

Science Ethics and Social Responsibilities of Scientists

Bilim Etiği ve Bilim İnsanlarının Sosyal Sorumlulukları

Abstract

As economic, social and political developments encumber responsibility to many parts of the society, they also encumber some responsibilities to scientists as well. In this context, scientists are required to produce solutions for problems about the topics which belong to their areas. Especially, the responsibilities of social scientists are higher about this issue. Because, rules of natural sciences are certain and mechanism of these rules do not change. On the other hand, the possibility of providing a direct recipe for solutions to problems in social sciences is almost impossible. In this context, the issue of "what is university and what should be the mission of university?" is handled. Therefore, the answers to the questions "who is scientist and what is the characteristic of a scientist" are revealed. Afterwards, scientific research ethics and its coverage are emphasized; ethical violations, ethical violations in the Internet and the sanctions of ethical violations are explained. Later on, social responsibility of social scientists were tried to be explained. In this context, a model which reveals the social responsibility of social scientists is presented. The model consists of four stages and it is explained that it follows a hierarchical path to achieve the social responsibility.

1. Characteristics of University and Scientist

1.1 What is University?

Universities, "universitas", are institutions, which produce scientific knowledge independent from the authority. In this context, universities always supported critical thinking in free thought environment despite the authority. Handling and evaluating different ideas require sharing and evaluation of every kind of thought independent from authority and people. Universities provide environments for people to perceive and argue the events in order to increase the awareness by pointing out the rationalization process rather than emotional process in philosophical discussion environment.

In this context, "university", is full democratic institutions since it provides the opportunity for everyone to reveal themselves in reciprocal discussion environment. "The University" as an abstraction as their primary source of identification, rather than their specific place of employment" (Degn, 2018:310). In the institutions, prominent people who are able to guide this discussion environment, have advanced certain philosophical view and accepted this view as his or her life style generally guide these environments. Evaluation and discussion of different ideas would trigger the emergence of new ideas. In this context, evaluation of events and facts together by related authorities would trigger positive consequences. In this stage, it is important to elucidate the subject. This subject is the question of will the topics be discussed or negotiated by the scientists. In the literature, the issue of "discussion" is frequently emphasized. However, in the discussion process, while view of one of the sides is accepted, view of the other side is disproved. In other words, one of the sides of the discussion is put in the position of "loser". In this stage, the satisfaction of egos of the debators comes into play.

Satisfaction or destroy of egos are concerned. However, people who think differently also contribute to the solution of problems. Consequently, using the concepts of evaluation and argument rather than using the concept of discussion would trigger more constructive consequences.

One of the most important duties of universities is producing science. Science has three dimensions which are history, society and individual. History dimension examines how scientists



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work, how they construct their inventions, which difficulties they encounter with when doing these work, how many scientists provide suggestions for a science problem, which scientists are successful and why some scientists fail. Social dimension, whom and why scientists receive economic support, how they determine their agenda, how they select their leaders, how the social relationship between them is and how they contribute to science. The third dimension considers the individual as a person who has psychological, social, cultural and ethical responsibilities. The relationship between these three dimensions should be examined to understand the science (Aydoğan; 2008: 82).

Every dimension is interrelated and complements each other. As it is impossible to understand the society without understanding the individual; the stages and accumulations of the society should be known in order to understand and analyze the society. In other words, understanding the society would be possible when cultural and historical accumulations which are the memories of the society are understood. In this stage, social scientists have many responsibilities. Which characteristics should scientists who fulfill the responsibilities in this area have? In other words, which characteristics should scientists have? It is perceived as beneficial to explain this issue.

1.2. Scientists and Characteristics of the Scientists

Scientists are people who think in a universal way, decide objectively, have high ethical responsibility, are intellectual, responsible from the whole humanity and nature, open to criticism and have encouragement to tell the truth. It is possible to remark the basic characteristics of scientists in this way (Aydoğan; 2008: 82):

- Seeing the integrity of the human: They soften the introvert life understanding in a process and therefore provide the expansion of someone's horizon and increase the sense of cooperation.

- Acquiring language sensitivity and doing analytical work: One of the required qualities in which especially an academician who is a social scientist is to acquire analytical working ability and competence. It is essential to learn the native language and a foreign language well and acquire language sensitivity to achieve this.

