

**Practical Research: | planning
and
design**

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About This Book

In a sense this is a do-it-yourself, understand-it-yourself manual. It is not a programmed text, but it will guide you, step by step, in planning and designing a research project, however large or small it may be. This is a *practical manual*, born from years of teaching research methodology to both graduate and undergraduate students and from observing, after the course was over, all their doubts and uncertainties in the face of a practical research undertaking. Many knew the *theoretical* aspects of research methodology thoroughly, yet they had difficulty planning a practical research project, preparing an acceptable proposal, or writing a research report. This may have been because the *practical* base under the theoretical structure was not as supportive as it should have been. Perhaps students had merely done lip-service to research, learning the essentials and proper orientations to theoretical methodology, without coming to grips with the mundane considerations that every researcher must learn if he is to get his project off the ground.

The types of uncertainties are many. Some students are not sure precisely what research is; others do not know how to go about finding the information they need. There are those who are terrified by statistics, and there are those who cannot get a proposal accepted or secure approval for the project they have planned. In these days of grants and financial assistance for research of all kinds, it is particularly important to know, when the need arises, how to present one's ideas for maximum effectiveness.

Many a student has labored over a research project, whether in high school or at the graduate level, only to be told by some instructor after all is done and much energy has been invested that "this was not quite what he expected of the student." Such a reaction is frustrating, comfortless, and unrewarding. To save you from such situations, this book has been written.

The word *practical* is perhaps the most significant word in the title. The practical approach means planning the project properly. It means simple, clear, pragmatic hints on how to get the job done. It is down-to-earth guidance from those who have traveled the road before you, who are aware of the pitfalls and are willing to share with you the wisdom of how to avoid them.

The author of this book does not undervalue the importance of a theoretical approach to an understanding of research. Many times it is basic and required. But a theoretical base

is not supportive enough for the practical needs of many students who must get their research off the launch pad of theory into the orbit of creativity. For this, theoretical methodology alone simply does not provide sufficient thrust!

One of the unique features of this book is the "Practicum in Research" section, a part of the end matter. Here, as you pass important milestones in learning the nature of research and how to plan it in the text section of the book, you structure your own research project or test your understanding of the basic concepts presented in the text. A high school or college student using this book should be able to write better term papers or research project reports. Similarly, a graduate student should be able to construct an acceptable proposal in a professional manner for his thesis or dissertation committee. Anyone using it should be able to produce a superior research proposal or final document, because he knows precisely what he is doing with respect to research and the demands it makes upon the researcher.

The author is indebted to so many for so much of this book that he refrains from mentioning any one in particular. To his own teachers who, during his doctoral study, gave him the first insight into the need for a book such as this, he pays much respect and acknowledges himself forever in their debt. Next, he wishes to acknowledge with humility the students who, again and again, have begged him to set down for others what they have found to be most helpful in the seminar sessions they have had with him. The same encouragement has come from faculty colleagues in several universities. Those with whom he has discussed the idea and who are engaged in professional research have also encouraged setting down some of the material in this book in permanent form. One esteemed colleague put it in these words, "Tell them the obvious; it may be what no one else has ever thought of telling them!" That is what the author has tried to do. The obvious is frequently so obvious that we feel it is unnecessary to direct the student's attention to it. To those of us who know, the nature of research is so obvious it needs no explanation; the basic reference keys to the library are so well known, we need not tell others about them; the reading of a statistical formula is so simple, we would never think of teaching one who doesn't know what the secret is; a proposal is so commonplace, we would never consider giving explicit instructions on how to write one. All these matters are so very obvious!

Perhaps it is at the very point of the obvious where students lose sight of what we feel there is no need to tell them. This book is an attempt to restore academic sight to those who see either with dim vision or, as in the case of many, with none at all. And our first exercise in seeing will be to try to glimpse what research really is.

P. D. L.

1 What Is Research?

Research is a very confusing term.

As commonly used, it has so many meanings that we must understand precisely what we mean when we use it in its scholarly sense. We shall discuss in this book what is commonly referred to as *basic or pure research*.

