

Sound evidence for what works in vocational education and training:

How we undertook a systematic review of research about skill development for mature age workers

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How did we come to do a systematic review of research?

- We learnt about the model from overseas
- Policy makers saw potential in this model of secondary research
- There was great interest in the VET sector in skill development for mature age workers

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EXPECTED BENEFITS

- Researchers and policymakers working together
- Critical assessment of body of research on question of significance to policymakers
- Greater awareness of what makes for quality research
- An aid and replicable infrastructure for further systematic reviews

What is a systematic review?

A thorough review and synthesis of evidence from an existing body of research to answer a clearly formulated question, using a transparent and rigorous framework

Steps of our systematic review

1. Identify the question
2. Develop the framework for a review (see handout)
3. Search for all relevant research
4. Select studies to be included
5. Appraise selected studies
6. Synthesise the appraised work to answer the question
7. Present findings to stakeholders
8. Disseminate the results

Steps 1 & 2: Question & Framework

What we did

- Established steering group and wider advisory group
- Identified question through consultation (population, intervention, outcomes)
- Developed detailed framework through consultation (meaning of terms, inclusion criteria)

What we learnt

- Importance of wider consultation – allow enough time

We confirmed:

- Importance of a question that is suitable for a systematic review
- Importance of clear definitions and of criteria for inclusion
- Usefulness of identifying population, intervention and outcomes

Step 3: Search for all relevant research

What we did

- Selected databases and a single person searched for all material against criteria, using wide range of search terms
- Found over 2000 initially, then reduced number to 85 (some added subsequently bringing it to 91)
- Recorded search details
- Entered details of the 91 studies in the SYSREV database

What we learnt

- Two people are needed for the searching process
- We must allow enough time to check references in the studies found
- It is useful to store the information in a structured database, for ease of retrieval and reporting

Step 4: Select studies to be included

What we did

- Reduced the set of 91 to 34 studies included for in depth review, against population, interventions and outcomes, based on the abstracts
- Recorded reasons for exclusion in the database
- Circulated the lists of included and excluded studies to advisory groups for comment

What we learnt

- We need to be stricter about excluding studies that do not research the population, intervention and outcomes and the link between them
- While it is useful to consult to ensure no key studies are missed, the final decision needs to be made by the project team

Step 5: Appraise the selected studies

What we did

- Developed reviewers' template (including quality criteria) and tested with internal pilot
- Selected and trained 20 external reviewers (tested and altered template)
- Allocated studies to pairs of reviewers, spreading allocation as widely as possible
- Provided reviewers with electronic template, and guidelines
- Kept in touch with the reviewers throughout the process and sought their feedback on the process

What we learnt

- The training and guidelines are essential
- Reviewers provided valuable input in the development of the template and quality criteria
- Frequent communication is essential
- Reviewers should be allocated studies to some extent according to their expertise (eg quantitative analysis)
- We confirmed that it is best for no pair of reviewers to do more than one study together

Step 5: Appraisal of relevance and quality

Assessment criteria for Weight of evidence A (relevance)

Population (i.e. mature aged)	L M- M M+ H
Intervention (i.e. skill development activities)	L M- M M+ H
Outcomes (i.e. improved attachment to the labour market or productivity)	L M- M M+ H
Overall Weight of Evidence A (relevance)	L M- M M+ H

Assessment criteria for Weight of evidence B (quality)

In this research study:	
Is the evidence valid?	L M- M M+ H
Is the evidence reliable?	L M- M M+ H
Is the evidence authentic?	L M- M M+ H
Is the evidence sufficient?	L M- M M+ H
Is the evidence current today?	L M- M M+ H
Overall Weight of Evidence B (quality)	L M- M M+ H

Step 5. What did we find?

