
Title: Scientific method: its historical development and application in the humanities and social sciences

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Abstract

The scientific method that organizes the intellectual processes carried out by the researcher in all disciplines is considered to be the correct and correct path in order to build sound scientific thinking, aiming to reveal or prove the truth, and to achieve the most important goals of scientific research in order to achieve scientific honesty, with Follow the correct method and present objective critical judgments, all of which target accurate, certain information to solve the problems facing humans in all fields.

This article deals with the scientific method as the healthiest and most effective way to reach valuable scientific research results that serve science and serious scientific research, while highlighting the importance and development of its uses throughout history, which have their own scientific method in dealing with their topics, with an attempt to give a comparison with the natural sciences to highlight Specific uses of the scientific method in the humanities and social sciences.

Keywords: method, scientific method, science, humanity, social

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1. Introduction

In order to build sound and purposeful scientific thinking to reveal facts or evidence for them, and in order to achieve scientific honesty, while following the correct method, and to present objective critical judgments, all of this will only come through a set of rules and techniques that must be followed, and research that It does not solve the problems that people suffer from within an organized scientific framework, in an integrated process between the totality of scientific research in all disciplines There is no value or benefit from it.

Definition of the scientific method: The method is a translation of the word (*Méthode*) in French and its counterparts in other European languages, and its original etymological meaning indicates the path or method leading to the desired purpose, and it did not take its current meaning until the beginning of the Renaissance, and the method in general is "the correct arrangement." For the mental processes that we carry out in order to reveal and prove the truth, which is coordinated analysis And organizing the mental and experimental principles and processes that necessarily guide scientific research... (Aboud Abdullah Al-Askari 2004, p.1)

Methodology in language is the clear path, and methodology is the path that links the problems of reality with the perception of researchers and scientists, and in terminology it is the path that leads to revealing the truth in science by means of a number of general rules that dominate the course of the mind and determine its processes until it reaches a known result.(Kamal Dashli 2016, p.26)

It is also considered a method of thinking and implementation, adopted by the researcher to complete his research, organize his ideas, analyze them, and present them to reach facts about the phenomenon, or the event that is the subject of the study, and present them to reach facts about the phenomenon, and this can only be done through a set of interconnected steps that lead to Each of them leads to the next step (Kamal Dashli 2016, p.26)

The scientific method takes on a general character when it refers to a set of general rules by which it operates in accordance with all sciences. There can be

scientific methods, qualitative, that vary according to the sciences, and the logical structure of each science, and the ultimate goal of all cases is to obtain scientific knowledge (Aboud Abdullah Al-Askari 2004, p.1), by following the steps of the scientific method.

Scientific research methods of all types share a set of characteristics that can be summarized as follows:

- Organization in the way of thinking and working, based on observation and scientific facts.
- Sequence and coherence in implementing successive research steps
- Objectivity, privacy, bias, subjectivity, and personal inclinations
- The possibility of selecting research results at any place and time, using scientific methods, but under conditions and conditions similar to the occurrence of the results of the studied phenomenon
- Treating phenomena and events that resulted from similar phenomena or events
- The ability to predict, that is, to conceptualize what phenomena will be like (Kamal Dashli 2016, p.26). A good scientific method requires the following:
 - 1- Logical analysis of the problem and formulation of hypotheses
 - 2- Good definition of the concepts and standards used
 - 3- Collect data related to the study problem
 - 4- Classification of data (i.e. scientific material related to the subject of study)
 - 5- Expressing variables quantitatively whenever possible (depending on the topic under study, some topics require a qualitative approach, others a quantitative approach, and some require both)
 - 6- Logic in examining hypotheses (Mundhir Al-Damen 2007, p.30), for topics that require this

