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ABSTRACT

This manual, prepared by the Distance Education Council (India) presents guidelines for action research in distance education, balancing practical research activities with a sound theoretical research base. Chapter 1, "Scope, Purpose and Design of the Manual," suggests several definitions of research; draws distinctions between academic research and action research; examines the purpose and scope of action research; and a offers a checklist of researcher competencies. Chapter 2, "Thrust Areas and Research Problems," discusses selection of a research area or problem and offers a list of suggested areas: philosophy and concepts; history of distance education; institutional mission; program planning and curriculum design; learning material development; teaching and learning processes; student support services; student evaluation; system evaluation; economics of distance education; media use; system management; application of new technologies; quality assurance; research methodologies; and staff training and development. Chapter 3, "Research Design," discusses the essential components and types of research design. Chapter 4, "Research Methods," discusses appropriate research methods; examines six methods, data collection tools and techniques, and data analysis; and offers suggestions for presenting results. Chapter 5, "Research Report Preparation," discusses organizing and documenting material; appropriate writing style; and evaluating the final report. Appended are a model process chart and a glossary. (Contains 39 references.) (SM)

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Action Research Projects in Distance Education

ED 443 353

C. Pushpa Ramakrishna
V.S. Prasad

A M A N U A L

DISTANCE EDUCATION COUNCIL
INDIRA GANDHI NATIONAL OPEN UNIVERSITY
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1999

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ACTION RESEARCH PROJECTS IN DISTANCE EDUCATION : A MANUAL

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FOREWORD

The Distance Education Council, Indira Gandhi National Open University, has the primary responsibility to promote, strengthen and sustain research in distance education in the country. The popularity of distance education at home and abroad has led a large number of researchers from different disciplines to undertake research studies in this area. The absence of a comprehensive document dealing with the basics of research in Distance Education was felt when the Distance Education Council launched the scheme of research projects in Distance Education in 1996. The Council is bringing out this Manual on Action Research Projects in Distance Education for the guidance of all those interested in undertaking research in this emerging area.

The Manual discusses the theoretical framework of research and also provides an illustrative list of problems for action research. The Distance Education Council had entrusted the responsibility of preparing this Manual to Prof. (Mrs.) C. Pushpa Ramakrishna and Prof. V.S. Prasad. I wish to place on record my sincere appreciation of their efforts in preparing this useful document. I would also like to compliment the Distance Education Council for bringing out the Manual.

I am confident that this Manual would be a useful guide for researchers in distance education.

Abdul W. Khan
Chairman
Distance Education Council

New Delhi
11th March, 1999

PREFACE

The Distance Education Council (IGNOU) launched the scheme of Research Projects in Distance Education in 1996. The idea to prepare a manual for research in Distance Education came as a response to proposals received by the Distance Education Council to the call for Research Projects in Distance Education. While the field is new and needed exploration, the prospective researchers were experienced practitioners. Some of them held research qualifications in their own subjects/ disciplines which they now wished to apply to the new area. What emerged from their responses, however, was that most of the proposals lacked a systematic application of attention to research procedures in action research and distance education. The Council therefore felt it was necessary to bring out a compact manual which gives brief guidelines for going about the research activity. Perhaps the most significant purpose of bringing out this manual was the need to collate the information available in different sources in a more accessible and relevant form for researchers in distance education. This is not a manual of direct instructions on how to produce a research project but a handbook that gives clues and suggestions for a discerning researcher to pick out and follow as and when necessary.

The purpose of this manual is to bring about a balance between practice and theory by underpinning practical research activities on a sound theoretical research base. It also aims at standardising the processes such that there is greater compatibility and interchange and sharing of ideas and expertise in this field.

The readers/users for such a manual, as mentioned above, would be the researchers who propose to take up projects in distance education. It should serve their institutional and individual professional use. This would be possible by its intention of cutting across disciplines and subjects. While being aware of conflicting arguments about the 'right way' of conducting research in different disciplines, this manual proposes to develop traditions for research in distance education that are validated by their systematicity and rigour. It contains many warnings that such stages of research design and methodology as are described herein need not be followed rigidly but should be seen assign posts or forward references to the entire process which result in a well-planned and deliberate activity.

We are grateful to the Chairman, Distance Education Council, (IGNOU) for entrusting us with the responsibility of preparing this manual. We are also thankful to the members of the D.E.C. Research Committee for their valuable suggestions in the design of the manual and to the academic and administrative staff of D.E.C. for their support in the preparation of the manual.

March, 1999
New Delhi.

C. Pushpa Ramakrishna
V.S. Prasad

CHAPTER I . SCOPE, PURPOSE AND DESIGN OF THE MANUAL

1.0 Introduction

1.1 Defining Research

1.2 Essential Features of Research

1.3 Action Research

- 1.3.1 Academic Research and Action Research: Broad Distinctions
- 1.3.2 The Purpose of Action Research
- 1.3.3 The Scope of Action Research

1.4 The Manual

- 1.4.1 Manual-Useful for Whom
- 1.4.2 Objectives of the Manual
- 1.4.3 Design of the Manual

1.5. Check List of the Essential Competencies of a Researcher

1.0 INTRODUCTION

Distance Education is a growing field of study. More and more institutions are turning to this mode of education as a supplement/complement to existing mainstream education and training. Scholars from different disciplines are also evincing interest in research studies in this field. At the same time, there is an interest in research activity from the practitioners and academics in distance teaching institutions. This may be evidenced by increased research articles in journals and the number of research degrees awarded in this field. Practitioners and academics with various backgrounds and research traditions are engaged in systematic research in this area. There is a need to identify procedures of research work in distance education. We have started this exercise with a discussion on the meanings/definitions of research followed by the nature of action research in distance education. We hope that a close look at definitions and meanings of research and the features of action research will help the researcher in locating his work in a proper framework.

1.1 DEFINING RESEARCH

Research has been variously defined by different experts in the field. Let us now examine some of these meanings/definitions to identify the elements, nature and scope of educational research. Some of the meanings/definitions are:

1. **An investigation undertaken in order to discover new facts, get additional information etc.**

   (Oxford Advanced Learner's Dictionary of Current English, ed. Hornby, A.S. 1991, Delhi O.U.P. p.1073.)

2. **A careful search; investigation; systematic investigation towards increasing the sum of knowledge.**

   (Chambers 20th Century Dictionary, 1983, Reprint 1993, p.1100.)

3. **A careful critical enquiry or examination in seeking facts or principles, diligent investigation in order to ascertain something.**

   (Webster's International Dictionary, 1978, p.1075.)

4. **A critical and extensive investigation to discover new factors, to interpret them in the light of known ideas, theories and laws to revive the current laws and theories in the light of the discovered factors to apply the conclusion to practical purposes.**

   (Ranganadhan, S.R., quoted in MLIS E-2, IGNOU, Research Methodology, p.7.)

5. **An honest extensive intelligent searching for facts and their meanings or implications with reference to a problem.**

   (Cook, P.M. quoted in Sidhu, K.S. 1984, p.2.)

6. **Research is a systematic and refined technique of thinking, employing specialised tools, instruments and procedures in order to obtain a more adequate solution of a problem than would be possible under ordinary means. It starts with a problem, collects data or facts, analyses them critically and reaches decisions based on the actual evidence.**

   (Crawford, C.C., quoted in Sidhu, K.S., 1984, p.3.)

7. **Educational research is that activity which is directed towards development of the science of behaviour in educational institutions. The ultimate aim of such a science is to provide knowledge that will permit the educator to achieve his goals by the most effective methods.**

   (Travers, R.M.W. (1978) An Introduction to Educational Research, New York, Macmillan Co.)

8. **Research is a point of view, an attitude of inquiry or a frame of mind. It asks questions which have hitherto not been asked and it seeks to answer them by following a fairly definite procedure. It is not a mere theorising, but rather an attempt to elicit facts and to face them once they have been assembled. Research is likewise not an attempt to bolster up preconceived opinions, and it implies a readiness to accept the conclusions to which an inquiry leads, no matter how unwelcome they may prove. When successful, research adds to the scientific knowledge of the subject.**

   (Rusk quoted in Sidhu, K.S. (1984), p.2.)

9. **The systematic and scholarly application of the scientific method, interpreted in its broadest sense, to the solution of educational problems; conversely, any systematic study designed to promote the development of education as a science can be considered educational research.**

   (Mouley George J. (1970). The Science of Educational Research, New York, Van Nostrand Reinhold Co.)

10. **Research may be defined as a method of studying problems whose solutions are to be derived partly or wholly from facts. The facts dealt with in research may be statements of opinions, historical facts, those contained in records and reports, the results of tests, answers to questionnaires, experimental data of any sort, and so forth. The final purpose of educational research is to ascertain principles and develop procedures for use in the field of education; therefore, it should conclude by formulating principles or procedures. The mere collection and tabulation of facts is not enough, though it may be preliminary to it or even a part thereof.**

(Monroe, W.S. quoted in Sidhu, K.S. 1984, p.3.)

11. **Research may be defined as the systematic and objective analysis and recording of controlled observations that may lead to the development of generalisations, principles or theories resulting in prediction and possibly ultimate control of events.**

(Best, J.W. and Kahn, J.V. (1995) Research in Education, Seventh Edition, New Delhi, Prentice-Hall of India Private Limited.)

12. **By 'Practical Research' I mean research which is undertaken to help a distance-teaching organisation do a better job. Some one is supposed to do something in the light of the results-to change a policy, to redraft some material, to launch or cancel a project, or whatever. And the researcher carries out his research with that in mind from the outset.**

(Mitton, R (1982) Practical Research in Distance Teaching: a handbook for developing countries, U.K., International Extension College.)

DOES YOUR RESEARCH FIT INTO ANY OF THESE DEFINITIONS?

1.2 ESSENTIAL FEATURES OF RESEARCH

We may see from the meanings/definitions given above that they have some common elements or essential features that can be listed as characteristic of any research study.

i) Research is highly purposive. It requires that a specific problem be selected and analysed and solutions suggested.

ii) Research is logically developed and applies unprejudiced principles to its analysis.

iii) Research is an extensive search for facts using specialised tools, instruments and procedures.

iv) Research is accurate, objective and verifiable.

v) Research is a systematic or organised act.

vi) Research is an intensive and painstaking activity which calls for an application of the skills of careful study and scrutiny.

vii) Research gathers new knowledge or information from primary or first-hand sources;

viii) Research searches out generalisable principles that can have larger application than the study itself.

On analysing these characteristics of research, and matching them with your own purposes for undertaking it, you may wish to describe your own research activity within these parameters. Alternatively, you may prefer to reframe one or more of the given definitions to provide a sharper focus towards your own objectives for the research study and analysis. Whichever of these methods you prefer, you may ultimately find that your definition will contain at least some if not all of the characteristics we listed above.

1.3 ACTION RESEARCH

For analytic purposes research in distance education can be broadly classified as academic and action research. Academic research, which is also referred to as fundamental or basic research, mainly probes fundamental, intellectual problems and is essentially theoretical in nature and approach. Action research is more in the nature of an inquiry related to an activity. Action research is expected to help the distance teaching institution to do a better job. It may result in changing a policy, re-drafting some material, launching or withdrawing a programme, change of programmes and systems etc. This is not to suggest that there may not be common elements in both action research and fundamental or academic research. In operational terms it may even be difficult to separate the two. These differences would rather be in terms of the perspective or focus in each and these analytical categories are more heuristic purposes. The broad distinctions between these categories of research are presented below in a tabular form.

