

**An Organisational Framework for Preparing and Maintaining
Systematic Reviews in Education¹
A Discussion Document**

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Introduction

The contribution of systematic reviews, meta-analyses and other types of research synthesis to substantive areas of social scientific inquiry such as education, criminal justice, and social policy and welfare is well documented (Glass, McGraw and Smith, 1981; Hunter, Schmidt and Jackson, 1982; Noblit and Hare, 1988; Kulik and Kulik, 1989; Hunter and Schmidt, 1990; Hedges, 1992; Lipsey and Wilson, 1993; Cooper, and Hedges, 1994; Schmidt and Hunter, 1995; Hall and Rosenthal, 1995; Petrosino, 1997; Slavin and Fashola, 1998). These issues and arguments hardly need repeating for participants attending the Inaugural Meeting of the Campbell Collaboration, or for those otherwise participating in the work of the Collaboration, though they have been reviewed elsewhere for those unfamiliar with this literature (Davies, 2000(b)).

This paper addresses a related, but different issue. That is, how does one organise and undertake systematic reviews of interventions in educational practice, policy and processes, given the diversity of substantive topics, methodologies, and groups of people who make up the learning community? This is an important strategic issue for evidence-based researchers and practitioners in the field of education, and one that has many organisational and procedural implications.

Educational Research

Educational research covers a wide range of substantive topics and formal theoretical approaches, using diverse methodologies, and focuses on a broad range of people from very young infants to mature adults and senior citizens. The concepts of lifelong learning and the 'learning society'

¹ For discussion at the Inaugural Meeting of the Campbell Collaboration, University of Pennsylvania, Philadelphia, USA, 24-25 February 2000

(Dearing, 1997) compound the problem in as much as they broaden even further the range of educational provision, and further diversify the types of people studying and learning at different stages of the life cycle and the educational system. Classifying educational activity, let alone educational research, is a busy and complex activity.

The nature of educational outcomes further complicates matters in as much as some studies focus on students' achievements on standardised tests, examinations and structured coursework, others on the development of psycho-social skills, including communicational abilities, others on perceptual-sensory and motor skills, and yet others on vocational skills and competencies. Other studies consider educational outcomes in terms of the acquisition and development of problem-solving skills and the ability to adapt to life chances and the changing demands of society over a lifetime. Some educational research has even more global outcome measures such as the development of the 'whole person' and of the citizen who is able to play his or her full role in democratic society (Dewey, 1938; Giroux, 1983; Ball, 1990). Recent government policy in the United Kingdom (Department of Health, 1999), and possibly in other countries, sees educational outcomes such as widening participation, improvements in educational attainment (credentialism) and better employment prospects as important means of enhancing the health status of the population, especially those on low incomes. Such policy objectives seem to be pursuing educational outcomes that will only be detected, if at all, in the long-term over years and generations.

Furthermore, there is not always consistency between different measures of educational outcome. Recent systematic reviews of Problem-Based Learning (PBL) in medical education (Albanese and Mitchell, 1993; Vernon and Blake, 1993; Davies, 2000(a)), for instance, have found that problem-based learning appears to be superior than more traditional methods of teaching and learning in terms of student satisfaction and evaluation, clinical performance, the acquisition of clinical knowledge, faculty satisfaction and evaluation, and the academic process and study behaviour of

students. It is less effective than traditional methods of teaching and learning in terms of academic achievement on examinations and other tests of factual knowledge and basic science.

An Organisational Framework for Systematic Reviews in Education

A classificatory system, or organisational framework, of educational research, therefore, needs to be multi-dimensional. It must represent:

- 1) studies which focus on educational *interventions* (e.g. methods of teaching and learning, school and classroom organisation, ways of financing and managing education, etc.);
- 2) different *target groups* of students and learners (e.g. males and females, different ethnic groups, different religions, different ability groups), with various learning goals and objectives;
- 3) different types of *educational outcomes* (e.g. tests scores, psycho-social development, vocational skills, etc.);
- 4) different *stages in the social organisation of education* (e.g. primary, secondary, tertiary, adult education, professional development etc.);
- 5) different *methodological approaches* of educational research (e.g. experimental, quasi-experimental, qualitative research, etc.).

The provisional organisational framework for preparing and maintaining systematic reviews of educational research proposed in this paper (Figure 1) has attempted to address this multi-dimensionality by forming a matrix consisting of dimensions 1, 2 and 3 in the rows, and dimension 4 in the columns. Given that this organisational framework is derived from Lipsey and Wilson's (1993) excellent review of meta-analyses of 'The Efficacy of Psychological, Educational, and Behavioural Treatment', it covers only systematic reviews of experimental studies in education. However, the proposed framework may also be used for organising systematic reviews and primary studies in education that use other methodological approaches, including qualitative methods.

