



Mauritius Research Council

Small Scale Research Grant Scheme

Guide

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FOREWORD

To many people, very often, research conjures the notion of advanced, sophisticated scientific activities or inventions, which are beyond the comprehension of the common person. While it is true that a degree in Physics is fundamental to the understanding of Rocket Science, there are plethora of real life situations that may be analysed, interpreted, understood and improved using very basic research techniques that can be mastered by all those willing to investigate the unknown. *You don't need a Ph.D. to undertake research!*

The most effective form of research is problem-driven research. That is, using research to address and resolve a specific problem. Many of us are aware of one or more problems affecting our living or working environment. These could be a local traffic congestion, absenteeism in schools, pollution of the environment, access to health care or even the filing system in the office, among many others.

It is against this background that the Mauritius Research Council introduced the **Small Scale Research Grant Scheme** with a view to popularising research while addressing practical problems.

This booklet, which has been adapted from an Australian publication, targets those who are willing to venture along the path of applied research through the Small Scale Research Grant Scheme. It provides simple guides of how to undertake research, particularly in the field of *social science*. It is by no means a reference document but it does initiate the novice researcher.

I hope you find the booklet useful and we would welcome your views for updating and improving its content.

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TABLE OF CONTENTS

1.0	INTRODUCTION	3
1.1	THE PURPOSE OF THE HANDBOOK	3
1.2	TERMINOLOGY	3
1.3	THE USEFULNESS OF RESEARCH.....	4
2.0	GETTING STARTED	5
2.1	CONDUCTING A LITERATURE SEARCH.....	6
2.2	NETWORKING WITH COLLEAGUES.....	6
3.0	THE METHODOLOGY OF RESEARCH	7
3.1	PURPOSE	7
3.2	DESIGN	8
3.3	WAYS OF CONDUCTING SOCIAL RESEARCH	8
3.4	THE QUESTION OF ETHICS IN SMALL SCALE RESEARCH.....	14
4.0	RESEARCH IN PRACTICE	19
4.1	APPLICATIONS.....	19
4.2	EVALUATION	21
	4.2.1 The Nature of Evaluation	21
	4.2.2 The Purpose of Evaluation	21
	4.2.3 The Subject of Evaluation	22
	4.2.4 The Evaluation Audience	22
	4.2.5 The Aim of Evaluation	23
	4.2.6 The Evaluation Approach	23
	4.2.7 The Methodology of Evaluation	24
	4.2.8 The Control of Evaluation	24
4.3	ASSESSMENT	25
5.0	PUBLICATION AND PRESENTATION	27
5.1	PUBLICATION.....	27
	5.1.1 The Introduction	27
	5.1.2 Methodology	27
	5.1.3 Results	28
	5.1.4 Discussion and Conclusions	28
	5.1.5 List of References	28
	5.1.6 Abstract	28
	5.1.7 Acknowledgement	29
5.2	PRESENTATION.....	29
	5.2.1 Referencing	30
	5.2.2 In-text referencing	30
	5.2.3 Bibliographic Entries	31
6.0	FURTHER READING	32
	BIBLIOGRAPHY	35

1.0 INTRODUCTION

1.1 THE PURPOSE OF THE HANDBOOK

1.1.1 This handbook has been written for people who are interested in undertaking research but feel that they need to know more about it. In particular, it focuses on small-scale research of the sort that will be typically conducted by individuals or small groups who have little or no experience in research work.

1.1.2 Methodology of doing research is not generally emphasised during undergraduate training. As a result, even newly trained graduates, with a good grasp of the technicalities and philosophies of their profession, will often find it difficult either to conduct their own investigations or to interpret the results of others. The end result may be that they fall back on the basic knowledge they gained as a student and this leads eventually, of course, to professional stagnation.

1.1.3 Collection of research data can be a tedious and arduous process, and much time and effort can be wasted when a research program is not designed to test adequately the hypothesis in question. Many of the problems of experimental design can be overcome by the researcher seeking advice from colleagues with experience in the relevant fields (*a theme which is taken up later in section 2.2*). Such an arrangement may vary from casual informal contact to a formal student-supervisor relationship as required in the case of a student studying for a post-graduate qualification.

1.1.4 This book obviously cannot deal with the whole range of specific research needs. What we do hope to provide is a broad set of guidelines which might help an aspiring researcher to get started. Our prime aim is to help overcome **the fear of investigating the unknown**.

1.2 TERMINOLOGY

1.2.1 Once a researchable problem or topic has been identified, planning can begin. First of all, it is necessary for the researcher to decide

exactly what he or she wishes to investigate. This may mean limiting the scope of the research in certain clearly defined and definite ways. It will certainly mean picking a title that accurately reflects the scope of the work. An important element in preparing a research proposal is the need to give a careful consideration of the terms that will be used.

1.2.2 Very often, terminologies are used without either the user or the reader/listener being aware of their exact meaning. While this is generally not so important in everyday usage, it does matter greatly in academic writing. Suppose, for example, that a researcher has chosen to investigate ways of improving the social interaction of students in his or her class. It should be fairly apparent that the term 'social interaction' needs to be clearly defined in operational terms, that is, the concept needs to be defined in such a way that it can be measured.

1.2.3 Hence researchers need to analyse the key terms they use and to define them precisely in operational terms. The process of thinking analytically and precisely about terminology will be greatly assisted by reference to:

- an informative English dictionary;
- relevant and up-to-date literature in the appropriate field; and
- browsing on the Internet.

1.2.4 As a general rule, the aspiring researcher is advised not to coin new terms or to improvise new meanings for terms already in use. A careful study of available terminology will often provide the particular word or expression that is needed.

