

Science and the Importance of the Scientific Approach

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Abstract

The objective of this article is to describe the background and principle of scientific studies and thereby to give inputs, interpretations and remarks which can be incorporated into a research proposal in order to improve the projected study. It gives future researchers recommendations and shows them how to deal with theories and methodology and how to integrate research findings both theoretically and practically into a paper. This article is a pioneering 'roadmap', which leads the researchers to go beyond their own confinement and to examine matters more precisely and truthfully.

Key words: Research Proposal, Science, Article, Study, Evolution, Knowledge, Faith, Analysis

Preamble

In this paper it hypothesized that dealing with problems of societies from a scientific perspective need a humanistic responsibility as well. The fact is, there are various challenges in society and each of them has a different dimension, each of them also needs a different handling process to ride them out. Seeing that, this project deals with challenges of society with a combined standpoint. If a problem is not properly defined and analyzed, it can't be properly solved. Science help us to definite and diagnose problems. The key to many questions of humanity can be found and solved through science. People have learned much through experiments and they know more than in the past. They know more particularly how to deal with their mistakes and failures. Without science we would not develop as much as today. So one wonders: What is science? How should young scientists successfully navigate their researches? Who may be renowned as a scientist? We try to find out the answers of above mentioned leading questions.

The focuses of the project are important and innovative. These subjects are of concern to the scientists in any branch. In this sense it gives researchers orientating views, which might support them to design their research project more precise and concrete.

The Evolution of Science

In the globalizing world society pay tremendous respect to science and its results. However, in our time and society, there are also traces of myths, medieval beliefs, superstitions, scholastic prospects etc. and there are also many hopes and new research for an extended horizon of mankind.

Science shapes society and society inspires the main rules of science. Science is like a map for the people, which is also a product of man, and tries to make the mankind's path more visible. On the other hand many governmental and private institutes manage as well influence the results of science.

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Therefore it would be too naïve to believe, that, what sciences presents to publicity as so called “scientific results” is the absolute truth and the best possible. Countries govern the world system through their political as well as economic consulting. They also influence social movements and developments.

If we consider the situation now, we can say that ideologies and politics play an important role in sciences. It can be said that science is a part of society and every branch is connected with and interdependent with the rest of the institutions and standards in some way.

Science itself and scientific methods are just as important as the discoveries of science. On the one hand, science tries to make new inventions and resolve the mysteries of life and of living things, and even undertakes new steps; they also develop better and more efficient methods. Knowledge and scientific theory is the method that requires us to follow the road step by step to truth and scientific theory.

Science developed because people tried to understand their environment and happenings in their environment. This behavior led to the further development of mythology. The first civilization is thought have arisen in Mesopotamia, built by Sumerian, Meds and other cultures of Mesopotamia. Later Thales of Miletus, Socrates, Aristotle and Plato tried to explain this development systematically and logically. Socrates tried to make men think through his questions and thereby to get them to express things that they already knew.

Modern science has vastly expanded our knowledge and expertise. Scientists have developed methods and theories about how the world functions. Despite these developments in science there are many hidden issues that need to be further processed or discovered. The epistemology and the philosophy of science have taken over the task of resolving mysteries and to maintaining the challenges of universe.

The universe is limitless; therefore our imagination is more important than our current situation. New visions encourage humankind to make more progress and invest in innovation. Following that, we should not limit our future plans just with some dogmatic beliefs or rules. That’s why every single one of us should have respect of his forebears, and same time should be a reformer.

The Natural Scientific Research versus Social or Humane Sciences

In this day and age, technology, technical progress is achieved on an epochal and world-class level. We can all quickly and visually communicate online in seconds. We can fly from one place to another within a short amount of time. People even fly to the moon and are able to access many other planets in the universe.

In contrast, social confrontations are still extremely vulnerable and problematic. This means developments in social consciousness are lagging far behind the technological advances. The reason for this lies in the deficit in scientific research. In natural scientific research, mathematical calculations play a central role. Every discovery and every project is simulated in the laboratory, or in advance by a special model. So you can calculate everything precisely beforehand in order to know whether this is feasible and if so, how it should go further.

In the humane sciences, the indicators are not very concrete and visible. And, moreover, they are exceptionally volatile and sensitive because one has to do with human values and features; beliefs, emotions, love, religion, death, sleep, birth, eating, sex, disease, conflict issues, confidence, frustration, identity, language, home, strangers, poverty, wealth and so on.

Therefore, the exact method of this project is innovative as well as guiding. The wounds and challenges of society are simulated with more realistic events and subjects. As Galileo Galilei said: “Measure everything what is measurable - and make measurable what is not yet measurable.”² Also we should make think more tangible and measurable.

