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Criteria for Evaluating Steps in Scientific Research

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Abstract:

This paper talking about the most important standrads that are used in evaluation of psychological and educational researches, confirming that the strict methodology is the base which the trusted and solid results stand on it. It start with discussion of the research problem formulation, showing the importance of accurcy and clarity, and pointing that the unclear problem many times lead the beginner researchers to mistakes that was possible to avoid. Then the paper go to talk about the hypotheses, as first explanations that connect between the variables, and it confirm the need to build them in logical way and to be possible for experimental testing. Also it strong emphasize on the importance of giving clear operational definitions for the main concepts, because they make the bridge that connect the theoretical side and the practical application. And it show also that reviewing the old studies in organized method give necessary context, and prevent repeat, and help in discovering the gaps that the new research can treat.

The paper also show the need of designing the research tools—samples, observation, interviews and questionars—with care that reduce the bias and the mistake, confirming also the importance of choosing represented samples and giving clear and specific instructions when using those tools. In the end, the study see that evaluation of researches in methodological way help in raising the accuracy, objectivity and the scientific strictness in the researcher, which make the research process go in organized path that lead to results with credability and value. And when these standrads is applied with effectivness, it make the study more valuable and increase its scientific and practical benefit.

Key words: Research evaluation, problem formulation, hypothesis testing, research tools

Introduction:

The attention to scientific research has become one of the necessary matters in revealing social phenomena, especially in connecting causes and reasons with results. Therefore, any applied scientific research must proceed according to sequential and connected procedural standards. This is what is called methodology, or the method, or the style that the researcher follows in identifying the general features of the research and evaluating them to reach the most accurate results. Accordingly, "the methods and approaches that the researcher uses are many and varied, and there is no single way to deal with these complex phenomena, because studying such factors drives the specialist to follow more than one methodological and scientific way in order to reach the facts and the objective data that are required to be collected and presented, in order to know the truth and the reality of the problem

that needs to be studied and treated." (Al-Hassan, 1986, p.16,17).

And since scientific research is the objective tool and means to discover the scientific truth, and it is an acceptable way to establish and confirm truth in human fields, where it is presented, criticized, and evaluated with objectivity, it is the easy way to expand the researcher's judgments with more acceptable and accurate evaluation among others. There is no doubt that the good researcher is that one who carefully considers all that he reads and observes how he arranges his ideas and the scientific methods he uses to prove the facts scientifically, and who distinguishes between the ideas that are more emphasized in the research than other ideas. Therefore, the research appears in this frame as an adventure that gathers scientific activities and experiments full of risks and novelty. But the adventure in this field does not happen by coincidence; rather, it follows a special effort characterized by precision, method, and objectivity. It is also an adventure that requires much attention and caution, evaluative standards, and a high ability of perseverance and scientific discipline. It is exciting because it gives the joy of discovery and the feeling of gaining new qualifications and abilities. (Angers, 2004, p.28)

Accordingly, we will put a general conception that explains the standards through which psychological and educational researches can be evaluated, which can guide researchers when judging the value of these researches and their summaries, and also to avoid the common mistakes that researchers are exposed to in this base. Some of these important standards in evaluating psychological and educational researches can be summarized as follows, with the note that their presentation will be according to their importance, not by methodological order, and they are as follows:

The first standard: The scientific and methodological formulation of the research problem and the degree of its accuracy.

One of the hardest matters for researchers, especially beginners, is to find a problem that can be researched. Many of them stumble more than once in reaching a problem suitable to be a subject for scientific study. Some of them make a mistake when they think that the stage of choosing the problem should not take more than a relatively short time, and that the greater part of the study time should be given to data collecting and analysis.

In fact, the greatest effort in any research must be directed to the planning stage, which includes not only the stage of formulating and defining the problem but also the initial or exploratory activities that must be done to ensure the soundness of its structure and its implementation procedures. (Adas, 1992, p.36).

And since research is the process of discovering something, and that thing which pushes us to act or work is called in science a problem, the problem is the source of questioning. It is what makes the researcher feel the emptiness that he must fill, and at the same time pushes him to direct toward discovery. To reach that, he must first precisely define the thing that interests him and find the means that allow him to reach it. All this is considered the content of the first stage, which we call the determination of the problem. (Angers, 2004, p.120).

Those who are interested in scientific research face a group of topics that need studies requiring the collection of information about them, analyzing, interpreting, and finding solutions and treatments, or at least exploring their trends and indicators that may affect the life of society. These topics really need scientific expertise and an advanced level of concentrated scientific thinking that the researcher must accept and not deviate from until he reaches, by his organized thinking, the awareness that leads him to the choice and taking decision with certainty. (Akeel, 1999, p.29).

