

Educational Research, Methodology, and Measurement: An International Handbook

Edited by

John P Keeves

Advances in Education

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**EDUCATIONAL RESEARCH,
METHODOLOGY, AND
MEASUREMENT**
AN INTERNATIONAL HANDBOOK

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JOHN P KEEVES



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Preface

This volume, *Educational Research, Methodology and Measurement: An International Handbook*, seeks to provide an up-to-date overview of the methods of inquiry that are employed in the investigation of problems which arise in the field of education. During the past 25 years different research strategies have been developed, not only in different parts of the world, but also as scholars drawn from different disciplines have endeavoured to examine educational problems with the approaches that customarily have been employed in specific disciplinary areas. The result has been great variety in the methods, theoretical perspectives, and approaches that have been used to investigate the processes and practices, the context and conditions, as well as the products and the procedures which occur in the field of education. Nevertheless, in spite of this variety, it is the claim of this *International Handbook* that there is an essential unity in these endeavours that justifies the many different tactics and strategies of investigation being brought together in one volume. Moreover, this unity supports the view of the field of inquiry as one of educational research, rather than accepting the contention that the disparities are so great that the field can only be seen as one of research into educational problems.

The purpose of this Preface is to answer five questions in order to explain the principles that have guided the development of this *International Handbook*.

- (a) Why is there a need for a volume concerned with the methods of educational research?
- (b) What are the relationships between the areas referred to in the title of the volume, namely methodology and measurement, and the four sections into which the volume is divided?
- (c) What are the links between this volume and *The International Encyclopedia of Education*, and what principles were followed in the preparation of this *International Handbook*?
- (d) How have the contents of this volume been organized?
- (e) How can this volume and the various sources of information incorporated within it best be used?

Before addressing these five questions, it is necessary to recognize the marked growth and development that has occurred in the field of educational research during the past 25 years. The opening article of this volume by De Landsheere examines the *History of Educational Research* and reports on a third phase of development in this field of inquiry which took place in the 1960s and 1970s and involved an unprecedented expansion of investigatory activity into educational problems. During this period educational research gained from the massive support provided by both governmental and private agencies. Scholars were drawn from many disciplinary areas in the social and behavioural sciences to undertake research into educational problems. This expansion of research activity took

place not only in the affluent industrialized countries, but spread to the Soviet Union and to less developed countries that were establishing or rapidly expanding their national educational systems. However, the late 1960s were also marked by the growth of an epistemological debate in the social sciences in reaction to the strident emphasis on a scientific approach that had occurred as a result of access to computers to carry out complex calculations and statistical analyses. These developments were accompanied by the student revolt in the universities of the more prosperous nations and by a challenge to institutionalized schooling together with a questioning of the value of traditional approaches to education. The confrontation that took place has in some ways damaged systematic research into educational problems. Nevertheless, it is now widely recognized that a rigid scientific approach to educational research is both incomplete and inadequate and that alternative approaches have much to contribute.

1. The Need for a Single Volume Concerned with the Methods of Educational Research

In the previous paragraph reference has been made to the conflict that has taken place between the two main perspectives employed in the investigation of educational problems, namely, the scientific and humanistic approaches. These issues are considered in greater detail in the second article in this volume by Husén concerned with *Research Paradigms in Education*. The scientific paradigm has been built on the approaches employed in the natural sciences and has emphasized the use of empirical, quantifiable observations in order to provide causal explanations of educational phenomena. The alternative paradigm has been developed from the humanities. Within this second paradigm there is an emphasis on holistic and qualitative information, and the purposes of research are to provide understanding and an interpretative account of educational phenomena. Moreover, it is argued that education is concerned with unique, goal-seeking individuals for whom the causal relationships of the scientific paradigm do not apply. The difference between these two paradigms is contained in the distinction made by Dilthey (1833–1911) in the field of psychology between *Erklären* and *Verstehen*, between explaining and understanding. He maintained that there were two kinds of psychology; the one employed experimental procedures and sought to generalize and predict, while the other used humanistic approaches and sought to interpret and understand. These alternative approaches to investigation can be viewed as forming one dimension of inquiry into educational problems.