The importance of the scientific method lies in the fact that it helps researchers think, based on the sound methodological method, which leads to the exploration of knowledge, which can be added to the stock of human thought, in addition to achieving scientific honesty and the logical presentation of objective critical judgments, and on this basis it must The

research must necessarily include a section on methodology in which the method adopted is clarified, because the results in themselves do not mean anything. Rather, it is the solid basis for a research and its validity that will be judged primarily, based on the suitability of the method and the means of applying it. The method is essentially defined by a set of precise procedures and methods adopted in order to reach a result, and therefore the method is considered a fundamental issue (Maurice Angres 2004/2006, p.31). The use of this approach requires rigor, by respecting the successive stages that must be followed in a coordinated and organized manner. The validity of any scientific research depends, to a large extent, on the method used and the method according to which it was used to study reality (Maurice Ingres 2004/2006, p.31). As long as science aims to reveal common characteristics and existing relationships between different phenomena, it depends on the scientific method that includes observation, Influenced, deduction, induction, and description,... The method may differ depending on the available means and capabilities. It is "the art of correctly organizing a series of many ideas, either in order to reveal the truth." When we are ignorant of it, or in order to prove it to others, when we know it" (Abdul Rahman Badawi 1977, p.5.) Therefore, the method is the path that the researcher follows in his study of the problem to discover the truth, and the science that investigates these methods is the science of methods, and it may be at the hands of specialized scientists and philosophers (Ahmed Badr (b, t), p.35) and in general, even if the truth reached, It is not necessarily the final truth about life and the universe, and whenever facts are discovered, they decline again permanently (Ahmed Taleb 2009, p.67). This can only be done through the correct steps of the scientific method according to each specialty.

This value can be summarized by likening the method method to a tree with multiple branches, for a single origin, as the general topic, which is the origin, branches into contents, and the contents in turn branch into topics, just as the topics branch into ideas, and while the researcher is in the process of organizing these elements, He must take into account in this delicate process the element of causality, to coordinate ideas in a rational and logical manner (Ahmed Taleb 2009, p.67)

The foundations of scientific thinking and research have developed very slowly, and this development took several centuries in human history. This thinking and scientific research, in its scientific and abstract form, goes back to ancient Egypt and to the Greeks. Then the Arabs took scientific research a long step forward, as they used the experimental method in research. They took observation and experiment as the basis for scientific progress, and from the Arabs, Europe transferred the scientific and intellectual Arab heritage at the beginning of the Renaissance. To confirm its foundations starting from the seventeenth century until the present time (Ahmed Badr (b, t), p.73)

History of research in antiquity:

These are the periods in which the ancient Egyptians, Babylonians, and Romans lived... (Ahmed Badr (b, t), p.74), for example, the practice of medicine and medicine (as a field of scientific research) was sometimes on scientific and methodological foundations, and they advanced somewhat in that, but that science was interspersed with some talismans, spells, and magic, and the priests played a major role in it. (Ragheb Al-Sargany 2009, p.13). As for the Egyptians, we find that their intellectual orientation was an applied scientific direction to achieve utilitarian goals. Then they excelled in mummification, engineering, arithmetic, medicine, astronomy, and agriculture... The priests also had great influence, were proficient in mathematics, and invented space so that they could restore the correct boundaries after the annual floods of the Nile. Many of their knowledge was recorded on papyrus, and their sciences were engraved on stones in hieroglyphics... As for the ancient Greeks, they made great progress in the principles of research and relied heavily on contemplation and abstract rational consideration. In terms of research methods and style of thinking, Aristotle established the rules of the standard method or inference, and called for work by induction and observation. The ancient Greeks relied in their scientific construction. On the subsequent discoveries recorded by the Egyptians and Babylonians, among whom Pythagoras became famous in geography, mathematics, and philosophy (600 BC).M), Hippocrates (the father of medicine) developed medical knowledge and practice, and Aristotle (4 BC).M), famous as a philosopher and logician.... (Ahmed Badr (b, t), p.74)

As for scientific research among the Romans, they were the heirs of Greek knowledge, and their contribution was focused on practical practice, more than their pursuit of knowledge itself... The Romans were more law makers and engineers than contemplative thinkers.