1.3 THE USEFULNESS OF RESEARCH

1.3.1 Research can be of immense benefit to those who undertake it as well as to those who hear about the findings. In the case of action research, one striking benefit is that the participants are helped to critically reflect on their own practice. Program evaluations can effectively assist administrators in their planning. Intensive, small-scale, participant research (such as an ethnography) can yield valuable information about group behaviour. Surveys and questionnaires are

most useful ways of obtaining much needed information in certain settings and sampling can be a highly accurate way of researching some aspects of a large population.

1.3.2 It hardly needs to be said that research can be trivial, even pointless. Where researchers are seeking the answers to important and practical questions, however, the results are almost invariably of interest to somebody.

1.3.3 It is our conviction that we need to expand the research base in Mauritius. If this handbook assists would-be researchers to take on the challenge of trying to discover, document and disseminate a few answers to questions which they regard as significant, it will have achieved its purpose.

2.0 GETTING STARTED

2.1 The most appropriate and usual beginning point for a researcher is to specify the particular problem or question that is to be investigated. This research problem should be stated as objectively and as concisely as possible: a process that may take some time. It is very common for researchers to be rather unclear about the scope of their work, at least in the beginning. For people in this situation, a notebook or professional journal is often a very useful means of recording one's evolving thoughts on a hard-to-define research question.

2.2 Some researchers prefer not to specify a problem area in advance but, rather, seek to explore a particular situation without quite knowing what the outcome of the investigation will be. As the old joke observes, *Christopher Columbus didn't know where he was going, didn't know where he was when he got there and didn't know where he had been when he returned home.* However, most researchers have a clearer sense of where they are going than Columbus did. In our view, most users of this handbook will be wanting to answer questions or solve problems or improve their own professional practice. (We see researchers being more like detectives than adventurers in uncharted waters).

2.3 Small scale researchers who have defined their research problem will often find it useful to write up a project proposal, especially if they are seeking funding support. A fairly typical proposal would be formulated along the format of the application form included as **Appendix A** “*General Conditions and Information to applicants*”. The rest of this guide provides a road map for undertaking research.

2.1 CONDUCTING A LITERATURE SEARCH

2.1.1 Regardless of whether one plans to publish the research findings or not, it is important to find out what is already known before the work is too far advanced. Becoming familiar with relevant published research is an obvious way of ensuring that a particular project is not merely duplicating someone else’s efforts. A literature search also helps a researcher to see where his or her efforts fit into the “big picture”. It gives research breadth and depth which it would not otherwise have. In addition, the literature helps a researcher to acquire the appropriate vocabulary for defining and describing the nature of the research task. However, in Mauritius, researchers may face a number of difficulties compared with their counterparts overseas. Access to library facilities and to recent specialist journal articles or books is not always easy or possible. It is important for researchers to realise that Mauritian libraries, while they do not stock everything, are still exceptional sources of assistance and it is our recommendation that they be utilised as much as possible. The internet now provides a useful source of information on a wide range of topics.

2.2 NETWORKING WITH COLLEAGUES

2.2.1 We do not encourage researchers to work in isolation, though of course they are welcome to do so if they wish. It makes sense for intending researchers to talk over their research plans with colleagues who are in a position to offer useful advice. We advocate joint research activity as being a most appropriate strategy in some situations as it allows the participants to test the validity of their perceptions with others and thus helps to lessen the feeling of isolation and insecurity associated with individual research projects.

2.2.2 However, having said all that, we would like to sound a note of caution. Researchers cannot expect to consult with experts, who may offer significant assistance, and then expect to write a subsequent report which does not fully acknowledge the assistance that was given. Acknowledging assistance is an ethical and professional obligation that cannot be neglected. (*see section 5.1.7*)

3.0 THE METHODOLOGY OF RESEARCH

3.1 PURPOSE

3.1.1 Researchers need to be clear, at the outset, about why they are undertaking a particular research project. Determining the purpose of research is a fundamentally important first step.

3.1.2 One way of doing this, known as purpose design, was developed by a Professor of Industrial Engineering at the University of Wisconsin-Madison in the U.S (Nadler 1981). This approach involves the following five steps:-

- Determining the purpose
- Generating solutions
- Selecting a target plan
- Specifying the plan in detail
- Implementing the plan

3.1.3 The first step requires the researcher

- (a) to brainstorm possible purposes,
- (b) to select the most specific one and ‘expand it’ by asking “What’s the purpose of this purpose” (in order to establish a purpose hierarchy), and
- (c) to choose the most appropriate level of purpose to describe why a particular project is being undertaken.

3.1.4 The purpose of research concerns the reason why it is done; the aim of research, on the other hand, has to do with what the researcher sets out to discover. Many researchers find it helpful to specify their

aims more clearly in the form of objectives, which are explicit, short-term, quantifiable and attainable.

3.2 DESIGN

3.2.1 The design of a research project clearly describes the methods and procedures used to collect data or generate information. These methods and procedures must be reliable, valid and appropriate (*see sections 3.3, 4.1 and 4.2*).

3.2.2 The next stage, execution, refers to the actual implementation of the research design; successful execution of a research design depends on a number of factors and circumstances including the research location, the researcher's skill, the availability of needed equipment and so on. Presentation is usually regarded as the last stage of a research project (*see section 5.0*)

3.2.3 These phases - determining the purpose specifying the objectives, designing the research, executing the design and presenting the report - are often regarded as the five key stages in any research project. However, as we shall see later, there are other equally useful ways of naming the sequence of activities in a research cycle.

3.3 WAYS OF CONDUCTING SOCIAL RESEARCH

3.3.1 There are two principal ways of conducting research. These are usually referred to as qualitative and quantitative approaches. They may, of course, be combined in a single research project.

3.3.2 Quantitative methods are aimed at providing ways of measuring or quantifying some particular variable such as ability, political opinion, germination rate, yield or attainment. Variables may, in turn, be analysed in terms of their respective values. 'Female', for example, is a value of the variable "gender".