Much that is said about basic research will also be applicable to the many pragmatic varieties of research activity: applied research, action research, developmental research, and so on. The difference between the pragmatic forms and the basic form of research lies in the depth to which basic research probes the underlying causes and meaning of observed phenomena and in the sophistication with which it demands that the collected data of observation be interpreted.

WHAT RESEARCH IS NOT

To understand more readily what research *is*, we should begin by considering what research is not. Some of the statements that follow may come as a distinct shock to the conventional way in which you have accepted the meaning of the term *research*. The reason for your surprise may be in part because you have been conditioned to the term in so many connotative frameworks that you may not be sure exactly what the term really does mean. Hence, when many students encounter the term for the first time in a truly professional and academic sense, it bewilders them.

To illustrate, let us take several instances in which the term *research* is used with entirely different meanings. For example, a housewife reads an advertisement and learns that because of "years of research" a new miracle product has been developed which she may now find on the supermarket shelf and which will make her housework easier, do the job faster, and give her more time for other activities.

Her husband, on the other hand, thinks of research in quite a different context. He identifies research with fact-finding surveys of consumer buying power, figures showing customer preferences and needs, charts and graphs detailing company growth and sales improvement, and, in general, the facts and figures representing the corporate economy. This

information comes to him through “market research” which the “research analysts” of the company make available to him.

His twelve-year-old son goes to school and the teacher sends him to the library to find the names and the sizes of Columbus’s three ships and also their route across the Atlantic. In so doing, she tells him that he is going to the library to do “research” for his history assignment.

His sister in high school has just completed a “piece of research” by writing a “research paper” on the role of the dark lady in the sonnets of Shakespeare. She has, of course, gone through all the motions of the “research” process by gathering her information on note cards, collecting a bibliography, and footnoting her statements in prescribed form. Furthermore, both she and her teacher seem quite serious in thinking of this as a “research project.”

Unfortunately, many students have labored under the false impression that looking up a few facts and writing them down in a documented paper is research. Such activity is, of course, nothing more than fact finding and fact transcribing. No amount of transfer of information from one place to another, even though the act of transportation is acknowledged by footnote, can be dignified by the term research. Transfer of information, transportation of fact from one place to another, is simply that, nothing more! Yet the strange misconception that fact transferral is research persists; and, even more disconcerting, it grows in magnitude as the student progresses through the formal learning structure from grade school to college and even from college to graduate school. What goes on in the grades and throughout high school, bearing the misnomer of research, is further magnified and encouraged during the undergraduate years in college. The deception is enhanced at the college level by a more glorified terminology. Fact transportation in college is frequently exalted by calling the end product a “research report” or a “research document.” Report, perhaps; and document, maybe-but research? Not at all.

The net result of all this is that the student becomes more and more deeply imbued with false concepts and incorrect conditioning. The student has never been taught; rather, he has been permitted to go unwittingly on his way without ever learning the true nature of research. He has never learned the distinguishing characteristics which differentiate true basic research from spurious fact accumulation.

When, therefore, this student comes to graduate study and is faced with his first course in research methodology or a seminar in basic research design, he is frequently unprepared for the discrete and unfamiliar demands that an entirely new academic discipline may make upon him. As a result, he may have a difficult time in fulfilling the exacting demands that writing a thesis or a dissertation requires of him. Consequently, he may give up in despair, or else, after many attempts, write such a mediocre final document that his graduate committee capitulates, despairing of ever getting a piece of real research from such a student.

All this is the result of the student’s never having been taught the demands of pure research. Such students are unprepared to conceive of research as a discrete academic discipline. They have never learned the particular way of thinking about facts, not as ends in themselves, but merely as components in a total process whose ultimate aim is to reveal their significance in the quest for the discovery of truth.

WHAT RESEARCH IS

Having discussed at some length what research is not, let us consider what it is. Successful research begins with a proper orientation. It is essentially a way of thinking; it is a manner of regarding accumulated fact so that a collection of data becomes articulate to the mind of the researcher in terms of what those data mean and what those facts say.