1.3.1 Academic Research and Action Research: Broad Distinctions

Feature	Academic Research	Action Research
1. Objective	Search for knowledge, adds to given body of knowledge	Practice-based, activity-oriented generated from critical examination of experience/ practice/products
2. Who is the researcher?	An academic expert trained to undertake such a project	A functionary in the system, a practising distance educator
3. Locating the research problem	An un-researched area is selected, review of literature helps in locating the problem	Emerges from functions and activities engaged in. A practising distance educator can select/identify it

4. Research design	Carefully done and systematically, often objectively worked out	Planned in general terms initially by the practitioner but systematically worked out later and verifiable by an external observer
5. Research Methods	Specific, well-formulated and adopted	General, including quantitative as well as qualitative aspects of the work. The topic would determine the details of the method
6. Involvement	Most often an external member not directly a part of the process	An interested party in that the researcher functions within the system or is directly involved in the research problem
7. Analysis of data	Complex using statistical tools	Includes evaluative statements on statistical analysis
8. Statistical treatment	Rigorous tools may be employed to prove/disprove the hypothesis with the given evidence	Simple procedures are considered adequate because the focus is on open-ended and unquantifiable data
9. Application of results	Results and findings are usually confined to libraries and publications and not directly useful to the discipline/ institution	Conclusions and insights can be applied directly to the contexts from which they have arisen. They have direct relevance to the institutions

Adapted from Sidhu, K.S., 1984, op.cit., pp. 16-18.

1.3.2 The Purpose of Action Research

Any system, organisation or institution needs research studies to provide it ongoing feedback for growth and development. It is not uncommon today to find exclusive research and development units in large corporate organisations where experts in the field examine and analyse given processes to improve upon them and better their performance.

Action research in distance teaching institutions can be useful in two respects;

one, it can benefit the individual researcher, and

two, it can be useful to the institution.

Benefits to the Researcher

Research can be useful to the individual in the following ways:

- ❒ for intellectual growth
- ❒ to provide academic satisfaction
- ❒ to enhance competencies of the users
- ❒ to develop authenticity of actions
- ❒ to sustain and support intuitions and hunches
- ❒ to help in career development.

Benefits to the Institution

Action research can be useful to the institution in the following ways:

- ❒ provide inputs in policy planning and forward thinking
- ❒ give feedback on effectiveness of policies, programmes and practices
- ❒ generate basic data which is useful in understanding the system and for planning and monitoring
- ❒ help in system evaluation
- ❒ may lead to innovative practices.

RESEARCH CANNOT GUARANTEE THAT PEOPLE ADOPT THE BEST PRACTICES BUT IT CAN BRING IN A BIT OF REALISM INTO THEIR THINKING

1.3.3 The Scope of Action Research

This brings us to the question of the scope and duration of the action research project. The type of research being advocated need not be massive. The danger in its being too large is that it may be too remote from action or may become unwieldy. Interest in the project can then begin to wane. Too long a project would also be as purposeless as a project which is extremely limited in time or perspective. Further, if research is commissioned it also needs to be time-bound. Issues which have provoked the probing into facts should not have changed by the time the report is submitted. The type of research being advocated should be closely linked to the work of the institution and should be evaluative in that it constantly feeds back into

processes of action. Research could also be a process of converting experiences into knowledge. The conversion of experiences into knowledge may result in the evolution of a new product, a new idea, a new design or a new tool. Such research could be termed as **Product-oriented research.** Evaluating activities in a distance teaching institution will also envisage the passing of judgement on their value to the system. It may involve measurement, assessment of effectiveness, judgement of

quality and efficiency in terms of the inputs into it and the outputs from it. In action research input in an activity and the output is a product in the form of a solution to the problem or a new product.

1.4 THE MANUAL

Ongoing research which is useful for policy makers and practitioners alike needs to be given some systematicity and structure. At times, in order to carry out action research in distance education, one may have to seek guidance to decide on the design model, or the specific methods that are suitable. Rather than browse through a large number of reference books on this subject one may look for a handy manual that gives the key processes in a summary form. That is the purpose of this manual – it gives in brief all those significant points a researcher should consider while undertaking his study.

1.4.1 Manual-Useful for Whom

For whom would such a research manual be useful one may ask.

- For practitioners in action research
- For institutions monitoring and evaluating action research projects.

1.4.2 Objectives of the Manual

The objectives of this manual are:

- to provide an action guide for research enquiry;
- to ground discipline-based theoretical studies and to generalise from existing practices;
- to integrate practices and knowledge from different disciplines with a common area of enquiry - distance education;
- to synthesize practices of different functions bringing together diverse processes from various operational activities in the overall distance teaching/learning process;
- to examine the relativity of practical research in the overall functioning of an educational institution; and
- to formalise intended and unintended benefits of a research evaluation of functions.

1.4.3 Design of the Manual

Now, here is brief overview of what this manual has in store for you. We begin with a description of the contexts within which we would like to locate action research in distance education. In response to the emerging trends in the educational arena and in order to cater to the needs of scholars in

this field, this manual concretises certain processes which would give substance to practice-based activities as well as provide living contact with realities for theoretical enquiries. The second chapter describes the context within which the thrust areas for action research can be identified for the selection of research problems. Action research arises from an institution-determined perspective and it feeds back into it the insights that it has produced. If, incidentally, there is knowledge generation by this activity, such theorising is not abstract but based on practical realities. The second chapter also lists out a series of areas which are researchable and within which research problems could be identified. Each problem, though interlinked with the entire process of distance instruction or distance learning, has an independent focus of enquiry.

The third chapter on research design speaks of the identification of research problems and structuring of them within the action research models provided in earlier sections. The various design models in research are described and the steps in formulating them enumerated. The fourth chapter is, in some sense, like the conventional research guideline in its treatment of research methods for possible research problems. It is, however, different in that it looks at research methods from the perspective of the problem. Thus generalisation is avoided and a topic or problem merits its own research approach and method. Research report preparation is the next aspect to which attention is devoted in the fifth chapter. Some common principles and guidelines are provided for the operationalisation of the report preparation process. Some lamp post functions of the manual and a model process chart are given at the end.

1.5 CHECK LIST OF THE ESSENTIAL COMPETENCIES OF A RESEARCHER

Academic or intellectual curiosity

Open mindedness

Competence and an interest in the research problem

Divergent thinking

Familiarity with the system

Willingness and inclination to take up the work

Ability to work consistently and patiently

Creativity - going beyond the frame set by tradition

Commitment and sincerity towards the work

Ability to work in a team

A habit of reading

Ability to relate his/her work to the work of the organisation

Ability to sharpen the focus adequately to make results meaningful

Ability to design research in a rigorous and workable form

Ability to articulate his/her ideas

Ability to present results in a readable form

Any other?

IS THIS TOO MUCH OF AN EXPECTATION?

CHAPTER II THRUST AREAS AND RESEARCH PROBLEMS

2.0 The Contextual Background

2.1 Selecting a Research Area or Problem

- 2.1.1 Deciding on a Research Area or Problem
- 2.1.2 Some Elements of the Research Problem
- 2.1.3 Methods of Collecting Ideas for the Research Problem

2.2 Some Possible Thrust Areas for Action Research

2.3 Identification and Classification of Problems/Questions

- 2.3.1 Philosophy and Concepts
- 2.3.2 History of Distance Education
- 2.3.3 Aims/Goals/Missions of the Institution
- 2.3.4 Programme Planning and Curriculum Design
- 2.3.5 Development of Learning materials
- 2.3.6 Teaching and Learning Process
- 2.3.7 Student Support Services and Delivery System
- 2.3.8 Student Evaluation
- 2.3.9 Economics of Distance Education
- 2.3.10 Media in Distance Education
- 2.3.11 Management of Open and Distance Education system
- 2.3.12 Application of New technologies
- 2.3.13 Open Education Network
- 2.3.14 Quality Assurance
- 2.3.15 Effectiveness of Research Methodologies in Distance Education
- 2.3.16 Technology Communication System
- 2.3.17 Effective Learning Strategies in individual/independent study
- 2.3.18 Network (web-based) Learning
- 2.3.19 On demand examination on intranet and internet
- 2.3.20 Audiographical contribution in preparation of self learning Materials
- 2.3.21 Fusion of text, Sound, images on CD for indepth study in professional courses

2.0 THE CONTEXTUAL BACKGROUND

Research is generally born out of problems and an interest and determination for solving them. The researcher's interest and competence and its relevance are the prime factors for the identification of the research problem. This interest or inclination to probe into processes and functions may arise from within the researcher's experience and socio-economic background or familiarity with a system or from reading of books or discussions with scholars in the area. For instance, if a researcher has done considerable reading on theories of distance education he may wish to apply them to the practical conditions prevailing. A variable, the researcher would then have to bear in mind is the

changes necessitated by the altered socio-economic conditions, that is, the application of models developed for small-community contexts to mass or large-scale community contexts. In his/her search for indigenous models, the researcher may study how the context and the product influence the problem and what sort of impact the increase in numbers can have on it. Similarly, if he is working in an institution where social differentiations are significant, he may wish to conduct a study on the learner's socio-economic background. As stated earlier, this interest should be matched with professional interest and competence. The intellectual curiosity of the researcher may result in his selecting a research problem from among the issues that confront him in his day to day activities. The persistent study of a problem however, can only result from a committed and concentrated examination of all parameters. The task would become easier if the researcher discusses the topic with his associates and undertakes a wide reading in related areas to find out the gaps in knowledge that may be filled up by conducting the study proposed.

At this juncture, it may be relevant to understand the structuring of open and distance learning institutions which provide the contextual background for the selection of research problems. A conventional educational institution normally has two basic sub-systems – the academic and the administrative. The academic sub-system encompasses all those activities which the institution undertakes for imparting instruction to those who wish to obtain it. The administrative sub-system is that machinery of the institution which provides the physical facilities and resources for enabling the academic functions to operate smoothly and effectively. In a distance teaching/learning context, however, we notice a different functional division.

Here there are three sub-systems – the administrative, the academic and the "industrial". The administrative sub-system has the responsibility of planning, decision-making, management of resources, control, co-ordination and evaluation. The academic sub-system includes the major functions of material development and maintenance and delivery through the student support services. The "industrial" sub-system undertakes the activities of mass production of learning materials and their distribution and marketing. Any research studies on the sub-systems of distance teaching institutions would have to locate their enquiry within one or the other of these sub-systems. Among all these sub-systems we may observe an internal co-ordination which results in their being to some extent interdependent and interlinked. The implications for the overall smooth functioning of the system are that these sub-systems must maintain their effectiveness, and it is in this context that research can prove extremely necessary and useful.

2.1 SELECTING A RESEARCH AREA OR PROBLEM

At times, the researcher does not have to select his own area or problem. That is, especially if the research is commissioned research, the decision about what is to be researched is already taken for the individual by the commissioning authorities. The institution decides that an area or problem is be researched to obtain information that would be useful for it. Its practices and priorities would guide the selection and focussing of the problem. If the problem or area is to be selected by the individual however, it is essential that the task be given careful thought by the researcher.

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2.1.1 Deciding on a Research Area or Problem

The first precondition would be an adequate familiarity with the area of operations. Sometimes this familiarity may come from exposure to the varied functions and practices. On other occasions, the familiarity may be the result of wide reading and discussions with practitioners. Whatever the means of ensuring the familiarity with the research topic, it is essential that the researcher grope around the area before fixing the focus on a specific problem. Consulting library catalogues, discussing the topic with friends, colleagues or functionaries who can act as sounding-boards would also help.

2.1.2 Some Elements of the Research Problem

- ❒ It should require an examination.
- ❒ It should be narrow enough but not too small for generalisation.
- ❒ It should be large enough to allow the derivation of general truths.
- ❒ It should be a problem that can be considered objectively.
- ❒ It should be a problem the researcher is genuinely interested in and curious about.
- ❒ It should be within the scope of the researcher's experience.
- ❒ It should be one that the researcher has some familiarity with.