Any researcher starts by choosing and formulating his problem worth to study, and he must make an accurate formulation so it can be researchable. He must decide exactly what he wants to know about the problem and what is the aim of this knowledge. The researcher returns to the scientific heritage to help him define the

problem and determine the theoretical framework that he will depend on in directing the research and determining the purpose of choosing this problem. This requires returning to the scientific heritage in the field of his research. (Lotfi, 1995, p.25).

1. Definition of the research problem: It is defined as "everything that may raise a question, that is, everything that appears to require study." The matter is related to determining the problem and controlling it in order to specify its different aspects and put it in the framework of thinking. In short, the formulation of the problem returns to raising the question connected to the reality that one wants to know through investigation and inquiry. (Angers, 2004, p.83,84).

Also, some researchers see the definition of the problem as the theoretical entrance that the researcher decides to adopt to treat the problem that he raised in the initial question, and it usually takes place in three stages. (Safari, 1999, p.74).

The first stage: The stage of controlling the different points of view about the subject, through defining, listing, and counting the theoretical framework.

The second stage: The stage of adopting the problem, either by forming a new problematic idea or by placing one's work within a theoretical framework through previous readings.

The third stage: The stage of refining the problematic, that is, clarifying the researcher's personal way in how he presents and answers the problem.

2. Basic considerations for evaluating the research problem: We have already confirmed that the person who intends to conduct a research must be well acquainted with theoretical studies, and he must also organize the knowledge taken from them as the foundation from which he will start in carrying out his research. From this, there are several considerations that researchers must take into account before choosing the appropriate research problem. These considerations are related to the following aspects. (Jaber & Kazem, 1973, p.53).

2.1. The novelty of the problem: That is, the problem must be new and innovative, and it has not been studied before by other researchers. The novelty of the problem may also be related to the novelty of the data, methods, and tools used in studying it. This does not mean that all problems that were studied before are not worthy of being researched again, but repeating some studies using new research designs and tools is of high scientific value.

2.2. The importance of the problem and its scientific value: This consideration is related to what is new in the subject of the research and its scientific and practical problem. Several questions help in determining the importance and value of the problem: Will the results of researching this problem add something new to the current scientific knowledge? Or will they have a direct effect in developing the methods used in scientific research? Are there deficiencies or specific gaps in the achieved knowledge that need to be filled through new research?

We have already indicated that the field of psychological and educational research needs a practical and direct evaluative approach, and this requires researchers to work on improving and raising the scientific efficiency of the research problem in its different dimensions through such questions.

2.3. The researcher's interest in the subject or problem: The researcher's interest in the topic and the problem he chooses for research is a matter of importance for carrying out the research, since the personal tendency of the individual provides stronger motivation for work and greater possibilities for success in it. This requires the researcher to ask himself the following questions: Does the research topic satisfy the genuine inclinations and motivations in the researcher's self, or is it merely an attempt to handle a problem for objective reasons such as obtaining an academic degree? (Angers, 2004, p.142).

Here, the researcher should not confuse interest in the problem with the desire based on bias toward reaching a specific result. He must maintain accuracy, objectivity, and scientific honesty in all data without any bias toward the results — regardless of whether they support his point of view or contradict his expectations.

2.4. The sufficiency of experience and ability to research the problem: That is, the scientific and practical experience, skills, and abilities that the researcher needs to study the problem and complete the research. Among the questions he can ask himself: Is there enough experience required to research the chosen problem, and in what aspects? In some cases, a researcher may choose a specific topic for research and, after progressing a considerable distance in executing it, discovers that his scientific experience is not sufficient to cover this topic. He may realize he needs to acquire certain statistical skills that enable him to handle and interpret data scientifically and statistically correctly. Such cases should be considered by the researcher before defining the research problem, and it should be chosen according to his experiences and abilities. (Al-Zuhri & Al-Bahi, 2000, p.17).

2.5. The formulation of the research problem: The researcher should take into account a number of questions through which the formulation of the research problem can be evaluated. Does the statement of the research problem carry a question about the relationship between two or more variables? And if so, is there an effect of one variable on another? But if the goal of the research is purely descriptive, then what are the repeating variables in the situation? (Adas, 1992, p.36).

Through these questions, the researcher can give the study its theoretical and scientific importance when it goes beyond the descriptive level to other levels such as explanation, prediction, and control, which calls for addressing the relationship between the research variables. The researcher, when evaluating the formulation of his problem, should also consider the correctness of the language and avoid the use of technical symbols, as well as consider whether the formulation carries a researchable problem. That is, can the research variables be defined operationally and thus subjected to observation, measurement, and collection of data and information about them. (Malhem, 2000, p.85).

2.6. The boundaries of the research problem and the findings reached: It is important that the researcher clarifies the boundaries of the research and study, in relation to the aspects of the problem, its field, the sample, and the individuals or institutions it includes. (Malhem, 2000, p.85). Defining the boundaries helps the researcher focus on specific objectives and keeps him during the process of research, data collection, interpretation, and conclusion aware of the limits of his research and its results. (Jaber & Kazem, 1973, p.64).