	Weight of evidence B (Quality of findings)				
	H	M+	M	M-	L
Weight of evidence A (Relevance of substance of the study to the Review question)					
H	91		45		
M+	2, 90	85	74		
M			68	4, 49, 89	18, 33
M-	78, 81	44, 57, 73	17, 83, 88	6, 29, 36, 87	38
L	86		10, 14	66, 70, 77	20, 43

Legend	
	= scope for inclusion in synthesis
n	= main question evidence
n	= Barriers and facilitators evidence

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Step 6: Synthesise the appraised work to answer the question

What we did

- Appointed one of our reviewers as a synthesiser
- Identified 7 key studies rating medium to high for relevance and quality
- Identified 7 studies rating at least medium for quality and addressing barriers or facilitators (3 were also key studies)
- Identified key findings by synthesising these 11 studies

What we learnt

- It was necessary for the synthesiser to return to the full text of the core studies, not just rely on the reviewers' extraction
- The synthesiser should be appointed early enough to be involved in the development of the framework
- The project team and synthesiser needed to moderate the ratings given by the reviewers in one case

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Steps 7 and 8: Present findings and disseminate results

What we will do

- Publish report in NCVER's standard format
- Provide full details of the process on the web, for transparency
- Present to conferences and seminars and provide briefings
- Prepare an associated "How to do it" publication, for our own and others' use

Forthcoming publications

- *Mature aged: improving attachment to the labour market through skill development activities: a report from a pilot systematic review of research*
- *An aid to undertaking systematic reviews of vocational education research in Australia*

(Will be available from www.ncver.edu.au)

What were some key findings?

- Evidence to answer the question:
*"What evidence is there that skill development activities for the mature aged lead to:
(i) improved attachment to the labour market?
(ii) improved productivity?"*
- Evidence about barriers and facilitators:
"Also to be reported in the findings are the factors (such as attitude) that have an important bearing on these key outcomes, either as barriers or facilitators"

What will we do in future systematic reviews?

Follow essentially the same steps as before, focussing particularly on:

- Establishing ongoing Steering Group
- Appointing expert synthesiser at the beginning of the reviews
- Appointing two searchers and allowing enough time
- Including a screening stage and apply the inclusion/exclusion criteria rigorously
- Making use of our trained external reviewers in subsequent reviews
- Continuing the thorough support and communication with reviewers, maintaining guidelines
- Making use of our database to store reviewers' coding, to use in synthesis

Final framework for the systematic review of research: Skills development activities that keep the mature aged in paid work

The framework for the NCVER/ANTA systematic review of research includes:

- the policy question(s) to be addressed by the review
- the definitions of the terms in the question(s)
- the criteria to be used to select research for inclusion in the review
- the coding to be used for recording the findings from the included studies
- the criteria for appraising the quality of the included studies

All components of the framework must be considered in conjunction with each other when carrying out the review.

A list of the steering group members and an outline of the review process are provided at the end of this framework document for reference.

The policy question

The question developed by the steering group to be addressed in this review is:

What evidence is there that skill development activities for the mature aged lead to:

- improved attachment to the labour market?**
- improved productivity?**

The steering group agreed that this question needs some unpacking. Implied in the review question, and to be reported in the research findings and final report, are the issues of which skill development activities work, when and for whom. Also to be reported in the findings are the factors (such as attitude) that have an important bearing on these key outcomes, either as barriers or facilitators, and the implications for policy, practice and research from these findings (see coding of findings section).

The definitions of the terms in the questions

The terms in the question as defined by the steering group are as follows:

Mature aged

The starting brief contained the term ‘mature aged worker’, but after discussion by the steering group the population was defined more broadly as ‘mature aged’.

Mature aged refers to all people 45 years and over. It includes all those who desire work, or who might desire work if their skills were more suitable or if there were more opportunity.

Skill development activities

Skill development activities are defined as 'deliberate' general education or specific vocational activities undertaken to learn new skills or further develop skills related to work. 'Deliberate' in this context refers to the person knowingly participating in the skill development activity, for example, an activity which has a predetermined plan and format designed to develop employment-related skills and competencies.

Skills development activities thus can include a structured (formal) learning activity such as undertaking an accredited or non-accredited course, or an informal learning activity such as self-directed learning, networking, coaching or mentoring, so long as it is predetermined or knowingly participated in.

Skill development activities may be initiated by self, employer or other (such as Job Network member).

Improved attachment to the labour market

Improved attachment to the labour market includes:

- increased labour force participation rate
- increased employment duration
- job retention or improved job security (no longer at risk of losing job)
- change of work role or new career following new interest (including self employment) (what's driving longer engagement with the labour market?)
- change in attitude to work, 'early retirement' or 'retrenchment' e.g. looking forward to continuing participation in paid work past 55 years.