3.3.3 Quantitative methods rely heavily upon instruments such as tests, questionnaires, schedules, checklists and inventories.

- 3.3.4** Although it would be unwise to make a rigid distinction between quantitative and qualitative approaches, they do reflect differing philosophical assumptions about how social reality might best be studied and understood. Quantitative analysis generally assumes that the procedures used in the natural sciences are applicable to the study of human relationships and culture, and that human reality exists 'out there' in a way that permits objective and scientific studies. Often referred to as the positivist tradition, this view derives from the work of August Comte and others. Reality is understood to be independent of the observer and his/her biases. The underlying logic of this approach may be contrasted with an alternative view: that reality has to be inferred from insights gained by a knowledgeable observer because the construction of reality itself is the outcome of complex interactions between mind and matter. Reality is understood to be probabilistic, many faceted and variable.
- 3.3.5** Whereas quantitative researchers can usually assume that the categories with which they work are 'given' and can be determined in advance of the research, qualitative research often sets itself the task of deducing those categories in situ and of improvising the means of description by which findings can be reported.
- 3.3.6** This concern with language and the degree to which it labels reality in ways that are valid, reliable, true to the situation and meaningful to the people being studied, is one dimension of contrast between qualitative and quantitative approaches.
- 3.3.7** It is often the case, but by no means necessary so, that quantitative research is large scale in scope whereas qualitative approaches are preferred for explorations into micro-settings. A synthesis of the two will often be preferred by researchers who want to closely investigate some particular aspect(s) of a broad social study and to incorporate such findings as instances of more general principles, patterns or trends.
- 3.3.8** Social science researchers often find that they have to keep a balance between two dimensions of their work: "the number of people studied" and 'personal involvement of the researcher', since maximising one can generally only be achieved at the expense of the other. As Worsley (1985:88) has observed:

Clearly those working within a 'positivist' orientation will tend to work towards the low numbers/low personal involvement' end of the continuum, whereas those working with an 'interpretive' orientation will tend to work toward the other end.

3.3.9 The principal techniques used in quantitative research include:

(i) The Experimental Method

This approach commonly involves some form of treatment, a pre-test and post-test with an experimental group and a control group, e.g. trialling an alternative reading group.

(ii) The Survey Method

Information about opinions or other characteristics is obtained by seeking answers to a series of questions administered by post, interview or telephone, e.g. Gallop Polls.

(iii) The Observation Method

In this approach, various forms of behaviour are recorded using an appropriate schedule or checklist e.g. classroom interaction schedules.

The design of tests or questionnaires, whether to be administered by post or during interview, is a highly skilled procedure. The format, the direction and wording of the questions, and the overall content have all to be considered if validity and reliability are to be achieved. The production of a successful instrument, therefore, normally involves extensive trialling. As a consequence, it is often preferable to use an existing instrument of proven performance, where one is available. This not only avoids a design problem, but also makes it easier to compare results with those of previous researchers. The same applies to observation schedules.

(iv) Statistical Analysis

From the results of quantitative research, numerical data can normally be derived which lend themselves to statistical analysis. The use of

statistics allows results to be summarised in the form of percentages, means, modes, standard deviations, correlation coefficients and so on. These are the simplest and most widely used forms of statistical analysis. Descriptive statistics apply to a whole population; inferential statistics refer to a sample drawn from a wider population.

It is a general rule of thumb in doctoral research that courses in statistical method must be taken before statistical procedures can be used in a thesis. **Small-scale researchers are similarly advised to undertake training in elementary statistical techniques**, if they have not already done so, before they attempt to apply statistical methods in their work.

Because it is frequently not practicable to study a population in total, researchers commonly obtain their data by studying a carefully selected sample of that population. Thus the organisers of political opinion polls do not attempt to survey every voter, but they do try to survey a representative sample. The more successfully the representative sample is chosen, the more accurate the results of the poll are likely to be. As a general rule, the larger the sample the better. Any standard text on statistical techniques will give methods of calculating sample size.

Decisions concerning the actual method of sampling to be used are influenced by the nature of the population to be researched. The most common forms of sampling and their applications are outlined briefly below.

(a) Simple Random Sampling

This type of sampling is used when the population is a homogeneous collection of individual units. An example would be when a random sample of the seeds of a particular plant is used for germination tests.

(b) Simple Stratified Sampling

Sampling of this type is appropriate when the population consists of clearly definable strata, which have distinct differences, although the individual units within each stratum are as homogeneous as possible, e.g. school students in different year levels.

(c) Proportional Stratified Sampling

This approach may be used where the population is comprised of distinct strata with differing characteristics, and where there is a proportional relationship between the number of members in each strata. For instance, the parents of school children in a particular community could be divided into distinct groups of strata according to their religious affiliations.

(d) Cluster Sampling

This approach to sampling is most appropriate where the population consists of clusters, which have certain characteristics in common as clusters, but whose individual members have heterogeneous characteristics. An example would be a survey of leading science museums, based upon the opinions of people who visit them.

(e) Random Sampling

In the process of conducting a survey, a sample is obtained by selecting a predetermined number of representative units from a much larger population. The method by which these units are selected is of crucial importance to the reliability of the survey. The usual method of selecting these units is by the process of randomisation which involves selecting a part of the whole population in such a way that the characteristics of the sample proportionally resemble the characteristics found in the total population. For randomisation to be successful, it is essential that blind chance be allowed to determine the outcomes of the selection process to the greatest extent possible.

3.3.10 There are various methods by which randomisation can be achieved.

(i) The Random Number Method

This is probably the most widely used method of selecting a sample. Random numbers may be obtained from tables designed for that purpose, from programmable calculators or computers, or even from the telephone directory. It is important that entry into the table be

governed by chance, e.g. through observing a vehicle registration number or the serial number on a hundred rupee note.