2.1.3 Methods of collecting Ideas for the Research Topic

Collecting ideas for the research topic before deciding on the design of the project is an equally significant function. As pointed out earlier, holding discussion with persons and taking a mental inventory could be a beginning. Next the researcher would need to log or jot down or journal all such informal fact-finding so that it can form the basis for later systematic probing.

Yet another mode of collecting ideas is brainstorming.

Brainstorming (may be done alone or with other researchers)

Stage 1

1) Agree on a time limit in advance.
2) Always record all ideas: Write them down or tape the session.
3) Define your general topic.
4) Blurt out or jot down any and every association that comes to mind, always recording.
5) Continue to associate freely and follow up on ideas, without worrying about reaching a conclusion.
6) Do not criticize any ideas.

7) Review the list of jottings, grouping related ideas and striking out irrelevant ones.

8) Experiment with statements that express the essence of each category.

Brainstorming or simply allowing persons to shoot out ideas on a topic in a random manner can form the beginning of a search for delimiting a problem area. Generally it is conducted in a group and is oral and unstructured. Its spontaneity is its greatest advantage because it is therefore not inhibited by constraints that come up in structured interviews or talks. The element of group response helps to cover up the reticence of persons who may otherwise be overawed by the presence of their superiors or be wary of contributing to the discussion.

Free writing is yet another method of gathering ideas for later reorganisation and restructuring. This is a more individualised process but functions like the brainstorming exercise in the researcher's recording immediate thoughts that spring from the first reflection upon the topic. It may take the form of early drafts or diagrammatic or figurative representation or simply a list of topics.

2.2 SOME POSSIBLE THRUST AREAS FOR ACTION RESEARCH

Some of the thrust areas for research in the field of distance education are as follows:

1) Philosophy and Concepts
2) History of Distance Education
3) Aims/Goals/Mission of Institutions
4) Programme Planning and Curriculum Design
5) Development of Learning Materials (Print and Non-Print)
6) Teaching and Learning Processes
7) Student Support Services and Delivery Systems
8) Student Evaluation (Formative and Summative)
9) System Programme Evaluation (Formative and Summative)
10) Economics of Distance Education
11) Media in Distance Education
12) Management of the System
13) Application of New Technologies
14) Open Education Network – National and International
15) Quality Assurance
16) Research Methodologies in Distance Education
17) Staff Training and Development.

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Action research, which is undertaken to help the institution to do a better job, should be mainly a response to the practical questions faced in the day-to-day operations by the practitioners. The research projects scheme is expected to help the institutions to find answers to practical problems. We thought that the problems may be presented as questions and central concerns for research projects. We have tried to list some illustrative questions as research problems in the different functional areas of distance education which are given above.

2.3.1 Philosophy and Concepts

The distance mode of education is underpinned by some clear philosophical and conceptual guidelines that take the socio-cultural and educational contexts into account for the educational provision that they make. These concepts can be examined for their relevance and appropriateness in different contexts. **Some research questions/problems in this thrust area are:**

- ❒ What are the premises of the philosophy of distance education?
- ❒ Do the differences in nomenclature reflect the core philosophy/concepts of distance education?
- ❒ How far is distance a relevant factor in distance education?
- ❒ What are the implications of openness in open learning?
- ❒ Is the philosophy of distance education reflective and responsive to the social realities and needs?
- ❒ What are the pedagogic implications of the philosophy and concepts in distance education?
- ❒ Does the philosophy of distance education suffer from ethnocentricities?
- ❒ What are the generic sources of the philosophy and concepts in distance education?
- ❒ Can the disciplinary status of the field of distance education be justified?
- ❒ What is the meaning of 'learning to be'?

2.3.2 History of Distance Education

Paradigm shifts, historical accounts of the setting up of Open Universities/Correspondence Education Institutes and comparative studies of different institutions and their experiences would belong here. Such projects would have to examine records and documents of the historical growth of the institutions. In its examination of paradigm shifts a project would have to study record of existing models and structures as also those of earlier periods to locate changes in patterns. The nature of modification in the original and altered frameworks may also be of interest. **Some action research questions in this thrust area are:**

What are the various institutional experiments with the concepts of distance education?

- What are the developmental problems experienced at various stages in the distance education institutions and what are the ways in which they are resolved?
- What does the survey of distance education over a period of time reveal?
- How have the socio-economic contexts influenced the emergence of different models of distance education institutions?
- What insights can be drawn from the experiences of founding the Open Universities/ Correspondence Course Institutes?
- What are different institutional experiences of design, development and delivery of materials?
- Can we learn anything from the history of distance education?

2.3.3 Aims/Goals/Missions of the Institution

The aims and goals of the institution should largely guide the actions undertaken by the functionaries in it. **In this thrust area the following research questions could be posed to provide greater clarity to actions:**

- Are the aims/goals of the institutions clearly stated and achievable?
- What does the comparative study of aims/goals of open universities reveal?
- Do the aims/goals of the institutions sufficiently reflect the social needs?
- Are the institutional aims/goals clearly known to the policy makers/administrators/employees/ learners/public?
- How do the functionaries in the system perceive the institutional goals?
- Do the policies, programmes and processes reflect the institution's goals/aims?
- Are the aims/goals of the institution in keeping with the philosophy and concepts of distance education?
- Is there any need to review/revise the aims/goals of the institution?
- What are the ways in which the institution achieves its mission?
- How can the outcomes of institutional performance be evaluated with aims/goals as benchmarks?

2.3.4 Programme Planning and Curriculum Design

In any educational institution, programme planning and curriculum design plays an extremely significant role. This is much more crucial in open and distance teaching institutions which bear the responsibility of providing instruction largely through pre-prepared materials. The mandate of the institution to meet social needs is also reflected in its programme planning and curriculum design. Here it would be necessary to examine academic planning and design in relation to policy guidelines issued by the planning and monitoring bodies of the institution as also the social needs of target

clientele. It may also be possible to study explicit objectives of offering courses and their relationship to the purposes to be achieved. Feedback and review of existing curricula is yet another dimension of research here. Yet another issue or concern would be the need to go beyond the present curricula conditioned by the conventional educational systems. **Some possible research problems are:**

- ❒ Can we have a model for development of programme planning?
- ❒ How far can the MIS be an input in programme planning?
- ❒ What MIS is needed for the development of programme planning?
- ❒ How can an institutional plan be prepared?
- ❒ Are the mechanisms for the implementation of the plan well conceived?
- ❒ Is the curriculum design based on sound principles of pedagogy?
- ❒ Does the curriculum design contain explicit exit performance standards?
- ❒ Is the curriculum design learner-centred?
- ❒ What are the processes of development of curriculum design?
- ❒ Are there effective procedures for the revision of curriculum design?
- ❒ What are the specific curricular needs of distance learners?
- ❒ What guidelines can be given for designing technical/industrial/vocational programmes?
- ❒ Can we identify new markets in the context of continuing education?
- ❒ What are the learning needs of an emerging globalised society?

2.3.5 Development of Learning Materials

Open and distance teaching institutions are markedly different from conventional educational institutions on account of their provision of instruction through course materials structured to suit the distance learner. The complex process of development of learning materials is an important function that has many parameters to examine and monitor. **Research into this area would need to posit questions such as:**

- ❒ Are the materials structured to meet the needs and competencies of distance learners?
- ❒ What are the characteristics of well-designed materials?
- ❒ What are the phases in the development of materials?
- ❒ How can we develop a style manual for production of materials?
- ❒ Do the materials conform to the style manual?
- ❒ What are the development strategies of learning materials?
- ❒ How do learners perceive and use the learning materials?

- ❒ What are the appropriate formats for presentation of materials?
- ❒ How can innovative methods for development of materials be framed?
- ❒ What are the methods for developmental testing of materials?
- ❒ Are the learners satisfied with the materials?
- ❒ What are the measures and the mechanisms for the maintenance of quality of learning materials?
- ❒ What is the peer group response to learning materials?

2.3.6 Teaching and Learning Processes

Teaching/Learning Processes in Open and Distance teaching institutions are much more visible and open to criticism. Research for feedback and review into these processes is therefore a significant thrust area. **Some possible research questions in this thrust area are:**

- ❒ What are the learning styles of distance learners?
- ❒ Are the learning materials suitable for self-learning purposes?
- ❒ How can the mix of multi-media in the learning process be decided upon?
- ❒ How far is the distance teaching/learning process interactive?
- ❒ What is the extent of use of audio-visual media by distance learners?
- ❒ What might be the impact of the innovations in virtual learning?
- ❒ How far are learners using the learning materials developed by the institution?
- ❒ What are the criteria to assess the effectiveness of teaching/learning process in distance education?
- ❒ What are the indicators of good teaching/learning materials?
- ❒ What should be the components in devising teaching/learning strategies for distance learners?
- ❒ Can teaching/learning processes be made programme specific?
- ❒ Who is an academic in distance education/How can an academic be identified in distance education?
- ❒ What are the roles of academics in distance education?

2.3.7 Student Support Services and Delivery System

Open and Distance Learning, in which self-study is a fundamental feature, establishes its institutional support role through a network of services to the learners. Being a crucial and vulnerable part of the entire system, it remains a popular theme for study and research enquiry. Here, the delivery mechanism for support pertains to the processes by which the institution's packages reach the

students. These therefore include such aspects as admission procedures, timely despatch of course material through well-organised systems. The machinery used for the decentralisation of support to the learner and the procedures for continuous monitoring of them would also come under critical review. **Here are some possible research problems:**

- ❒ What are the methods of providing student support services and how far are they effective?
- ❒ What are the mechanisms for two-way communication in student support services?
- ❒ How far are administrative arrangements suitable to provide support services?
- ❒ Are the counselling sessions effective in serving the needs of learners?
- ❒ Can individualised support services be provided to learners?
- ❒ Are the learners satisfied with the support services?
- ❒ What are the ways of distribution of learning materials?
- ❒ What are the methods of pre-enrolment counselling and how far they are effective?
- ❒ What are the services available at study centres?
- ❒ How far can the multi-channel delivery systems be used for support services in India?
- ❒ What support methodologies should non-experts and others guiding learners informally use?

2.3.8 Student Evaluation

In any educational system the output is measured by reference to the evaluation of the performance of students in examinations. Questions such as the reliability of the results and the validity of the tests therefore become significant. The means used for this assessment may be formative or summative. Moreover, an issue that is of constant concern to evaluation researchers is whether there is a correlation among the various components of the curriculum — the objectives, the methods of instruction and the evaluation procedures. **Some research questions that could be raised in this area are:**

- ❒ To what extent is the system of evaluation valid and reliable?
- ❒ What are the systems and structures needed for on-demand examinations?
- ❒ How far are learners satisfied with the scheme and arrangements of examinations?
- ❒ How can question banks be designed and developed?
- ❒ What are the advantages and limitations of various patterns of award of credits for performance?
- ❒ How far can the question papers stand the tests of reliability and validity?
- ❒ What is the performance of learners with various backgrounds in the examinations?
- ❒ Do the assignments serve the purposes of learning?
- ❒ How can we determine the pattern of a question paper?
- ❒ What is the role of self-assessment/peer assessment in motivating and strengthening learning?

2.3.9 System Programme Evaluation (Formative and Summative)

In distance teaching institutions where the functions and processes are interlinked, system evaluation has an essential role. On-going research into and review of activities alone can give systematic feedback for improving procedures and streamlining processes. **Listed below are some researchable questions:**

- ❒ What are the outputs of the system?
- ❒ What are the unit costs of the learning material production?
- ❒ How far can the institution be able to achieve the aims/goals?
- ❒ What are the performance indicators to evaluate the institution/programme/course?
- ❒ How does the society perceive the performance of the system?
- ❒ What are the steps in the formative evaluation of the institution?
- ❒ What are the appropriate mechanisms for the system programme evaluation?
- ❒ Who should evaluate the system?
- ❒ What are the strengths and the limitations of self-assessment as an institutional evaluation mechanism?
- ❒ Are the evaluation systems in developed countries applicable to India?

