a breakdown of the number of research projects funded under the *Industry and employers* theme. The Level 2 theme with the highest number of research projects is *Investment in training* followed by *Industry and employer views*.

Table 5: Industry and Employers

Level 2 theme	Projects	Publications
Investment in training	11	30
Industry and employer views	10	36
Specific industries	6	71
General	6	25
Skill shortages	5	34
Existing workers	4	9
Training within the enterprise	3	28
Industry organisations	3	4
VET/Industry partnerships	2	11
Group training	2	5
Specific occupations	1	22
Small business		10
TOTAL	53	285

Investment in training and industry and employer views have been funded the most however the publications are highest for Specific industries.

Table 6 provides a breakdown of the number of research projects funded under the *VET system* theme. The Level 2 theme with the highest number of research projects is *Funding and financing* followed closely by *VET providers* and *VET system performance*.

Table 6: Theme: VET System

Level 2 theme	Projects	Publications
Funding and financing	7	18
VET providers	6	54
VET system performance	6	34
General	5	52
Apprenticeships and traineeships	5	38
VET workforce	4	41
Policy and reform	3	44
Training packages	3	7
VET in schools programs	1	14
Structure and governance	1	6
Management		8
Quality assurance		5
States and territories		3
TOTAL	41	324

This is the main theme with the least number of funded projects and some level 2 themes have not had any projects funded. Publications are highest for VET providers and general level 2 themes.

Preliminary findings for two of the five main research themes (*Students and individuals* and *Teaching and Learning*) in relation to the gender of the principal researcher and the “Approach” taken to the research is reported in Tables 7 and 8. Please note that for the research theme *Students and individuals*, projects from one of the Level 2 themes (*Learner groups*) are yet to be analysed and this represents over one half of the total number of projects from this main theme. Basic demographics of the principal researcher have been collected however only gender is presented in this paper. These demographics will be analysed against methodological and main theme preferences and frequency of receipt of funding.

Table 7: Theme: Students and individuals

Level 2 theme	Projects	Gender of PR	Approach
Careers and pathways	19	8 Female 11 Male	QUANT (4) QUAL (5) MM (3) Case Study (1) Develop framework (1) Lit review, data gathering & analysis (4) Not stated (1)
Student achievements and outcomes	15	3 Female 12 Male	QUANT (5) QUAL (4) MM (2) Data analysis (2) Literature review (1) Not stated (1)
General	7	3 Female 4 Male	QUANT (2) QUAL (1) MM (2) Surveys (2)
TOTAL	41 100%	14 Female 34% 27 Male 66%	QUANT (11) QUAL (10) MM (7) Lit review, data gathering & analysis (4) Surveys (2) Data analysis (2) Not Stated (2) Case Study (1) Literature review (1) Develop framework (1)
**Learner groups	58		

****Analysis not completed for this level 2 theme to date**

Quantitative approaches are the most frequent (n=11) closely followed by qualitative approaches (n=10) and mixed methods (n=7). None of the seven mixed methods projects explicitly mentioned they were “mixed methods” but described the use of both a qualitative and quantitative methods. Of the 2 projects which did not state the “Approach”, one commenced in 1999 and the other in 2009.

Two thirds of the principal researchers are male and one third female for this theme. This may change when the gender of principal researchers is calculated for the 58 projects under the level 2 Theme learner groups. It is interesting to note that two female principal researchers had been funded for two projects and three male principal researchers had been funded for two projects each across these level 2 themes.

The Australian Research Centre (ARC) noted that in terms of early career researchers (ECR) applicants for ARC Discovery Project grants from 2001-2009 there was a gender imbalance:

Of further concern has been the trend that female researchers within the ECR cohort have been significantly less successful than male ECRs, and significantly less successful than male researchers overall. The participant success rate for females on ECR-only proposals over the nine year period is 16.5 per cent compared to males at 19.9 per cent, a difference of 3.4 percentage points... The overall participant success rate in Discovery Projects for the nine year period is 25.8 per cent, which is 9.3 percentage points higher than females on ECR-only proposals (ARC, 2010, p.14).

The study also found that female researchers perform similarly to their male counterparts 15 years out from being awarded their PhD and that the numbers of female researchers is small:

Although retention rates for female researchers is generally poor, for those that remain in a research career, success rates improve until a point 15 years from PhD and from then on females achieve very similar levels of success as males. At this point however the total number of female researchers is small (ARC, 2010, p. 15).

This study will be unable to estimate the length of time since the completion of a PhD for those researchers awarded NCVET funds however, the gender analysis may provide some insights into the gender mix of Australian VET researchers who have been successful in being awarded NCVET grants.

Table 8 contains the gender breakdown and “Approaches” for the main research theme: *Teaching and learning*. Projects from two of the nine level 2 themes (*Literacy and numeracy* and *Learning*) are yet to be analysed.