(ii) The Chocolate Wheel Method

This is suitable where the population is small, say between 50 and 100. Each member of the population can be allocated a number and the wheel is then spun until enough numbers have been selected to complete the sample.

(iii) The Lottery Method

As the name implies, in this method the sample is selected by drawing the names or numbers out of a container. Names or numbers representing the population are marked on slips of paper and the sample is obtained by drawing out the required number of slips.

In small-scale research, it is often possible to survey the whole population, in which case this is generally the preferred method, since the results are then absolute and there is no possibility of bias due to sampling.

3.3.11 The principal techniques used in qualitative research include the following:-

(i) Interviews

Interviews may be either structured or unstructured. The first approach relies on standardised techniques and prepared questions that are aimed at minimising the researcher's biases. The second technique, which depends on a high degree of researcher training and sensitivity for its success, allows for open-ended exploration of significant questions.

(ii) Observation

Non-participant observation may raise some delicate ethical questions and is consequently less commonly used now as a technique for studying small groups, but it is quite often employed by sociological

researchers as a way of studying the behaviour of large groups such as football crowds.

Participant observation is a technique in which a researcher becomes immersed in the everyday life of the group being studied. Fairly obviously, the length and depth of participant observation varies from researcher to researcher, ranging from a single lengthy stay, to intermittent contact over many years to carefully planned but somewhat short-term involvements. Two well known examples of participant observation are action research and ethnography. Action Research is a kind of participant observation in which the focus is generally on a researcher's own practice. Teachers, for example, may choose action research as a way of improving their own effectiveness. It is customary to view action research as a cyclical process involving the following steps: planning, acting, observing and reflecting.

Ethnography undertakes the work of describing a culture from a 'native' or 'ethnic' viewpoint. An ethnographer, for example, might set out to interpret the culture of a particular fifth grade classroom, from the pupils perspectives. Ethnographic research will often be buttressed by new technologies such as video recording which, with its freeze frame and playback features, allows social scene to be analysed with the microscopic attention worthy of a painting or a ballet. The minimum unit of useful micro-sociological analysis is generally thought to be a triad (three people in interaction with others or with each other).

Case studies can incorporate either or both quantitative or qualitative approaches to research. An organisational case study, for example, might describe a local initiative, which seems to contain a message for the system.

3.4 THE QUESTION OF ETHICS IN SMALL SCALE RESEARCH

3.4.1 Various disciplines (such as psychology) have rules of conduct governing research. Ethical researchers need to be aware of these rules and to abide by them. For example, Aboriginal people complain that they are the most researched population in the world. Anti-vivisection groups aim at preventing research using live animals.

Research sponsored by governments or large corporations often raises ethical issues.

- 3.4.2** Obviously, researchers need to ask if the results of their work will cause harm to an individual or a particular section of society. In addition, there needs to be full consultation with those who participate in the research.
- 3.4.3** Where appropriate, researchers should talk with children, parents, teachers and community councils about their work. **Permission should be obtained from appropriate authorities.** Researchers need to remember that they are relying on the good wishes of participants and assistants (whether they are direct or indirect assistants) for the success of their study.
- 3.4.4** Another important consideration is how research is reported. Confidentiality needs to be respected and clues which would lead to the identification of locations and individuals may need to be suppressed. Some communities may prefer not to be identified.
- 3.4.5** If researchers have any doubts about the ethics of their work, they should consult with others. In this way they can obtain feedback and reorganise (or scrap) their work if necessary. This, of course, should be done in the early stages of the project.
- 3.4.6** If people are involved in assisting the researcher as assistants or subjects, they have a right to read the work when it is finished. The research findings may not be of interest to them at present but they should still be made available, for future reference. One teacher, at a remote school some years ago, was annoyed by the number of researchers who assumed that it was their right to talk to and assess the children in his care.
- 3.4.7** Ethics in research covers three major areas:-
- (1) the way the researcher presents the research to the community;
 - (2) the way in which the data is gathered; and
 - (3) what the researcher does with the information once it has been obtained.

3.4.8 Each of these activities is governed by established rules of conduct. Whatever the situation, researchers should resist the temptation to disregard the rights of other people.

3.4.9 We include here a set of 'Advisory Principles for Ethical Considerations in the Conduct of Cross-cultural Research':

Responsibilities of the Principal Investigator

1. Accept personal responsibility for evaluating the ethical acceptability of each study in terms of the guidelines governing research.
 - (a) Only engage in activities abroad that are ethically acceptable at home.
 - (b) Avoid actions that are ethically unacceptable to the community.
2. The investigator should respect the cultural integrity of the research site and avoid actions that violate cultural expectations or reveal a culturally-biased perspective when formulating the research problem, executing the study, and/or reporting the findings.
 - (a) Gain some understanding and appreciation of the culture, language, history, social structure, and other aspects of community life, before starting research.
 - (b) Seek frequent guidance and cooperation from members of the community.
 - (c) Avoid "oversaturating" a particular community.
 - (d) Attend systematically to the technical problems of equivalent measurement across cultures. Consider multiple measures to minimise methodological problems and unwarranted conclusions.
3. Communicate openly and honestly, in a way that is conducive to the creation and maintenance of trust. Openness should characterise the relationship between the investigator and the individuals and communities

studied. The purposes, sponsorship, and funding source of the research project should be communicated clearly and accurately.