2.3.10 Economics of Distance Education

Open and Distance Education is considered to be a cost-effective and cost-efficient alternative to traditional modes of teaching. Hence studies in this thrust area would need to probe such claims and question their validity.

Some questions in this thrust area are:

- ❒ What are the funding patterns of distance education institutions?
- ❒ What are the expenditure patterns of distance education institutions?
- ❒ How can we arrive at rates of student fees in distance education institutions?
- ❒ How can we calculate the study costs of distance learners?
- ❒ How far is the distance education system cost-effective ?
- ❒ How can resources be generated for distance education?
- ❒ Are the distance education systems and practices cost-efficient?
- ❒ What are the criteria for a differential fee system?
- ❒ What is the cost benefit of studying through the distance mode?

- ❒ Can systems which involve such heavy investments for technology be cost-effective?
- ❒ Are open and distance education institutions able to provide cost-efficient services?
- ❒ How can effective learning support be provided using cost-efficient measures?

2.3.11 Media in Distance Education

One of the strengths of the Open and Distance teaching institutions is the availability and use of media for making educational packages more interesting and accessible. Learners who are new to the system may derive great benefit from the use of media in presenting instructional content. The development and delivery of media packages however is an area that needs greater probing and debate especially in developing countries. **Listed below are some problems that could be addressed:**

- ❒ What should be the criteria for the selection of the media in distance education?
- ❒ What is the learners response to the Audio programmes/Video programmes/Radio programmes etc.?
- ❒ What is the role of tutors in the electronic communications?
- ❒ How do the learning cultures influence the choice of the media?
- ❒ What are the appropriate formats of the audio-visual programmes?
- ❒ What institutional arrangements are required for the effective use of media?
- ❒ What are the steps/stages in the adoption, adaptation and translation of media materials in distance education?
- ❒ How effective are the programmes of education through satellite channels?
- ❒ Can the newspapers be used for the programmed learning?
- ❒ What type of media is appropriate with low enrolment programmes?
- ❒ What measures can be introduced to make learners use media inputs more effectively?
- ❒ What are different media used in distance education?

2.3.12 Management of the System

Open and distance teaching institutions have a series of interlinked functions which require careful monitoring and review. Any failure at any stage of the activity is likely to disrupt the entire system causing losses to the institution in terms resources and time. Well-planned Management Information Systems are therefore needed to organise the activities smoothly. Research in this area could help in identifying priorities for focus and strategies for implementation. **Some suggestions for framing research problems are given below:**

- ❒ What are the basic features of a distance education management system?
- ❒ What are the relative strengths and limitations of different models of institutions?

- ❒ What are the criteria for deciding upon the staff strength of distance education institutions?
- ❒ What are the criteria for the classification of staff in a distance education institution?
- ❒ How can decentralised, participative and efficient management structures in distance education be created?
- ❒ How can we ensure the accountability and the responsiveness of management in distance education?
- ❒ How can we design a personnel policy system appropriate to the goals of a distance education institution?
- ❒ How does the technology contribute to the efficiency of the management system?
- ❒ What is the nature and role of leadership in a distance education institution?
- ❒ How can management techniques like MIS, PERT, CPM etc. be used in the management of a distance education institution?

2.3.13 Application of New Technologies

The special feature of open and distance teaching institutions is their flexibility in the use of New Technologies for imparting instruction for the many different functions undertaken. The strengths and potentials of new technologies such as computers,teleconferencing, multi-media can best be exploited when offering education through the distance mode. New technologies also open up possibilities for evolving virtual institutions and activities. **Here are some questions and problems:**

- ❒ What are the educational potentialities of computer technologies?
- ❒ What are the experiences of learners in the use of new technologies?
- ❒ What are the experiences of institutions in the use of new technologies?
- ❒ Does the use of technologies keep away the poor and rural people from distance education?
- ❒ What pedagogic changes are required in the use of new technologies?
- ❒ Does the use of technology result in changes in the role of academics?
- ❒ What new technologies in distance education are relevant to developing countries?
- ❒ What are the relevant criteria for the application of new technologies in distance education?
- ❒ What organisational changes in the structures and processes are required for the effective use of technologies?
- ❒ What can we learn from the experience of others in the use of technologies in distance education?
- ❒ What are the pedagogic and operational implications of using virtual learning activities/virtual institutions.

2.3.14 Open Education Network – National and International

This is a thrust area under which the projects may be undertaken to see how far the institutional functions respond to the developments taking place in education-nationally and internationally. Research problems here would also examine the institutional requirements for taking up networking at different levels. **Here are some questions/problems:**

- ❒ How does networking contribute to the efficiency and the effectiveness of the system?
- ❒ What are the stages in the creation of a network of the system?
- ❒ How can a network of the system be built in a highly differentiated institutional context?
- ❒ What structural and behavioural changes are required for the creation of a networked system?
- ❒ What are the structures and arrangements needed for the creation and sharing of common resources?
- ❒ What are the experiences of network arrangements?
- ❒ What are the models of networked systems?
- ❒ How can international collaboration contribute to the national/local institution's effectiveness?
- ❒ What are the consequences of globalisation in distance education?
- ❒ How can international networks contribute to the effectiveness of national systems?

2.3.15 Quality Assurance

Assurance of the quality of its services is one of the primary responsibilities of a public organisation/ institution. Educational institutions too are responding to the need for quality control by reviewing and critically examining their functions. Research in this area will provide useful feedback for monitoring and control of services through quality checks and the maintenance of quality through frameworks designed for the purpose. **Here are some questions/problems in this thrust area:**

- ❒ What are the criteria for determining the quality of inputs, processes and outputs in distance education?
- ❒ What mechanisms are required at the institutional level for the development and application of quality measures?
- ❒ What are the steps in the development and application of quality assurance manuals?
- ❒ What are the experiences of other institutions in the quality assurance measures?
- ❒ What role can the external agencies play in the quality assurance measures?
- ❒ Does accreditation help in maintaining and improving the quality of the system?
- ❒ What type of accreditation systems and processes help in quality assurance?
- ❒ Does openness contribute to the quality of academic operations?

- ❒ What incentive schemes can be designed for the assurance of quality?
- ❒ How can the competencies of the staff be updated to maintain the quality of the system?

2.3.16 Research Methodologies in Distance Education

One of the primary functions of an educational endeavour is probing an intellectual area or field. Distance educators too need to keep their academic and professional interests alive by constantly introspecting the issues and practices in the field. This enquiry is facilitated by following clear principles of research design. The institution too needs to encourage such studies. **In this thrust area we may find some of the following topics/problems:**

- ❒ What are the premises of the research policy of the institution?
- ❒ How can the research problems in distance education be identified?
- ❒ What institutional arrangements are appropriate for undertaking systematic research in distance education?
- ❒ How can the practitioners be motivated to undertake action research?
- ❒ What mechanisms are required to convert the research findings into policy/action inputs?
- ❒ What are the appropriate methods for action research in distance education?
- ❒ Are the methods of research in distance education different from research methods in other areas?
- ❒ How can the quality of research work be ensured?
- ❒ What are the experiences of researchers in the field of distance education?
- ❒ What competencies are required for undertaking research in distance education?

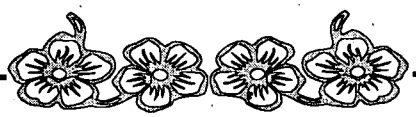
2.3.17 Staff Training and Development

Professional growth and development of competencies is another aspect that the institution must give serious attention to if it wishes to progress systematically and keep its personnel proficient and interested in their work. Manpower planning, work definition, staff and personnel needs, training and appraisal would belong here.

- ❒ What are the appropriate training methods for development of competencies of the staff?
- ❒ How can the effectiveness of training be evaluated?
- ❒ How can a multi-media package for training be prepared?
- ❒ How can training programmes be designed through distance mode for different categories of staff?
- ❒ How can a programme for training of trainers be designed?

- How can the active participation of staff in the training programmes be ensured?
- What institutional arrangements are required for the training of staff on a continuous basis?
- What is the training policy of the institution?
- How can the new technologies be used for staff training?
- How can arrangements for national and international collaborations in staff training be developed?

The research questions/problems framed in this chapter are based on expected outcomes. This focus on the outcome provides the thrust for research. The area wise questions, however, are inter-related. Depending upon the selection of the problems, the researcher may have to address one or more inter-related area. Further, in the enquiry of the problem he may also have to look into more than one functional area in the system.



CHAPTER III RESEARCH DESIGN

3.0 Significance of Research Design

3.1 Essential Components in Research Design

- 3.1.1 The Statement of the Problem
- 3.1.2 The Hypothesis
- 3.1.3 The Purpose and Significance of the Problem
- 3.1.4 Definitions and Assumptions
- 3.1.5 Delimitation of the Problem and its Limitations
- 3.1.6 Survey of Related Literature
- 3.1.7 Detailed Analysis of Proposed Research Procedures including the Population and the Location
- 3.1.8 Sampling: Some major methods
- 3.1.9 Data Collection and Data Analysis
- 3.1.10 Time Schedule for the Work
- 3.1.11 Budget
- 3.1.12 Chapterisation

3.2 Types of Research Design

3.3 A Check List for Research Design

3.0 SIGNIFICANCE OF RESEARCH DESIGN

Research is a serious enquiry into a problem. Its rigorous nature gives it strength and credibility. When research is conducted according to a well-designed structure it is most likely to be accurate and purposeful, generating the expected type of outcomes. Only such research can be relevantly linked to action. The research procedure itself should be well-planned and designed rather than haphazard or vague. Practical research should be linked to action. This link can only be formed if the purpose of the research is clearly outlined. The drawing of an outline is called research design. Design is a plan in the mind or a drawing or pattern showing how something is to be made.

Very often it is very difficult to build connections between research and action because the research has not been clearly designed. Proper focus on research design shows that this process is not accidental or unplanned but that it is a well-thought-out activity.

Designing a research project is therefore a complex process which may make or mar it entirely. This is the reason why a number of institutions which sponsor research expect the researcher to present a research proposal for scrutiny before they agree to support the project. The research proposal is a systematic plan of the procedure to be followed by the researcher and the clarity in it reflects the clarity of the entire exercise. Some institutions lay down specific steps that are to be followed; others leave the decision to the researcher. In any case, worthwhile research can only result from a well-designed proposal.

Let us now see what the essential components of a research design are:

1. The statement of the problem
2. The hypothesis
3. The purpose and significance of the problem
4. Definitions and assumptions
5. Delimitation of problem and its limitations
6. Survey of related literature
7. A careful and detailed analysis of the proposed research
8. Data collection and data analysis
9. Setting out a time schedule for the work
10. Budget
11. Chapter scheme.

A brief discussion of each of these components will clarify their contribution to the entire research project.

3.1.1 The Statement of the Problem

The statement of the problem is either in question form or as a direct statement including the scope of its operations. This introductory section of the research project is the one in which the subject is first described. It may be posed in the form of a series of questions or statements on the broad theme to be examined. References to important works on related areas may be made. The problem needs to be described as a researchable one and adequately significant for the given situation. A broad description of the context within which it is relevant could also be included. For instance, the problem may be an evaluation of a training project for skills development in the use of new technology (computers) in geographically remote and isolated areas. It would, in this case, be necessary to describe the context, the trainees' previous background and the specific significance of evaluating such a technology-updating programme in the remote isolated areas. The evaluation may then make accessible documented information to a wider audience for replicating the experiment in other similar contexts, with or without modifications. If posed as a series of questions the problem may look somewhat like this:

Is it necessary to evaluate this programme?

Why?

For whom?

What information may they seek?