² Bartoccini F., (Edit.), Dizionario Biografico degli Italiani, Band 51, Istituto della Enciclopedia Italiana, Rom 1998

Science and its Relationship to Convictions and to Knowledge

Opinion, belief and knowledge can be described and defined very clearly from one another. On the other side, we cannot definitely separate them from one another. People can believe in some metaphysical mechanism without having any tangible and scientific evidence.

Even one can just ignore scientific results and don't want to believe in them. Religious believes can be given as example for such situation.

The opinion can be transformed into faith or knowledge at any moment and any time. It is difficult to measure opinions about whether they are right or wrong without testing them. Nevertheless, opinions, beliefs, faith, and knowledge depend on one another. First we believe in something. Then we get our own idea or opinion about it and finally we try to understand the matter by testing and investing it scientifically. This last step called scientific knowledge. Hence the scientific approach can be recognized from dogmatic and metaphysic orientations. For instance, a rationalist would claim and describe a traffic jam with social reasons. The empiricist would focus on the infrastructure problems and traffic management. That's why he needs facts and figures. In this context, all transport options would be analyzed in order to find out a solution. On the other side a scholastic would probably view this condition as a punishment from God. As car owners and passengers do not have to worry about poor people, so they have be punished by God thought this traffic jam.

In fact, to be more effective and to represent their interests in the society many scientists make statements. This tendency is increasing in a parallel size to the scientific activities of researchers and their success in their field. The more successful a scientist the more he or she involved into the socially problems around him or her. However some of their stamens or articles could be contented with some controversy statements, which not fit the vision of science.

Who can be called as a Scientist?

Anyone, who writes a scientific paper, undertakes a scientific research, or proves an innovative discovery can be defined as a scientist. But since there is a little problem concerning the recognition of a person as scientist. As long as any work or research cannot obtain any recognition, it is difficult to survive in the scientific field. Because there is also a battle for survival and it is matter of power relations between scientists. But if any work or research would find no recognition, may one classify them as scientific?

Dogma and institutions and dominant persons are not always objective in a work of recognition. In history, many scientists and researchers and thinkers were even tortured, exiled or killed, because their theories and research were differed from those of the dominant power of their time. Scientific methods are based on the theory of knowledge. Scientists can through knowledge and science theory make clear where their investigations lead.

In this way, researchers can examine the cause of events. For scientific work, one should evaluate all claims and reviews for specific theories. This gives research strong creditability and acceptance. However, this is not always the most ideal way.

“Facts” have many advantages and disadvantages. These regulations can even prevent new discoveries. No wonder almost all innovative research and new theories were discovered by those who had not accepted these rules. Such researchers are called pioneers or inventors.

Scientific research work can also be the discovery of a continent. The continent of America, was not created by people, it has been only discovered. So scientists discover what was previously unknown to us. If we can imagine what we would lack have without the continents of America, it will be clear to us that what riches would have escaped from us if there were no science.

However, science has also a number of dark sides. If certain research has no humanistic spirit, it can even be dangerous and disastrous. Therefore, in every discipline, it is extremely important to respect human rights and environmental preconditions, with respect to doing useful researches and discoveries.

It would be recommended to young researchers: Do not worry about making mistakes. In fact, the more mistakes you make, the more you will learn from them. It's just like learning to ride a bike. Sometimes, you fall off regardless of what you do, trying it again and again, until you can finally ride the bike.

Finally it would be advised every researcher, regardless what their field of expertise is, to develop their own style. All great scientists developed a style that worked for them. They did it with their own method in order to serve the humankind. They knew where they can find indicators and evidence for their research objects. More important they knew how important it is to discover something innovative and useful for our civilization. In short; science is based on knowledge, and knowledge is based on evidences.

Main Requirements of Scientific Paper

In a scientific study the topic should be relevant to its field. The topics shall be documented analytically from scientific perspectives and relevant methods should be used. Overall, in the research a systematic examination of the investigated objects and their relationships and differences should be clearly presented and the role of research in its field shall be defined.

The research should make a contribution to its field. It should have the scientific characteristics of a scientific work by applying with scientific data and theories.

The structure of the work should be well organized and systemically developed. In terms of research, the object should be more empirically held and limited to priorities. The limitation of topics makes the work more precise. Without this limitation, a study would not take exact topic of a study foreground. The study should intend to meet the content and methodology of a research paper requirements. More importantly, before writing a thesis or scientist article, one should answer following questions:³

- Where does the topic of the essay / thesis come from: Social problems (the problem or a case that need to be examined), Science internal issues, economic problems?
- How thesis will be defined: The situation (current situation of topic, that should be examined), the target (what will thesis contribute to its field), research question (which question will be answered), the structure of the work (Capital I, II, III etc.)
- What interests on the essay/ thesis are there and where these interests come into existence: Own interests (give reasons why you choose this topic), foreign Interests (institutions, academic institutions, companies) etc.
- What methods and theories determine your problem or the subjects of access? A decision must be made about which method of analysis is to be carried out: Method (for example comparative: In comparison, it must be specifically defined for what and on what criteria this comparison is carried out. In the method of comparison, the issues that are to be compared must first be defined and categorized or classified.), theory (e.g. Location Theory).
- What advantages and disadvantages do they have?
- Were there alternatives?
- What are the working conditions and environmental factors may influence the course of the project: On the scientific discourse, to the author, society etc.