- (a) Inform subjects of all features of the research that might reasonably influence their willingness to participate, including the research auspices.
 - (b) Convey truthful communications to all subjects throughout the research process.
 - (c) Willingly provide information to the members of the community about professional qualifications and competencies, sponsorship, research funding, and the nature and goals of the study.
 - (d) Resist efforts by sponsoring or funding agencies to conceal any aspect of the research from the individuals or communities studied.
4. The rights and responsibilities of the investigator should be defined by an agreement that is contextually both clear and fair.
- (a) Avoid coercion. Protect the subject's right to participate or not.
 - (b) Obtain explicit permission to observe in settings intended to be private or to probe into areas considered personal.
 - (c) Solicit subjects' participation only if confident that the research problem is significant (scientifically and/or socially), that the methods are suited to the problem, and that the cultural context is sufficiently familiar to permit meaningful, valid interpretations.
5. Protect the welfare and dignity of research subjects and communities participating in the research. This responsibility includes protecting subjects from undue physical and psychological discomfort, harm, or risk as well as detecting and correcting procedures likely to have undesirable consequences for subjects or community.
- (a) Inform subjects in a clear and understandable way and secure their free consent before proceeding with research that involves potentially stressful experiences or damaging consequences.

- (b) Clear research activities with appropriate authorities whenever such clearance is necessary to protect the interests and safety of subjects and to maintain access and goodwill for future researchers.
 - (c) Keep confidential all information obtained about individual subjects and treat the data in ways that ensure anonymity.
 - (d) Make every effort in reporting findings to forestall misinterpretations that may be damaging to the population studied.
 - (e) Prevent or counteract, wherever possible, the misuse of research findings in ways likely to be harmful to the population studied, particularly in the formulation of public policy.
 - (f) Ascertain the responses of potential sponsoring to funding agencies in supporting research and their intended use for the findings.
 - (g) Recognise that both the process and the products of research may have implications for individuals and groups within the community.
6. Benefit to the participants: The total research experience should enrich and benefit in some ways the individual subjects and the community.
- (a) Consider, in setting research priorities, not only theoretical problems of the discipline but also the needs of the community for research related to its welfare and development.
 - (b) Make the results of the research available to the community by publishing in local outlets, writing in the vernacular and in an understandable form. Provide direct feedback of the findings to subjects, their representatives and other relevant groups in the community.
 - (c) Contribute something of lasting value to the community after completion of a research project.

4.0 RESEARCH IN PRACTICE

4.1 APPLICATIONS

4.1.1 Many textbooks on social science research recommend a hypothesis-testing model for the design and conduct of research. This model provides a theoretical framework which is suitable for a great variety of research applications including:-

- (1) pre-test and post-test research, where a single group of subjects is measured twice;
- (2) matched groups research;
- (3) population survey or polls;
- (4) case study research focused on individuals; and
- (5) tightly controlled experimental research, and so on.

4.1.2 There are many variations of this model but a fairly common version would be more or less as follows:-

- (1) Statement of the Problem
 - (a) Clearly outline the problem to be investigated, defining concepts where necessary
 - (b) Describe the significance of the problem.
- (2) The Theoretical Framework
 - (a) Link the problem to a theoretical framework
 - (b) Review relevant research literature.
- (3) The Hypothesis
 - (a) State the hypothesis to be tested
 - (b) Define the key variables
 - (c) Discuss the probability of error in testing the hypothesis.

- (4) Design of the Experiment or Inquiry
 - (a) Describe the research design.
 - (b) Specify statistical tests.
- (5) Sampling Procedures
 - (a) Describe sample(s)
 - (b) Explain selection of sample(s)
- (6) Data Collection
 - (a) Describe measures or tests used (such as questionnaires, schedules, interviews, etc).
 - (b) Discuss problems encountered and their solution
- (7) Results
- (8) Interpretation of Results
- (9) Bibliography
- (10) Appendices

4.1.3 The model presented above has been simplified; Miller (1964) gives an expanded version. It is not possible or appropriate in this handbook to go into too much detail about such matters as null hypotheses, dependent and independent variables, intervening variables, type 1 and type 2 errors, and so forth. However, use of the hypothesis-testing model will often require knowledge of such things, and readers are referred to Twaite and Monroe (1979) for precise explanations of these and other concepts.

4.1.4 There is an alternative approach to conducting research which is beginning to find wider acceptance. While we have not put a name to it, it is an approach which demystifies and simplifies research methodology by doing away with the need for rigorous hypothesis-

testing. Goal-free evaluation, action research and ethnography are some of the more common applications of this approach.

4.2 EVALUATION

4.2.1 *The Nature of Evaluation*

It is generally accepted that the process of educational evaluation should involve or assist some form of judgement concerning the quality of an educational activity or resource. There is, however, an ongoing debate amongst the leading practitioners as to whether the evaluator should pass judgement upon the main issues himself (or herself) or merely present the evidence and allow the audience to judge those issues.

Evaluation is a form of practical research activity, which uses both the methods and findings of pure research. Thus evaluation studies use the same techniques in the analysis and collection of data as do other forms of research. Similarly, evaluation studies frequently make use of previous research to validate a strategy or finding.

4.2.2 *The Purpose of Evaluation*

Evaluation may be formative when it takes place during the life of a program and the findings provide feedback intended to influence the future development of that program. This type of evaluation concentrates upon process and progress rather than upon product or outcomes.

Summative evaluation, on the other hand, generally takes place at the end of a program and the findings provide information intended to assist in making judgements about the effects or outcomes of the program.

A third type evaluation, which Stake (1977) has named operative evaluation, is aimed at providing information for decision makers through identifying choice points, the alternatives available, and the implications of each alternative. This type of evaluation is not aimed

at either generalisation or understanding, but is for monitoring, trouble-shooting, crisis-managing and the alleviation of problems.