Improved productivity

Improved productivity includes:

- increased wages
- promotion
- increased efficiency in processes and work output
- reduction in accidents and injuries to workers through improved health and safety.

Outcomes do not include participation in the voluntary sector.

Research selection criteria

The search strategy will involve hand and electronic searching (databases and websites), to select studies that:

- are in English (from Australia and overseas)
- are recent (from approximately the last 10 years)
- match keywords deemed relevant to the review question.

Note however, that research dealing with a population under 45 years will also be included where the research findings are relevant to improving attachment to the labour force for the matured aged. Similarly, while the research is likely to cover those up to 65 years, relevant research focussing on over 65 year olds will also be included.

All found studies will be recorded with reasons for any exclusion noted, such as because they do not answer the set question, or a study has been replaced by a primary research study on which it was based.

All included studies will undergo a further coding process as outlined below:

Coding of the findings from the included studies

As well as defining the question for the review, the steering group and others who provided feedback on drafts were concerned to ensure maximum value from the review by specifying how the findings of included research were to be recorded.

Findings from the included studies will be recorded and the studies coded by the reviewers within categories as suggested in Table1. Note that more than one code may apply, and some categories will be open-ended and more terms may be added as needed to code the studies systematically.

Table 1: Coding of the included studies

Item	Details
Bibliographic details, including: <ul style="list-style-type: none"> • title • author(s) • publication details • series • url 	Title, author(s), publication date and other relevant bibliographic details
Aims of the research	Brief description of study aims, including research questions and any hypotheses.
Study methodology (proposed and actual) <ul style="list-style-type: none"> • Textual description 	Brief textual description of the proposed methodologies for the study. Including details of the sample size, population and coverage. Any differences between the actual and proposed methods used will be noted.
Geographic location <ul style="list-style-type: none"> • Local (Australian) • State (Australian) • National (Australian) • International (one country, not Australia) • International (more than one country) 	Location the study covers
Time period <ul style="list-style-type: none"> • Date range, by year 	Time period the study covers
Mature age population <ul style="list-style-type: none"> • 45 to 65 • over 65 • under 45 but relevant to over 45 <i>Other terms may be needed, arising from the studies that are included.</i>	Size and nature of the mature aged population in the study. This will include the population from which the sample was drawn as well as the sample itself.

Item	Details
<p>Skill development activities (the 5 categories here will be further subdivided, as indicated by the examples)</p> <ul style="list-style-type: none"> • Provider (eg school, TAFE, higher education, adult and community education, private training provider, enterprise training) • Delivery (eg on-the-job training, off-the-job training, apprenticeship, traineeship, distance education, e-learning, in classroom, informal) • Field of education (ASCED categories)) • Level of qualification (AQF and non-AQF, eg Non-award, subject only, Cert I-IV, diploma, Bachelor degree or higher) • Duration (eg short-term, long term) <p><i>Other terms may be needed, arising from the studies that are included.</i></p>	<p>Description of skill development activities, to include but not be limited to: education sector, formal or informal, duration</p>
<p>Outcomes (the 2 categories here will be further subdivided, as indicated by the examples)</p> <ul style="list-style-type: none"> • Any changes in attachment to the labour market (eg in labour force participation, employment duration, job retention, job security, change of work role, change of career, change in work attitude, re-entry to labour market, move to or from self-employment) • Any changes in productivity levels (eg wages, promotion, demotion, efficiency, output, health and safety) <p><i>Other terms may be needed, arising from the studies that are included.</i></p>	<p>Description of the outcomes (in relation to attachment to the labour market and/or productivity) of the skills development activity</p>
<p>Barriers or facilitators</p> <ul style="list-style-type: none"> • Attitudes as barrier/facilitator • Other social/cultural factors as barrier/facilitator • Financial circumstances as barrier/facilitator • Health as barrier/facilitator • Disadvantage (equity group) as barrier/facilitator • Access to services (educational or other) as barrier/facilitator • Alternative opportunities as barrier/facilitator • Prior educational background as barrier/facilitator • Area of residence as barrier/facilitator <p><i>Other terms may be needed, arising from the studies that are included</i></p>	<p>Description of barriers/facilitators (to include how other factors might have impacted on the effectiveness of the skill development activities such as attitudes, financial circumstances, health, availability of alternative careers, or socio-economic context)</p>
<p>Findings</p>	<p>Findings as described by the author will be recorded</p>
<p>Expert comment</p>	<p>Relevant additional comments, for example, about the context of the study, supplied by a reviewer or other external expert.</p>