This delimitation also helps us to avoid excessive generalization or the extension of the results beyond the limits of the research. It is preferable that the researcher clarifies broad justifications where he may ask: Is the problem sufficiently broad so that it can lead to obtaining valuable and genuine results? Also, the narrow boundaries of the problem make the results not generalizable except within these limits and under special conditions. Moreover, is this problem of a kind that its study opens the way toward better development of knowledge?

Good research should not end in a closed path but rather lead to other new fields. Limited scope studies cannot have great weight in reviews conducted in educational areas, and they may have even less weight when trying to deal with a problem.

The second standard: The importance of defining concepts and operational definitions in research

When formulating the research problem, the researcher must accurately and clearly define the meaning of every scientific concept used in the research, which he sees as not having one agreed meaning among all specialists. (Lotfi, 1995, p.26). The definition of concepts means

"showing what they mean, clarifying what they include of meanings, and what they demonstrate of characteristics." (Akeel, 1999, p.5).

A concept becomes clear when a person distinguishes it from other meanings that share with it some characteristics. This requires the researcher to define his concepts to remove any confusion that may stick in the reader's mind, because the concept may bear more than one meaning, making it necessary to clarify its ambiguity. And if social research in general is concerned with dealing with urgent issues in society according to a specific methodology to obtain more accurate and realistic results, then the field researcher should be clear in observing the reality of his research subject through defining the concepts used in it, since the concept represents a link between theory and field. (Gharbi, 1999, p.90).

The researcher aims through defining concepts to convey information clearly to the reader, which helps him understand, absorb, and connect it with other previous concepts. Concepts become clearer the more their purpose is clarified, and they are most clear when their words form an image for them. Therefore, defining concepts aims to show and clarify meaning. The researcher must define his concepts with precision and attention, which makes him tend to abstract and operational definitions in his research to demonstrate the indicative intentions of his scientific features, which can then be measured in their dimensions and results. (Akeel, 1995, p.8).

1. **Definition of concept:** Defining a concept by using simpler or more observable concepts is called an abstract definition. This definition forms the link between research and theory. The operational definition, on the other hand, is the one that defines the concept through what is followed in its observation, measurement, or recording. This concept will determine the type of material that the researcher will collect through observations, sources, and ways of gathering it. (Lotfi, 1995, p.27). We will try below to explain and define the meaning of both the preliminary and the final operational definitions. (Mukhtar, 2001, p.55).

a. The preliminary definition of the concept: It means giving a definition that includes the primary characteristics of the phenomenon in an attempt to direct the researcher toward the basic characteristics without going deep to discover its hidden facts.

b. The operational definition of the concept: After the researcher defines the variables of his research in the light of the preliminary definition of the concept, he determines the necessary operations to reach the measurement of the concept. That means the researcher's attempt to study the phenomena as they are in reality.

2. Basic considerations for evaluating the research-related concepts: Despite the scientific and methodological importance of defining concepts and terms, the way of using and developing them in sociological research in general is not well controlled by some beginner researchers. There is no doubt that concepts sometimes differ and even contradict their meanings, which leads to:

a. Difficulty in obtaining a model of social phenomena, as the difference among researchers, for example, in defining the operational meaning of any concept makes the existing statistics inconsistent, and this prevents obtaining general rules about the studied phenomena.

b. Difficulty in connecting theory with reality and inability to interpret reality precisely, which reflects a variation in diagnosing the phenomenon and analyzing its resulting outcomes.

Accordingly, we can distinguish a set of considerations through which the concepts can be evaluated, namely the formulation of concept definition.

First. Since the operational definition determines the meaning of the questions raised in the questionnaire—which, as we know, are originally related to the fundamental hypotheses of the research—when the subject of the study

and its analytical unit are defined, the concept and its definitions must take shape in the form of a specific question in the questionnaire. (Mukhtar, 2001, p.58,60).

Second. The concepts must be defined with a relatively precise determination concerning the research problem, using other researches and studies as assistance. This is related to the researcher's scientific competence, depth of insight, and ability to define. (Mukhtar, 2001, p.60).

Third. While determining concepts and terms related to the research problem, the researcher must ask: what are the concepts in scientific research? Everyone agrees that the vocabulary of social reality is not clear to all people in the same degree; it differs based on two considerations. (Gharbi, 1999, p.85).

These vocabularies differ according to the differences of the observers, and they also differ according to the differences of the specialists in them.

This pushes the researcher to clarify the behavioral indicators that govern people in a particular society as well as the meanings they submit to, which should be what is intended to be studied in the field. In other words, the researcher must focus on (Gharbi, 1999, p.85): the specificity in meaning, the distinction in scientific value, and the uniqueness in indicators.

