

## Transparency in planning, warranting and interpreting research

Educational research valuably uses a diversity of approaches to provide richness of insights and sophisticated empirical findings. However, this diversity challenges research users when interpreting the meaning of findings and makes it particularly important for researchers to be transparent about their methodological choices.

The driver for all research is the question being asked. There is surprisingly little guidance in the research literature on how to frame questions. The TLRP Thematic Group reporting here piloted a basic tool to assist in conceptualising the questions being asked, the methods being used and the warrant for the results found.

- Research questions for individual studies often contain a number of different questions on different levels which are appropriately addressed by different methods → Where studies include more than one research question, each needs to be warranted by an explicit link with the appropriate research methods and conclusions
- Current typologies of research questions are limited in scope and in their links to the full range of social research methods → Descriptions of the research process and the basis on which to interpret and warrant findings need a language that incorporates the types of questions and purpose of the research
- Classifying research questions and methods is complex and indeterminate → A tool that prompts thought and discussion can enable transparency in planning and interpreting research

# The research

## Diversity in research questions, methods and warrants

Research is undertaken for a variety of reasons to develop insights, provide meaning, generate theory and answer empirical questions for the development of academic understanding and to inform policy and practice development. The research depends upon different perspectives and paradigms with different epistemological assumptions resulting in a rich diversity of research and a variety of approaches for appraising its quality (Furlong and Oancea 2007).

This diversity in research is a strength. Making use of this diversity requires that the studies are transparent about their aims, assumptions and methods. It assumes a model of expertise in the producers and users of research in understanding the conceptual, ideological and methodological assumptions in different parts of a research study or wider research programme. Without this transparency and skill the reader has to struggle with a mass of information, with decisions/judgements requiring professional expertise yet with contradictory imperatives that are hidden from view.

To enable clarity and accountability the TLRP programme therefore requires projects to be explicit about the logical link between the research questions, methods and study conclusions; a warrant that justifies the conclusions of a study (Gorard with Taylor 2004) and 'providing a set of findings about rigour and transparency, (that) represents a public obligation and is in the interests of educational research as a field' (Pollard 2005, p17). There are "many forms of warrant and ...each approach should be appropriate to the type of research reported" (Pollard 2006 p260).

Research questions ⇨ Methods  
 ⇨ Warrants ⇨ Conclusions

Different approaches create warrants differently so how can users of research judge across perspectives? To fully specify what type of warrant is appropriate for what type of method requires an overarching theory of the nature of research knowledge. The problem is that any one theory is likely to reflect only certain epistemological assumptions rather than the breadth of research paradigms and methods. Different theories, values and other assumptions effect not only the research questions that are asked but also the appropriate research methods to apply and the means by which conclusions are warranted. Providing a basic tool for describing components of a warrant claim can make those claims more explicit and allow transparency and debate on the appropriateness of different questions, methods, warrants and conclusions in planning and interpreting research in education. It can also provide a language for examining the similarities and differences in questions, warrants and conclusions across the range of social science disciplines. The aim of this theme is thus to explore the issues that lie behind

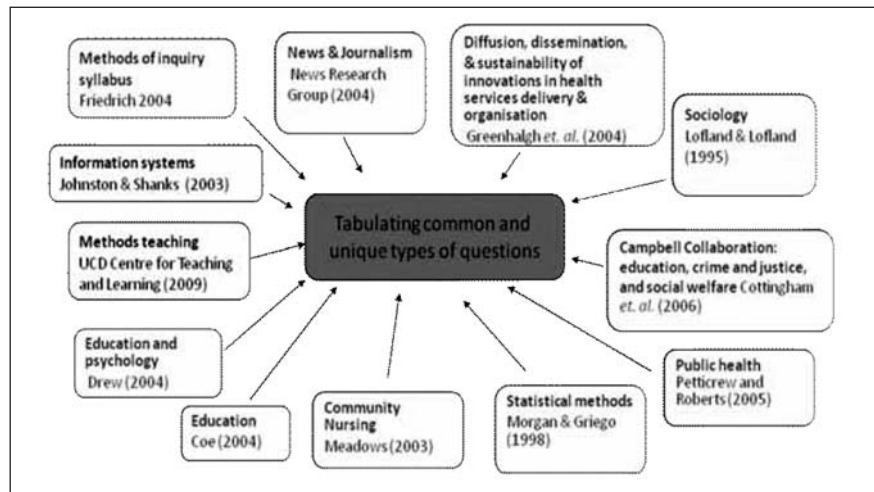


Figure 1: Examples of research question lists within disciplines

judgements about research and provide a tool to help with the challenging process of making such judgements more explicit.