In part as a consequence of the greater financial support for educational and social science research that has occurred during the past 25 years, there has been increasing interest in and concern for the usefulness of the findings of research. Of particular importance has been the emergence of an area addressed by Nisbet, namely that of *Policy-oriented Research*. It is, however, necessary to recognize that the investigation into educational problems can be undertaken from a perspective that is concerned with either the promotion of change, or alternatively the conservation of an existing situation. It is argued that there is a further dimension concerned with the uses of educational and social science research within which the advancement or retardation of change is considered. The purposes of inquiry extend beyond the cumulation of knowledge about education processes and the explanation or understanding of phenomena. Thus the policy or applied orientation of investigation involves a second dimension that necessarily interacts with the first and is concerned with the uses of inquiry for the solution of educational and social problems.

The emergence of a second dimension and the multiplicity of alternative approaches to the investigation of educational problems, together with a growing interest in undertaking studies that involve evaluation have generated, during the 25-year period from 1960 to 1985, great diversity in the tactics and strategies that can be employed in educational research. While the distinctions which lie beneath the scientific and humanistic approaches are maintained throughout this *International Handbook*, it is argued that the field of inquiry of educational research is more complex than a simple dichotomy would permit and that the differences which can be identified are essentially ones of degree rather than of kind. The purpose of this volume is to bring what is known about the many disparate approaches to research into educational problems together into one volume, so that the full diversity in methods is revealed. However, it is also claimed that there is a unity in the field that arises both from the epistemological bases of inquiry into educational problems (see *The Epistemological Unity of Educational Research*), as well as a coherence that arises from recent changes in social theory (see *Social Theory and Educational Research*). An emphasis on both the unity and diversity within the field of inquiry into educational problems is seen to meet the urgent need for reconciling the conflicts that currently exist in the field and for the development of a more coherent approach to research. The publication of the many different perspectives in a single volume should be seen as a contribution towards this goal.

This *International Handbook* seeks to be a truly international publication, providing coverage of the many different research traditions that are used in different parts of the world as well as looking forward to the future. It is clear that educational research is a dynamic enterprise. Its methods and procedures are changing, sometimes quite rapidly. This *International Handbook* aims at capturing this changing nature of educational inquiry and at assisting the enterprise to move ahead rapidly and with strength in a way that will contribute both to the creation of knowledge about educational processes and to the use of the findings of inquiry to improve both educational policy and practice.

2. Relationships between Methodology and Measurement and the Four Sections of the Volume

An important influence on educational research over the 25 years from the early 1960s has been the electronic computer, which has provided a remarkable boost for empirical and quantitative research into educational problems. This *International Handbook* has been assembled after a 25-year period of creative activity in the field of educational research. Initially in the early 1960s educational research workers reacted against the historical and philosophical approaches to inquiry of the 1940s and 1950s, which they saw to be highly conservative and unrelated to the practical problems of education. However, after a resurgence of empirical research conducted within the scientific perspective, the humanistic approach reemerged in more constructive forms with a concern for innovation and change. As a consequence of these oscillations in orientation this *International Handbook* seeks to adopt a flexible perspective that takes into account the variations which might be expected to occur in the future in the approaches adopted towards the investigation of educational problems. Since the future cannot be foretold with accuracy, approaches and procedures that have yet to be widely accepted, as well as those that are the subject of some controversy are presented alongside those that are well-established. Thus the traditional approaches and the alternative approaches that are being employed by some research workers in some countries are both presented.

Relationships between research methodology and measurement strategies are commonly technical in nature. Nevertheless, it is important to recognize that new approaches

to measurement are being gradually introduced and are replacing the classical approach that has so far dominated educational research throughout the twentieth century. Some of the shortcomings of norm-referenced tests, which rely heavily on comparisons between individuals within groups, have been overcome in the new approaches of domain sampling and latent trait theories. Two questions face those concerned with the use of measurement procedures in educational research and evaluation studies. The first involves a choice in the construction of achievement tests and attitude scales of either classical test theory, domain sampling theory, or latent trait theory. A sound understanding of the strengths and weaknesses of each theoretical approach is necessary before a choice can be made as to which approach is most appropriate in measuring achievement and attitudes in specific research situations. The second question involves the use of generalizability or latent trait models in the investigation of particular research questions. The application of these approaches to measurement in situations concerned, for example, with the investigation of change, have not been adequately appreciated or explored. Relatively little use has been made of these measurement procedures in the investigation of major problems as opposed to illustrative examples. The task ahead is concerned with the use of these models in intervention studies and inquiry into the development of human characteristics. Latent trait models would appear to have the potential to reform investigative strategies where measures of change are required.

This *International Handbook* contains articles which have been clustered into four sections, namely:

- (a) the methods of educational inquiry;
- (b) the creation, diffusion, and utilization of knowledge;
- (c) measurement for educational research; and
- (d) research techniques and statistical analysis.