Appraisal of the included studies

To evaluate the studies, there will be two weights of evidence allocated to each study rated on a 5 point Likert scale.

Weight of evidence A: Reviewers will rate the **relevance of the particular focus of the study** for addressing the review question. (Considering the population, intervention and outcomes, as described in this framework, compared with those described in the study).

Table 2 Assessment criteria for Weight of evidence A (relevance)

	Rating				
Population i.e. mature aged	High	Medium+	Medium	Medium-	Low
Intervention i.e. skill development activities	High	Medium+	Medium	Medium-	Low
Outcomes i.e. improved attachment to the labour market or productivity	High	Medium+	Medium	Medium-	Low
Overall Weight of Evidence A (relevance)	High	Medium+	Medium	Medium-	Low

Weight of evidence B: Reviewers will rate the **quality of the study** in terms of the trust that can be put in its findings against the questions posed (considering the rules of evidence criteria: sufficiency, validity, reliability, authenticity and currency).

Table 3: Assessment criteria for Weight of evidence B (quality)

In this research study:	Rating				
Is the evidence valid?	High	Medium+	Medium	Medium-	Low
Is the evidence reliable?	High	Medium+	Medium	Medium-	Low
Is the evidence authentic?	High	Medium+	Medium	Medium-	Low
Is the evidence sufficient?	High	Medium+	Medium	Medium-	Low
Is the evidence current today?	High	Medium+	Medium	Medium-	Low
Overall Weight of Evidence B (quality)	High	Medium+	Medium	Medium-	Low

Note: Both weighting A (relevance/focus compared to review question) and weighting B (quality/reliability of the findings of the study) will be taken into account in preparing the final synthesis report.

Reporting

Full reporting will detail:

- number of studies found in the initial search
- number of studies excluded, and reasons for exclusion
- full details of results of appraisals of included studies.

The final synthesis phase will answer the review question by detailing the evidence (and weight) for skill development activities for the mature aged that lead to improved attachment to the labour market and/or improved productivity. It will state explicitly what skill development activities work, under what circumstances, and for which groups of the mature aged, noting barriers and facilitators, and detailing the implications for policy, practice and research.

Background

The National Centre for Vocational Education Research (NCVER) received funding from the Australian National Training Authority (ANTA) to undertake, for the first time, a systematic review of research for Australian VET policymakers on a question of policy salience. Systematic reviews in the field of education have been undertaken overseas since the late 1990s but this method has not previously been used in Australian education research. In the course of undertaking the review NCVER will also be developing a framework and capabilities for similar reviews.

The outcomes of the ANTA–NCVER systematic review of research project to be achieved by the end of 2004 are:

- a report of the systematic review of research into a key policy question that ANTA has specified is to be related to mature aged workers
- a replicable framework and infrastructure within which further systematic reviews of research can be conducted
- a report on the process of this systematic review of research.

In undertaking this review, NCVER is seeking a highly interactive relationship with Commonwealth, state and territory policy makers, and a network of VET researchers throughout the systematic review process. Consultation will ensure that this first Australian VET systematic review of research has current relevance to policy and decision-makers.