Many students need to understand the implications of these statements. They need to see clearly the characteristics of what for many of them is an unfamiliar procedure. Research is simply the manner in which men solve the knotty problems in their attempt to push back the frontiers of human ignorance. We shall discuss these characteristics in the order in which they appear logically in the research process.

Characteristics Of Research

Research has seven discrete characteristics which appear sequentially. Every researcher is familiar with these steps, which taken together comprise the particular approach to the discovery of truth which we call research.

- *Research begins with a question in the mind of the researcher.* Man is a curious animal. Everywhere he looks he sees phenomena which arouse his curiosity, which cause him to wonder, to speculate, and to ask questions. He discovers situations, the meaning of which he does not comprehend. By asking relevant questions man creates a favorable attitudinal climate, an inquisitive receptiveness to pertinent fact which is a basic prerequisite for research itself, for research arises from a question intelligently asked in the presence of a phenomenon that the researcher has observed and which puzzles him. By asking the right questions the researcher finds both relevance and direction in his quest for truth.

Look around you. Consider the unresolved and baffling situations that compel you to ask, "Why?" "What's the cause of that?" "What does it all mean?" Here, for example, is a familiar real-life situation: two children begin school from the same neighborhood; both are in the same classroom and have the same teacher. One learns to read and progresses well; the other has great difficulty with reading. Why? What do we really know about human learning and the reading process? What do we not know about human learning and the origin of reading disability in the early grades? These are questions that reveal man's need for knowledge. They are also questions that suggest departure points for research, for through research we can discover the answers in the light of the facts. Research, thus, begins with a questioning and inquisitive mind in the presence of baffling and perplexing fact.

- *Research requires a plan.* Research is not hoping naively that somehow, in some way, you will discover fortuitously the facts that you need or the truth that you seek. It is not aimless, undirected activity: merely "looking something up" in the hope that you may "come across" the solution to your problem. Research, rather, entails a definite plan, direction, and design.

The whole research process should proceed purposively from the awareness of the need to know to the point where the relevant facts speak to the researcher, giving him the answer. And between these two extremes there must be a clear statement of the research problem, a development of hypotheses, a design for gathering and interpreting the data, and finally a test of the hypotheses and an arrival at factually based conclusions. Research is, thus, an orderly procedure, planned and logical in design.

- *Research demands a clear statement of the problem.* Successful research begins with a clear, simple statement of the problem. The perplexing and unanswered questions that the researcher finds indigenous to the research situation must crystallize at the very beginning of the research endeavor in a precise and grammatically complete statement setting forth exactly what he seeks to discover. The reason for this is obvious: before we begin we must understand the problem and look at it objectively. We must see clearly what it is we are attempting to research. We shall say more about the research problem in a later chapter, but the necessity for a concise statement of the central problem that the research aims to solve cannot be overemphasized.

- *Research deals with the main problem through subproblems.* Most researchable problems have within them various other problem areas of lesser breadth and importance.

RESEARCH AND THE TOOLS OF RESEARCH

Because many researchers take neither the time nor the trouble to isolate the lesser problems within the major problem area, they find their research project becoming poorly defined, cumbersome, and unwieldy. From a practical standpoint, therefore, it is more expedient to divide the main problem into appropriate subproblems, all of which when resolved will result in the solution of the main research problem.

To illustrate: University X has been a fast-growing and rapidly changing institution for the past three quarters of a century. Originally conceived as a graduate school with a major emphasis on the social sciences, it has changed direction and emphasis over the years. Now University X is quite a different institution from that which its founding fathers envisioned. Underlying any educational institution is a basic philosophy, a fundamental orientation to the educational milieu in which it exists. A student wishes to determine the basic educational philosophy of University X. Nowhere is this stated explicitly. It is implicit, however, in the history, the structure, the policies, and the way in which the university operates. Moreover, the cumulative result of past events has been responsible for a significant change in direction of the university. Looked at in total perspective, the central issue begins to blur. We can perhaps bring matters back into focus and deal more effectively with the main question of the educational philosophy of University X by considering first some lesser aspects, or subproblems, of the main problem:

1. What was the original educational philosophy of the founders and early administration of the university?
2. What major events have caused a change in that philosophy?
3. What is the present educational philosophy of the university?