3.1.2 The Hypothesis

This is generally an assumption or a calculated guess or even a strong hunch based on experience. Research design should normally contain a stated hypothesis because it gives an objective framework to the research or the project. For instance, the broad direction for a research project on the learner's use of a programme on Mushroom Cultivation may generate hypotheses such as these

The learners need this course for updating their skills

The learners need it for improving their professional status

This course will help them to change their attitudes and food habits.

Notice how the hypothesis is generally a declarative sentence rather than a question. But it could also lead the researchers to ask a series of questions that could help to design the project. For example:

Which skills are to be developed?

Change to what extent?

For which particular group of learners?

How will this be done?

What components will it have?

How can practical training be given?

The hypothesis need not, however, be stated in a rigid null hypothesis form or in any other precise statistical terms. It can be a clear enunciation of the problem to be explored.

3.1.3 The Purpose and Significance of the Problem

Generally this element of the research design is the one which gives it a direction. When the researcher drafts it, introspecting about his own reasons for its selection and its significance to the overall scheme of things, he is likely to clarify his objectives and give himself a set schedule to be achieved. Take the example of a problem such as this — An analysis of learning styles and learner attitudes to self-learning. In a problem of this kind the researcher may conduct the inquiry with the specific purpose of developing instructional materials and structural formats to suit the learner preferences. It would be possible to make a meaningful investigation only by detailing out reasons for undertaking the probe. The researcher would have to list out the benefits that would accrue to the institution and the users if such a study is conducted into the ways in which learners prefer to study. Decisions regarding structuring of the course formats and the house-style to be adopted may also depend on the results that are obtained. When the purpose is clearly laid out it is easier to set benchmarks for the evaluation of the research project.

3.1.4 Definitions and Assumptions

Any research into a specialised area would make an in-depth study into the subject and field. This will entail the use of specialised terms and expressions. Sometimes the familiar words may be used with a specialised meaning or context which is built round the concepts described. The researcher then would specify that for the purposes of his study the meanings of terms are fixed and ambiguity and mis-interpretation can be avoided. It is also necessary to state what the assumptions of the study are and how such assumptions have been drawn. Once this prepares the ground it will be possible to clearly build on a given base of facts or notions.

3.1.5 Delimitation of the Problem and its Limitations

Any research study, while it needs to be comprehensive, cannot cover all the possible information available. If effective conclusions are to be drawn the researcher needs to delimit the study and make a declaration of such an intention quite clearly and early in the process. Setting out clear reasons or criteria for delimiting the focus will enable the project to move in a meaningful direction. It is also useful to mention in the research design itself, the anticipated limitations of the study well before it comes under criticism for such lapses. It would be of credit to the researcher if he is able to declare that he is aware of these limitations but had his own reasons for not being able to overcome them or was constrained by the situation, or context which did not permit him to rise above them.

3.1.6 Survey of Related Literature

Research, though innovative and novel in some respects, does not arise out of a vacuum. Any researcher would be conscious of similar work that has been conducted in the area and the distinction between his own attempt and those of others before him. This section of the research design relates to the researcher's general reading and bibliographical search. It shows his familirity with previous studies in the field. If the study is an entirely new one, the researcher need not delve into an examination of previous work but this may be very rare. More often that not such a survey can help to locate, identify and synthesize previous research with the present study. In academic research 'literature' meant previous research studies published in books, journals, etc. For Action Research purposes, however, 'literature' could include a wide spectrum or materials such as news paper reports, hand-outs, opinions/statements made by observers and even unrecorded experiences. Such 'literature'/statements should, however, be the starting point for initiating action on the problem to be explored rather than be taken as given truths.

3.1.7 Detailed Analysis of Proposed Research Procedures including the Population and the Location

As mentioned elsewhere above, research makes specialised use of vocabularly. Population in research refers to the entire group of items, persons or subjects proposed to be studied and the researcher often only makes a selection from the population. This is one means of delimiting the study and stated criteria may be employed for the shortlisting process. If we take the instance of a distance

teaching institution the delimiting may be in terms of the age group, sex, social status, or previous educational background of the learners. Location may be delimited by similarly stated explicit criteria e.g., if study centres are selected for the examination the researcher may declare that only urban, rural or tribal area study centres will be selected. The selection may even be on the basis of the student strength in the study centre. An important point to guard against, however, is to ensure that the selection is adequately representative of the group and enables generalisation on a wise basis.

3.1.8 Sampling: Some Major Methods

Sampling is the process of selecting a small proportion of a population for observation and analysis. It is especially relevant to select a representative sample in research. However, if the population is very large its characteristics can not be measured easily and the researcher finds it difficult to locate the principles which can have universal application. On the basis of the sample, he can draw inferences about the characteristics of the population. Selecting the sample is therefore one of the significant steps in research. While the elements of randomness is often connected with sampling, samples are not selected as haphazardly. So the chance factor or the operation of probability is limited by applying what is called a **systematic random sampling method :**

The following are some major typical methods of sampling :

- ❒ the simple random sample by picking lots.
- ❒ random numbers using a table of random numbers.
- ❒ systematic sample by selection of each nth item from a list.
- ❒ stratified random sample by special division into smaller homogenous groups.
- ❒ Area or cluster sample by successive random sampling.
- ❒ Non-probability samples using available classes of a sample where the studies of groups may be equated by statistical means such as analysis of co-variance.

The sample size: There is no fixed number or percentage of space that determines the size of an adequate sample. The suitability of the sample would depend upon the nature of the population, or the data to be calculated and analysed.

3.1.9 Data Collection and Data Analysis

In academic research when the researcher intends to make a contribution to knowledge on a particular topic, it is a commonly established practice to review previous work. In action research, however this feature is largely replaced by data collection. When we discuss research methods we shall go into greater detail about the ways in which information may be authentically gathered. Here what we need to remember is that it is a significant element in research design and is followed by a quantitative or qualitative analysis of the data collected. For instance, if one wishes to review design models of different distance teaching institutions and their usefulness for learners, one may prepare

a structured proforma for the collection of information that may later be compared or critically analysed by reference to common features or qualities.

3.1.10 Time Schedule for the Work

One of the most important and often overlooked features of research is its time dimension. A sincere researcher must place a time schedule on his work in order to make it worthwhile. A research work that does not fix time schedules may also run into other problems such as its overshooting its budget and validity.

3.1.11 Budget

The budget is directly related to the time scheme. If a researcher extends the project beyond its limit he may face problems with the budget as the longer it takes the more its expenses are likely to build up.

3.1.12 Chapterisation

For any extended piece of writing it is necessary to have a coherent shape. In research design too, the chapterisation gives the structural coherence to the work, giving the reader an idea of what to expect in the study and where to find it.

The research design is thus a complete outline for the conduct of the proposed research study which helps the researcher to carry out his work systematically.

3.2 TYPES OF RESEARCH DESIGN

The types of research can be categorized in many different ways. One primary method of differentiation would be to say that research can be classified by purpose. We would then have

Fundamental or Academic Research

Applied Research or Action Research

But it is also possible to variate this classification. For instance if one distinguishes them by the methods they use for the process we may make five broad divisions as follows:

Descriptive research

Historical research

Quantitative research

Qualitative research, and

Experimental research

The design of research would vary with the type of research undertaken. For instance, if the focus of the problem is one collection of data – a survey or documentation of existing facts and figures may be warranted. On the other hand, if the researcher is trying out a new method or technique it may involve experimentation and try-outs. For process-oriented research, the researcher may select descriptive, historical, survey, quantitative or qualitative methods to gather data and interpret them in terms of the objectives of the topic selected.

In product-oriented research the inquiry leads the researcher to develop a new model, generate a new idea of new product based on his examination of previous models or his experimentation or analyses of techniques previously employed. Such decisions could broadly be taken by the researcher after setting out the parameters of the problem to be investigated and examining the resources available for such purposes.

3.3 A CHECK LIST FOR RESEARCH DESIGN

From all the types of research design discussed above we may conclude that having a clear plan of action for conduct of research is essential. It should be possible to obtain optimum benefit from research activities by an objective, systematic and reliable design.

Well-framed research design should be able to answer the following questions effectively.

a) What is the purpose of the study?

b) What is its location/universe?

c) What sources are used for collecting the data?

d) How much time does it need?

e) What is the total population and the sample size?

f) What techniques were used to select the sample?

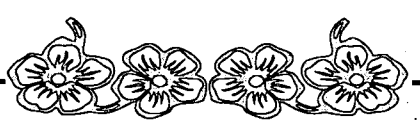
g) How is the data collected and analysed?

h) How much expenditure is to be incurred on the study?

i) What methodology is to be adopted for the study?

j) What is the nature of the study?

Research design formulated in this manner is sure to be purposive and goal-oriented.



CHAPTER IV RESEARCH METHODS

4.0 Selection of Appropriate Research Methods

4.1 Classification of Research Methods
- 4.1.1 Historical Method
- 4.1.2 Survey Method
- 4.1.3 The Case Study Method
- 4.1.4 The Statistical Method
- 4.1.5 The Experimental Method
- 4.1.6 The Ethnographic Method

4.2 Tools and Techniques of Collecting Data
- 4.2.1 Observation
- 4.2.2 Documentary Evidence
- 4.2.3 Talking to People
- 4.2.4 Experiments
- 4.2.5 Exploratory Techniques
- 4.2.6 Tests and Rating Scales
- 4.2.7 Social Surveys
- 4.2.8 The Interview
- 4.2.9 Questionnaires
- 4.2.10 A Combination of These

4.3 Analysis of Data

4.4 Presentation of the Results

4.0 SELECTION OF APPROPRIATE RESEARCH METHODS

In the previous chapters we had examined the definitions of research, identification of research problems and designing of research proposals. In the course of our discussions we had demonstrated that the research is a serious and systematic study seeking out facts or discovering principles that lead to new conclusions or new facts. Action research, we had further noticed is related to the organisational need and its processes and practices. Some of the important questions we need to ask ourselves therefore, are

What is actually meant by carrying out research systematically?

What is the process of research?

How can this process be carried out effectively?

Are there any definite steps in carrying out research?

What precautions should be taken before the investigation commences?

How can the results be made reliable?

Reserch Methods for Action Research

Research methods for action research would vary from those for an academic investigation. In an academic investigation the purposes would pre-determine methods which may be more structured or formatted and predictable. In action research however these research methods will essentially evolve from the design and will be somewhat unstructured or open-ended including modes and tools that draw upon some of the most common communication skills of daily life such as observation, questioning, interviewing etc.

Logically speaking one would imagine that the procedure would be to select a problem to be researched and then a method from among a large and varied collection of tools and methods to execute it. But this is not necessarily possible as smoothly in practice. Perhaps it is so because the research design model is shaped and reshaped as one goes along or because of the use of a combination of design models. For the same reasons it may also be necessary to mix methods which are used for research.

In this chapter we shall look at the different modes of gathering data, collating it and presenting it in a form that enables analysis and generalisation. Reference will also be made to the types of tools and their preparation so that the research becomes more focussed and its results are more directly usable.

As we noticed elesewhere above, the problems of research and the areas under which they could be categorised need also to be spelt out as clearly as possible. Then the research design is to be determined and suitable methods selected for it. The research design and the research methods should constantly interact and each should get moulded or reshaped by the other. The tools and techniques selected for conducting the research should similarly be determined by the problem identified, the method selected and the design drafted. Here we shall specifically discuss the selection of the research methods.

RESEARCH IS A CREATIVE PROCESS DEMANDING THE IMAGINATION OF IDEAS AS MUCH AS THE PRECISION OF WELL-CHOSEN METHODS

4.1 CLASSIFICATION OF RESEARCH METHODS

Methods of classification of research may be categorised using different criteria or from different perspectives. Let us see how methods could vary if our points of view were different.

In terms of the fields to which they are applied research methods may be categorised as methods for distance education, for science, for psychology etc.

