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# Quality frameworks & procedural checklists for mixed methods research

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# AIM

- Overview of research quality criteria in quantitative and qualitative research before presenting a synthesis of quality frameworks and procedural checklists emerging from the field of mixed methods research.
- Procedural checklists and quality frameworks are useful pedagogic tools for ECRs
- Helpful to established researchers: teach research methods; examine theses; review papers etc...

# What constitutes good research?

- The concept of **rigour** is often referred to along with theoretical and methodological robustness when reference is made to making some form of evaluation or critique of research as process (act) and research as product (publication).
- Andrews and Halcomb (2009, p. xvi) define rigor as “*The thoroughness, accuracy, confirmability and ethical soundness of all aspects of a study’s design*”.

# This paper.....

The potential utilisation of quality criteria for **3 sets of stakeholders** in the VET research community:

- higher degree research students;
- early career and established researchers
- research funding bodies.

Brief comparison of the criteria for evaluating research funding proposals from three **VET relevant funding bodies**:

- NSW Department of Education and Training (DET)
- National Centre for Vocational Education Research (NCVER)
- Australian Research Council (ARC).

Commonly agreed quality criteria of **quantitative (QUANT)** research

Multiple stances taken by **qualitative (QUAL)** researchers in terms of quality criteria

Quality criteria and procedural checklists **mixed methods research (MMR)**



# Use of Quality Frameworks: HDR Candidates

- Guidelines and standards for the design, conduct and reporting of research (*process*)
- Guidelines for critiquing research (*process*) & literature (*product*)
- Tool for reflexivity-critical self reflection
- Guidance planning & production of research products (conference papers; articles; dissertations; reports)

# Use of Quality Frameworks: ECR & established researchers

- Pedagogic tool for teaching research methodology
- Assist in roles such as: reviewing conference papers, journal articles and research reports
- Guide to thesis examination
- Self reflective tool for own research and research reporting
- Assist in writing & judging research grant applications

# Use of Quality Frameworks: Research funding bodies

- Writing research funding grant descriptions/selection criteria/call for tenders
- Assessments of research proposals and funding applications
- Evaluate research reports and publications
- Judge the use/practical value/ relevance of research

# Criteria for evaluating research funding proposals

## **3 VET relevant funding bodies:**

- NSW Department of Education and Training (DET)
- National Centre for Vocational Education Research (NCVER)
- Australian Research Council (ARC).

# NSW DET

*Criteria for Quality Research*, in which the department gives equal value to both quantitative and qualitative methods and has listed criteria for judging the quality of research under two main areas:

- *Methodological and theoretical robustness*
- 12 main dot points
- *Value and impact*
- 3 main dot points

# NVETRE

**Table 1: NVETRE Funding Criteria**

<b>Essential Criteria</b>	<b>Desirable Criteria</b>
<ol style="list-style-type: none"><li>1. Proposed research program</li><li>2. Research questions, methodology and timeframe</li><li>3. Research experience, expertise &amp; related research</li><li>4. Project quality assurance and risk management</li><li>5. Value for money</li></ol>	<ol style="list-style-type: none"><li>1. Research team composition and skills</li><li>2. Value adding and dissemination</li><li>3. Data analysis skills for research programs proposing a large quantitative component</li></ol>

*Source: NCVET (2010)*

# ARC

**Table 2: Selection Criteria for ARC Linkage Project proposals commencing in 2011**

<b>Criteria</b>	<b>Description</b>	<b>Weighting</b>
Investigators	<ul style="list-style-type: none"> <li>a. Research opportunity and performance evidence.</li> <li>b. Capacity to undertake and manage the proposed research.</li> </ul>	20%
Proposed project content	<ul style="list-style-type: none"> <li>a. Significance and innovation (25%)</li> <li>b. Approach and Training (20%)</li> <li>c. National Benefit (10%)</li> </ul>	55%
Nature of the alliance, commitment from Partner Organisation(s) and Budget	<ul style="list-style-type: none"> <li>a. Is there evidence that each of the Partner Organisation(s) is genuinely committed to, and prepared to collaborate in, the research project?</li> <li>b. Will the proposed research encourage and develop strategic research alliances between the higher education organisation(s) and other organisation(s)?</li> <li>c. Value for money and budget justification.</li> </ul>	25%

*Source: ARC (2010)*

# HISTORICAL DEVELOPMENT OF QUALITY CRITERIA

## QUANT

- Validity
- Reliability
- Replicability
- Generalisability

## QUAL

- 3 stances:
  - 1. Use QUANT criteria
  - 2. Use QUAL criteria
  - 3. Can't use pre determined criteria for QUAL research

## MMR

- Beyond Triangulation
- Sale & Brazil (2004)
- GRAMMS (2008)

# Quality criteria in quantitative research

Majority of the discussion on quality frameworks in quantitative research is **implicit**, rather than explicit and is often referred to in the products of research as part of the stages of the research process (e.g, sampling and measures).