These three lesser problems, answered in terms of data derived from documents, addresses, university publications, and similar sources will provide an answer to the principal problem.

● **Research seeks direction through appropriate hypotheses.** Having stated the problem and the attendant subproblems, the subproblems are then each viewed through logical constructs called **hypotheses**. An hypothesis is a logical supposition, a reasonable guess, an educated conjecture which may give direction to thinking with respect to the problem and, thus, aid in solving it.

Hypotheses are a part of our everyday experience; we employ them in the approach to everyday problems. They represent the natural working of the human mind. Something happens. Immediately you attempt to account for the occurrence by a series of guesses, postulates, logical deductions. In so doing, you have been hypothesizing. For example, you flip the switch of your car; the starter grinds; but the car does not start. Here you have a problem for "research." What's wrong? Why doesn't the car start? You now begin a series of reasonable guesses as to the cause of the trouble. In other words, you hypothesize several possibilities:

1. You have no gasoline in the tank.
2. The spark plugs are worn out.
3. Moisture has condensed in the distributor cap, causing a short-circuit.

Each of these assumptions provides direction in seeking out the facts to determine the real reason why the car will not start. At this point you go in search of the facts. You check the fuel tank: it is half full. That rules out hypothesis 1. The motor has just been reconditioned, and new spark plugs were installed. That invalidates hypothesis 2. You glance out of the window of the car. You note that the other automobiles have condensation on them from the humidity and early-morning fog. Hypothesis 3 may lead you to

the solution of the problem of your stalled car. To test this hypothesis you remove the distributor cap, wipe out the moisture that is indeed there, and replace it. The car starts. Hypothesis 3 is supported.

Similarly, when you are faced with a problem for research, you make educated guesses to assist you in discovering the solution and in giving you direction in looking for the facts.

- **Research deals with facts and their meaning.** Having now isolated the problem, subdivided it into appropriate subproblems, and posited hypotheses which will suggest the direction in which the facts may lie, the next step is to collect whatever facts seem to be pertinent to the problem and to organize them into meaningful aggregates, capable of being interpreted. We shall suggest methods of such organization in a later chapter. Facts, events, happenings, observations are in themselves merely facts, events, and happenings—nothing more. They are, nevertheless, potentially meaningful. Frequently, however, the significance of the data depends upon the way in which the facts are seen, the manner in which the data are regarded. Often different researchers read entirely different meanings from the same set of data. And, for the researcher, there is no single rule which will guide him unerringly to one “correct” interpretation. Two historians may study the same series of events. Each may be equally competent, both scrupulously honest in their reactions. One may read the meaning of the facts of history one way; the other, viewing precisely the same facts, may arrive at an entirely divergent interpretation. Which one is right? Perhaps both are, or perhaps neither is.