4.2.3 *The Subject of Evaluation*

Any form of educational activity or resource may be selected as a subject for evaluation. Thus the evaluation topic could range from a single lesson to a whole education system. Some of the more common subjects of evaluation would include:

- (1) a program such as a curriculum unit;
- (2) a project such as a field study centre;
- (3) a set of materials such as a reading kit; or
- (4) an organisation such as a school

Because of the great variety of topics, which may be subjected to educational evaluation, the technique of educational evaluation must be similarly varied. In each case the method should be tailored to suit the particular activity or resource to be studied.

4.2.4 *The Evaluation Audience*

In the same way that the subject of evaluation may vary widely, so also may the audience. The following list gives some idea of the possible range of audiences.

- (1) the evaluator for his or her own use;
- (2) a lecturer or supervisor for study purposes;
- (3) the committee funding the subject of the evaluation;
- (4) an organisation which has undertaken or commissioned evaluation;
- (5) the clients of the program evaluated; and/or
- (6) the participants in the program evaluated.

It follows that in planning an evaluation the evaluator must take account of not only the subject but also the audience and plan the

approach accordingly. For instance, if the evaluation style fails to match the expectations of the audience, its usefulness may be seriously compromised.

4.2.5 *The Aim of Evaluation*

An evaluation study usually aims to provide certain specific information; that is, it is focused. It is normally both possible and useful, therefore, to encapsulate the aims of the evaluation in a series of questions, which may be helpful in achieving this focus.

4.2.6 *The Evaluation Approach*

In the design of an evaluation study, there are many possible approaches from which the evaluator can choose. Thus the selected approach may be:

- (1) qualitative or quantitative;
- (2) survey or experimental;
- (3) goal-based or goal-free
- (4) process or product oriented; and/or
- (5) portrayal or measurement.

It does, however, have to be realised that although these approaches have been presented as dichotomies, the alternatives are by no means mutually exclusive. Thus it is not uncommon for evaluation studies today to use a combination of both quantitative and qualitative techniques. However, it is unlikely that the degree of emphasis accorded to each approach will be heavily influenced by the subject and purpose of the evaluation. It follows that where the evaluation topic lends itself to the techniques of educational measurement, an emphasis upon quantitative techniques may be appropriate.

In the same way, a formative evaluation may be more concerned with portraying the processes or procedures involved in a program, whereas a summative evaluation may emphasized techniques intended to measure the product or outcomes.

In the case of goal-based evaluation, the study focuses upon the extent to which the project or program is achieving, or has achieved, its intended objectives. In the goal-free approach, on the other hand, the study attempts to evaluate all the significant outcomes irrespective of whether they were intended or not. In fact Scriven (1977), writing about goal-free evaluation, maintains that the evaluator should, if possible, be completely unaware of the intended outcomes.

Goal-based evaluation was, of course, epitomised by the objectives model, which dominated the evaluation scene for so many years. Under the objectives model, the procedure was to identify the intended outcomes of the program, and then try to measure the extent to which these were achieved. No attention was generally paid to either the process or the unintended outcomes.

4.2.7 *The Methodology of Evaluation*

As stated earlier, evaluation studies draw upon the same methods as those used in pure research. Thus the evaluation methodology should take into account the techniques of

- (1) data collection, e.g. surveys, tests, document analysis;
- (2) data analysis, e.g. statistics, display, reduction, interpretation; and
- (3) data reliability, e.g. triangulation.

Clearly, the methodology must be related to the other aspects of the evaluation. Thus, for example, a quantitative approach is frequently combined with statistical analysis of data obtained by way of a questionnaire survey.

4.2.8 *The Control of Evaluation*

Educational activities do not take place in a vacuum but in a context which has social, political and ideological evaluation study in the same way as do the evaluator's own personal values. MacDonald (1977) has developed a political classification of evaluation studies which identifies three categories of evaluation:

- (1) bureaucratic
- (2) autocratic; and
- (3) democratic

A bureaucratic evaluation is one where the study is owned and controlled by the organisation, which has commissioned the evaluation. Its prime purpose is to assist the achievement of organisational objectives. The evaluation techniques must be acceptable to policy makers and the findings must not cause them embarrassment. Frequently, the evaluator is an employee of the organisation and derives his authority therefrom.

Autocratic evaluation is undertaken as a conditional service to an organisation, under a contract, which guarantees the independence of the evaluator. The evaluation is intended to provide an external validation of organisational policy. The study is owned and controlled by the evaluator. Although the report is lodged in the files of the organisation, the findings may also be published in academic journals. The evaluator derives his authority from the academic community.

An evaluation would be described as democratic where the intention is to provide information, about an educational activity or resource, to the community. It recognises the differing interests of the participants, the policy makers, the funding agencies and other groups. The report is widely accessible to members of the general community and derives its authority from its acceptability to lay audiences.

4.3 ASSESSMENT

- 4.3.1** There is a commonly accepted distinction between evaluation and assessment whereby the former term is usually applied to judgements concerning the performance of programs, whereas the latter term is more often used in judgements relating to the performance of people, e.g. student attainment.

- 4.3.2** One form of applied research, known as needs assessment (Witkin 1984), is a form of planning which may be undertaken at the commencement of a project or program. It focuses on the collection of facts and opinions both from within and without organisations. As such it is the first phase in a planning, implementation and evaluation cycle.
- 4.3.3** The assessment of learning is another area of applied research. Generally, student assessment uses the techniques of measurement, observation or estimation to appraise learning, often with specific focus on cognitive, affective and/or psychomotor domains. The collection of accurate data is crucial if assessment is to be a useful tool in diagnosis or judging mastery of certain specified learning objectives. Assessment may be holistic, concentrating on broad areas of performance (*such as “fluency” in the assessment of oral language ability*) or discrete point (*focusing on accuracy and the attainment of specific skills*).
- 4.3.4** A broad distinction is often made between criterion-referenced and norm-referenced testing. The former measures student attainment with respect to a specified level mastery (*which is, often, getting 80 percent of the answers correct*); the second measures individual performance against some normative measuring stick (*such as the performance of other students in the same class or the distribution of skills in a certain population*).
- 4.3.5** Educational assessment tends to focus more on the attainment of cognitive skills but, in theory, assessment could be concerned with the measurement, observation of sensory motor abilities, affective behaviours, cultural features and personal identity characteristics as well as skills areas like symbol manipulation (*such as reading, writing and numeracy*), spatial relationships and oral communication.
- 4.3.6** Some of the interesting and contemporary areas of research in assessment include looking at student self-assessment, cooperative forms of testing, descriptive assessment, moderation, folio-based assessment, the development of item banks and assessment procedures which take account of cross-cultural differences.