For a period of time, Western Europe lacked knowledge and research methods after the collapse of the Roman Empire, and I say Greco-Roman civilization, but the Arabs were the bearers of the torch of science and scientific research to Europe after that (Ahmed Badr (b, t), p.74)

This is the period in which the Arab-Islamic civilization flourished, as one of the most prominent civilizational achievements of Muslims was "scientific civilization," which preserved for the world the heritage of humanity in this field, when the pioneers of Islamic civilization translated the books of the Greeks, Persians, Indians, and Chinese that reached them, and they were not satisfied with that. Rather, they saved, aimed, then innovated and created in the fields of science, arts, and literature, and thanks to that, the universities of the Islamic world from East to West became a demand for the kings of Europe. Princes and students came to it out of a desire for knowledge and treatment (Ragheb Al-Sarjani 2009, p.34)

One of the most important contributions of Muslims in the scientific field, in the medical sciences, were those sciences related to human health, and related zoology, botany, pharmacology and genetics, as the creativity of Muslims in the medical sciences was not limited to treating diseases only, but went beyond To establish an original experimental approach whose effects were reflected in aspects of medical practice What constituted the group of Islamic contributions in graduating a great group of rare medical geniuses (Ragheb Al-Sarjani 2009, p.32)

Among the testimonies of Western scholars regarding the virtue of Arabs in developing scientific curricula, Dr.Sarton, one of the most famous American scholars in the history of science, said: "The Arabs were the greatest teachers in the three centuries: the eighth, 11 AD, 12 AD,... If the treasures of Greek wisdom had not been passed on to us, the city's progress would have been halted for a few centuries...." (Ah-

med Badr (b, t), p.78), as the Jewish researcher Franzosenthal testified, expressing his admiration for the greatness of Islamic civilization: "The emergence of this civilization is an exciting topic, and one of the most worthy topics for contemplation and study in history.... It could be called a miracle civilization....." (Ragheb Al-Sarjani 2009, p.45)

The most famous Muslim scholar in mathematics, Muhammad bin Musa Al-Khwarizmi, is the most important figure worth mentioning, as he wrote a book entitled "Algebra and Muqabalah." On the basis of this book, studies of algebra were carried out in the Islamic and Christian Middle Ages, and the study of chemistry among the Arabs also began, and from The Arabs transferred chemical knowledge to Europe in the Middle Ages under the name of chemistry, and thus the Arabs contributed their original scientific production and contributed to the synthesis of the method of induction They took observation and experiment as a basis for scientific research, and transferred and developed the knowledge of the Indians and Greeks (Ahmed Badr (b, t), p.78)

Among the factors that helped move the scientific renaissance forward:

- Freedom of opinion and scientific research, as the Arabs enjoyed great freedom of opinion, which Europe did not practice until centuries later.
- The rulers and governors appreciated knowledge and scholars, as they were proud of those who attended their council.
- The superiority of Arab scholars over luxury, money, and power.
- Mental readiness, patience in work, and an appropriate scientific climate. Ibn Sina produced 276 books and Ibn al-Haytham about 200 books (Ahmed Badr (b, t), p.78)

The modern era is the period that begins from the seventeenth century until the present time, in addition to the contemporary period. During this period, the foundations of scientific thinking were completed in Europe, and these steps began at the hands of many, the most important of whom were Francis Bacon, John Stuart Mill, Claude Bernard and others.

At the beginning of the Renaissance, the Europeans' knowledge of the Arab heritage was the starting point for European civilization, which flourished after that. At the forefront of laying the foundations for thinking and scientific research in Europe were Roger Bacon (1214 AD - 1294 AD) and Leonardi Vinci (1452 AD - 1515 AD), and others who called for the use of observation and experimentation to reach facts, and to support the demand of these thinkers to adopt the scientific method. However, they did not use this method except within narrow limits, and despite the gradual liberation from the authority of the church, churchmen, and clergy, this authority was still effective (Ahmed Badr (b, t), p.P.79.80)

By continuing the process of scientific research since the 17th century AD, it can be said that the geological and biological sciences have flourished as new fields of study and research, as a new view of the natural world came, with that beginning study of antiquities, with the discovery of fossils, psychology, and the science of studying the shape of the skull, as evidence of personality and faculties. Mentality during the 19th century AD, and during the 20th century AD, there were developments in the use of biochemistry or bacteriology, in the study of medical problems, and the use of new ideas in physics, to destroy the atom.