### Classifying research questions

As part of a related piece of work<sup>1</sup> we attempted to identify the range of research questions used in social science. An examination of current discourses found many lists of descriptors or types of research questions in texts from different social science and related disciplines (see Figure 1).

To provide a more systematic examination of questions within social science, we took a random sample of seventy studies across the sixteen different social science disciplines listed by ESRC. This revealed that studies undertook a range of activities leading to a range of products similar to the typologies listed in the literature:

Types of questions	Research activities	Products
What is it, are they?	Describe	Descriptions
How many, how much	Measure	Measurements
How do they compare to each other?	Compare	Comparisons
How do they relate to each other?	Relate	Relationships
What is their value or salience?	Assess	Valuations

These were not mutually exclusive categories and were often hierarchically related so that to address issues of relationship or comparison one might, for example, also produce measurements. In addition, we found that these activities were related to theory in terms of generating new theory, exploring existing theory, or testing theories. These distinctions relate to others in the research literature comparing studies from different research paradigms with inductive or deductive and a priori and iterative methods. The combination of five types of research activity and three positions on theory provide a possible fifteen activity/theory combinations that could be used with very many potential research designs. Not all of these combinations may exist in practice and the categories are provisional but they provide a framework for examining the nature of research questions in social science.

<sup>1</sup>As part of the Methods for Research Synthesis Node of the ESRC National Centre for Research Methods, we examined the variation in research questions relevant for driving different methods for undertaking systematic reviews.

### Piloting the framework on TLRP projects

The framework was applied to twenty reported TLRP projects in twenty five Research Briefings. This revealed:

1. The projects often contained more than one question: an overall question representing the overarching aim of the programme of research and one or more specific research questions (SRQ) that were being addressed by the specific methods of the study being reported. The twenty TLRP projects contained twenty overall questions and sixty more specific questions. The richness of questions in the projects may be specific to the broad nature of TLRP projects though this may not be unusual with the increased interest in mixed methods research projects.

#### Example of a TLRP project's questions: From black boxes to glass boxes: On-screen learning in schools with concept maps (Bevan 2007)

Overall aim: Is knowledge mapper an effective tool for developing pupils' understanding of relationships within a specific area of study?

SRQ 1: What is the effect of introducing an automated scoring system into the mapping activity?

SRQ 2: Does the effectiveness of this on-screen activity depend significantly on the strategy adopted by the teacher?

Examples of a TLRP project's questions

2. Two or more researchers independently applying the framework to individual studies often found they categorised the research questions differently. However,

discussion of their discrepancies provided a constructive method for exploring the nature and transparency of the research questions and how the research methods acted as the warrant for answering the research questions.

3. Many projects in this sample appeared to explore theory using descriptions of participants' views or observation. Their warrants specified the methods used to address these questions but the research briefings often did not spell out how each method linked to each research question, whether they were overarching questions about a body of knowledge for specific research questions related to the collection and analysis of data. This is partly an artefact of interrogating briefings rather than full reports but nevertheless shows the benefits of a framework to assist planning, reporting and interpretation of studies.

### Using the framework as a tool to assist study planning and interpretation

The experience of applying the framework to TLRP projects showed its potential as a tool for assisting in the planning and interpretation of the questions, sub-questions, methods, warrants and conclusions of research projects. This is shown with a simplified example in Figure 2.

### Applying the tool in practice

*Planning: question and method*

Applying the tool in practice involves several steps in considering the aims, assumptions and methods of a piece of research.