Most of the problems can be identified in the formulation of hypotheses and the attitude to scientific testing of these hypotheses. If this step is a problem, then there is usually no appropriate solution. Therefore, the

³ Schülein J. A., Reitze S., Wissenschaft für Einsteiger (Science for Beginners), Facultas Publishing 2005, Vienna

hypotheses, and data of a scientific work should be verifiable. Moreover, the hypotheses of a piece of research should be clear, flowing from literature and clearly setting the stage for the proposed study.

There should be an effort to produce an analytical model within which topic considerations can be linked to each other. So that we might think about these issue in terms of cause and effect. Hence precision and clarity should in all part of work be taken foreground. These questions should be modified so they are more specific, allowing the researcher to design a realistic test for evaluation. Overall, an essay or thesis should satisfy the methodological standards of the field and it should contain new scientific results.

Furthermore, with respect to the review of the background literature, a study should provide an overview of existing literature with coherence and clarity. The references should be cited to motivate the theories of mentioned study and most recent works should be present.

Additionally:

- Before submitting a paper, the text should be scoured by a specialist
- Strength of text should be taken foreground and the weak point should be strengthen.
- Graphs and tables shall be analyzed in detail
- Text should be visually and optically good organized
- Banality and repetitions should be avoided
- Quotations and references should be placed precisely

Choosing the Accurate Theory and Methodology for a Study

The advantages and disadvantages of theory and methodology in a study have tremendous effects on the results of a research. Moreover they determine the efficiency in the evaluation of research data. Hence objectiveness of a study shows significant correlation between results as well as the methodologies and theories. The evaluating of also depends on the preferred theory and methodology. According to natural as well as social scientists, the identification of an object or a phenomenon begins with the observation of an object to distinguish it from others and to recognize the similarity of related objects and phenomena. In research, data evaluation is a process, which enables us to recognize out the similarities and differences of research objects. Comparison and finally analysis of research data enables us to measure its position in a certain case or in its specific area.⁴

Difficulties of Collecting Recognized Data for a Study

Undertaking researches on scientific fields needs obtaining precise data. Nevertheless the time, place, quality, quantity and assurances of mentioned data is important as proposal of research itself. Getting data as well as analysis of data has a wide application field. However, there are also some difficulties in the evaluation process of data or in the credibility of their results. By applying such data analysis, confidence in the data plays a crucial role for checking the research results. For instance, it is difficult to get data from the Third World countries and to prove them.

Another problem is the definition and limitation of the investigation field. The data of such fields can change very quickly for various reasons. Then they can no longer be optimal for research, or even no longer be relevant. For example, a change of government, revolutions, a coup, natural disasters, high immigration, etc. all have an impact on economic, political and demographic data.

Another problem is objectify in a research. For instance in qualitative research, especially in field research often emotions and other human values come to foreground. A field research based on observation,

⁴ Berg-Schlosser, Müller-Rommer, (Hrsg.), Vergleichende Politikwissenschaft (Comparative Politics), 2003, Lüneburg, p. 56.

interviews and direct inputs. Therefore objectivity of fieldwork is often partly influenced by the researcher's current state of emotion. As a matter of fact, in a research it is difficult question to remain neutral and objective. For that reason, objectivity and neutrality are extremely important in a research. Emotions one might have, but they also need to have a reason.

In fact, people's emotions play an important role in all their actions and activities. As human beings we can not imagine ourselves without emotions. This also applies to our daily life or during a scientific research. More importantly it should be in this way. Otherwise, the results would not be useful for human benefits. Nevertheless, it is important to find a balance between emotion and fact for a scientist.

Résumé

In the present time it is well-known, that the sciences play a significant role in the development of society as well economic and political developments. This shows us how important is the role and responsibility of scientists. For that reason, science should take over more responsibility and commitment particularly in challenges of society. If science doesn't have this spirit, it will even accelerate the destruction processes of societies.

It is appreciable to get engaged and to get involved in these challenges of society and pay more attention to common solutions. Hence scientists, particularly young researchers should take more responsibility and duty by the evolution scientific processes. Consequently the challenges in societies should be studied and definite in time. If we do not recognize social problems in time, they can then spread out and bring huge conflicts and confrontations. In this sense, science should expand the vision of humanity. In this work we tried to give researchers some ideas, which might support their vision to undertake more beneficial and efficient researches.

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