Fourth. The researcher must not neglect the theoretical determinants surrounding the concepts when defining them, because the theory exerts a binding influence on the researcher in determining or raising the problems that need research. The theory also leads the researcher to confirm the strength of the relationship between variables, so research has little value if it is not supported by a theoretical framework. That means the social dimensions of the concept must be defined. (Gharbi, 1999, p.88).

2. Conditions for defining concepts: The following conditions must be observed:

- The concept must be described comprehensively and accurately in terms of its content meanings, using simple, easy, and common expressions.
- The researcher must avoid personal impressions and sensory perceptions; that is, avoid subjectivity. (Gharbi, 1999, p.96).
- The researcher must be convinced that defining concepts should not stop at explanation and clarification but must go further to help in determining the objectives of his work and field study.

3. Objectives of defining concepts: The functions of concepts should achieve the following:

- To guide the researcher through the determination of concepts toward a clear perspective and to specify the starting point for understanding relationships between phenomena.
- To determine the necessary operations and procedures for observing those variables that can help us in identifying the subject of the study.
- To assist in clarifying how to carry out these observations since the concept includes characteristics that help the researcher achieve his goals.
- The concept must allow for scientific inferences to generalize concepts in the future, taking the form of prediction.

4. The role of defining concepts in the steps of research: The concepts must be linked to the essential elements of the research, starting from the analytical unit and ending with the results. (Gharbi, 1999, p.100).

- The operational definition must be related to the theoretical analytical unit in an operational, measurable way.
- The determination of concepts must be connected to the hypotheses because the operational definition of

meanings helps to transform them into scientific indicators and bases.

- The determination of concepts must be linked to the questionnaire because it is on its basis that statistical data are extracted in the results.

- The determination of concepts must also be connected to the results, as it gives them a gradual, broader meaning beyond the statistical dimension they indicate.

The third standard: The scientific formulation of hypotheses.

After the researcher finishes choosing and formulating the research problem and defining its basic concepts, he moves to the stage of formulating hypotheses. This stage includes the first step in giving a concrete form to the research question, usually by answering it in the form of a hypothesis. The hypothesis is considered one of the most effective tools of scientific research because it represents proposed explanations for the relationship between two variables: the first, the independent variable, is the cause, and the second, the dependent variable, is the result. (Bouhouch & Al-Dhenibat, 2001, p.47).

The hypothesis also represents in the researcher's mind a possibility or probability to solve the problem that is the subject of the study. Therefore, it is regarded as possible or expected solutions, as if it were a contract the researcher makes with himself to reach a confirmed result, either to accept or reject the hypothesis. (Tahir, 1983, p.66).

The hypothesis is a preliminary assumption by which the researcher seeks to understand the dimensions of the subject and to present an initial interpretation of the studied phenomenon through analyzing its relations, objectives, and significance. Because hypotheses are probabilistic, their assumptions may prove true or not. Therefore, they should be used only in the light of what results they achieve. For this reason, working with them is considered a preliminary project that the researcher defines and formulates clearly to be able to follow systematic methodological steps that will allow proving or disproving it.

1. **Definition of hypotheses:** They can be defined as temporary solutions or provisional explanations that the researcher proposes to solve his research problem. They also mean the possible answers to the research questions, representing the relationship between the research variables. (Malhem, 2000, p.94).

   They are also defined as a suggested answer to the research question and a prediction of what the researcher may uncover in reality, acting as a scientific means to verify to what extent the expectations and assumptions correspond to reality. (Angers, 2004, p.151).

2. **The importance of using scientific hypotheses:** The importance of using scientific hypotheses in research lies in the aim of the study. They play an essential role because, through them, research moves from the abstract side to the tangible side of the scientific method. The researcher may have some ideas about reality, but these ideas have no real value until they succeed in becoming hypotheses. On this basis, the hypothesis expresses a prediction, whereas the aim of the research becomes a purpose, yet both lead to verification. (Angers, 2004, p.157).

In any case, the existence of hypotheses in a study brings the following importance:

- They guide the researcher's efforts toward collecting information and data related to the hypotheses, thus saving much of the time and effort spent obtaining information.

- They determine the appropriate procedures and methods of research for testing the proposed solutions.

- Hypotheses provide explanations for the relationships between variables and determine the outcomes in the relationship between the independent and dependent variables.

- They supply us with further hypotheses and reveal the need for new research. (Omar, 1983, p.35).

3. Sources of hypotheses: The sources of hypotheses are various and do not emerge from nothing. They reflect an intellectual effort through which the researcher tries to explain the studied phenomenon. There are subjective and objective factors that help the researcher establish hypotheses. External factors start with the observation of a phenomenon that the researcher thinks about and tries to assume the law that governs it. (Al-Azhari & Bahi, 2000, p.18).