5.0 PUBLICATION AND PRESENTATION

5.1 PUBLICATION

The effort in conducting a research project is largely wasted if the results are not available for full circulation. Where the likely audience is small, an unpublished report would probably suffice. If the topic is one in which there is wider interest, formal, refereed publication in a reputable professional journal is a desirable form of dissemination. Whatever reporting medium is used, presentation of results is particularly important: the researcher's reputation is enhanced, the information becomes available to other researchers, and the moral obligation to those who suggested the project is discharged.

Published research papers usually follow a format such as the one set out below.

5.1.1 *The Introduction*

This brief section states why you did the project. It should describe the general area of work and then focus on the particular aspects, which you wish to investigate. It is here that you give your reasons for choosing the topic. If the paper is to be a short one, literature supporting your hypothesis may be cited here. If the paper is long (e.g. a formal thesis), the literature review should have a chapter of its own.

5.1.2 *Methodology*

In this chapter, the author describes what was done, and what was needed to do it. The size and nature of samples, the survey or experimental techniques used and any particular aspects of data collection which need description, are all components of this section. Actual results come in the next section but methods of analysing results may need to be detailed. This can be done in the Methodology Section, in a brief chapter (which serves as a kind of preamble) before the Results Section.

5.1.3 Results

The opening remarks usually summarise the findings. In any report there should be space for a fairly bold statements of what measurements were made without accompanying interpretation or discussion. The bulk of this section would normally comprise tables and graphs, without very much written text. If the raw data is too bulky to include in the text itself, it should be inserted in an appendix and only summary statistics included in this chapter. Given the propensity of the latter-day student to generate enormous quantities of computer print-out, authors should consider lodging this in an appropriate library where it can be inspected by someone who has used the report or paper, and wants to know more about it.

5.1.4 Discussion and Conclusions

After what is often a fairly unimaginative presentation in the previous results section, many authors use this opportunity for discussing the findings and drawing conclusions as a way of 'letting their hair down.' This is where authors say what they think, what their findings mean, how they might be used, and they might perhaps comment on further directions for research on that particular topic. When the size of the report permits, these two items occupy separate chapters of their own, but many research journals, pressed for space, prefer the two sections to be combined.

5.1.5 List of References

Where and how items are cited varies with the discipline and the journal, and authors may save much time by deciding in advance which journal they wish to use, and adopting the relevant method of citation from the beginning. Where there is a choice, for instance in an unpublished report, then the type of citation used should be that which fits best the layout of the entire article.

5.1.6 Abstract

This very brief section should contain firstly a statement, perhaps only one sentence, saying what was done, e.g. "The migratory patterns of the Tibetan Trothing Duck were observed over three winters." The

remainder of the section should be no more than an equally terse precise of your results section, including actual key statistics if necessary. It should contain few elements of your discussion and conclusions, having as its main purpose the role of informing a potential reader what you did and what you found.

5.1.7 Acknowledgement

Researchers need to acknowledge the participation of different parties involved in the research process.

5.2 PRESENTATION

Publishing organisations have particular requirements for layout, and these are usually freely available on request. They should include instructions on figure plate and table format, use of correct units and their abbreviations, margins, typing instructions, etc. What no journal editor will tell you is how to write good English; he (or she) will merely reject your article if you don't. Competence in technical writing is a particular skill, one which few demonstrate at high level when writing, but which many of us suddenly acquire when we asked to criticise someone else's manuscript. It is nevertheless critical that someone not involved in the work should continually review the manuscript. It is very easy to become so familiar with a project that glaring errors can go unnoticed. The final proof reading should also be done by an outsider for the same reason.

Many strategies are available for presenting the findings of a research study and these include:

- (1) narrative description;
- (2) diagrams, e.g. flowcharts;
- (3) graphs;
- (4) maps;
- (5) tables; and
- (6) pictures, e.g. photographs, sketches.

It is generally the case that the nature of the data and the methods of analysis determine the most appropriate presentation strategies. However, it is also true that qualitative research is very often reported in narrative prose even though, as Miles and Huberman (1984) suggest, there are some excellent alternatives to prose for reducing, displaying and interpreting data, such as matrices, figures, context charts, even histories, casual networks and other information displays.

5.2.1 Referencing

The most important aspect of referencing is simply to be consistent. The main aim, of course, is to provide the reader with sufficient information to be able to (a) check your statements, (b) check your figures, (c) refer to the article or chapter you mention to be able to follow-up in greater detail some thing of importance or interest about which you have written and (d) to allow the reader to verify your data.

Therefore, what you are doing is providing the reader with more information about the topic you are considering in your article.

Referencing then is particularly important from the viewpoints of reader consideration and author credibility.

Two systems are commonly used - the Harvard and the footnoting systems. Traditionally, different disciplines have tended to favour one or other although sometimes a different system is used altogether. In the field of Education the Harvard (author-date) system is generally preferred. However, regardless of the system that is chosen, it is most important that it be used accurately and with total consistency. Editors and others insist on correct and consistent use of referencing conventions. Accuracy in every detail is important, to ensure that readers can easily locate any source materials that are cited. Quotations, facts, titles—all should be accurate in every detail.