#### I. OVERALL QUESTION

- The question: What is the overarching question that the project is attempting to answer?
- Conceptual framework: What are the theoretical and ideological assumptions and specific definitions of the key terms?
- What is the purpose of the project in relation to a theory/argument, to generate, explore, or test this theory?
- Theory or argument: What is the particular theory or argument being considered?
- What research product is being sought (descriptions, measures, comparisons, relations, or values)?
- What more specific research questions (SRQ) are addressed by the different components of the research project?

#### II. SPECIFIC DESIGN RELATED QUESTIONS TO HELP ADDRESS THE OVERALL QUESTION

- What is the question to be addressed by this specific research study?
- What is the purpose of the study in relation to a theory/argument, to generate, explore or test the theory?
- What theory or argument does this relate to?
- How does this contribute to the overall research question?
- What research activity is needed to achieve this, describing, measuring, comparing, relating, or assigning a value?

# Major implications

### 1. Where studies include more than one research question, each needs to be warranted by an explicit link with the appropriate research methods and conclusions.

The complex nature of research questions and their assumptions can make it difficult for all aspects of a research question to be comprehensively addressed by a single method of study. Thus research projects often address a broad overall research question, part of which is addressed in one or more specific sub research questions. The method of a research study provides the basis (the 'warrant') on which the research questions are answered. The questions, methods and conclusions of individual components of a study provide the warrants for answering broader research questions.

### 2. Descriptions of the research process and the basis on which to interpret and warrant findings need a language that incorporates the types of questions and purpose of the research

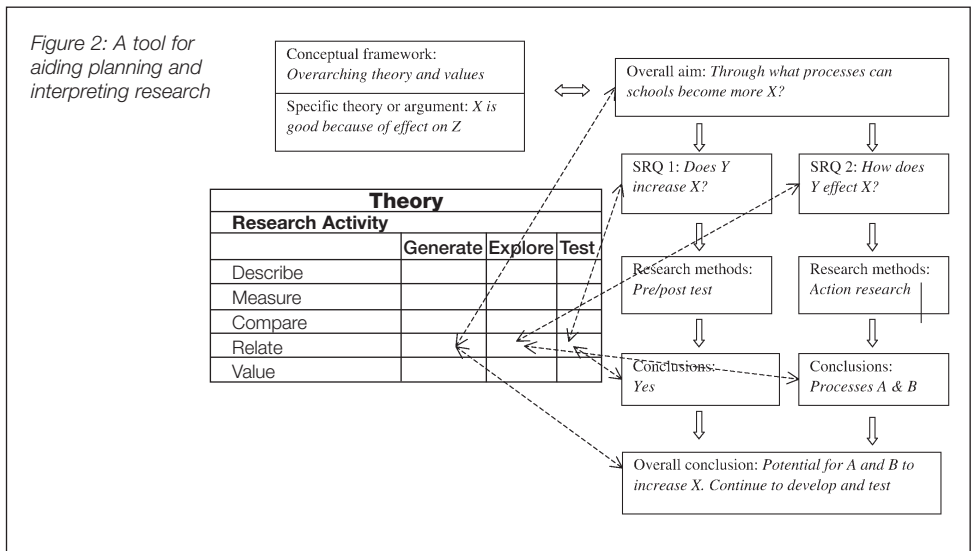
Social research is based on different ideological and theoretical assumptions which is reflected in the variety of types of research questions and methods to address

them. The lack of consensus in research methods is an obstacle to an overarching systems of classification of research. A shared language can enable greater transparency about the specification of research questions, research methods and the warrants on which research conclusions are made. A typology of questions and methods has power as both an analytic and planning tool.

### 3. A tool that prompts thought and discussion can enable transparency in planning and interpreting research

Readers of research reports bring to the task their own many varied assumptions which influence their interpretation and understanding of research even when using a standard classification system. Instead of attempting a falsely objective assessment of a piece of research, a system of classifying research aims and methods provides a basis for describing such interpretation. Thus enabling a more explicit and accountable dialogue on research programmes, projects, questions, methods and conclusions. It helps provide a loose natural history, but not the natural history, of educational research.

Figure 2: A tool for aiding planning and interpreting research



- What specific research design can achieve this?

*Interpretation: warrants and conclusions*

Research users can ask themselves a number of questions when judging whether research findings are warranted.