- Historicalness of the humanity: Having relative consciousness of knowledge.

- Establishing the causality: Ability to establish a causal relationship between events.

- Acquiring a suspicious manner and critical understanding: The basic characteristics of a scientist are critical thinking. In this way, he/she provides a basis for the emergence of new ideas by treating the events suspiciously.

In the announcement of Turkey Sciences Academy dated 14/04/2011, scientist is described as : "Scientist accept scientific compatibility as basic criteria at all the stages of academic life and at duties related with instructive, administrative and academic evaluations; do not exit the code of ethics; and do not tolerate the destroying of these rules. Giving inadequate education, cheating, not obeying the criteria of scientific compatibility in academic progress and reward juries, showing favor to someone and similar behaviors can not be accepted."

The characteristics of scientists are stated in this way in other source: (Ortas, 2004: 13, Ortas, 2002: 2):

Scientist is universal: Of course, scientist is the person who fulfills the universal principles of science. As mentioned above, scientist has a very large responsibility in conducting and concluding scientific research systematically. Since the scientist also lives in the society, he/she must enter the production process with compulsory relationships regardless of their will and share the common culture of the society when they must be with the society.

Scientists are required to search the truth: First of all, a person who acquired scientific thinking structure has a realistic structure. He/she is respectful to events and knows that every event arises from a reason.

Scientists are required to share their findings with the public: A person who deals with science should not keep himself away from the society. Many scientists perceives the confused and amazed attitudes of people against their work as pride and superiority source for themselves by isolating themselves and supporting the techniques and technology that they use. First of all, scientist should

simplify their knowledge and look for presentation methods for societies with a language which everyone could understand.

Scientist is responsible from all humanity and nature: Scientist must think in a universal way since his work has a universal quality. For this reason, scientist must get rid of all kind of narrow-mindedness; and must be universal when sharing his knowledge with all people around the world without discriminating people based on their race, religion, language and so on.

Scientists are open to criticism: A person who deals with science should be open to criticism and self-criticism. Scientist is the person who is able to examine, investigate and question especially their work, events and facts objectively.

Scientists are courageous to tell the truth: First of all, scientist must be courageous to tell the truth and not tolerate other views except from science. When toleration occurs, it is impossible to mention about science in a realistic manner. Scientist is the person who is able to decide independently and express his thoughts clearly and freely (Evers; 2001: 47) regardless if his thoughts are in line with the current understanding or not when it is required.

Barbusse stated that "People who tell the truth should never be quiet". Moliere also expressed that scientists should not hide the truth by stating that "A scholar who is quiet, is not different from an idiot who can not tell anything". Isaac Newton also explained the encouragement of a scientist in this way: "We, scientists are like children who search for pebbles in the beach. If I was able to collect much more and more colourful than my friends, the reason of this is that I dared to enter to the water up to my knees." In this context, it is stated that scientists should engage in ethical behavior, work with patience and stability against difficulties.

About this issue, an academician can decide if his/her behaviors are ethical or not by asking these four questions. This system can be summarized as "PLUS" and evaluated as a way of providing auto-control (Arıkan and Demir; 2009: 220):

P: Policies: Is my behavior or decision appropriate for the policy, procedure and regulations of my organization?

L: Legal: Are these appropriate for law rules and regulations?

U: Universal: Are these appropriate for the universal principle and values accepted by my organization?

S: Self: Do these satisfy my own concepts of true, good and fair?

Besides the answers to these questions, according to another view about the responsibilities of the scientists, the ethical responsibilities of scientists is stated as (Ertekin et al. 2002: 13): Scientific honesty is a concept which has a sense of trust in its basis and constitutes the essence of all scientific relationships and connections. It is essential for all scientists to protect the values based on trust and honesty.

Besides the basic characteristics that scientists should have, scientific research ethics is also really important.

People who conduct scientific research must always adhere to the following basic principles in an unprivileged manner.

-Having the highest occupational standards in the process of the design and conducting the research.

- During the conduct process of the research and analysis of the data, retaining the honesty and openness,

Behaving in a sincere and open manner to deliver the contributions of other researchers who conducted or is conducting research about the same subject and fully protecting this manner in the process of writing scientific article.