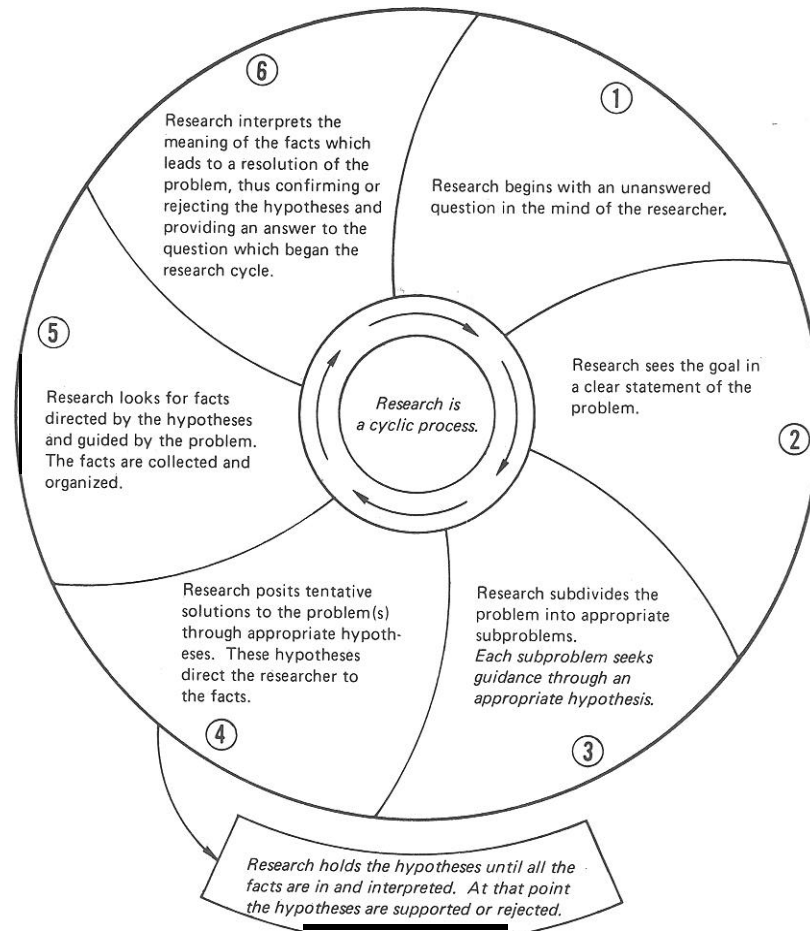
There was a time when we considered that clocks measured time and yardsticks measured space, and in one sense they do; but we further assumed that time and space were two separate and discrete entities. Now we regard both of these factors differently and deal with them within a more sophisticated concept called the time-space continuum. The facts of time and space have always been the same. The difference between the earlier and later concepts is not in the facts themselves, but in the increased keenness of insight that the researcher has had into their meaning.

- **Research is circular.** The research cycle begins simply: a questioning mind is confronted by a perplexing situation. To see his target clearly, the researcher isolates the central problem for research. This central problem is then further divided into subproblems, each of which is an integral part of the larger whole, and all of which collectively comprise the principal research problem. What we have been calling the environment out of which the researchable problem arises is more appropriately called the research universe,⁷ and it is potentially fact-laden. The researcher seeks from within the universe for those particular facts which seem to be pertinent to the solution of the problem and its attendant subproblems. His search is facilitated by the construction of tentative hypotheses. They point in the direction of relevant facts. The collected facts are then organized, analyzed, and interpreted for the purpose of discovering what the facts mean. Such discovery aids, in turn, in solving the problem; and this, then, satisfies the question which gave rise to the research originally. Thus, the cycle is completed. Such is the format of all basic research.

Schematically, the “circle of research” might be represented by the diagram on p. 8. This diagram may be thought of more as a helix than as a circle. In the helical process of solving problems, we create still more problems; consequently, research continues progressively onward. To see research in this way is to invest it with a dynamic quality—a far cry from the common view of research as a static, end-in-itself matter.

The term universe is perhaps better understood when it is looked at in terms of its elemental meaning. It means simply an “area” surrounding the problem which may contain facts relevant to the problem. Literally, the word signifies the factual area that revolves around the central inquiry, or main problem of the research. The word derives from *unus*, “one,” and *vertere*, “to turn”; that which turns or revolves around one central inquiry.

THE RESEARCH PROCESS



Practical Application

This book is more than a theoretical discussion of research and its methodology. In addition to the discussion—which is a very practical, grass-roots, “how-to-get-it-done” approach—this manual will provide you with an opportunity to apply those matters that have been discussed. It will provide you with an opportunity to go into the field and to observe research and to evaluate it. These applications of principle to operational research practices will be given in a special section at the back of the book.

We learn to do by doing. You become a researcher by engaging in those activities which provide training in the discipline of basic research. However, at the very outset you should be able to recognize research when you see it. You should also be able to recognize what is not research but masquerades as research. Turn, therefore, to p. 218, where you will find directions for surveying some research studies and evaluating them in terms of the guidelines suggested in the foregoing pages.