Table 8: Theme: Teaching and learning

Level 2 theme	Projects	Gender of PR	Approach
VET practitioners	9	4 Female 5 Male	QUAL (3) Action research (2) Adult Literacy project (2) Case Studies (1) Not stated (1)
Teaching and learning delivery	7	6 Female 1 Male	QUAL (4) Adult Literacy Project (1) Not stated (2)
Student assessment	6	2 Female 3 Male 1 not stated	QUAL (1) Case studies (1) Desk research (1) Not stated (3)
General	3	3 Female 0 Male	QUAL (1) Not stated (2)
Generic skills	2	0 Female 2 Male	Search conferences (1) Not stated (1)
Quality of teaching and learning	1	1 Female 0 Male	Not stated (1)
Competency based training	1	0 Female 1 Male	Survey (1)
		16 Female 55.5% 12 Male 41.5%	Not Stated (10) QUAL (9) Adult Literacy project (3) Action research (2) Case Study (2) Search conferences (1) Survey (1) Desk research (1)
TOTAL	29 100%		
**Literacy numeracy	29		
**Learning	10		

***Analysis not completed for these Level 2 themes to date*

In terms of gender of the principal researcher females represent 55.5% and males 41.5%. This may change when the gender of principal researchers is calculated for the 39 projects under the level 2 themes of *Literacy numeracy* and *learning groups*. There appears to be a dominant use of qualitative approaches and no quantitative or mixed methods approaches listed. There is also a significant proportion of projects which have not stated their “Approach”. Of the 10 projects which did not state the “Approach”, 3 commenced in 2000, 2 commenced in 2002 and 5 commenced in 2003. The omission of a stated methodological “Approach” in the project summary documentation is telling in itself.

Further analysis planned

This paper reports the preliminary findings of this large undertaking and will now describe the full analysis that is planned. Each project under each of the five main research themes

will be coded as either: In House or; Managed Research Program. The year the project was funded, the approach and methodology as described on the project description page will be coded and basic demographics of each principal researcher will be coded. This will include the allocation of an identity code for each individual principal researcher, gender and organisation/affiliation. The actual amount of funding is not available from the project description summaries and will therefore not be analysed. It is hoped this further analysis will provide a methodological scan of the research design and methodologies utilised in research across these five broad research themes and level 2 themes. Particular attention will then be paid to those using mixed methods and it is envisaged that the findings will add to a small but growing research activity within the mixed methods movement that has begun to analyse the quality, adoption and acceptance of mixed methods in government funded research.

Conclusion

The VET research funded by NCVET in the past nineteen years (1992-2010) has been preliminarily analysed in terms of frequencies of funded projects across two of the five main themes and the majority of the corresponding level 2 themes. No substantial conclusions can be made as yet although this preliminary analysis does indicate that for three of the four level 2 themes for the main theme of *Students and individuals*, there is almost an equal use of quantitative and qualitative approaches and that mixed methods (although not explicitly stated as such) is not far behind in terms of frequency. There also seems to indicate a gender imbalance in terms of principal researchers with two thirds being male. For eight of the ten level 2 themes for the main theme of *Teaching and Learning* there is a dominance of qualitative research and a high rate of approaches not stated. No quantitative or mixed methods research approaches were coded for these level 2 theme projects. There is a more balanced gender ratio in terms of principal researchers for this theme with just over one half (55.5%) being female.

Further analysis and a deeper investigation into the methods utilised and in particular the use of mixed methods is planned. As noted by Plano Clark (2010) this type of analysis provides evidence of the quality, prevalence and adoption of mixed methods across a discipline and within an Australian context and may be an indicator of either the research funding inhibitor or stimulus effect on mixed methods referred to by Creswell (2010).

The findings from this large study will help to inform the VET based research community and the mixed methods research community about the methodological approaches which are being funded under the NCVET in house and NVETRE programs, across a nineteen year period and five main research themes. The study will provide data on the openness of NCVET to fund emergent methodological approaches, the level of diversity in methodological choices and may indicate the level of methodological innovation or otherwise within the broad methodological categories (QUANT and QUAL) and across them (MMR). The study will also examine the basic demographics of principal researchers and may shed some light on gender balance and an issue brought up by the Review of the National Centre for Vocational Education Research Ltd Research and Services Report (DEST 2006). Namely, that there was some concern in the VET sector of the over reliant nature of the research programme on a number of university researchers, despite NCVET working actively to encourage wide participation of researchers. This concern led the review to recommend:

Recommendation 11: Broad participation by researchers

NCVER should monitor the research grants programme to ensure that funding guidelines support broad participation by researchers in diverse institutional circumstances (DEST, 2006, p. 6).

The study will assist the VET research community to reflect back on nineteen years of funded research and to hopefully gain some insights into lessons for the future.

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