As for the subjective factors, they include the researcher's personal experience, imagination, specialization, intelligence, insight, and ability to infer, guess, or logically deduce. Some researchers have classified the sources of hypotheses as follows. (Onsar, 1999, p.117).

a. Careful reading of scientific social writings and articles published in scientific journals.

b. Previous research conducted on the same topic.

4. Basic considerations for evaluating research hypotheses: Since the hypothesis is a speculation, but not a random one—it is intelligent and calculated, not dependent on chance—it becomes difficult to establish a sound hypothesis because it requires intelligence, accuracy, and deep knowledge. Therefore, we will discuss the aspects in which the formulation of scientific hypotheses can be evaluated as follows:

a. Conditions for formulating scientific hypotheses: In order to avoid confusion between what is scientific and what is not, several conditions must be observed when formulating hypotheses. (Shorouh, 2003, p.50). The most important are:

- The hypothesis must not contradict the laws and self-evident principles accepted by people.

- It must be verifiable through investigating its data, explanations, and outcomes, and it must not be imaginary or unmeasurable scientifically.

- It must be clear in language and meaning, free of ambiguity and contradictions.

- It must be concise and meaningful, avoiding excessive expressions that waste time and effort.

- The hypotheses must be connected with previous knowledge, whether to confirm or reject it, or to introduce an alternative or a new idea.

- The hypotheses should not be contradictory among themselves to reach clear and specific objectives.

- The research must not rely on a single hypothesis, because the more hypotheses the researcher has, the wider the field of research becomes.

b. Formulation of hypotheses: Before thinking about formulating the scientific hypothesis, the variables it includes must be studied: are they quantitative variables or qualitative variables? The independent variable and the dependent variable must also be determined. (Lotfi, 1995, p.33).

The possibility of formulating hypotheses constitutes in most cases about one-third of the research work. It is the link and translation between theoretical work and field work. Neglecting it affects the success of the research, since the main difficulty here lies in how the researcher deduces the hypotheses and how he formulates them appropriately for the problematic. Because "the hypothesis does not impose itself on the researcher externally, but

comes as a result of deep intellectual effort, crystallized and harmonious with the studied problematic. It does not come from nothing, but it is a mental image that approaches the description of social reality." (Zardoumi, 2000, p.34).

If the value of hypotheses lies in enabling the researcher to explain phenomena, and this is only achieved by testing the hypotheses, then hypotheses must be formulated in a form that allows testing them. (Onsar, 1999, p.118).

This means that the hypothesis formulation should specify the relationship between two or more variables, and that these variables can be measured.

Scientists have added, on this basis, some conditions through which hypotheses can be formulated: the hypothesis formulation must be limited in its scope, so that these hypotheses are of high importance. The hypothesis formulation must also be consistent with most known facts that are verified in its specific field. (Adas, 1992, p.43).

c. Testing hypotheses: The researcher must establish a number of steps and practical procedures to prove the hypothesis he has set. Some hypotheses can be tested through direct observation, while others require taking specific scientific measures to prove them.

The hypotheses that the researcher formulated at some stage in the research steps are subject to empirical testing. Therefore, each hypothesis has a meaning that it carries, provided that these meanings do not contradict or conflict—at least theoretically—because that would reflect on the other steps. For this reason, the researcher must try to evaluate the procedures for testing these hypotheses through the following questions:

- Do the proposed hypotheses have practical and realistic feasibility for actual testing?
- Do these formulated hypotheses support the definition of the problematic as it is, or do they completely clash with it? Did these hypotheses actually reveal the truth after testing, that is, did they achieve results? Did these hypotheses clarify the degree of correlation between the variables?
- Did they depict social reality according to the objectives set for the research? Are there some difficulties in understanding the meaning of the hypothesis? Is the researcher's position negative toward the phenomenon or positive toward the phenomenon, and does that reflect on the hypotheses?

All these questions and others are the basic considerations through which hypotheses can be evaluated. (Zardoumi, 2000, p.35).

The fourth standard: Previous studies and their proper use in research.

Previous researches are indispensable sources of inspiration for the researcher, because every research is nothing but an extension of the researches that preceded it. Therefore, it is necessary to review the works and studies that were completed before about the topic, considering them the path of exploration and reading appropriate texts that allow the researcher to fully grasp his research topic and control it well. (Angers, 2004, p.125).

The researcher needs the theoretical framework for his study to highlight the value of the current study. This is done by addressing related researches and their practical connection. Justifying conducting this study may also be done by revealing aspects of contradiction or inconsistency in the results of previous studies, which requires updating them with new conditions and information. (Malhem, 2000, p.98).

The researcher has several researches at his disposal on which he can rely for his personal achievements. His reading pushes him to raise new questions and conduct research on a new topic. (Angers, 2004, p.125).

There are several sources from which he can derive his topic, especially when there is limited knowledge around it or none at all:

- A methodology used in a previous research where errors were discovered.

- Doubt regarding the possibility of generalizing some results and conflicting conclusions about the same topic.