The issues which should be "carefully" fulfilled in the scientific research ethics are stated as follows (Erdem; 2012: 26):

Assumption and design in the research:

It is essential to review in detail the scientific literature related with the targeted assumption topic before conducting the scientific research and examine the possible position of the assumption and unique thought in the previous accumulated knowledge.

Research project, protocol and methodology: Research project is prepared for the supporters of the study to present as a detailed and justified proposal. Nevertheless, duration of the research and documentation of the expected expenditures, responsibilities and allocated time of the researchers should be clearly revealed. Methods and techniques in the research methodology should be explained in a way that others could understand as well. New methods might be required to be developed in order to prove the assumption and produce original knowledge. In this situation, the possible harms of the new method to the participants and environment and the precautions for this must be clearly stated.

Participants of the research: Protection of biological, psychological, sociological and legal existences of the individuals as participants and respect to their free will are the primary regulation. Participants can participate to the study either voluntarily or in return for fee.

Archiving of the data in the research: All data should be archived safely and easily accessible. Records can be protected in files or books safely or in electronic environments.

Analysis of the research data: It is compulsory to obtain the data with instruments that are found to be reliable and valid. Statistics is tool for analyzing the data. Original findings should be revealed with statistical analysis. Obtained results should be provided in an objective manner.

After stating the basic principles of scientific research ethics, behaviors which are not appropriate for scientific research ethics and principles to contribute to a better understanding of the subject are tried to be explained in the following sections.

2. Scientific Research Ethics and Ethical Violations

2.1. Behaviors That Are Not Appropriate for Scientific Research Ethics

According to TÜBİTAK Research and Publication Ethics, behaviors against scientific ethics are revealed as follows:

- a) Fabrication and fraud: presenting, reporting or publishing imaginary data
- b) Misinterpretation: making changes in the research instruments and materials, procedures and records or changing the results.
- c) Plagiarism: Using others' ideas, methods, data, texts and figures without appropriate citation or getting permission from the owners.

It can be said that plagiarism is also prevalent in our country. The reasons for this can be stated as follows (İnci, 2009: 73):

From the early years of education, free thinking, learning and producing are not really valued.

Memorization and usage of readily prepared work is preferred rather than examining, studying and being compelled in an education system which gives priority to learn transferred information. Ethics education will contribute to the students to learn ethical values and solve ethical problems (Benya; 2012: 15).

Societies which read and write less and have limited access of work to larger groups and in these environments, plagiarism easily occurs and reader control is remained as inadequate.

In the recent years, the prevalent passion of "turning the corner" begins to occur in science and art institutions as well.

- Giving priority to quantity instead of quality in assignment and promotion has triggered the prevalence of plagiarism in recent years.

Since there is a lack of a serious examination and control system in universities, suitable environments arised for people who have a tendency for plagiarism.

Plagiarism is relatively supported in a country in which practices and regulations for protecting the author rights remained as inadequate. If plagiarism is not prosecuted, no sanctions are applied when it is proved, it is not seen as an obstacle in academic promotions; way of taking advantage becomes prevalent.

d) Duplication of Publication: Publishing or attempt to publish the same research results more than once.

e) Separating into segments: Making many publications or an attempt to make many publications about the results of a research by separating into segments inappropriately or in a way that will destroy the integrity of the research.

f) Not specifying any support: Not specifying the support of the institution or foundation in which it is essential to specify in the presentations or publications which is conducted with support.

g) Determining authors: In the presentation or publication of research results conducted by more than one researcher, excluding the names of the authors without having permission of the contributors or including the names of authors who do not deserve any right to be the author or arranging the sequencing of the authors inappropriately.

h) Citation: Quoting from one's own research inappropriately without referencing.

i) Use of the resource: Using the resources provided by the institution inappropriately

j) Unfounded claim of ethical violation: Claiming of an ethical violation without any basis or evidence.

k) Other: engaging in behaviors which are not in line with ethical principles.

Unfortunately, the behaviors against scientific ethics mentioned above frequently occur in the world of science. The basic reasons of these behaviors were also tried to be revealed by scientific institutions and scientists.