Within each section the articles are grouped in such a way as to provide a coherent view across the topics which are presented. In general, a pluralistic perspective is adopted and it is contended that the different approaches to research are complementary to each other.

In the *Introduction* to each section, issues that have arisen in research are addressed. These issues are concerned with the problems faced by educational research workers in the use of the different strategies presented in the articles within the section. In addition, an overview of the articles included in the section is provided.

3. The Preparation of the International Handbook

This *International Handbook* has been developed from *The International Encyclopedia of Education* which was edited by Torsten Husén and Neville Postlethwaite, with the assistance of an editorial board of 17 persons, and published in 1985. The *Encyclopedia* was organized around 18 areas of scholarly specialization related to education. Two key areas of the *Encyclopedia* were: evaluation and assessment, and research policy and methodology. After the *Encyclopedia* was published it was recognized that there was a need for a series of reference books and textbooks for university teachers and graduate students who were reading and studying in different areas of educational inquiry. Thus it was proposed that a volume should be prepared which cut across the two areas referred to above and would be concerned with research methodology and measurement. During the five-year period from when the *Encyclopedia* was planned in March 1981 at a meeting of the

Section Editors with the Editors-in-Chief, to when the contents of this *International Handbook* were determined, there were many important developments in the areas of research methodology and measurement. As a consequence, it was necessary to commission a significant number of new articles related to these developments which could be published together with the substantial number of relevant articles that had been included in the *Encyclopedia*. Of the 139 articles contained in this *International Handbook*, 115 were drawn from the *Encyclopedia*, and 24 were specially prepared for this volume in order to reflect the developments that had taken place during recent years. Further comment on such developments has been provided in the *Introductions* to each of the four sections of this *International Handbook*.

In the preparation of articles for both the *Encyclopedia* and this *International Handbook* authors were provided with a booklet of *Guidelines to Authors* on format and style. In addition, authors were given the opportunity to use either British or American spelling according to their own practice, and were requested to avoid sex bias in their use of language. All articles that were submitted were received by the Section Editors and the Editors-in-Chief and were commonly sent to an eminent scholar in the field who was asked to appraise the article for balance and accuracy of content.

Prior to the publication of the *Encyclopedia* the Section Editor for the area concerned with Evaluation and Assessment, Bruce H. Choppin, died while on a lecturing tour in Chile. The emphasis on the new approaches to educational measurement associated with the use of latent trait theory reflects his strong interest in this field. While the implications of these developments for both student assessment and research methodology have not been widely recognized, there is a rapidly growing interest in this area both with respect to research into theory and the application of the procedures to educational problems. As a consequence these approaches are likely to be more extensively used in the future, as the article by Carroll on *Future Developments in Educational Measurement* suggests. The preparation of this *International Handbook* owes a great debt to Bruce Choppin whose untimely death cut short his distinguished contribution to the field of educational measurement.

4. *The International Handbook's Structure*

As mentioned above this *International Handbook* is divided into four sections. The first section seeks to provide a broad coverage of topics related to the methods of educational inquiry. The introductory articles are concerned with general research perspectives. They are followed by articles that consider the two major approaches to research, namely, the humanistic perspective and the scientific perspective. It is not the purpose of this volume to advocate the use of one approach in preference to the other but rather to present the pluralism of views and perspectives that are employed in educational research. Moreover, as discussed above, this volume seeks to emphasize the unity and coherence that exists in the field of educational research rather than to emphasize the differences in outlook and the divisions that have arisen. The first section concludes with four articles on different aspects of policy-oriented research, one of which, a key article by Tyler on *Evaluation for Utilization*, describes both the new directions being followed in evaluation as well as the practical applications of evaluation. These four articles recognize that educational policy and practice are not independent of the cultural and social context in which they operate, and that educational researchers are rarely able to adopt a completely neutral perspective which is independent of problems relating to existing policy and practice.

The second section of this *International Handbook* is concerned with the creation, diffusion, and utilization of knowledge. It is increasingly being recognized, although it was

probably never denied, that the creation of new knowledge and understanding of educational processes is not enough. The work of educational researchers extends beyond the building of coherent bodies of knowledge, however intellectually stimulating and challenging this might be. It has become clear that funding is available only for research studies that are seen to be useful and related to the problems of educational policy and practice. As a consequence consideration is increasingly being given to the dissemination of the findings of research and to the utilization of the theories and products of research in the provision of education.