- A theory or part of a theory, or a model derived from it, or an interpretation of a phenomenon that has not yet been subjected to scientific verification.

1. The importance of employing previous studies in research: Exploring previous studies shows that sciences in all their fields, areas, and branches pour into the ocean of knowledge that enriches every new scientific research. Thus, new researches are affected by the studies and researches that preceded them. For the researcher to find a place for his research among previous researches, he must review them before writing his research or conducting his study so as not to waste his effort. If his research is a repetition of previous researches, readers will not pay attention to it and it will not find a place among the researches and studies that preceded it in his field of specialization. The stage of exploring previous studies is considered important (Akeel, 1999, p.34) for several reasons:

a. Before determining his research topic, that is, during the confusion that accompanies him when searching for a research topic, the researcher can benefit from previous studies through awareness from critical reading and interpreting the results and information reached by his predecessors, and through its scientific form that motivates him to research.

b. After the researcher determines his research topic, he must pay attention to the weaknesses that his predecessors fell into in order to avoid them.

And since these studies that enter within the theoretical heritage are a review of studies in scientific research through presenting summaries of their methodologies and results. (Safari, 1999, p.104).

They are of importance in scientific research, as they perform many tasks for the researcher during the implementation of this process when he reads what was written about these studies. The importance of employing previous studies is manifested as follows: (Al-Tahami, 1999, p.104).

- It enables the researcher to know the aspects of deficiency in them in terms of content and methodology to prove the importance of the proposed research and the feasibility of implementing it.

- It provides the researcher with the standards, measures, operational and reformative concepts that he needs, and thus he benefits from the positives of their methodologies and avoids their negatives.

- Previous studies contribute to clarifying the dimensions of the problem and showing the position of the proposed research from other previous efforts, while alerting the researcher to sources he may not have known.

- They help the researcher know the nature of the available scientific material and enable him to determine the theoretical framework on which he builds his study and the background in which he discusses his research results.

2. Basic considerations for evaluating previous studies in research: The phenomenon of underestimating the topic of previous studies and not taking them seriously is widespread among beginner researchers despite the importance these studies acquire for researches. In light of these observations, it was necessary to point out that scientific research at any level and whatever its purpose represents an integrated structure with interconnected parts. (Safari, 2000, p.38).

Therefore, the researcher must take into account some points to evaluate previous studies, which are: (Malhem, 2000, p.99).

a. Reliance must be on studies similar to the research, and thus the researcher must choose well the studies that touch the study.

b. Previous studies must lead the researcher to proper testing in crystallizing the research problem and determining its dimensions and fields.

c. Previous studies must enrich the research problem with knowledge, studies, hypotheses, and results reached by others to direct the researcher to avoid the difficulties they faced in research.

Moreover, reviewing previous studies requires insight and intelligence, as this process involves evaluating some methodologies and results and linking them. For these reasons, the researcher, when reviewing, must not risk issuing judgments of deficiency and inadequacy on others' contributions without evidence and before delving deeply into reading them. On this basis, there are specific methods to address all elements of the problem without leaving it to a particular side. To achieve this goal, the researcher follows the following steps:

- Collecting and listing all previous studies using independent cards, for every detail of the scientific material.
- Making a conception of the main divisions of the paragraphs of the previous studies element and their contents, taking into account the purpose of the division.
- The researcher must show the aspects of difference and agreement between these studies so that they can be reviewed in the current study.
- Determining the position of the proposed research from the previous studies collectively, as the researcher must prove through what he reviews that previous efforts will inevitably add new dimensions and information to the topic.
- Discussing the similar deficiencies in different studies to avoid repeating this deficiency in the current study.
- Highlighting the essential points included in previous studies without distortion or blurring their features in evaluation.
- The researcher must avoid highlighting or issuing judgments of deficiency for some studies without providing sufficient evidence, and he must review them in a way that enables the reader himself to identify the deficiencies in those studies. That is, previous studies must be reviewed through classifying, listing, arranging, and organizing different information, taking into account the necessity of having a central idea consistent with the study's problem around which the current study revolves. (Al-Tahami, 1999, p.107).

The fifth standard: Scientific research tools and their proper use.

Methodological tools are considered means of collecting data about phenomena. Each methodological approach, type of data to be obtained, nature of the study, and studied sample contribute to determining the type of tools used for all data. Once the research preparation stage is finished, the researcher begins the data collection process. Usually, the tool is determined during the research design stage in light of the objectives, available data, and the extent to which these tools are suitable for studying the research topic, in addition to the researcher's bias toward using one of the quantitative or qualitative approaches or combining them to increase clarity of vision and deepen the comprehensive view. This matter helps in the accuracy of analysis and control of interpretation. (Lotfi, 1995, p.75).