This question arises when unethical behaviors in scientific research are explained above: What are the factors that direct the scientists to engage in unethical behaviors? It would be beneficial to look at the basic obtained evaluations about this issue in brief:

2.2. Reasons for Behaviors against Science Ethics

In the report prepared by TUBA (2002) (Ertekin and others; 2002: 40), the reasons why scientists engage in unethical behaviors are grouped under four headings. These reasons are explained as follows (Ucak and Birinci, 2008: 192):

The first one is considered as inadequate education. Not giving education about scientific research and discipline to individuals in their early years of academic lives might be the reason of this kind of behaviors. Individuals who enter academic life should receive education about issues such as how scientific research is conducted, how the research results are converted into scientific publication (Stern and Elliott; 1997:8), how scientific publication is done, what is science ethics, what are the content, details and consequences of science ethics, ethical falsifications affect the world of science and society and so on. Scientist candidates who do not have any information about scientific research discipline accept the behaviors of previous educators as accurate. However, receiving social, emotional and ethical education of the researcher is really important in the success of the researcher. Academicians who have these values can contribute to the society and democracy effectively (Cohen; 2006: 202).

The second factor includes components which can be explained with individual characteristics. Fabrication and plagiarism because of individuals' passions about immediate promotion, desires for gaining fame and their greeds are evaluated in this group. In the report, it is also stated that these kinds of behaviors are more likely to be developed in societies which science culture and norms of research ethics are not adequately settled. The intended scientific performance and intended number of publications from the candidates are important factors for unethical behaviors to occur. However, these expectations can never be an excuse for intended ethical violation.

a) Acquiring high status in universities or other research institutions, acceptance among their colleagues or motive for passing their colleagues are the most serious reasons for violating scientific ethics. In this situation, unethical conditions such as issues in authorship (gifted authorship, ghost authorship, and virtual authorship), addition of authors themselves with agreement based on increasing the number of publication and citation are concerned.

b) The motive for rapid promotion of young people might direct them to engage in unethical behaviors such as, falsification, multiple publication, duplication publication misinterpretation

(Evers; 2001: 193) and plagiarism. Motive for gaining or retaining fame; (Holywood Syndrome) might also direct people who are experienced and expertise to engage in unethical behaviors.

c) The pressure of making publications is one of the most important reasons. "Publish or do not exist" is the most serious pressure about this issue in the world. The member of institutions which do not have adequate research opportunities, lack of substructure (information technologies, library, laboratory, experiment animal production center etc.) engage in such unethical behaviors in order not to stay behind in the academic competition.

The third reason can be explained as the obviating of quantity rather than quality. This situation which can be explained as a failure to believe that with more publications, the scientific prestige will increase; results in publishing the same research in different places by separating into segments since the number of publications has become a criteria in academic promotions in universities especially in recent years. The ethical knowledge and attitude of the administration is also another important factor. When administrators of science institutions (YOK, Commission of Inter-Universities), Rectors of Universities, Deans, Directors, TUBITAK, TUBA) continue being not decisive and open, unfortunately, unethical behaviors continue to occur.

The fourth factor can be considered in the group of economic reasons which include unethical behaviors occurring with the fear of losing scholarship, project or industrial support. Rapid publication with the pressure of fund managers of institutions might bring serious errors as well. The possibility of losing the economic support, scholarship and funds, industrial support might lead to unethical behaviors.

Some of the reasons for unethical behaviors during publication process:

Fifth reason; unethical behaviors might become prevalent in institutions which science culture, research ethics and publication ethics are not settled and in environments which administrations do not rely on law, ethics and academic cultural values. When "academic culture" is inadequate in scientific institutions, unethicality in science are more likely to occur. If there is no depth in about research-education/instruction issues and scientific discussions and academic ethics-freedom-autonomy-compliance concepts are inadequate in the institutions, unethical behaviors are more common (İnci, 2009: 81). Also, some people, "arrogant", who do not have any place in science engage in unethical behaviors when doing scientific citation and referencing.

