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# **ABOUT SOME DISQUIETING PHENOMENA IN ETHICS OF SCIENCE**

## **1 Introduction**

As in other areas of human activity also in the area of scientific activities are occurring phenomena that can be considered undesirable negative. A part of the activities is covered by laws of the particular society. Wearer any of these activities can be tried for them and if found guilty can be punished. As examples of such activities that occur in the field of scientific activity we can indicate copyright infringement and computer piracy.

But there are plenty of undesirable activities that are not subject to the provisions of the legal system and their holders cannot be prosecuted for them. Society against such activities prevents using morality, by postulating what is moral and what is immoral.

The issue of morality is very old. It has become a traditional part of the oldest science of philosophy. Within the system philosophical disciplines deals with issues of morality the discipline named scientific ethics. This philosophy branch deals with morality in the broadest possible context. Philosophical principles of ethics are subsequently applied in many fields of science closer. This fact is reflected so that to the term ethics is added another term element that expresses belonging to the area in question. Such is the case of science ethics which reflects special aspect of scientific activities in comparison with general ethics. It has two basic levels. The first concerns such macro aspects as responsibility of scientists for consequences his work in relation to mankind, nature, and other general questions of human existence. The second concerns micro aspects of scientist life, such as work climate, objective assessment of their work results, copyright, and similar.

Scientific ethics is general in nature and applicable to all disciplines. Its principles are applied in ethics of many particular scientific branches and disciplines. As example we can quote medical ethics. The founder of medical ethics is considered Greek physician Hippocrates, the creator of so-called. Hippocratic Oath, even today is one of the foundations of medical ethics. Highly developed ethics have a number of other sciences, for example legal sciences, biological sciences and in the last time also management disciplines.

The issue of ethics in the case of university teachers is more complex than in the case of single-subject-oriented researchers. The part of their activities associated with the educational process is governed by the principles of teacher ethics. The second part of their activities associated with scientific research is governed by the principles of scientific ethics. This part is also specifically modified, depending on the field of science in which the educator involved.

The results of scientific work of a university teacher are taken into account not only in his personal career advancement, but as well as his contribution to the portfolio of his university in accreditation processes. We believe that the results of scientific activities of a university teacher are overestimated at present, and vice versa results of its educational activities are underestimated. As a university educator carries out oft also many activities of organizational nature, his time fund for performance of scientific activities is disproportionately small and, moreover, very dispersed into smaller periods of time. This may be one reason that some educators are looking for an easier way to meet the increasingly demanding criteria in assessing the results of their scientific work.

The aim of this paper is to highlight some undesirable phenomena in scientific work of university teachers with which we met during our many years of activity at universities in Slovakia and the Czech Republic, and also as guarantors 27 years existing international scientific conference DIDMATTECH. The same time we not only point out the negative aspects, but also submit some proposals and initiate discussions how to eliminate them.

## 2 Undesirable events that are in violation of copyright law

During the last tens of years we have observed many phenomena in the field of scientific ethic which can be considered as violations of copyright law and can not be tolerated in the future in the academic environment. The academic communities must develop internal defence mechanisms against these phenomena and eliminate them first before they reach the public, which reduces their authority. The most frequent phenomena of the nature are **violations of copyright, i. e. author's law**. The main form of the violation is plagiarism. **Plagiarism** takes place, when some person consciously appropriates results of a work of another author and presents them as the results of his own work. Plagiarism has several forms. The grossest form of plagiarism is the literal translation of a work of another author and his pseudo originally publishing under own name of the plagiarist. Less gross form of plagiarism is taking over smaller segments of foreign works without proper citation of the original source. Gross but at least the most frequent form of plagiarism is taking small elements of foreign work (images, factual data, diagrams, photographs, etc.) without indicating their origin.

Another issue is **violations of software law**. This issue we plan to address in a separate study.

## 3 Undesirable phenomena in terms of scientific ethics

In scientific environment there are a number of undesirable phenomena for which are not applicable rules of law. For these phenomena, however, apply ethical standards. For these phenomena are covered by general ethical standards or norms of scientific ethics or ethics of a particular branch of science. Relevant scientific communities must fight against this phenomenon. There are many forms of defence against these phenomena. We personally prefer preventive measures, e.g. including of teaching of copyright and ethics of science in curricula and requiring strict compliance with the rules in the development of all professional and scientific work of students and teachers. We recognize, however, the sanctioning holders of undesirable phenomena by appropriate forms, rang-

ing from scientific criticism and ending by various forms of sanctions. As the most frequent form of undesirable phenomena are:

**False co-authorship**, when the true author/authors list voluntarily for purpose of an or under a pressure as co-author an another person/persons which did not participate creatively and significantly in the production of the particular scientific work.

**Effect of the position**, when a person in leading position (superior, trainer and similar) requires the real author to be presented as a co-author, although he has no creative contribution to the work;

**Ignoring work results of other scientific schools or other authors**. In many scientific papers, especially dissertations and thesis, is absent an overview of achievements in the particular field or the overview is treated very superficially.