Since the data collection process for evaluation and scientific research purposes is one of the important stages that needs care, the researcher must design his research and

determine the tools he will use in a clear way so that he can apply his research objectives. Data acquires its general value to the extent that it sheds light on the problem and to the degree it helps in finding a solution for it.

1. **Sample design:** Testing the research sample is considered one of the main steps in collecting data and information. No doubt, when the researcher links determining a research problem with the procedures he will use, he will determine the nature of the sample and the data in which the researcher will use his tools. (Malhem, 2000, p.218).

Accordingly, using samples to study a phenomenon scientifically has become common in the field of scientific research. But for this to be possible and accurate in representing the population, the sample design and its development must aim to reach results that can be generalized to the population from which it was drawn. (Delyo, 1999, p.144). The sampling is a set of operations aimed at building a representative sample for a population for its targeted research. There are basic considerations that must be observed when evaluating the choice of the research sample, which can be summarized as follows. (Angers, 2004, p.301).

a. Conditions for choosing the sample: This is done through the following steps: (Malhem, 2000, p.220).

- Defining the original population of the study clearly and precisely, with identifying the individuals of the original population for the study and preparing a list of individuals.
- Choosing a representative sample for the research population.
- Choosing a sufficient number of individuals in the sample so that the appropriate sample size is determined through a number of factors, the most important of which is that the homogeneous original population makes choosing the sample easier, and the research method used affects the sample choice.
- The required degree of accuracy: the researcher who wants accurate results must rely on a large sample size that gives him confidence to generalize his results to the original population.
- Before starting to choose the sample, the researcher must know: what information is needed? Why does he want it? What is its importance, how will he use it, and why does he want to use the sample to obtain the data?

b. Basic steps for conducting sampling: There are basic steps that must be taken into account when conducting any sampling. (Bouhouch & Al-Dhenibat, 2001, p.63,64).

- Defining the required study: the required study and problem must be defined so the researcher knows what is needed, then search for appropriate designs and questions that the researcher wants to reach answers for.
- Defining and determining the population that the researcher wants to sample and knowing its internal elements to isolate external factors and units.
- Studying all possible references to know the required data and information and to know everything collected about them.
- Determining the data to be collected, which depends on the purpose of the research, and it is necessary to verify that all data is essential for the research.
- Reaching an opinion on the method of collecting data and measuring it, with choosing the sampling unit, type of sample, collecting it, and knowing its costs.

c. Errors in sample selection: Some researchers may fall into some errors related to sample selection and collecting data from its individuals. These have been classified by

(Akeel, 1999, p.216,217) into two elements that must be considered for each:

Bias error: The researcher gets rid of bias errors by not misunderstanding the results obtained from the samples on the population from which they were taken. Otherwise, there will always be the possibility of accusing bias and doubt in the researcher's choices as a result of his intellectual bias or the absence of part of the population and relying only on the information of those who responded to the study.

- Attribute error or designation error: Since the researcher's goal from choosing the sample is to generalize its results, he may fall into multiple errors accompanying the inverse relationship between sample size and error rate, because the larger the sample size, the fewer the errors. As for the existence of individual differences between sample individuals and the population, designation errors are always occurring. Therefore, in this case, chance error must be avoided, such as choosing certain elements purely by chance and depriving others from this choice, which achieves designation errors.

In general, the better the definition of the research population, the more information the researcher has about it and the better he can access it. This does not mean taking a number of elements more than what the nature of the research requires, but rather the selection must be well generalized in light of the prior definition of the problem. Because the researcher cannot afterward make the information say more than what its source represents, and this source is the selected elements, whose limits must be known relative to the research population from which they were chosen. (Angers, 2004, p.326).

2. The importance of using data collection tools in research: It is known that the researcher uses, in close relation to the chosen research methodology and research topic, many scientific research tools or what is called scientific research techniques, which help him collect the necessary evidence and proofs to test the validity of his hypotheses. No doubt, the good use of such tools is related to the extent of the researcher's benefit from his scientific abilities and his skill in using these tools.

a. Observation: There are many definitions for observation, but generally it is defined as the careful watching of a phenomenon with the help of research and study methods that fit the nature of this phenomenon. (Gharbi, 1997, p.259). Observation as an important tool for collecting data can shed light on quantitative data, adding a qualitative and typological dimension that gives it a more comprehensive and clearer meaning. It is also a criterion to which one can resort to verify the validity of data. (Lotfi, 1995, p.77).

Accordingly, there are difficulties facing the researcher when using observation, manifested in:

- Difficulty using it in cases where predicting the occurrence of the studied behavior in advance is hard.
- The observer may be biased by giving interpretations of the behavior instead of describing the behavior itself.
- External factors may enter the observation subject that affect the results, and it requires good training for the observers.

Since this technique assumes taking some methodological procedures and general rules for its application—because it allows forming a temporary conception of facts, situations, and conditions—before the researcher starts his field observations, he must try to answer several inquiries he poses to himself to help him define and evaluate his observations accurately and regularly. Among these inquiries are the following. (Kanouna, 1999, p.185).