#### III. SPECIFIC RESEARCH QUESTIONS AND METHODS

- How did the study question, purpose, activity, and results relate?
- Are there any aspects of the implementation of the research that change the research questions, methods and warrants?
- What then are the conclusions in relation to addressing the research question?

#### IV. OVERALL QUESTION PROGRESSION

- How do the warranted conclusions of all the design related specific research questions address the overall question?
- What, of the overall question, remains to be addressed?

There are of course many further methodological issues that need to be addressed in planning or interpreting research. One key example is the choice of participants recruited for a study and the consequences such sampling choices have for the conclusions drawn from the results. Another is the ethical challenges involved in the research and how these are addressed and to what effect. The aim of this framework is not to include all of these other necessary features of research but to focus on the questions driving the research, their components and their link to all the other methodological issues to be considered.

# Further information

Please see the project website or the methods section of the EPPI-Centre website at:  
<http://eppi.ioe.ac.uk/cms/Default.aspx?tabid=89&language=en-US>

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# The warrant

The framework was developed in another project and applied by three independent coders using the warrants specified in twenty five TLRP Research Briefings. Each of the twenty overall questions and sixty micro questions were inspected using a standardised framework by two researchers who worked independently then met to discuss their discrepancies. This pilot work demonstrated the feasibility of using the framework as a tool for examining the questions addressed by the research, the research products being sought and the relation of these questions and products to theory. It is assumed that the framework can also be usefully be applied to planning and developing a research projects though this has not been assessed.

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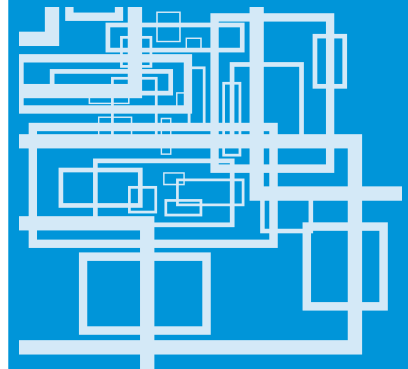
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# Teaching and Learning Research Programme



TLRP involves some 90 research teams with contributions from England, Northern Ireland, Scotland and Wales. Work began in 2000 and the Technology Enhanced Learning phase will continue to 2012.

**Learning:** TLRP's overarching aim is to improve outcomes for learners of all ages in teaching and learning contexts within the UK.

**Outcomes:** TLRP studies a broad range of learning outcomes. These include both the acquisition of skill, understanding, knowledge and qualifications and the development of attitudes, values and identities relevant to a learning society.

**Lifecourse:** TLRP supports research projects and related activities at many ages and stages in education, training and lifelong learning.

**Enrichment:** TLRP commits to user engagement at all stages of research. The Programme promotes research across disciplines, methodologies and sectors, and supports various forms of national and international cooperation and comparison.

**Expertise:** TLRP works to enhance capacity for all forms of research on teaching and learning, and for research-informed policy and practice.

**Improvement:** TLRP develops the knowledge base on teaching and learning and collaborates with users to transform this into effective policy and practice in the UK.

## TLRP Directors' Team

Professor Andrew Pollard | London  
Professor Richard Noss | London  
Professor Miriam David | London  
Professor Alan Brown | Warwick

## TLRP Programme Office

Sarah Douglas | [sarah.douglas@ioe.ac.uk](mailto:sarah.douglas@ioe.ac.uk)  
James O'Toole | [j.o'toole@ioe.ac.uk](mailto:j.o'toole@ioe.ac.uk)

## TLRP

Institute of Education  
University of London  
20 Bedford Way  
London WC1H 0AL  
Tel +44 (0)20 7911 5577



## Project website:

<http://www.tlrp.org/themes/seminar/gough.html>

## Project contact:

Professor David Gough  
[d.gough@ioe.ac.uk](mailto:d.gough@ioe.ac.uk)  
44 (0)20 7612 6812

SSRU, Institute of Education  
18 Woburn Square  
London, WC1H 0NR

## Project website:

David Gough\*, Sandy Oliver\*, Mark Newman\*, Karen Bird\*, Marion McIntosh and Claudia Niza

\*Research Briefing authors

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