What follows is a brief resume of how the Harvard system operates: the full stops, commas, spaces etc. are intentional and should be placed in the positions shown.

5.2.2 In-text referencing:

This is probably the most straightforward aspect of the system. Some examples follow:

Direct quotation:

- (1) Green (1986) noted “Zen culture abounds with tales of lawless and irascible masters, yet one of its most obvious elements is a deep respect for clarity and order” (p.280); or
- (2) “You don’t always have to say a lot to say a lot” (Green 1986:107).
- (3) A longer quotation will be typically set out in an indented block of text without quotation marks.

Paraphrasing:

The surname of the author and the date of publication can be included in parenthesis; for example, In a more recent study of Nechaev’s activities (McIellan 1979), it was observed that ...

5.2.3 Bibliographic Entries

All references should be listed in alphabetical order.

Book:

GUILFORD, J.P & FRACHTER, B. Fundamental Statistics in psychology and education. *New York: McGraw Hill, 1973.*

Article in a journal:

FREEBODY, P. & BAKER, C. “Children’s first schoolbooks: introductions to the culture of literacy.” *Harvard Educational Review* 55 (1985): 381-398.

Chapter in a book:

CICOUREL, A.V. “Cross modal communication: the representational context of sociolinguistic information processing.” In R.Shuy, (ed,

Monograph series on language and linguistics. *Washington: Georgetown University Press 1972..*

Unpublished documents:

DAY, J.D Training summarisation skills: a comparison of teaching methods. Unpub. Doctoral Dissertation. *Urbana: University of Illinois, 1980.*

6.0 FURTHER READING

Title: Doing Research: The Complete Research Paper Guide

Author: Dorothy U. Seyler

Publisher: Mc Graw Hill (1998)

Book Description:

Illustrating both the “hows” and “whys” of research. DOING RESEARCH encourages researchers to view research as an exciting avenue for learning. Its distinctive process approach is designed to stimulate the creative processes behind successful research as researchers learn its procedures and convention. DOING RESEARCH strikes the proper balance between explaining the research process and providing guidelines and checklists for completing a paper. This book incorporates run coverage on the internet and other forms of electronic research and provides helpful guidance for evaluating sources.

Title: Conducting Research

Authors: Patrick J. Schloss, Maureen A. Smith

Publisher: Prentice Hall (1998)

Book Description:

Presents the research process in a step-by-step manner that provides a context for the discrete research skills. Each step of the research process is presented in a comprehensive manner to meet the needs of the beginning researcher. The authors provide sufficient detail readers need to conceptualise a problem, to review literature, to select a design, to conduct the study, and to report research findings.

Title: Conducting Social Work Research: An Experiential Approach

Author: Reginald O. York

Publisher: Allyn & Bacon (1997)

Book Description:

Social workers at any level in the profession will find this reference extremely helpful as they foray into the ever-increasing important research stage of their careers. As the need and desire for social workers continue to increase, this book will help those learn the proper ways to conduct research in the field. Readers are given information on specific tasks in research in which they will be called upon to evaluate alternative ways to complete each task in the research process. This book focuses on the purposes of research and the entire research process.

Title: Designing and Conducting Research: Inquiry in Education and Social Science

Authors: Clifford J. Drew, Michael L. Hardman, Ann Weaver Hart

Publisher: Allyn & Bacon (1995)

Book Description:

The purpose of this book is to provide a first step into the world of research. The material serves as an initial conceptual framework for students without a background in research methods.

Title: Doing Social Research

Author: Therese L. Baker

Publisher: McGraw Hill (1998)

Book Description:

This edition offers a hands-on, step-by-step approach to social research that combines authoritative content, effective pedagogy, and an engaging writing style. To that end, the author includes real, classic and contemporary research studies, as well as interviews with the authors of these studies, to personalise the experience of doing social research, and keep students interested and motivated. The author exposes students to a broad range of research methods, encouraging them to explore the rich universe of social research. In this text, Baker encourages a sense of commitment to doing social research. She exposes students to the choices, the challenges, and the excitement of trying to study some piece of social action, and encourages students to believe that they can become social researchers. Doing Social Research is the answer for sociology and social science students who need a practical understanding of today's key research theories and techniques.

BIBLIOGRAPHY

MACDONALD, B. "A Political Classification of Evaluation studies." In *Beyond the Numbers Game*. Edited by David Hamilton, David Jenkins, Christine King, Barry MacDonald and Malcolm Parlett. *London: MacMillan Education, 1977.*

MILES, M. and HUBERMAN, M. *Quantitative Data Analysis: A Sourcebook of New Methods.* *Beverly Hills: SAGE, 1984.*

MILLER, D.C. *Handbook of Research Design and Social Measurement.* *New York: David MacKay Co: 1964.*

NADLER, G. *The Planning and Design Approach.* *New York: John Wiley and Sons, 1981.*

SCRIVEN, M. "Goal-Free Evaluation, part I", 11-71 *NIE 2A* and "Goal-Free Evaluation, part II", 11-71 *NIE 2B, 1971.*

STAKE, R. E. "Formative and Summative Evaluation." In *Beyond the Numbers Game*. Edited by David Hamilton, David Jenkins, Christine King, Barry MacDonald and Malcolm Parlett. *London: MacMillan Education, 1977.*

TWAITE, J. and MONROE, J. *Introductory Statistics.* *Gleview, Illinois: Scott, Foresman and Co.: 1979.*

WITKIN, Belle. *Assessing Needs in Educational and Social Programs.* *San Francisco: Jossey-Bass, 1984.*

WORSLEY, P. *Introducing Sociology.* *Harmondsworth: Penguin, 1978.*

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