2.3. Ethical Violations in the Internet

It is possible to consider the unethical behaviors occurring in the internet under five headings (Ucak and Birinci, 2008: 195):

- Fraudulence (sabotage of academic work of other researchers on the internet; addition of names who did not contribute to the research; intended wrong citation; owning others' research)
- Plagiarism (Using the complete research or some important parts of the research in the Internet without citation; using many resources from the internet by integrating them without any citation, using a research from the internet without having permission from the researchers)
- Misinterpretation (manipulation of scientific knowledge found in the Internet with personal interpretations (Pimle; 2008: 193); changing the content of the reference in citation and relating this with the idea of the author)
- Not obeying the rules (using the same text in many contexts; citation from the internet in an unaccepted manner)

Formal Support (buying or hiring text from the internet; preparing the individual texts with the help of forums, chat rooms, blogs or groups; preparing text for someone else)

With the entrance of the internet to the all domains of life and the easy access to information in these days; the unethical behaviors also increase accordingly. Both research institutions of the government and High Instruction Committee (YOK) take precautions against scientific ethics violation and apply many sanctions about this issue. Turkey Science Technique Research Institution (TUBITAK) is concerned as a good example which has good sanctions against ethics violation. TUBITAK Research and Publication Ethics Regulation (15.10.2010) state the sanctions against ethics violation as follows:

In order to apply sanctions, the action which is claimed to be against ethics should have occurred as a result of intention and serious violation and the violation should be persuasive and be proved with sufficient documents. The following sanctions are applied to people who are proved to have an unethical action:

1) Three months to one year in the case of quotation without appropriate citation from his or her study,

2) Six months to two years in the case of duplication of publication, separating into segments and not specifying the supporting institutions,

3) One year to three years in the case of in the presentation or publication of research results conducted by more than one researcher, excluding the names of the authors without having permission of the contributors or including the names of authors who do not deserve any right to be the author or arranging the sequencing of the authors inappropriately,

4) One year to three years in the case of using the resources provided by the institution against the aim and manner

5) Three years to five years in the case of fabrication, misinterpretation and plagiarism,

6) Three years to five years in the case of the misuse of the duties of referee, counsellor, editor, panelist, reporter, audience, moderator and similar duties,

7) Three years to five years in the case of claiming ethical violation with intention and without any evidence,

8) In the case of engaging in other behaviors which is not in line with research, publication and science ethics, it can be also determined that either the person will be warned based on the characteristics of the concrete event; or it can be determined that the person will not be given any support up to five years. In this situation, these people can not make presentations in institutions publication agencies' institution-supported meetings.

a) The sanction will be applied with a half-time increase in the previous sanction from the decision date in five years in the case of new unethical action.

b) Except the situations in which the decision is warning the individual, their relationships with projects which project manager or other researchers conduct are broken off without requiring any other process. In the situations in which the decision is warning the individual, concerning the relationship of the individual with the project and the quality of the event, institution decide to break off the relationship or not based on the suggestion of related department by the presidency.

c) The texts which is found to include unethical situations in institution publications are concerned as withdrawn and this situation is announced with the reason through the same publication.

In the case of falsification, misinterpretation and plagiarism and in the misuse of referee, counsellor, editor, panelist, reporter, audience, moderator and similar duties, the decision are declared written by presidency to the individuals who are proved to have unethical violation behaviors if the Science Commission decides that it is appropriate.

d) Additional process is applied for the individuals who are proven to have unethical behavior and institution personnel based on the related legislation.

In scientific research, acting with commitment to ethical principles of scientists is directly proportional with their knowledge about basic values about this issue and embrace them. First of all, it is emerged that there is a need to give education about values. An individual who receive education about values would adopt these values to his/her life, work and job. If there is deficiency in values education at earlier years of education, the compensation of this will be difficult afterwards. However, giving education about academic values to an individual who received education about basic values would be easier. In this context, it is beneficial to explain the basic values related with scientists.

3. Basic Values Related with Scientists

In a section of the work of High Education Commission Presidency titled "High Education Institutions Ethical Behavior Principles (2014)", the values and behaviors scientists should have are explained as follows:

- *Academic freedom and autonomy*: Academic freedom is that academicians are free about acquiring, developing and transferring information through examining, investigating, discussing, documenting, producing, teaching, explaining and writing. "By academic freedom," said Albert Einstein, "I understand the right to search for truth and to publish and teach what one holds to be true (Corbett and Gordon, 2018:467). Academic autonomy is independence of high education institutions at making decisions about their academic functioning; activities related with education, research, community service, international relations and other related activities, and their independence at constituting their own policies and against other authorities of the government and society.

- *Academic honesty*: It is behaving in an open, responsible and appropriate manner based on required ethical principle and standards which provides society the trust to science and scientist in academic environments (Joanna; 2013: 26).