- What does the researcher want to achieve through using the observation tool? Or in other words, what is the goal he seeks by resorting to this tool, and this assumes the researcher knows the subject to be observed with its elements.

- What is the type of data to be observed? And do these data help in deepening and enriching the aspects of the topic?

The researcher must also realize the sources of researcher bias during observation, because this problem is one of the most problems in using observation. But if the researcher is aware of these sources, he becomes able to limit their impact, even partially. They are: selection in perception, recording, and presentation; considering the error as an incidental incident with a specific attribute; the effect on behavior due to the researcher's presence. Also, the researcher must consider some main considerations for organized observation to obtain useful information in data collection, which are (Malhem, 2000, p.229):

- Obtaining prior information about the aspects to be observed in the phenomena.
- Testing the general and specific objectives that need research so they dictate to the researcher the phenomena to be observed.
- Adopting a specific method to record results quickly and efficiently, taking into account objectivity in observation.
- Organizing selective behavioral situations to verify the accuracy of judgment on the observation.
- Necessity of classifying the information unit descriptively at the time of its occurrence.

b. Interview: The interview is defined as a verbal interaction that occurs through a face-to-face situation where the interviewer tries to elicit information, opinions, or beliefs from the interviewee. (Gharbi, 1997, p.291).

Collecting information through interview requires training the researcher himself on planning, implementing, and recording the interview. Analyzing what the researcher does when conducting the interview allows setting a prior training methodology for planning, implementation, and studying the interview's return. The researcher's training includes making him capable of (Shroukh, 2003, p.40):

- Defining the research problem, determining the necessary information and tools best for collecting it.
- Determining the appropriate type of interviews with formulating suitable questions to achieve his goals, along with implementing the interview with the researched.

There are also sources of bias and error that the researcher must consider in evaluating interview preparation, as researchers pointed to a number of sources that lose the interview's validity and reliability, allowing interviewees opportunities for bias and error. The most important are:

- The style of the interviewers, their orientations, expectations, differences in recording, training interviewers, and variation in their ideas.
- The researcher's ideological affiliation, class affiliation, professional ethical values, and the social and cultural characteristics of the research community.

c. Questionnaire: It is defined as a data collection tool related to a specific research topic through a form filled by the respondent. (Malhem, 2000, p.259). To evaluate the questionnaire well, there are a number of conditions taken into account to build a good questionnaire:

- The questionnaire addresses an important problem whose results contribute to advancing the research, clearly showing its importance without bias in the question.
- The instructions specific to the answering method are clear, it is concise as much as the problem allows, the questions are clear, and avoiding generalities.

There are general rules for formulating and building the questionnaire that must be observed:

First. General rules:

- The questionnaire must be short, not taking much time to answer, without including unimportant or superficial questions.
- Every question must be related to the research problem and help achieve the research objectives.
- When placing questions, it must be considered that the expected answer does not carry more than one interpretation.
- The questionnaire questions must progress from general to specific, and questions should be presented in a way that facilitates the extraction process.

Second. Rules related to formulating questions:

- Questions must be formulated with clear expressions and easy words, avoiding concepts that allow more than one meaning.
- Questions with a quantitative nature that require precise answers must be formulated.
- Questions linked to answers to other questions in the questionnaire must be placed.
- The logical order in presenting questions must be considered, and the question must not contain more than one answer.

The form can also be tested by verifying its validity and suitability for research purposes and coordinating this plan by presenting the forms to those with methodological, scientific, and field expertise. Their directions give the researcher the opportunity to review the form in terms of form and content. Accordingly, the researcher can modify the form, avoiding its negatives through evaluating the degree of response from sample individuals to answer and knowing the suitability of questions in terms of formulation and clarity, along with evaluating questions in terms of their necessity. (Malhem, 2000, p.267).

Conclusion:

There is no doubt that what best enlightens researchers and students in sciences in general and attracts them is arming them not only with methodology but with field research techniques and tools for controlling their use. Through this, scientific research appears as an adventure that combines scientific activities and experiments full of difficulties and novelties. But the adventure in this field does not happen by chance; rather, it follows a special effort characterized by precision, method, and objectivity. It requires continuous great efforts, perseverance, and great satisfaction when undertaking the task of completing the research project and reaching its desired goal. Before starting the adventure, the researcher must prepare himself for it and seek as much as possible to know its nature through using some standards that help them perform their researches in the best way. These methodologies and techniques represent a real wealth that seeks to have a great dimension in determining what they want to reach.

Finally, the process of evaluating psychological and educational researches to give them scientific credibility allows the researcher to ensure the validity of his research, as it prevents mismatch between the researcher's goal and the obtained data. It also develops the scientific value of the research method and elevates it to be a research of importance and free, to a large extent, from errors.

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