In terms of the *purpose* for which they are used we may classify them as methods for description, prediction, determination of studies, or determination of causes.

In terms of the place where the research is conducted we may describe methods as field methods

or laboratory methods. In terms of the *application* of the research we may define methods as methods for pure research or academic research and methods for applied research or action research.

In terms of *data gathering devices* used we may group methods as methods using tests, rating scales, questionnaires, interview schedules, observation etc.

In terms of *character of the data* collected we may say that methods are either objective or subjective, quantitative or qualitative.

In terms of the *form of thinking* that is employed we may say that methods use deductive thinking or inductive thinking.

In terms of the *degree of control* or the experimental conditions we may say that the methods are controlled or uncontrolled. Research methods however, need not fall into these categories in any exclusive manner. That is, there may be a certain degree of overlap between one and the other or there may be a mix of methods used.

In the design of research we had discussed six different types of design models. To match these we may have more or less six different methods of research. They are:

Historical method

Survey method

The Case Study method

The Statistical method

The Experimental method, and

The Ethnographic Method.

While classifying methods of research and the techniques used for gathering data no attempt is, however, made to suggest that one method can be more suitable than the other in isolation. The research design will always have a bearing on the method selected, and data gathered and the purpose that is to be served by the research. Therefore the classification or categorisation described above is merely an attempt to present a systematic arrangement of investigation procedures to be adopted. There is no finality about these categories nor are they mutually exclusive. Hence, at times it may be necessary to use more than one method. This classification of research methods may be presented in a tabular form using the source of data, type of control, approach, typical purposes for the research methods, typical form of stating results as features. The chief source of collection of data is direct and indirect observation under controlled or experimental conditions. The approach adopted may be either longitudinal as in historical, case study, or genetic research, or cross-sectional as in normative survey and experimental work. Study the table given below to compare these features.

Distinguishing Characteristics of the Major Research Methods

Method	Source of data	Type of control	Approach	Typical purposes	Typical forms of stating results
1. Historical/ Survey/ Delphi	Direct observation, as an eye-witness; indirect observation through documents, and eye-witnesses	Uncontrolled observation	Longitudinal	Accurate record of past events. Status of phenomena at given times. Interpretation and evaluation procedures. Determination of causal relationships	Verbal exposition and interpretation
2. Normative/ Comparative Studies	Direct observation, interview and measurement; indirect observation through questionnaires check lists	Chiefly uncontrolled observation but controlled in the case of testing	Cross-sectional	Status and comparison of objects and conditions at the present time.	Measures of central tendency and variability
3. Experimental/content Analysis	Direct observation and measurement	Controlled observation	Cross-sectional	Determination of causal relationships, evaluation and comparison experimentally	Amounts and reliabilities of experimentally produced changes
4. Other Methods					
(a) Ethnographic		Chiefly uncontrolled/ schedules	Cross-sectional		Verbal exposition & interpretation
(b) Causal comparative	Direct observations	Uncontrolled observation	Cross-sectional relationships	Determination of causal differences	Group likenesses and differences
(c) Statistical Methods	Direct observation and measurement	Chiefly uncontrolled observation/ controlled observation	Cross-sectional	Indication of probable associations	Correlation coefficients and regression equations.
(d) Case Study	Direct and indirect observation, measurement & documentary evidence.	Chiefly uncontrolled observation.	Longitudinal	Determination of change, growth and development.	Individual case histories.

Source : Adapted from Sidhu, K.S. (1984) op.cit. pp. 90-92.

4.1.1 Historical Method

The historical research method is a method in which an enquiry is conducted into the past events. This may be with regard to the setting up of an educational institution such as an open university. Systematic study is undertaken into the factors which led to the development of the idea of establishing the university. In the case of an open university, it may include a probe into the political decisions such as the passing of a Bill, the launching of the idea, the preparation of a project report, the appointment of a Special Officer, nomination of a Committee to study the need and jurisdiction of the institution etc. The research study which conducts an enquiry into all these processes with the purpose of documenting past events for the sake of historical record, may be said to be falling within the historical method. In this context one may mention Sir Walter Perry's recording of his experience as the first Vice-Chancellor of the U.K. Open University in the book called "The Open University Opens". His description records the debate undertaken by the government regarding the setting up of the Open university and its supporters lauding it in Parliament as an innovative educational idea for bringing in openness into the closed systems. Though some may criticize the historical method for its heavy reliance on secondary sources and anecdotal information, it is one of the best methods to recreate the socio-economic, political and cultural environments within which significant events have been placed.

In this method which gathers data from actual records or documents the researcher uses direct means of observation. He may be an insider, i.e., one among the subjects being interviewed or he may be an outsider, i.e., one who studies the phenomena as an objective spectator. On the basis of the data collected he would then proceed to draw conclusions which have relevance to the present times. Most often this method is not directly controlled but it is useful for the researcher to have his own criteria based on which the collection of data is undertaken. The crucial features of this method would be accuracy of recording data and clarity in establishing causal or other relationships among the items of information gathered. The means of gathering and documenting information could be verbal or written exposition.

4.1.2 Survey method

Survey, as the name suggests, deals with mainly collection of information, analysis and presentation of data relating to the present time. This method is widely reviewed in social and behavioural sciences. A commonly available example of the survey method is the use of the "Opinion Poll" by the media during elections. It is also not uncommon today to find advertising groups and media persons conducting enquiries, reading or viewing habits etc. In such studies the organisation commissioning the research selects a group using the survey method on consumer behaviour, product preferences, reading or viewing habits etc. In such studies the organisation commissioning the research selects a group from among the population to conduct the survey and to generalise on a broader perspective as also to prepare the ground for marketing their own products. The survey method of research includes the following steps:

1) Selection of a sample for study

2) Design of the research

3) Selection of tools/instruments for collection of data

4) Administration of the tools

5) Analysis of the data

6) Presentation of the report.

The reliability and success of this research method would depend solely on selection of the representative sample from the population and the unprejudiced mode of gathering and analysing data. This method is particularly useful if the group is very large and spread out over a large geographical area.

The survey method is essentially different from the historical method in that instead of examining documents or evidence from the past it searches out data from objects and conditions of the present in order to compare and contrast or to generalise about the total population. Such a method while it will depend on research design is also cross-sectional as against the longitudinal approach adopted by the historical method. In some cases the relationships observed among data may be causal. The most common tools used for this method would be interviews, observations, questionnaires check-lists, opinion forms etc. The results of such a survey are typically presented using measures of central tendency and variability.

4.1.3 The Case Study Method

The case study method is a popular procedure for research in Medicine, Psychology, Sociology, and more recently in Management. The method itself consists of a comprehensive examination of a single unit or 'object' which may be an individual, a group, an institution or a locality taken to be representative of the class. Exhaustive information is gathered about the selected object. Care is taken to ensure that the qualities that are noticed in it are observable in all similar cases. For example, for a study on 'examination anxiety' in Open university learners a, small group of learners may be selected and their behaviour through their academic life in the institution studied for possible evidence of characteristic examination anxiety. Such studies may be categorised in terms of the approach adopted. That is, the study may be longitudinal covering the learners' behaviour patterns over a number of years, or it may be cross-sectional showing their differences or similarities with other subjects of the same year, batch or cohort.

The essential characteristics in the case study method are:

- It is a detailed and intensive study.
- It aims at an in-depth study of a unit.
- The case study is continuous in nature.
- It preserves the wholeness of the unit by selecting a large variety of units and the size of the unit covers the entire community.

- It has completeness of data and is comprehensive in scope.
- There is validity of data inherent in the collection process.
- It involves confidential recording and scientific synthesis.

Thus we may observe that though it is generally considered as an extremely time-consuming and subjective method of conducting research, the case study method is, by and large, reliable and comprehensive.

4.1.4 The Statistical Method

The statistical method is essentially of two kinds, one, using descriptive statistics and the other, using inferential statistics. In descriptive statistics, statistical methods and procedures are utilised for summarising, simplifying, reducing and presenting of raw-data to communicate the essence of the data. The purpose of such a method is related also to the reporting of the results. Inferential statistics, on the other hand, is used to make predictions to test a hypothesis and to infer the characteristic features of a population from the characteristic features of a sample. Most often the techniques of inferential statistics do not end with a mere description of the data, they also attempt to draw the conclusions from the raw-data. Statistical tests such as chi-square, or T-test, F-test etc., could be used to draw the inferences and to analyse the information collected. Some of the common statistical methods in use are:

1) Correlation coefficient, ratios, percentages
2) Measurements of central tendency such as averages, frequency distribution, mean, medium and dispersion range, standard deviation.
3) Multi-variate analysis and factor analysis, variance etc. On the basis of these methods indications of probable associations may be derived.

4.1.5 Experimental Method

The experimental method of research involves the determination of causal relationships, evaluation and comparison through experiments. The sources of data are thus mainly measurement tools that are used on controlled groups of subjects to observe the impact on them. The experimentally produced effects are reported by referring to amounts and their reliability when compared with other methods. This is believed to be one of the most systematic and rigorous methods of research. It originates from scientific research where the researcher controls the variables or factors and conducts experiments on limited groups. Control is the most crucial word in experimental research. As discussed in the research design models, the experimental research method uses comparative statements to establish its facts. The factors or variables can be limited according to the choice of the researcher. While there may be equivalence amongst the two groups to facilitate comparability the control group and the experimental group differ in at least one or two features. Such research can enable the researcher to make statements about causal relationships among phenomena that occur or obtain in the existence or otherwise of a crucial factor. In distance education this method

may be used in different ways. For instance, the control group may be given some support services under normal conditions whereas the experimental group may be provided one additional factor of support so that the research enquiry shows whether the crucial factor is effective or not.

4.1.6 The Ethnographic Method

We can draw a contrast between surveys and experiments on the one hand and ethnographic methods on the other. The 'naturalism' of the ethnographic method sets it apart from both experiments and the surveys. Formal interviews with schedules of questions, attitudes scales or attainment tests are not used in the ethnographic style because of the possible problems they present in obtaining unbiased and undistorted measures of behaviour. Deviant behaviour is a popular subject for ethnographic methods but deviance is not the only subject appropriate for them. Any subject where the emphasis is on natural processes is suitable although this method is strongest when deviance is being studied. This is because of its use of unobtrusive modes of observation which reduce reactivity. It enables the study and interpretation of human behaviour in natural contexts.

As has been pointed out elsewhere above, research may not follow one exclusive method throughout or it may at times, where necessary, variate and improvise depending upon the conditions prevailing while the research study is being conducted. When this happens, the researcher may have to bring together a number of methods selected discriminatingly to suit his purposes.

4.2 TOOLS AND TECHNIQUES OF COLLECTING DATA

The research design and the research method generally determine which tools or techniques may be required for the collection of data. All the above mentioned components are directly interrelated and influence the others.

Some of the most common tools and techniques are listed below:

Observation
Documentary evidence
Talking to People
Experiments
Exploratory Techniques
Tests and Rating Scales
Social Surveys
The Interview
The Questionnaire, and
A Combination of These.

4.2.1 Observation

This is one of the most widely used modes of collecting facts about the objects or phenomena being

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studied. Observation implies that a careful and systematic study has been conducted for putting together the available information. It may be classified as falling into different types such as listed out below:

Participant	Vs.	non-participant
Structured	Vs.	unstructured
Controlled	Vs.	uncontrolled
Criterion based or Formatted	Vs.	random

Observation means seeing things with a predetermined purpose. Here it is very crucial to select the sample for study very carefully because the reliability of the study will depend on it.

4.2.2 Documentary Evidence

This is also like observation in that it involves a close scrutiny of relevant material but it differs in that it may involve the researcher's selectively probing into records and documents that already exist whereas observation may entail the actual creation of a records base after watching or gathering data.