At the same time, research had begun in relatively new fields such as social relations, economics, education, and others, making optimal use of the scientific method as a tool for research in various fields, and the remarkable growth in technology and in all elements of contemporary civilization can be largely attributed to our use of scientific research. (Ahmed Badr (b, t), p.84)

In the field of development of study methods in the human sciences and natural sciences, the methods that we adopt to study intellectual life, history, and society are very different from the methods that led to natural knowledge, and controversy still exists to the current stage about the scientificity of the human sciences, since the phenomena of thought are not Natural phenomena, we cannot establish a science about them, for nature we explain; That is, we determine the conditions of its phenomena, and the fixed relationship between these conditions, and justify them in a law. As for the human phenomenon, we understand it, and this understanding is the only approach that is

appropriate for studying human phenomena, according to some (Muhammad Baba Ammi, 2014, pp.90 et seq.).

The human sciences are sciences that take the human being as a subject of study, and man as a subject of study are sciences that have their own scientific characteristics and advantages, and the goal of such studies that take place in various branches of the human sciences is to know and understand man, and the meaning and significance of his actions includes these sciences, which are "Human Sciences" (Maurice Angers, 2004, pp.53, 54 et seq.), which have a close connection with the social sciences.

All of this aims to serve humanity, meaning that the goal of science is to reach a solution to human problems, and these problems take the form of questions that science comes to answer through research, and these answers are called science, but the path to reaching these answers is not random, but rather has rules that govern it, which have developed since Several centuries ago and proved its accuracy.

Therefore, research that does not come to solve a problem cannot be a contributor to science, but rather has nothing to do with science. Science is a set of answers to questions or solutions to problems that burden a person, and the means of obtaining it is research, meaning that the source of scientific knowledge is research through the method (Zakaria Sarayesh, 2018, p.8)

As for the human sciences, the use of the science method in them does not reach the level used in the natural sciences. Generalizations in the human sciences do not equal generalizations in the natural sciences. Among the determinants that limit its use in the human sciences are:

- Complexities in the topics discussed. Humanists deal with topics related to humans, their behavior and complex development
- Difficulty in observation. Interpretations often depend on the observed part, and values and attitudes are not subject to examination. The problem also lies in the fact that researchers' personal values and motivations affect their evaluation and the results of their studies

- The difficulty of repeating the experiment, due to the difficulty of repeating the conditions in which the study is conducted with the same accuracy.
- The difficulty of control in the human sciences is more difficult than in the natural sciences, as many variables are dealt with, under less precise conditions, in addition to the problem of measurement (Mundhir Al-Damen, 2007, p.22.)

Due to the close connection between the human and social sciences (the society in which a person lives and deals), Ingres believes that the previous human sciences were the same as the social sciences due to the relationship between the topics studied, all of which flow into human interests, on the basis of their many branches that study humans from multiple aspects. In psychology, for example, the focus is specifically on psychological phenomena, and in sociology, we will look specifically for the explanation of social phenomena, and in history, We will study past events and facts. As for political, economic, and administrative relations, they will be the subject of interest to the branches of political science, economics, and management (Maurice Angres, 2004, pp.55, 54 et seq.)

It is necessary to point out the statistics method as a necessary method in the humanities and social sciences, as we find that both the method and the scientific method are intertwined in terms of statistical methods, meaning that the design is experimental and statistical treatment are two sides of the same coin. Designing research and experiments, and conducting them, cannot be separated from the treatment. Statistical results: Experiments must be designed to help process the results in a way that allows for correct interpretation and leads to achieving the purpose for which the experiment was carried out.

One of the most important things that statistics provides for scientific research is that it is more correct to reach results with a specific degree of accuracy from relatively small samples, as the researcher needs to analyze the data statistically, in preparation for drawing conclusions from it, with the possibility of generalizing them (Aboud Abdullah Al-Askari, 2004, p.116)

Natural sciences are sciences that take the physical and biological fields as a subject of study. Everything that exists or is produced without human intervention is often called nature. As for special branches such as physics, chemistry, and biology, they were originally developed to study this nature, and whether they are called natural sciences or correct sciences, Or the exact ones are just sciences, they are currently called natural sciences, and there are other branches related to them, such as: astronomy, geology, And new ones were formed through so-called twinning, such as astrophysics and organic chemistry (Maurice Angres, 2004, p.54)

Unlike the human and social sciences in terms of the difficulty of repeating the experience, we find work in the natural sciences based on dealing with material things. They attempt to discover relationships between phenomena or material things, and to observe these phenomena and things in a good way, these sciences use highly advanced tools.