The major categories in the columns are:

Education Interventions

- 1) Methods of Teaching and Learning
- 2) School and Classroom Organisation
- 3) Subject Area Teaching and Learning
- 4) Finance and Management of Education
- 5) Teacher Training and Teacher Education

Target Groups

- 1) Students and Learners
- 2) Special Education and Special Needs

Educational Outcomes

- 1) Test and Examination Scores
- 2) Psycho-Social/Personal Development/Communication Skills
- 3) Vocational Skills
- 4) Perceptual, Motor and Sensory Development

Educational Research and Methodology

The sub-categories of studies that have been subsumed under the main categories above are listed in Appendix 1. These categories of educational research are derived, with adaptation, from the paper by Lipsey and Wilson (1993) mentioned above. The adaptation includes using the broader term 'Methods of Teaching and Learning' rather than terms such as 'Instruction', 'Instructional Systems', 'Instructional Design' or 'Instructional Interventions/Treatments' that one finds in the American literature (e.g. Kulik and Kulik, 1989). The adaptation also includes the category

'Finance and Management of Education' to represent those studies and systematic reviews of topics such as school vouchers, opting-out arrangements (in the U.K), local management of schools (also in the U.K.) and educational provision by independent and private schools. Educational Research and Methodology is included to cover systematic reviews of topics such as the Hawthorne effect in educational research (Adair, Sharpe and Huynh, 1989).

These main categories, and the sub-categories within them (see Appendix 1), are provisional. They may be added to as additional topics of educational research are identified, or deleted if they are considered redundant or imprecise². They account for most, if not all, of the topics of systematic reviews identified by Kulik and Kulik (1989) and by Lipsey and Wilson (1993).

The stages of education (the rows in the proposed framework) are also provisional, and may also be expanded, or reduced, should participants think this is appropriate.

The content of the framework (the cells), consists mainly of the systematic reviews cited in Lipsey and Wilson (1993). Some additional studies have been added from more recent searches and further additions will be made as more searches are undertaken.

The proposed framework may provide the basis for organising the work of Campbell Review Groups. The Medical Education Group, which seeks to establish Best Evidence Medical Education (BEME), for instance, might take responsibility for preparing and maintaining systematic reviews of Methods of Teaching and Learning in medical education, which would include the best available evidence on Problem-Based Learning, Self-Directed Learning, Student and Peer Tutoring, and possibly other categories in Figure 1. This Group would contribute systematic reviews of the effectiveness of interventions in higher education, postgraduate education, and continuing education (including continuing professional development).

² Some additional sub-categories have been added to the framework since the first draft was distributed. These additions were in response to feedback and suggestions from colleagues.

Those colleagues interested in preparing and maintaining systematic reviews on the Subject Area of Maths and Science education might also focus on Methods of Teaching and Learning, and possibly on particular target groups of Students and Learners (including those with Special Needs). Evidence of the effectiveness of maths and science teaching is required at all stages of the education system.

Other colleagues interested in the most effective ways of doing Health Promotion (listed as a Subject Area in Figure 1), might want to organise reviews under Methods of Teaching and Learning, Students and Learners, Educational Outcomes and Special Education and Special Needs. Health Promotion is also a subject matter that is undertaken at all stages of the education system, possibly with differential effectiveness across the range. The proposed framework would allow this range and diversity of evidence to be classified and identified appropriately.

Any proposal to establish a Campbell review group in these or any other sub-categories of education will need to reflect the criteria that will be applied in assessing applications to become registered groups within the Campbell Collaboration (see Appendix 2).

Avoiding Duplication of Effort with the Cochrane Collaboration

Although there is little likelihood of there being duplication of effort with work going on within the Cochrane Collaboration in most of the areas the classification system outlined in Appendix 1, it will be important to ensure that there is no wasteful duplication of effort in areas where overlap could occur, for example, health promotion and medical education. Appendix 3 draws attention to these potential problems and outlines ways of avoiding them.

Summary

The proposed organisational framework for preparing and maintaining systematic reviews in education is provisional, and attempts to capture the diversity of substantive topics, methodologies, and groups of people who make up the learning community. This framework is offered in the spirit of stimulating discussion and debate within the community of educational researchers and users of educational research. Comments and criticisms will be most welcome.

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Categories and Sub-Categories of Educational Research³

A. EDUCATIONAL INTERVENTIONS

1. Methods of Teaching and Learning

- Computer and Technology Assisted Education
- Individualised Instruction
- Lecturing and Direct Instruction/Didactic Learning
- Problem-Based Learning
- Self-Directed Learning/Independent Learning
- Seminar Discussion/Small Group Learning
- Audio and Video Based Instruction
- Cooperative Task Structures/Cooperative Learning
- Teacher Tutoring
- Paraprofessional/Volunteer Tutoring
- Student/Peer Tutoring
- Behaviour Reinforcements/Feedback/Cues
- Homework Instruction/Support
- Creative Thinking/Training
- Feedback to Teachers
- Test Taking/Test Preparation/Coaching
- Perceptual-Motor Training and Sensory Development

2. School and Class Organisation

- Open Classroom Learning/Activity Based Learning
- Class Size
- Ability Groupings/Tracking/Streaming (Between)
- Ability Groupings/Tracking/Streaming (Within)
- Accelerated Learning
- Test Anxiety (Therapy)
- Guidance and Counselling
- Out of School Learning

3. Subject Area Teaching and Learning

- Maths and Computing
- Sciences
- Social Sciences and History
- Literature and Humanities
- Reading and Reading Recovery
- Concept Development
- First Language/Language Proficiency
- Second Language
- Bilingualism/Multilingualism
- Writing
- Art
- Design and Technology
- Health Education/Health Promotion

³ These categories and sub-categories are derived (with adaptation) from Lipsey and Wilson, 1993. Please refer to text.