4.2.3 Talking to People

This method of collecting information, while it may appear to be rather unsystematic is very useful if the information sought is not recorded or likely to be of an ad hoc nature. The researcher's specific interest in the subject will make him draw out the necessary details that are either not already recorded or are not sufficiently well-researched. This method of collecting information has often generated very interesting and surprisingly relevant data which may have missed being documented in formal records. The added dimension of different perspectives on issues can also be made available to the researcher while collecting information by this method.

4.2.4 Experiments

This mode is generally used to collect data in research in the physical sciences. Though it is a rigorous method of data collection it may be very rarely used in social science research. The subject of the experiment is the basic unit on whom the experiment is being conducted. For example, learners, Academic Counsellors, prospective students may be the subjects of the study on whom the experiment is conducted. Causal relationships are sought to be established between the dependent and independent variables. In experimental research the accent is on the control and manipulation of the variables identified for study.

4.2.5 Exploratory Techniques

This is a fairly flexible mode for collection of data and design of research. It may be conducted as a preliminary survey of the field under study to familiarise oneself with the possible foci of attention.

Later more rigorous design models may emerge after some data is gathered for building up the methodology or approach. At times it may include literature survey or even a case study. This mode is particularly useful if the population is large.

4.2.6 Tests and Rating Scales

There are two broad types of techniques used for data gathering. One, if the respondents are willing to give information, and the other, if the information is to be gleaned from the responses of the subjects indirectly. Tests would fall into this category. In social science research such indirect techniques which often result in the subjects giving information which they are themselves unaware of are called disguised techniques. Here we may include tests such as the following :

1) Inkblot Tests

2) Story telling tests

3) Graphic Techniques

4) Completion Tests, and

5) Social Attitude Tests.

Such tests are relatively easy to administer and interpret in terms of some pre-established psychological conceptualisation. They are useful for developing profiles of subjects and their attitudes or inclinations/ preferences towards given features.

4.2.7 Social Surveys

The survey technique of investigation may include a number of other modes such as direct observation, questionnaire, interview etc. An example of an area where this technique is used is the population survey. The most clearly defined steps in a social survey are :

i) Planning the purpose and scope

ii) Description of the variables

iii) Sampling and sampling methods

iv) Presentation of Data using coding, tabulation, statistical analysis and inference.

Here, as noted earlier, sampling is a very crucial step as the validity of the entire survey would depend on it.

4.2.8 The Interview

This method as a tool for gathering data is commonly used by present data researchers because it is both flexible and direct. It can help the researcher to access information in the manner specifically required using an informal interchange with the interviewee to draw out data. It should, however,

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be necessary to structure the process in some random manner especially if the same type of facts are to be collected from different subjects on different occasions.

Some points the researcher should bear in mind while using the interview process are:

Fix the appointment with the interviewee in advance

Tape record the conversation, if necessary after informing him

Prepare the list of questions or interview schedule before hand

Set the interviewee at ease and talk informally.

Don't use directly suggestive questions or intervene when the subject is speaking.

Conclude with an expression of thanks.

4.2.9 Questionnaires

Questionnaires are of two types:

1) Fixed response or multiple-choice

2) Open ended free response

While questionnaires are also some of the most commonly used devices for collecting information in research, it would be an understatement to say they are the most misused. This is because of the researchers not taking adequate care in their preparation. Primary data can be collected most conveniently (either directly or through posted questionnaires) from large and widely scattered groups of respondents through fixed response or multiple choice questionnaires. As the interviewee fills the details himself it is essential that this tool is very sensitively developed and is unambiguous to the reader. In social science research very often it is necessary also to build in questions that capture the modalities of the information being gathered. For this purpose, the free response questionnaire is most useful. Thus qualitative information such as reasons for choice or explanations for selection of a particular option should also be built into the questionnaire so that while analysing and presenting the results, the researcher may draw useful inferences and conclusions.

Some do's and don'ts in questionnaire preparation

- ❒ Don't make the questionnaire too long.
- ❒ Don't make the questions too vague.
- ❒ Do specify the time to be taken.
- ❒ Make the questions answerable.
- ❒ Don't make them lead only to one answer.
- ❒ Don't use complex phrases or words.

- ❒ Don't assume too much about your respondents.
- ❒ Do include questions to reinforce answers.

4.2.10 A Combination of These

It is not unusual in action research to make use of more than one technique or tool in the collection of data. Thus the same study may employ the questionnaire, interview and observation modes for gathering data from the sample selected.

4.3 ANALYSIS OF DATA

Data analysis is the next stage after collection of information in a research project. As in the case of research design and selection of research methods, the analysis of data should bear in view the original purpose of conducting the research. This will give the entire project the proper focus and thrust. That is to say, the results or statistical or other data gathered should not overawe the researcher as they do not hold value or relevance in themselves. For the analysis of the data the results would have to be tabulated and classified. The presentation of the data which precedes its interpretation could be in one or more of the following forms:

Graphs
Bar diagrams
Pie charts
Tables
Histograms
Such other graphic representations.

Proper presentation of data in an attractive form can enhance its usefulness and applicability. The reader's attention is captured by it and it enables critical examination and interpretation. The purpose of these techniques is essentially the reporting of the conclusions to the organisations or group or individuals who have commissioned the research or even the reader who wishes to draw some benefit from it.

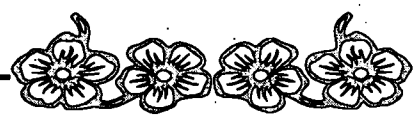
The tabulation of the data helps in the following ways :

Summarising
Simplifying
Reducing raw data
Comparing
Contrasting
Generalising
Testing hypotheses.

4.4 PRESENTATION OF THE RESULTS

The results of research can only be presented after inferences and conclusions have been drawn from them. Here the researcher must be careful to adopt safeguards against making illogical jumps from the data gathered to the conclusions derived. The principal need to interpret results correctly is on account of (i) the understanding that the interpretation gives to the present study itself, and (ii) the theoretical implications it has for future research studies in related areas.

In the selection of methods and tools the researcher should be careful to ensure that they are linked to the problem.



CHAPTER V RESEARCH REPORT PREPARATION

5.0 The Research Report
5.1 Recording Library Procedures
5.2 Organising the Material
5.3 Documentation: Basic Conventions
  5.3.1 Ways of Introducing Quotations
  5.3.2 Sample Standard Style Forms for Reference
5.4 Writing in an Appropriate Style
5.5 Preparing the Pough Draft
5.6 Using a Word Processor
5.7 Preparing the Final Copy
  5.7.1 Revision
  5.7.2 Proof Reading
5.8 A Possible Research Report Outline
5.9 Research Report Evaluation

5.0 THE RESEARCH REPORT

Having gone through the laborious process of gathering, collating, tabulating and interpreting the results the researcher has to take systematic steps to present the results and conclusions of his research in the form of a report. This ultimate stage can produce considerable difficulty if it is not planned earlier and preparations have not been made for it throughout the entire process. Keeping a proper research log or proper documentation of the background reading and data are essential steps that lead to report writing. Library procedures, brainstorming, free-writing, buzz sessions, discussions etc., all contribute significantly to the final document. Let us now see how the actual report writing should be done.

5.1 RECORDING LIBRARY PROCEDURES

When beginning the research it is common for the researcher to feel that collecting material for the research work will take time especially because he may feel that he needs to cite references that give his work greater credibility. Later on, however it will become clearer that it is more crucial to give the research work a clear line of thought or thesis to present than to have a number of disjointed quotations that do not clearly convey their ideas in a particular direction.

5.2 ORGANISING THE MATERIAL

Note cards on which brief points have been jotted down should be preferably classified in terms of

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the chapters, significant theories or even the criteria stated in the research design. Eliminate the cards which on second thought, appear to be irrelevant to the main thesis and put the doubtful ones in a separate pile. Of course there would be a tendency to use every bit of information that has been collected, but the researcher must guard against letting such notes destroy the unity of the thesis or report.

Preparing a working outline and filling out the details is one of the useful ways of going about one's work of writing. Here too different schemes may be followed. If one classification is chronological, the other may be varied to make the flow of thought more interesting. Somewhere along this process of reading, review and jotting down ideas it may be necessary to return to the library to do additional reading. Weak spots may have to be filled out and supplemented. One must, however be careful to see that such a diversion from action to passiveness, and from the writing process back to the reading stage does not become unduly long.

5.3 DOCUMENTATION: BASIC CONVENTIONS

Documentation or listing of the sources used in a paper and acknowledging the borrowed information is an important part of serious research. Very often researchers neglect proper management of quotations and following of the basic conventions. While this may not always lead to direct penalisation, the serious researcher should guard against the danger of borrowing material without acknowledgement. The word used for such 'quoting' is plagiarism. It comes from a Latin word which means kidnapper and has been defined by the Random House Dictionary as the "unauthorised use or close limitation of the language and thoughts of another author and the representation of them as one's original work." Having discussed what we should not do, let us see how quotations must be used.

5.3.1 Ways of Introducing Quotations

(a) Lockwood emphatically states his conviction as follows:

"The aim of all research is to eliminate systematic error in any data that are collected; recognising and reducing the effect of the experimenter, surveyor and interviewer are activities common to all styles and traditions of research".

(b) Lockwood wrote "The aim of all research is to eliminate all systematic error in any data that are collected; recognising and reducing the effect of the experimenter, surveyor and interviewer are activities common to all styles and traditions of research."

(c) According to Lockwood, "The aim of all research is to eliminate all systematic error in any data that are collected;"

(d) "The aim of all research," according to Lockwood, "is to eliminate all systematic error in any data that are collected;"

(e) Lockwood maintained that "the aim of all research is to eliminate all systematic error in any data that are collected;"

A block quotation of more than four lines however, is included slightly differently. It is usually indented and shown differently from the rest of the text. Some times only a few words or phrases may be used from the entire quotation. In such cases, a series of three dots or ellipses should be used to indicate the omission of words.

5.3.2 Sample Standard Style Forms for References

1. Books

a) Lockwood, F.G. (1992). *Activities in Self Instructional Texts,* London: Kogan Page.

b) Indira Gandhi National Open University (1994) Master in Library and Information Sciences – *E2 Research Methodology.* New Delhi. IGNOU.

c) Open University (1979). DE 304: Social Sciences: A third level course, *Research Methods in Education and the Social Sciences,* Milton Keynes: Open University Press.

d) Rowntree, D. (1974). *Educational Technology in Curriculum Development,* London: Harper and Row.

e) Nunan, T (1991). *An Introduction to Research Paradigms in Distance Education.* Geelong: Deakin University Press.

2. Journals

a) Lockwood, F.G. (1989). "Data collected by self recorded audio cassette tape', *Research in Distance Education,* 1, 2, pp. 7-8.

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5.4 WRITING IN AN APPROPRIATE STYLE

Writing the research report in an appropriate style is another important feature to keep in mind. While reports are no longer being written in a strictly formal style, it would be inappropriate to use a casual style and manner of writing for a research report. For instance, the researcher should avoid

using abbreviations and contractions. Similarly, he may take care to use specialised terms accurately and consistently. Words should not be used loosely or without accurate clarity regarding their meanings. Nor should the researcher put on an unduly pompous and wordy style of writing because such a style is most likely to affect communication.

The interest of the researcher in the subject selected is often displayed by the attitude or tone of the research report. If one is bored with the subject the style will probably make this evident. Hence, choosing a topic of one's interest and liking and developing the research design carefully is very important. Keeping the reader constantly in mind can help to make the report more accessible and interesting to read.Varying sentence length and arrangement is also useful.

5.5 PREPARING THE ROUGH DRAFT

- ❒ read through the jotted notes/log to recall details
- ❒ read through data and original design of research
- ❒ resist the temptation to postpone work to another day
- ❒ get an overview of the material
- ❒ jot down words and phrases as they come, do not linger over the choice of words and phrases
- ❒ re-read and review your draft with the target audience in mind.