For its part, the human sciences have their own way, and they deal mainly with humans. The human sciences are not a blind imitation of the natural sciences, especially since the characteristics of the subjects of each of them differ, even if the fields of activity are defined within a scientific framework. Despite all this, there is no conflict in the scientific method followed. In both cases, except for some differences that is inevitable during processing

Actual taking into account the specificities of each topic (Maurice Angres, 2004, pp.55, 56)

- Subject in the humanities
- He is aware of his existence
- He gives meaning to his actions
- It is of the same nature as the observer
- It cannot be reproduced
- Complicated
- Partially accepted
- Accepts interpretive analysis

- Accepts the understanding analysis
- The topic is in natural sciences
- He has no awareness of his existence
- He does not give meaning to his actions
- Not of the same nature as the observer
- It can be reproduced
- Simpl
- Accepts measurement
- Accepts causality

It does not accept comprehensible analysis (Maurice Angers, 2004, p.58)

The difference between natural phenomena and the phenomena of thought (human sciences) is essentially the reason for this difference in the way topics discussed in them are treated:

- Phenomena of Nature
- Realized within the framework of external experience
- Separation between subject and object
- Given in experience in the form of independent and dispersed phenomena with no connection between them
- The researcher's task is to organize and unify these natural facts thanks to hypotheses that attempt to pay attention to objective causal relationships between phenomena, and that is the method of interpretation
- Phenomenology of thought
- Realized within the framework of an internal experience
- Self-attachment to the topic
- Given in the inner experience in the form of a certain sum characterized by its totality and unity

The researcher's task is to try to understand the human experience (Maurice Angers, 2004, p.59)

The human sciences have developed after the natural sciences, and in fact the subject of their study (the human being) shows very clearly the degree of complexity of these sciences during the course of their formation. The matter is not related to the human sciences imitating the natural sciences, as much as it is related to showing their originality, with the same difficulty in the method of work. In the human sciences, with an emphasis on the need for the researcher in the human sciences to focus on subjectivity (Muhammed Baba Ammi, 2014, p.90)

Quantitative methods: A set of procedures for measuring phenomena. They aim primarily to measure the phenomenon under study. These measurements may be of the ordinal type, such as more than or less than, or numerical, using arithmetic. We find that the majority of research in the human sciences uses measurement, as well as Using indicators, ratios, averages, or tools provided by statistics in general (Maurice Angers, 2004, p.100).

Quantitative methods rely mainly on mathematical formulas, and due to their regular and repeated uses by the natural sciences, they were considered from the beginning to be more rigorous and scientific than qualitative methods. This led the human sciences to believe for a long time that their growth and credibility depended on more use of quantification in their research.

Some disciplines, branches of the human sciences, such as: economics, geography, sociology, psychology, and management sciences, have used mathematics in their study of phenomena, because the nature of their subjects and topics requires it, with the inability to always subject human phenomena to quantification. Therefore, they are obligated to use methods. The method that uses more judgment, accuracy and flexibility of observation, and understanding of the experiences that individuals live (Maurice Angers, 2004, p.101)

This is why we see that modern scientific progress has moved the center of attention from sensory observation, to converting qualities into quantities, and expressing the facts of sense in numerical numbers,

and the observed phenomena have begun to be translated into graphs and statistical tables, and since the modern human sciences have in turn tended to artificialize the experimental method. As much as possible, it also tended to quantify its study, and the laws of science were transformed into mathematical semantics (Raja Wahid Dwidari, 2000, pp.31, 32)

When conducting any experiment, we find that what we have in the end is a set of data,² Or observations or measures, from which no useful results can be reached merely through a simple, direct examination of these data. At this stage, the experimenter or researcher must resort to classification and brief and comparative description, and here statistics have a vital fundamental role in providing the researcher with the tools or methods that enable him to achieve This (Aboud Abdullah Al-Askari, previous reference, p.115)