- Medical and Healthcare Education
- Other Professional Education
- Personal Development
- Sex Education

4. Finance and Management of Education

- Voucher Payments
- Opting-out/Direct Grant (UK)
- Local Management of Schools (UK)
- Independent /Private Schools

5. Teacher Training and Teacher Education

- In-Service Training
- Human Relations Training
- Practice Teaching
- Classroom Management

B TARGET GROUPS

1. Students and Learners

- Gender
- Ethnicity
- Religion
- Disabilities

2. Special Education/Special Needs

- Socially/Culturally Disadvantaged
- Emotional Needs and Problems
- Behavioural Needs and Problems
- Cognitive Needs and Problems
- Language Problems/Language Proficiency
- Physical Needs and Problems

C. EDUCATIONAL OUTCOMES

- Test and Examination Scores/Graded Coursework
- Psycho-Social Skills/Personal Development/Communication Skills
- Vocational Skills
- Perceptual, Motor and Sensory Development

D. EDUCATIONAL RESEARCH AND METHODOLOGY

Appendix 2**DRAFT CHECKLIST FOR REGISTERING
A CAMPBELL COLLABORATIVE REVIEW GROUP**

The main function of a Campbell Collaborative Review Group is to prepare and maintain high quality systematic reviews of studies on what works, and engage people from different countries in a collaborative effort. The Group's reviews should have transparent standards, be periodically updated, and modified to take account of comments and criticisms submitted after initial publication.

This checklist for developing and registering a Review Group is a periodically updated guidance document.

The Campbell Collaboration Steering Group will use it tentatively. Comments are welcome, of course, on its improvement.

Please check if appropriate

A Process

- 1 Have tentative and firm plans for the new Review Group been developed in consultation with the Campbell Collaboration Steering Group?
- 2 Was notice of the plans for preparatory and exploratory meetings sent to the Campbell Collaboration Steering Group?
- 3 Has a formal exploratory meeting on the Review Group been held?
- 4 Was a member of the Campbell Collaboration Steering Group present to chair/facilitate the exploratory meeting?
- 5 What proportion of the people associated by name with the proposal were present at the exploratory meeting?
- 5 Is the application for registration supported by the a member of the Campbell Collaboration Steering Group

B Scope/Topic List

- 1 Is the scope appropriate for a new Review Group?
- 2 Is the scope of the Review Group sufficiently broad?
- 3 Is there a provisional topic list showing the reviews that the Review Group considers might be performed? N.B. This should not just include a list of reviews for which reviewers have been identified.

- 4 Has potential duplication with existing review groups been considered?
- 5 Have links been made to groups where some overlap may exist to ensure reviews are not unknowingly duplicated?
- 6 Have links been made to groups in the Cochrane Collaboration as well as the Campbell Collaboration where overlap in scope may exist?

C Editorial Board/Base

- 1 Has a provisional editorial board been nominated by the Review Group?
- 2 Has a geographical editorial base been identified?
- 3 Has a co-ordinating editor been nominated?
- 4 Is the co-ordinating editor willing and able to provide the review group co-ordinator with the appropriate support (minimum 1 day per week) or willing and able to find someone who can?
- 5 Are the other members of the editorial board able/willing to spend a minimum of 4 hours per week performing their editorial responsibilities?
- 6 Is the editorial board multi-national?
- 7 Is the editorial board multi-disciplinary?
- 8 Has each of the editors undertaken to prepare and maintain at least one Campbell Collaboration review?
- 9 Is a review group administrative co-ordinator being sought?
- 10 Has computing support for the editorial base been considered?
- 11 Has someone volunteered to be Criticism Editor for the group?

D Contributors

- 1 Is a provisional list of contributors given along with the role they might play?
- 2 Is there a clear statement that the group is open to new contributors and that collaboration is voluntary?

- 3 Is there multi-national representation?
- 4 Are all relevant disciplines represented?
- 5 Are consumers represented in the provisional membership?
- 6 Is there a list of provisional reviewers along with their planned reviews?
- 7 Is there a plan to attract new reviewers/contributors?
- 8 Is there a plan for how consumers are to be involved and recruited?

E Specialized Register

- 1 Have the inclusion criteria for the Review Groups' specialized register been made explicit?
- 2 Has a register already been established?

Appendix 3