Most research methods textbooks will refer to the concepts of **validity** and **reliability** which are rooted in the **positivist** and quantitative traditions of “scientific method

# Commonly agreed quality criteria in quantitative research

**Table 3: Quality criteria for judging quantitative research**

<b>Criteria</b>	<b>Description</b>
Validity	The degree to which a research tool measures what it is supposed to measure
Reliability	The degree of consistency with which a research tool measures what it is supposed to measure
Replicability	The same interpretation will be drawn if the study is repeated by different researchers with different respondents following the same methods
Generalisability	The degree to which we can infer the findings from the research sample to the population

*Source: Andrews and Halcomb (2009)*

# Quality criteria in qualitative research

*“...the rise of qualitative research over the last 25-30 years represents one of the reasons for the growing interest in research quality criteria because it is widely assumed that whereas quality criteria for quantitative research are well known and widely agreed, that is not the case for qualitative research”*

(Bryman, Becker and Sempik 2008, p. 262).

## 3 broad stances for judging qualitative research:

- QUAL research should be judged according to the same criteria as quantitative research (reliability & validity)
- QUAL research should be judged using its own criteria (Lincoln and Guba 1985)
- Appropriateness of any predetermined criteria for judging qualitative research is questioned (Rolfe, 2006; Sandelowski & Barroso, 2002).

# First stance Johnson (1997)

In qualitative research 3 types of validity can be discussed:

1. **Descriptive validity**-*factual accuracy of the account as reported by the qualitative researcher*
2. **Interpretive validity**- *the degree that the participants' viewpoints, thoughts, intentions, and experiences are accurately understood and reported by the qualitative researcher*
3. **Theoretical validity**: *the degree that a theory or theoretical explanation developed from a research study fits the data and is, therefore, credible and defensible*

# Arguments against applying traditional QUANT criteria to QUAL research

*Scientific discipline or rigor is valued because it is associated with the worth of research outcomes and studies are critiqued as a means of judging rigor. Qualitative research methods have been criticized for lack of rigor. However, these criticisms have occurred because of attempts to judge the rigor of qualitative studies using rules developed to judge quantitative studies. Rigor needs to be defined differently for qualitative research since the desired outcome is different*

(Burns & Grove, 2005, p. 55)



# Second stance: Common criteria for QUAL

Definition of **trustworthiness** “the degree of confidence that the researcher has that their qualitative data and findings are credible, transferable and dependable” (Andrews and Halcomb 2009, p. xvii)

**Trustworthiness** was a term proposed by Lincoln and Guba (1985) and is often referred to as a ‘goodness of fit’ criteria which parallels the term rigor in quantitative research.

A set of four criteria to determine the trustworthiness of QUAL research:

- *Credibility*
- *Transferability*
- *Dependability*
- *Confirmability.*

# 4 criteria of Trustworthiness

- **Credibility** (in preference to internal validity) is one of the most important factors in establishing trustworthiness and is about determining how congruent the findings are with reality.
- **Transferability** (in preference to external validity/generalisability) requires the researcher to provide sufficient data and context to enable the audience to judge whether the findings can be applied to other situations and contexts.
- **Dependability** (in preference to reliability) refers to having sufficient details and documentation of the methods employed so that the study can be scrutinised and replicated.
- **Confirmability** (in preference to objectivity) refers to ensuring that the study's findings are the result of the experiences of the informants rather than the preferences of the researcher(s) and can be achieved through an audit trail of the raw data, memos, notes, data reduction and analysis.

# 4 criteria of Trustworthiness

**Table 4: Quality Criteria for Qualitative Research**

<b>Credibility</b>	<b>Transferability</b>	<b>Dependability</b>	<b>Confirmability</b>
Prolonged engagement of site	Identical elements	Multiple data collection methods-triangulation	Use triangulation
Persistent observation	Theoretical/ purposive sampling		Practice reflexivity
Peer briefing Triangulation	Thick description		Confirmability audit through member checking
Member checks			

*Source: Guba and Lincoln (1985)*

# Some QUAL research developed own criteria

## Grounded theory

Charmaz (2006) proposes four quality criteria for judging grounded theory:

- credibility
- originality
- resonance
- usefulness

# Third stance

Sandelowski and Barroso (2002) and Rolfe (2006) question the appropriateness of any predetermined criteria for judging qualitative research as there is no unified qualitative research paradigm.