Qualitative approaches: A set of procedures for identifying phenomena, which aim primarily to understand the phenomenon that is the subject of study. Attention is focused more on determining the meaning of the statements that were collected, or the behaviors that were observed. Therefore, the researcher focuses more on studying the case or studying a small number of individuals, for example. When the researcher tries to know the stages of the child's learning, or the events that marked a period of time, he uses qualitative approaches (Maurice Angers, 2004, p.100) 101)

Human phenomena, no matter how accurate the quantitative measurements used to measure them are, will continue to maintain their qualitative dimension. When a researcher talks, for example, about prosperity in a country or the history of a human group in the degree of its satisfaction with its conservative tendency, and they are all phenomena that have mathematical measurements, the terms used are of A qualitative nature that refers to human facts that do not respond to quantitative measurements, but rather require a qualitative approach (Maurice Ingres, 2004, p.101) From it came qualitative research, which includes collecting information over a long period of time. Its historical uses began in the late 1800s and early 1900s. For example, this research dealt with studying the situation of the poor in Britain and Europe, and

such reports related to cultures. Different, where the focus was on social sciences.

This research can also be applied to past and current events, as the past is intended for historical research (Ahmed Badr (b, t), p.135)

From the above, it is possible to distinguish the difference between quantitative and qualitative research. Quantitative research, in terms of defining the problem, depends on describing or clarifying the relationship between variables, and finding the relationship means the extent of the impact of one variable on the other, while in qualitative research the researcher focuses on exploration and understanding.

Qualitative research Quantitative research

The purpose is to examine the phenomenon through precise details to study the relationship, cause and effect. Generalization during the study is developed before the study. The method is inductive, forming an inferential theory by examining the theory of tools. Interaction, face-to-face uses standardized samples. The sample uses small samples. The analysis uses large samples. Description and interpretation of statistical analysis of data, numbers (Ahmed Badr (b, t), p.145, 146)

Objectivity: It is one of the most important principles of scientific research, and it means neutrality, staying away from self-interests, and not being biased towards an opinion or position, and it is the advantage of everything that honestly describes a thing or phenomenon (Abdel Fattah Khader 1994, p.26), and from it we say "objective writing." ", meaning abstraction from all whims, emotions, ideas, and beliefs, and monitoring human reality as it is or realizing reality as it is In science, there is a commitment to excluding subjective experience in knowing things. Science is based on describing things and determining their state as they are in reality. If a group of scientists is presented to study one topic, they will ultimately reach the same results, even if they disagree with each other on some topics or details. They settled the dispute by resorting to reality, and what is correct for them is the experiment that can be conducted to reach results in a purely objective manner (Tawfiq Al-Taweel 1990, p.95) 96), which includes scientific objectivity, with the researcher adhering to the scientific

methodology of the research, and collecting and processing data as it is, without modification.

Talking about objectivity requires us directly to talk about documentation, which is considered a very difficult process. When a researcher writes, he tries to give the impression that he is committed to objectivity, scientific honesty, and seeking the opinions of others to strengthen his view, and at the same time express his point of view and defend the values that filled him with. His mind, and reviews the ideas that seem important to him and expressive of the topic, and it remains to have objectivity, scientific honesty, and a spirit of accuracy and honesty in dealing with the topic *Relative things* (Ammar Bouhouche 1985, p.47), and the serious attempt on the part of the researcher must approach objectivity as much as possible, especially in the humanities and social sciences.

Therefore, objectivity is dealing with facts without bias or making value judgments. Results must be free of personal beliefs, love and hate. Data and analyzes are supposed not to be biased. Among the factors that affect objectivity are:

Personal bias, which is believing something without taking into account evidence of it.

Value problems, such as attitudes toward the economic and social situation, which are affected by the researcher's values.

Ethical crises, and this is related to the researcher's relationship with others involved in the research process, such as the entities that fund the research, as well as the relationship with the sources of data provision and with the individuals of the samples studied.

Social phenomena are rarely easy to study, as the fact is that they are extremely complex (Mundhir Al-Damen, 2007, p.121), especially since they and the human sciences revolve around the study of man and his actions, and he himself is the one who carries out the research process that requires objectivity.