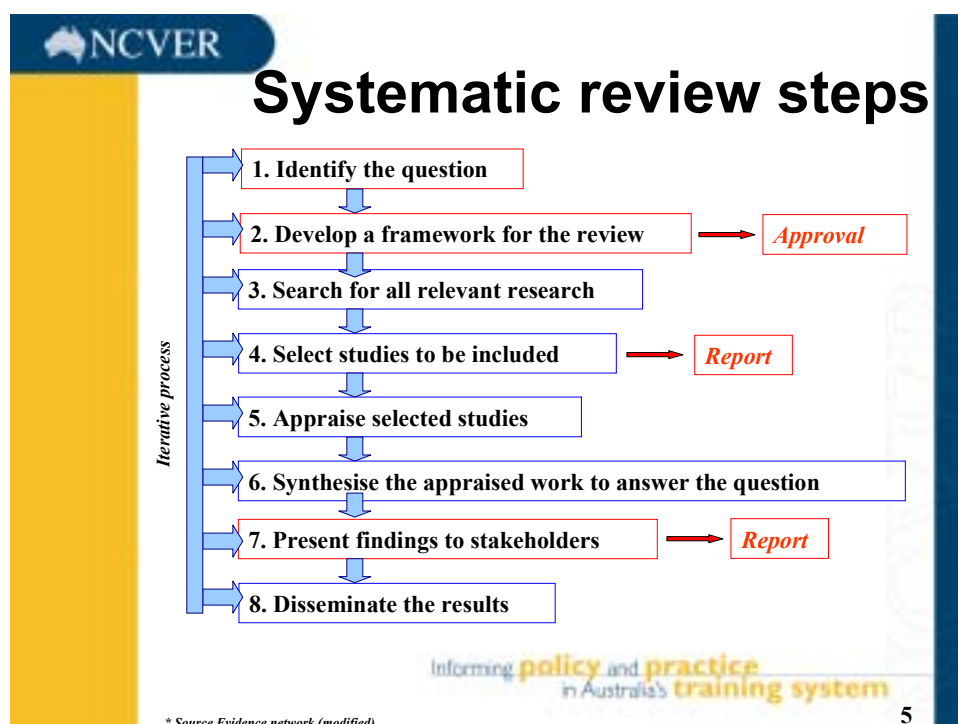
What does a systematic review of research involve?

A systematic review of research is a secondary research activity that locates all relevant existing material (published and unpublished) on a focused policy question. It evaluates this material for its information content, approach and robustness, concluding with a balanced and relevant synthesis of the findings.

A systematic review of research follows a structured framework, and is transparent in its approach, making clear the criteria and reasons why a study has or has not been included, and the basis for the judgment of its quality. Thus it provides an empirically based foundation for decision making.

The UK based Evidence for Policy and Practice Information and Coordinating Centre (EPPI-Centre) was established in 1993 to address the need for a systematic approach to the organisation and review of evidence-based work on social interventions. The EPPI-Centre developed model of systematic reviewing has been followed and adapted by the Learning and Skills Development Agency in the UK. In this project, NCVER will adapt the EPPI-Centre and other approaches to suit our purposes. The eight steps for this systematic review are outlined in the following chart.

Figure 1: Summary of the steps of a systematic review



* Source Evidence network (modified)

The systematic review steering group

Steering group personnel:

Tom Karmel, Chair	Managing Director, NCVER
Jim Davidson	Deputy Secretary, OTTE, Victoria
Michael Stevens	Deputy Secretary (VET Strategies), OPCET, Tasmania
Rebecca Cross	Branch Manager, Quality and Access Branch, DEST
Bill Martin	Associate Professor, National Institute of Labour Studies, Flinders University
John Whiteley	Manager, Planning, Research Planning & Reporting Division, ANTA
Diane McEwan	Assistant Secretary – Mature Age & VET Policy, Dept of Employment & Workplace Relations
Steve Balzary	Director-Employment & Training, Australian Chamber of Commerce & Industry (ACCI), ACT

Project personnel:

Kaye Bowman	General Manager, NCVER
Sarah Hayman	Manager, Information Services, NCVER (Secretariat)
Susan Dawe	Senior Research Fellow, NCVER
Alison Anlezark	Senior Research Fellow, NCVER

The reviewers

External reviewers

Cathy Down Richard Elvins Jane Figgis Jennifer Gibb Martha Kinsman Michael Long Diannah Lowry Peter Pfister Chandra Shah Lynne Stevenson Peter Thomson John Whiteley

Internal reviewers

Susan Dawe
Other NCVER research staff as required

Questions about the systematic review framework and process can be addressed to Sarah Hayman, Manager, Information Services, NCVER. Tel. 08 8230 8643, email sarah.hayman@ncver.edu.au