*“We need to either acknowledge that the commonly perceived quantitative-qualitative dichotomy is in fact a continuum which requires a continuum of quality criteria, or to recognize that each study is individual and unique, and that the task of producing frameworks and predetermined criteria for assessing the quality of research studies is futile” (Rolfe, 2006, p. 304).*

# Mixed methods research (MMR)

Teddlie and Tashakkori (2010, p. 5) define mixed methods research (MMR) as:

- *The broad inquiry logic that guides the selection of specific methods and that is informed by conceptual positions common to mixed methods practitioners (e.g., the rejection of “either-or” choices at all levels of the research process). For us, this definition of methodology distinguishes the MMR approach to conducting research from that practiced in either the QUAN or QUAL approach.*

# Creswell and Plano Clark (2007) time periods in the evolution of MMR

Formative period (1950s - 1980s)

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graph TD; A[Formative period (1950s - 1980s)] --> B[Paradigm debate period (1970s - late 1990s)]; B --> C[Procedural development period (late 1980s - 2000)]; C --> D[Advocacy as a separate design period (2000+).];
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Paradigm debate period (1970s - late 1990s)

Procedural development period (late 1980s - 2000)

Advocacy as a separate design period (2000+).

# Evolution of MMR CRITERIA

## Triangulation

- Use of triangulation in QUAL to meet quality criteria
- Critiques: linear and one dimensional

## Sale & Brazil (2004)

- Truth Value
- Applicability
- Consistency
- Neutrality

## O’Cathain, Murphy & Nicholl (2008)

- GRAMMS
- 6 items

# MMR- Sale and Brazil (2004)

- Truth value
- (QUAL-Credibility vs. QUANT-Internal validity)
  
- Applicability
- (QUAL-Transferability vs. QUANT-External validity)
  
- Consistency
- (QUAL-Dependability vs. QUANT-Reliability)
  
- Neutrality
- (QUAL-Confirmability vs. QUANT-Objectivity)

# Sale & Brazil (2004)

QUANT	QUAL	MMR
Internal validity	Credibility	Truth value
External validity/ generalisability	Transferability/ Fittingness	Applicability
Reliability	Dependability	Consistency
Objectivity	Confirmability	Neutrality

# Cooksey (2008)

*'In the social and behavioural sciences, there is a continuing debate about the criteria one should use to judge the research quality, impact and contribution. The crux of this debate has centred on the different meanings held for the criteria of 'validity' and 'generalisability' within various research traditions or paradigms ... Meanings of 'internal validity' and 'external validity', two of the dominant criteria in the positivistic or 'normative' paradigm, have been **borrowed, distorted and recast** to fit different expectations and paradigm assumptions'*

(Cooksey 2008, p. 4)

# GRAMMS-O'Cathain, Murphy & Nicholl (2008)

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

# Procedural checklists for MMR

**Table 6: Procedural checklists for mixed methods research**

<b>Collins and O’Cathain</b>	<b>Andrews and Halcomb</b>
<b>Research Formulation Phase:</b> <ol style="list-style-type: none"> <li>1. Importance of a definition</li> <li>2. Importance of a mental model for mixing</li> <li>3. Utilizing typologies of designs</li> <li>4. Selecting the reason, rationale, and purpose for mixing</li> <li>5. Determining the research question</li> </ol>	Planning a mixed methods study:  Purpose and relevance Theoretical orientation Research questions
<b>Research Planning Phase:</b> <ol style="list-style-type: none"> <li>6. Selecting a mixed methods design</li> <li>7. Determining the sampling design</li> </ol>	Sampling strategy Methods of investigation
<b>Research Implementation Phase:</b> <ol style="list-style-type: none"> <li>8. Collecting data</li> <li>9. Conducting data analysis</li> <li>10. Legitimizing inferences and formulating generalizations</li> </ol>	Methods of analysis

*Sources: Collins and O’Cathain (2009, p.2-6) and Andrews and Halcomb (2009, p. 35)*

# Conclusion-key messages

- Several approaches to addressing the quality of research and quality criteria can range from commonly agreed to sets of criteria for mono-method quantitative positivist traditions, to a much more contested terrain within qualitative research.
- The manner in which research funding bodies assess quality also ranges and has been noted.
- 3 main stances taken in qualitative research and hinted at quality criteria that has been developed for specific qualitative methodologies (e.g, for grounded theory).
- Mixed methods is a relatively recent and emerging movement and yet members of the mixed methods research community have begun to develop quality criteria and frameworks to enable the evaluation of a mixed methods study in terms of process (act) and product (publication).

# Conclusion-key messages

Those engaged in the teaching of research methods and/or of building research capacity need to become familiar with the emerging mixed methods movement and its associated theoretical underpinnings, designs, nomenclature and the quality frameworks and criteria that is being developed within.

Cameron (2010) methodological scan of VET based research, the most dominant approaches were qualitative (45%) and mixed methods (15%). This is evidence in itself of the need to embed quality frameworks and criteria into research training and capacity building.



# Conclusion-key messages

- VET researchers need to be aware of this array of quality criteria and they need to acknowledge this when choosing and arguing for a set of criteria that they apply to their own research
- Those in charge with building research capacity in the VET research community be cognisant of this array of criteria and the need to impart this knowledge to novice VET researchers.

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