Subjectivity in scientific research

Subjectivity: It is interest, the opposite of objectivity, and the inability of the researcher to remain neutral, as every researcher on a scientific topic must

avoid subjectivity, while using all the means at his disposal, in order to avoid manipulation or fraud that could be the results he aspires to achieve. We are vulnerable to it, including self- or personal writing, which refers to personal opinions or feelings, regarding a specific topic. It includes personal opinions or visions that are not based on truth, and they guide us to the person's way of thinking, his interpretation of his thoughts and feelings, and his cognitive background.

The most important methods for avoiding subjectivity and achieving objectivity in scientific research are:

□ Patience and self-control, as the researcher is supposed to stay away from the personal fantasies and ideas that he desires.

□ To be open-minded.

□ It must use codified concepts, and concepts must be defined precisely to avoid confusion and confusion.

□ Using the quantitative method, as the mathematical and statistical method reduces subjectivity.

Collaborative research: Collective research is better than individual research, and reduces individual bias, especially in the social sciences. This is done by having more than one researcher in the research project, or seeking the help of researchers and colleagues to read the research and express their comments on the way the topic is treated, and the method of writing the study.

Therefore, the researcher must stay away from the influence of whims and emotions, and prove what is revealed to the researcher with the truth, and according to what the evidence leads him to, even if it contradicts his inclination and whims, even if it is a difficult requirement, as the researcher always suffers from the influence of multiple factors in his emotions and emotions, all of which are linked to the society in which he lives. Including what is political, economic, social, or cultural...The researcher only has to elevate his style in expressing his critical opinions. This method gives the characteristic of decency, avoiding sar-

casm or belittling the status of others by trivializing their opinions.

Definition of scientific criticism: Scientific criticism is the art of distinguishing good from bad. Scientific criticism means studying and analyzing the subject, comparing it to something similar, then judging it or against it, by clarifying its value and degree. Criticism requires:

- Neutrality, objectivity, and distance from personal aspects.
- Avoid getting emotional while criticizing the topic, as it is a way to highlight the facts, with the aim of evaluation and reform.
- An analysis of the elements of the topic, an explanation of the strengths and weaknesses of the topic and their reasons, and ways to treat the weaknesses.

Characteristics of a critic: Whoever criticizes must have:

- Scientific erudition.
- Experience as a result of long training.
- Objectivity in criticism, and that the critic's goal is correction and reform (Mohamed Al-Sawy Muhammad Mubarak 1992, pp.342 et seq)
- The criticism process includes two stages: the external criticism stage, then the internal or internal criticism process of the document:
- External criticism: Through external criticism, the researcher can evaluate the authenticity of the document or documents, and the examination here is done with the help of four questions:
- What is the status of the document? Before giving a general evaluation of the document, it is necessary to confirm whether this document is complete, damaged, forged, readable or not.

When was the document issued? The researcher must have the appropriate information to determine the period during which the document was issued. After that, we will realize whether we are able to ob-

tain sufficient documents for the period within which the research topic is being processed.

Who is or are the authors of the document? We must determine the source of the document, as it reflects the point of view of its author or authors, to better understand the meaning of the documents we are studying.

Where was the document issued? What is required is to know in which society or environment the document was issued. Thus, we will learn about the breadth and extent of the documents (Maurice Angres, 2004, pp.140, 139)

Internal criticism: based on the data provided by the researcher, which generally ends with issuing a judgment that shows with all possible objectivity the importance of the author (Paul Bascon 1981, p.8)

Conclusion:

The scientific method, with the recorded differences in its uses between the disciplines of the humanities, social sciences, and natural sciences disciplines, remains the most useful way to reach real scientific results, and the organized intellectual method for collecting information and data that leads to solving scientific research problems, which is "Science" is the goal of every committed, serious scientific researcher who actually aims to add the required value in his field of specialization. The use of this approach has developed in all fields of research over long historical stages, until it has reached what it has reached today, where the great development that humanity has reached with the development of its sciences is known for its regular uses. In this context, the great addition and significant roles that it has played have been recorded. It was carried out by Muslim Arabs, and their great contribution to the development of the experimental method during the Islamic era.

The use of this approach in the humanities and social sciences remains different, and more complex because the subject of study is the human being, and because that approach depends mainly on understanding, and applying observation and experiment in it remains difficult if it is compared to the scientific method in the natural sciences

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