For most people including researchers, writing the opening part of the project or report appears as if it is very difficult. Just as the beginning of the lecture is difficult for the speaker, writing the first few sentences can be problematic. Some tips on beginning may be handy here. Begin with

- ❒ an anecdote
- ❒ a quotation
- ❒ a contradiction of an accepted notion or idea
- ❒ a statement of significance
- ❒ origin, meaning or a definition of a term.

5.6 USING A WORD PROCESSOR

It is now most common to use a work processor for writing one's report or thesis. The advantages at the stage of editing in doing so are tremendous. The handwritten/typewritten initial draft can be entered or transcribed on to the computer. Its adaptability makes it a valuable aid while revising and reviewing the draft. This can be either done directly on the monitor or from rough print-outs. The researcher can according to his convenience, add, delete or shift material in the initial document including small connectives or adding the polishing touches is also easy with the word processor.

One common danger with the computer however, is that one is likely to lose the entire document if it has not been saved. Hence, it is always advisable to save the typed material periodically or to take a print-out and keep it handy for revision or even to copy it from the computer on to a back-up floppy disk which can be stored with the document intact. Many computers and word processing programmes have useful commands such as alignment, justification of margin, underlining, highlighting, changing of type and font sizes which can considerably simplify the editorial task. Similarly different programs also allow the researcher to give a global command to find out the word count, sentence count or readability ease of a document. Computers cannot however replace the human writer who must take decisions and exercise options to make his research work perfect. The most important word processor after all is in the human mind.

5.7 PREPARING A FINAL COPY

While preparing a final copy the researcher may need to keep some of these points in mind.

5.7.1 Revision

While making a thorough revision the researcher must keep the reader or user in mind. The final test of the quality of a research project is not whether the scholars understand it but whether the users understand it.

The consideration therefore should be

Unity, smooth and logical presentation of details.

Smooth transition in argument and style.

Avoiding typographical errors.

5.7.2 Proof Reading

While proof reading seems to be a boring and mechanical task when compared with the writing process, it is this which provides the dressing to the piece of written work. If done carelessly it can ruin a well-written, well-researched work. There are clear guidelines which may be followed for marking errors in typography, spelling, punctuation, capitalisation, and so on. With the advent of word processing equipment it has become fairly easier to carry out editorial changes and proof-reading corrections.

Check during proof reading if

(a) punctuation marks, especially commas, and quotation marks are used correctly

(b) doubtful looking spellings have been checked in a dictionary – a spell check in the word processor could be used.

(c) There is overall consistency in format and layout.

5.8 A POSSIBLE RESEARCH REPORT OUTLINE

A. Preliminary Section or Front Matter

1. Title page
2. Approval sheet
3. Acknowledgements (if any)
4. Preface or foreword
5. Table of contents
6. List of tables (if any)
7. List of figures (if any)

B. Main body of the report

1) Introduction
   a) Statement of the problem
   b) Significance of the problem
   c) Purposes of the study
   d) Assumptions and delimitations
   e) Definition of important topics
   f) Statement of hypothesis
   g) Assumptions underlying the hypothesis

2) Review of related literature or analysis of previous research

3) Design of study
   a) Procedures used
   b) Methods of gathering of data
   c) Description of data gathering instruments

4) Presentation and analysis of data
   a) Text
   b) Tables
   c) Figures

5) Summary and conclusions
   a) Brief Restatement of problem and procedures
   b) Description of procedures used
   c) Principal findings and conclusions
   d) Recommendations for futher research

6) Policy Implications/Action Implications

C. Reference Section

1) Bibliography

2) Appendix

3) Index (if any)

5.9 RESEARCH REPORT EVALUATION

It is desirable to conduct a self evaluation of the research project after its completion. Given below is a model of a research report evaluation form developed by Best and Kahn (1995).

PRODUCT/RESEARCH REPORT EVALUATION

Name ..... Date ..... Grade .....

\+ adequate — inadequate

TITLE

clear and precise .....

PROBLEM AND HYPOTHESES

clearly stated .....
specific questions raised .....
clear statement of hypothesis .....
testable hypothesis .....
significance recognized.....
properly delimited .....
assumptions stated .....
important terms defined .....

DATA ANALYSIS

perceptive recognition of data relationships .....
effective use of tables .....
effective use of figures .....
concise report of findings .....
appropriate statistical treatment.....
logical analysis .....

SUMMARY

problem restated .....
questions/hypothesis restated .....
procedures described .....
concisely reported .....

REVIEW OF LITERATURE

adequately covered .....
well-organised .....
important findings noted
studies critically examined
effectively summarised

PROCEDURES

described in detail .....
adequate sample .....
appropriate design .....
variables controlled .....
effective data-gathering .....
instruments or procedures .....

FORM AND STYLE

typing .....
spacing .....
margins .....
balance .....
table of contents .....
list of tables .....
list of figures .....
headings .....

pagination.....
citations/quotations .....
footnotes .....
tables .....

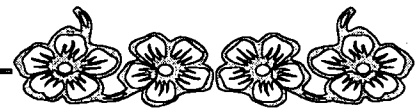
supporting data included .....
conclusions based on data analysis .....

figures .....
bibliography .....
appendix .....
spelling.....
punctuation.....
sentence structure .....
proof-reading
clear and concise style

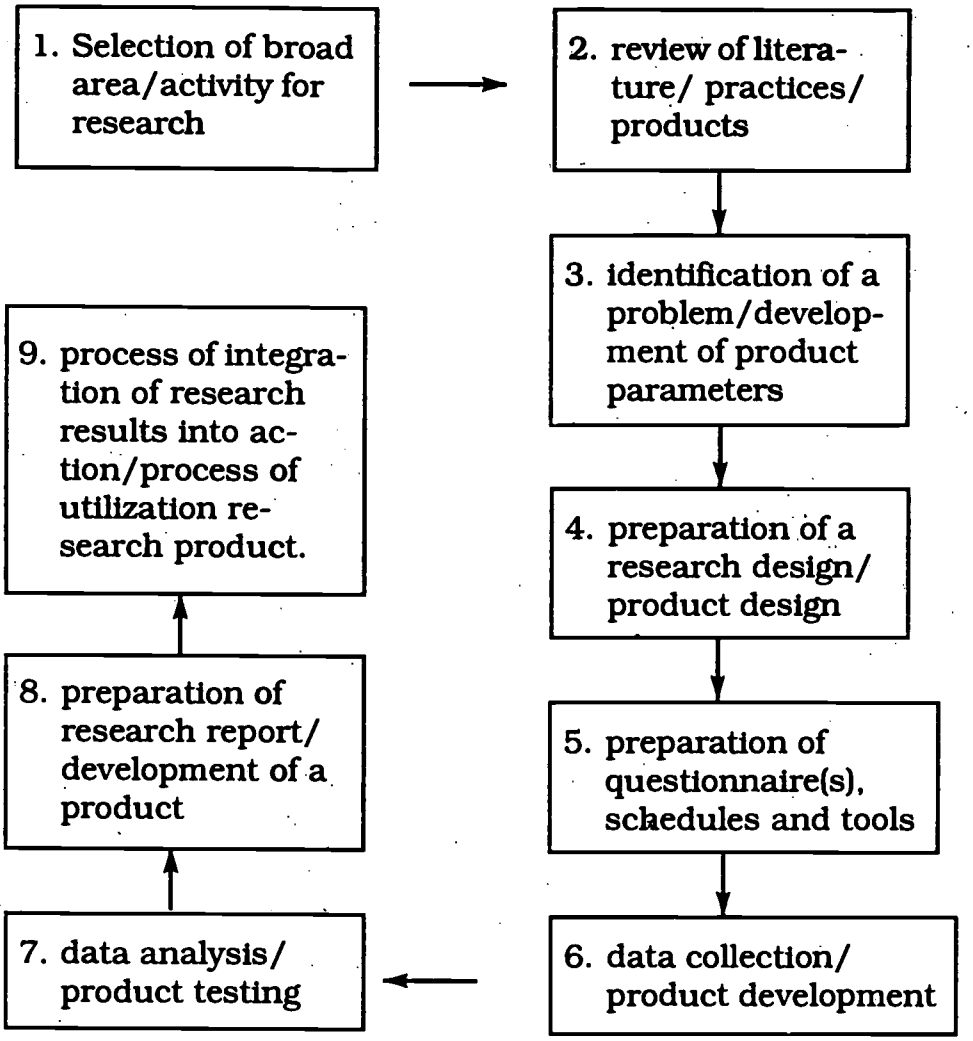
POLICY IMPLICATIONS/ACTION IMPLICATIONS

clearly stated .....
well related to the agency concerned .....
level of decision making identified .....
direct suggestions given .....
what change expected?.....

Adapted from Best, J.W. and Kahn, J.V. (1995) op. cit p. 407.



RESEARCH PROJECT : A MODEL PROCESS CHART



The time frame for each of the stages of these activities would be variable and dependent upon the type of research project and its duration.

LAMP POST FUNCTIONS OF MANUAL

We hope this manual will be a lamp post for —

- identification and location of your research concerns:
- selection of a researchable area/problem/question;
- development of research design;
- selection of research methods and techniques;
- preparation of a research project report;
- clarification of meanings of commonly used terms in research;
- survey of bibliographical references.

APPENDIX 1

SELECT KEY WORDS FOR RESEARCH AND THEIR MEANINGS

1.	Abstraction	:	An idea of a quality as separate from any object.
2.	Causal Hypothesis	:	Assumption about cause-effect relationship between two variables.
3.	Econometric	:	The application of statistical methods to economic theories.
4.	Empirical	:	Knowledge based on observation or experiment, not on theory.
5.	Formulation	:	To create or express in a precise form
6.	Generalisations	:	Top draw general conclusions from a particular example or evidence.
7.	Hypothesis	:	A proposition made as a basis for reasoning without the assumption of its truth. A supposition made as a starting point for further investigation from known facts.
8.	Interval Scale	:	It is based upon the metric concept.
9.	Null Hypothesis	:	A hypothesis that states that there is no difference between two classes.
10.	Pilot Study	:	A study preceding the main study usually to check the viability of the research design
11.	Population	:	The aggregate totality of objects or individuals regarding which inferences are to be made in a sampling study. It means all those people or documents, etc., who are proposed to be covered under the scheme of study. A population is any group of individuals that have one or more characteristics in common that are of interest to the researcher.
12.	Qualitative Analysis	:	Analysis based on quality.
13.	Quantitative Analysis	:	Analysis based on quantification
14.	Ratio Scale	:	It is an interval scale in which an absolute zero point exists at a point at which zero indicates a total absence of that which is being measured.
15.	Rating Scale	:	Numerical values assigned to pre-coded replies
16.	Sample	:	A sample is a small proportion of a population selected for observation and analysis. It is a collection consisting of a part or

subset of the objects or individuals of population which is selected for the express purpose of representing the population. By observing the characteristics of the sample, one can make certain inferences about the characteristics of the population from which it is drawn.

17. Sampling : It is the process of selecting a sample from the population. For this purpose, the population is divided into a number of parts called sampling units.

18. Secondary analysis : Analysis of the already existing data collected initially for some other purpose.

19. Structured questions : Multiple-choice questions in a questionnaire

20. Textual criticism : Linguistic analysis of a text.

21. Tabulation : An orderly arrangement of data in column and rows. It is a part of the technical process in statistical analysis of data. The essential element in tabulation is the summarization of results in the form of statistical tables. This is of great help in the analysis and interpretation of data. While preparing the tabulation, the purpose of the study has always to be kept in mind.

22. Value judgment : Estimate of the worth (of a statement in Delphi questionnaire)

23. Variable : A variable is a quantity or characteristic which may possess different numerical values or categories.

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