- *Responsibility and ability to account for*: Responsibility is that the members of the high education institutions fulfill the duties, all kinds of academic and scientific behavior with required quality and quantity and use the resources of high education institutions effectively. Ability to account for is that the requirement to explain and be transparent about how the members of the high education institutions who use public or private resources which is entrusted to them in order to fulfill a duty.

- *Protection and empowerment of basic rights and freedom*: It is essential for the members of the high education institutions to protect and support the basic rights and freedom of all individuals in the society. Change within organizations may cause academicians to ask questions such as 'who are we?' or 'how do we do things?' The way in which academicians make sense of these questions impacts their understandings of their own identities and that of the organization (Degn, 2018:306)

- *Being respectful to others*: High education institution members' respecting the differences among individuals, giving value, not allowing behaviors such as discrimination and abuse; treating with respect and kindness to departments and people not from the university, students, colleagues, workers and stakeholders and concerning honor and personalities of all people whom they have relations with.

- *Academic compliance*: Selection and assignment of members of the high education institutions through evaluation of talents, quantities and experiences when they are candidates for a job or duty.

In addition to these basic values mentioned above, in another source, scientific ethical principles are stated as follows (<http://web.deu.edu>):

- *Accuracy*: not fabricating and misinterpreting the data, not hiding information, objectivity, neutrality

Being careful: not doing any mistake both in the process of presenting the results and in the process of the research, taking precautions to decrease the experimental, methodological and personal mistakes, avoiding self-deception, being objective, preventing biased results and personal interest conflict.

- *Being open*: being open to exchange of data, result, view, technique and material with other researchers, allowing them to criticise and evaluate the results and reveal new ideas. "Recognition and adoption of open research practices have rapidly risen, and has been associated with policies that increase public access to data" (Powers and Hampton, 2019:3).

- *Freedom*: being open about scientists to conduct research in order to resolve a problem or a hypothesis about an issue, reveal new ideas and criticize the old ones.

- *Rewarding*: Giving reward when it is required and not giving if it is not necessary.

- *Education*: Scientists should train the future scientists and assure that they transferred the principles of making "good science" to them (scientists should train the society about science as well)

- *Social responsibility*: scientists' avoidance from harming the society, attempt to obtain social benefits.

- *Legitimacy*: scientists' obeying the rules related with their job when doing their research.

- *Evaluating the opportunities*: Not depriving the scientists from the use of resources required to conduct research and academic progress.

- *Mutual respect*: scientists' being respectful to their colleagues

- *Efficiency*: Scientists' efficient use of research resources

- *Respect for subjects*: Obeying the ethical rules related with human and animal rights in the research which use human and animal subjects. Within animal research, responsibility is linked to reassurances about how animals are used and cared for during the research process (McLeod and Hartley, 2018:724).

After explaining the basic values related with scientists and science ethics principles, the question of "what are the responsibilities of scientists for the society and humanity and which method will they use when fulfilling these responsibilities?" arises. We will try to explain answers to these questions with "social responsibility model of scientists".

4. Social Responsibility Model of Scientists

The basic aim of social responsibility activity is to contribute to the issues that society needs assistance. These activities are based on the essence of voluntariness and beneficent. The concept of "volunteer" is described as "intentionally taking responsibility of doing a work when there is no obligation"; beneficent is described as "a beneficent person who likes to help poor people and people in need of help, benevolent, helpful person" in Turkish Language Institution (TDK-Large Turkish Dictionary, 2009).

Social responsibility actualized regarding the companies can be describes as "management of economic activities, related sides (stakeholders, workers, consumers and whole society) without giving any harm to any of them (Dincer; 1998: 155).

Although social responsibility is prevalently seen in business management literature, it is used in all domains related with humans. The basic philosophy of social responsibility is that individuals contribute to the society that they live in. Some of the contributions of individuals to other individuals and society are determined by legislations. As a requirement of a work conducted by the individuals, these legislations determine the duty and responsibilities of that work. For instance, duties of an academician are determined in the law. These duties are viewed as a compensation for the salary and fee that academicians get. However, social responsibility expresses voluntary activities and contributions as mentioned in the definition above. Academicians have certain responsibilities to contribute voluntarily to the sides that they are related and constitute added value. Because, the individual has to spend some amount that he/she earn from the society also for the society.