The third section of this *International Handbook* is concerned with measurement for educational research. The emphasis of this section is primarily on the improvement of measurement which is attainable as a consequence of recent advances in measurement theory. Developments in measurement theory have important applications for achievement testing and the measurement of attitudes, both areas being of importance for educational practice as well as for further research. There are, however, many additional areas where recent development in both measurement theory and the techniques of measurement are capable of advancing the quality and the accuracy with which measurements are made in educational research. Some of these areas that are of importance for educational research, such as the use of census data and statistics, environmental measurement, the measurement of social background, classroom observation techniques, and the use of questionnaires and rating scales have been considered in articles contained in the closing pages of this section.

The fourth section includes articles on research techniques and statistical analysis, with the purpose of increasing the strength of the inferences that can be drawn from evidence collected in educational research. Consideration is given to the procedures employed in the use of both the humanistic and scientific approaches, as well as to a wide range of techniques of statistical analysis.

The articles in this section reveal the efforts undertaken since the 1960s largely by scholars working within the scientific perspective to improve their research techniques and increase the validity of their conclusions. The availability of computers has greatly facilitated their efforts and the considerable number of articles concerned with statistical procedures reflects the developments in this area that have occurred during the past 25 years, particularly in the United States, but more recently in European countries, such as Sweden, Denmark, and the Netherlands. There are relatively few articles within this section that address the question of drawing inferences from evidence based on research conducted from the humanistic perspective. Without the development and use of clearly identifiable methods, there would seem to be no way in which the conclusions of research undertaken in this context could be verified. Thus there would appear to be an urgent need for work in this area of investigation.

The collection of articles assembled in the four sections of this *International Handbook* is unique, and the range and depth of treatment of the articles goes well beyond that previously brought together in other works on educational research, methods, and measurement.

5. *How to Use this International Handbook*

Educational research, as pointed out above, draws on diverse disciplines that have bearings on problems in the field of education. While it is the Editor's contention that there is a unity and coherence running through this volume, it must be seen as a compendium of articles, written by different scholars with different research traditions, drawn from different countries across the world. Thus the volume is intended as a reference or source book

for university and college teachers to use in the preparation of lectures; for graduate students to use as a first introduction to a procedure or research technique; and for practising research workers to obtain information on a research strategy that they might employ in their work or might explore in greater depth, if the strategy is likely to serve their needs. As a consequence of the inclusion of articles on so many separate topics in a single volume, it will be clear that no article can be complete in itself. Thus each article seeks not only to be relevant and up-to-date, but also to provide reference, through a concise bibliography, to key articles or publications likely to be readily available, from which a scholar, student, or research worker could obtain further information.

To emphasize the unity and the coherence of educational research as an investigatory activity the articles have been grouped into the four sections and into areas within each of the sections. Nevertheless, there is likely to be a need for information on a topic that is treated within one or more articles in the volume. In order to facilitate the search for information, references are provided within each article to other articles in the volume where related information has been presented.

The compilers of both the *Encyclopedia* and the *International Handbook* were fortunate to have advanced computer technology available for processing the articles through the various stages of publication, which has made possible the composition of an exhaustive Subject Index based on key words or phrases identified by the authors as cornerstones in the structure of the information they wished to convey. As a consequence, the user of this *International Handbook* who wants information on a specific topic could begin by looking up appropriate key words in the Subject Index in order to locate either an article related to the topic or to identify articles where the topic, as referenced by the key words, is considered. In a similar way, the Name Index can be used to locate references to the writings of a particular author who is known to have made a significant contribution to a field of research related to the topic on which information is sought. To facilitate this task, page numbers are given both for the bibliographic reference and for the point at which the reference is cited in the text.

6. Acknowledgements

No work of the size of this *International Handbook* could be published without considerable effort by many people. To several of these people a special debt of gratitude is due. First, I am grateful to Neville Postlethwaite and Torsten Husén who guided the preparation of this *International Handbook* and the earlier *Encyclopedia*. Second, I am grateful to the many authors who prepared articles, carefully checked galley proofs and in many cases acted as consultants for other articles in the volume. Third, I am grateful to Barbara Barrett, Editorial Director at Pergamon Press, who directed work on both the *Encyclopedia* and the *International Handbook*, and to Priscilla Chambers, Clare Watkins and Joan Burks, who assisted her at different stages of the production enterprise. Finally, I am grateful to Marjorie Balloch and Anne Pettigrove and to many secretarial assistants who have undertaken the typing of articles and correspondence in connection with the preparation of this volume. To them all, my sincere thanks.

August 1988

John P. Keeves
Parkville, Australia

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