Besides social responsibility has many definitions, the obligations of scientists about social responsibilities can be stated as follows:

- The responsibility of scientists; are engaging in behaviors in accordance with institutional citizenship, social performance and work structure (Fortaine; 2013: 111) and using previous knowledge in making decisions about social responsibility (Zandvoort; 2007: 7).

- Contributing to the social ethics beyond instruction and research,

- Contributing to the solutions for socio-economic problems in the society that they live in.

- Contributing to the students, business world and other social stakeholders not only to the institution that they belong to.

- Contributing not only to institutional duties but humanistic values more comprehensive as well.

- contributing to the solutions for environmental and humanistic problems, while fulfilling his/her duty at the same time (Rotblat; 200:3).

The stages and which should be followed when providing solutions for problems mentioned above are demonstrated in the following figure. Fulfillment of scientists' own social responsibilities will only be provided when they obtain certain hardware with a systematic effort. The stages that scientists should follow for fulfilling their social responsibilities are provided in the hierarchy in the following figure: Being open to learn, continuous effort to develop oneself, desire to share information and engaging in exemplary behavior. This hierarchy is illustrated in the following figure.

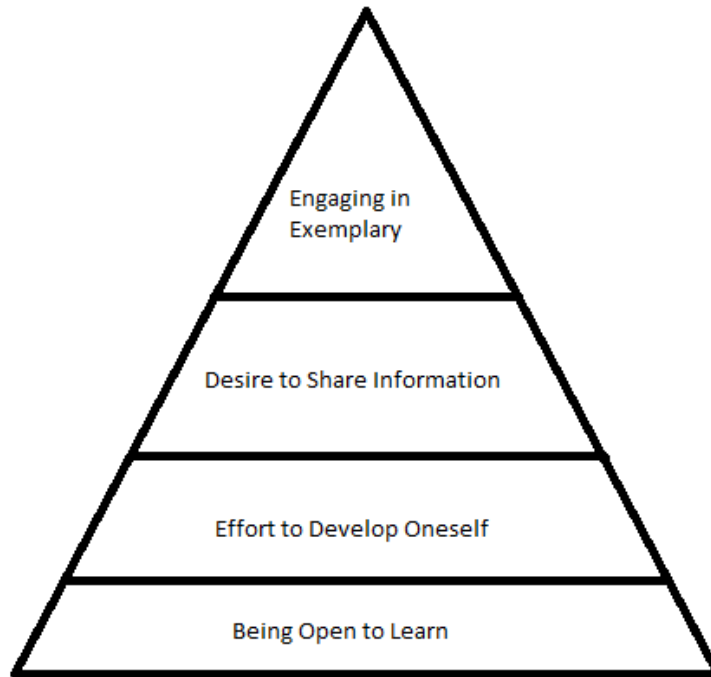


Figure 1: Social Responsibility Model of Scientists

4.1. Being open to learn: Scientists are required to be open to learning when they fulfill their social responsibilities. This effort will increase the occupational knowledge and hardware. Being open to learn also expects to follow actual developments and benefit from these developments. "A powerful learning culture forms an effective breeding ground for continuous learning" (Verduijn and Heijboer,2016:123). Openness to learn and development of themselves continuously of the scientists is a prerequisite for being self-sufficient which constitutes the basis for social responsibility.

First of all, scientists must know his research topic in a deep and broad sense. When they know their research topic they are required to deal with social problems. A scientist who grows up in this sense must follow the problems of the society and broadly the humanity, analyze and constitute his/her opinions based on scientific perspective (Hansen; 2006: 72). If an academician is social scientists, his/her responsibility increases much more and also takes the responsibility of enlightening his/her environment and resolving problems.

Intellectuality is one of the most important characteristics of the scientist. The concept of "intellectuality" was used firstly in France in the year of 1898. Although there is not a certain group of intellectuals, they exist in all societies and have a certain duty; this duty is to reveal the truth which is trying to be keep as secret. The real duty of an intellectual is not revealing their commitment to the government by ignoring the whole society, is protecting independence against pressures (Aydogan, 2008: 84).

In this context, scientist should be intellectual. He/she should have the potential to follow the developments closely by being open to learning and science. If this is not so, he/she is confronted with the danger of entering under the dominance of the superior authority. Engaging in such behavior would result in losing scientific objectivity.

4.2. Effort to develop oneself: Next stage of being open to learn is the effort to develop oneself. Scientists should have an information and hardware at some level in which they would be able to meet the expectations of all sides that they have relations with, beyond taking academic title. It is scientists' responsibility to provide scientific solutions for the problems of the society. Just as enterpreneurs have the responsibility to constitute new employment areas, politicians have the responsibility to constitute a free and democratic environment, and scientists have the responsibility to provide scientific solutions to social and educational problems of the society. Providing these solutions is possible when scientists feel responsible about resolving these issues. Feeling of responsibility requires thinking about the solutions, examining and keeping their information actual and being dynamic. Since an individual who do not feel the need for self-development could not even fulfill the requirements of his/her duty, it is not expected that this individual will contribute to the solutions for social problems and social ethics.

4.3. Desire to share information: Scientists are required to have a desire to share the information and hardware that he/she acquired until that time. After scientist has the sufficient knowledge about his/her expertise area, he/she might want to hide this information to feel stronger. Organizational identity is important for shaig information. "Threats to the organizational identity are not only assumed to be important to the perception of the organization's identity, but also to the social and personal identity of the individual organization member" (Degn, 2018:308). This will lead information to stay in a narrow domain. However, scientists who are self-confident and willing to contribute to their environments must share their knowledge and hardware with other people. Based on the principle that knowledge will increase by sharing it, the shared knowledge will contribute to the society's social and economic welfare. Nevertheless, scientists should not only share the knowledge with the university, they should share the knowledge with local governments, non-governmental organizations and all stakeholders in the society. In the rapidly changing environmental and technological setting, scientists should also contribute to the society with the same proportion and fulfill their social responsibilities.

One of the basic responsibilities of the scientists is to raise "scientists", and help them to acquire certain attitudes and behaviors. The attitudes and behaviors which should be acquired can be summarized as follows (Erdem; 2012: 26).

- Not being prejudiced
- Being open-minded
- Looking for rationale in the opposite perspectives
- Being curious
- Staying as independent in thoughts and observations
- Ability to delay decision for evidence
- Making decisions based on criteria
- Being steadfast and conscientious in their studies
- Ability to think in a relative way

Being demure regarding the possibility of being mistaken and including possibilities in their judgment

4.4. Engaging in exemplary behavior: When scientists guide the society with their scientific research and findings, they should also guide the sides that they are in relation with their attitudes and behaviors as well. First of all, they have occupational and ethical responsibilities for their students. Since humans are social beings, they affect the society and at the same time they are being affected by the society. In this context, scientist, especially academicians should be role-models for their students. Students should imitate the academicians about love, respect, fair, tolerance, equity, being sharing and helpfull. As mentioned before, the principles which are required to be included in the values education should be reflected in the scientists. Regardless of being aware or not, the academicians are being modelled at some level, concerned and followed. So, the academicians should have an effort to be a good example with this awareness.

Conclusion

First of all, scientists should be aware of the fact that he/she should show an effort and responsibility to contribute to the solutions for all humanity and own society. This responsibility awareness is possible when the scientist provide the some of the oppurtunities to own society and humanity in which the society and humanity provide to them. For this, scientists must conduct their activities without getting away from ethical principles. When the scientists conduct research, "in the relationship with others and daily life, they engage in decency behaviors which means having beautiful ethics and qualities. The plural form of decency behaviors is "politeness" (Buhari, 2014: 29).

About this topic, the proverb of Ebubekir Razi Eyvani (865-925) who is one of the precious physicians of Eastern medicine, "One drachma of science is in need of one thousand okka of politeness." explains this topic well. About this topic, scientists responsible for producing rationalistic and humanistic solutions to the problems of the humanity. They behave with social responsibility awareness without getting away from ethical principles as mentioned before, while producing solutions. When fulfilling these responsibilities, they should be open to learn and willing to self-development. Nevertheless, they should show a willing and devotion to share the learned information with others. Besides all these activites, social scientist should be an exemplary for the society with the attitudes and behaviors. In all activities that scientists are responsible for, they embrace humanistic values such as love, respect, fair, equity, sharing and helping; share and show effort to impose these values to the base of the community as well.

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