**False citations** – These are cases when in the lists of bibliographical references of a particular works are references of other works which are not mentioned in the text of the particular works. In many cases, these works have nothing to do with theme of a particular work.

**Purposeful citations** – The authors in this case, in citing consciously prefer those persons favour of which they want to get. Authors of this subjective preference knowingly misrepresent the objective merit of the purposefully cited author in the field.

**Overestimation of results of authors' own work**. It takes place when a person appropriate merits that not match objective reality.

**Poor assessment of quality of scientific works** by their opponents or reviewers – It is especially harmful in education and in the assessment of works of beginners in science.

**Double standards**, when the assessment criteria vary depending on from which community comes judged author or according to personal relationship of the opponent the author's person;

**Oversights of serious conceptual or errors** of assessed work in reviews. This indicates that the opponent omitted serious ethical error if he did it intentionally. Otherwise, it indicates that he has undertaken reviewing from the area in which he is not sufficiently knowledgeable.

**Oversights of gaps in language and terminology culture and in scientific communication style of reviewed work**. In professional ad science presentations are cultural aspects of written as well as spoken communication often undervalued. The culture is very important in education processes and educationally oriented publications. Importance and content of it we have presented in studies (1), (2) and (3). On common mistakes and shortcomings we have shown in the studies (4) and (5).

**Unilateral highlighting of advantages and ignoring of disadvantages of assessed work in reviews of professional and scientific works**. This act constitutes a serious ethical peccadillo of the opponent or evaluator. They are often hidden corruption, lobbying or group interests behind this.

**Disrespect of personalities from the history of science** – It is expressed mainly superficial proofreading when personal names are misspelled in the text. In spoken presentations the names of personalities are often pronounced incorrectly. Frequent case is also spelled wrong way of putting co-authors. In one by us assessed publication we have found reference to statistical test, the authors of which are two persons Samuel Sanford Shapiro and Martin Wilk. The reference was made in form “Sapiro-Wilk test”. In Slovak

(and also in Czech), it means that the author of the test is one person with compound surname. The correct form should be "test Shapira – Wilka", or better "test Shapira a Wilka".

**Mutual or one-sided jealousy** for success of a colleague which leads to make him obstacles, lowering his merits or even intrigues against them.

**Mutual or one-sided personal animosity** which leads to the same consequences as before. The best prevention against to two latest phenomena is the fair manager and good working relationships in a team.

**Auto plagiarism** takes place when author uses its own work contrary to the rules of scientific ethics. A typical example is repeated publishing previously published work as new, often with a different name or in different language.

**Data manipulations** take place e.g. if author of an experimental work intentionally excludes the data which are not in accordance with the ideas and needs or author. The grossest form of manipulation - deception - is publishing of factious or falsified data.

**Second hand quoting** takes place when author uses other than original source of information. In this case there is always a risk that a distortion of the original information will take place.

There are some undesirable phenomena also in the management of universities and university departments in Slovakia, such as:

**Tendencies to liquidate so called, "country" universities** without objective causes. These trends are evident in the SR despite the fact that smaller cities are more responsive to the universities, costs of living and transportation are appreciably lower. Moreover, life in them is calmer and exists less "temptations" that divert students and teachers from their work. Universities have also very positive influence on increasing the culture of the place.

**Permanent organizational changes and changes of rules "during the game"**. This is reflected at all levels of management from government and ministries to universities and their faculties. New manager or management teams often disrupt the continuity and invalidate the results of their predecessors. In all seriousness, it can be stated that the demands on the work of university teachers is constantly growing, but the conditions for their successful work is steadily growing. As the "rules of the game" are constantly changing and often for the worse, an educator is unsure, frustrated and often leaves the university. It seems to us that, as there is a charter of children's rights, we should be sought creation of a charter of rights for university teachers.

**Arbitrary changes of criteria for the qualification processes**. Recently, rector of one Slovak university introduced a new requirement to receive a university professor degree. According to her, for this title may require docent/associated professors after five years from appointment as docent/associate professor. Such a condition the Slovak Higher Education Act does not impose. To obtain the degree docent there is no time requirement after obtaining PhD degree. On this university the current rector of another university in the same year won the scientific-academic degree PhD. and the scientific-academic degree docent.

We are sure, that the list of the negative phenomena is not complete and that the phenomena are present not only in Slovakia and Bohemia. Nevertheless we will point out on some of them in order to eliminate them as the task is over the possibilities of an individual scientist.

#### **4 Current state and some proposals for improvement of level scientific ethics**

Above mentioned and commented findings of many undesired phenomena in the field of scientific ethics allow us to say that the current state of knowledge of university students and teachers is not satisfactory.

1. Into curricula of all study programs Incorporate the obligatory information about copyright of the particular state, the law (5) in Slovak Republic and that one (7) in Czech Republic, and establish written test for verification of acquiring of the relevant parts of it.
2. To propose a new grant project in order to create a complex monograph about ethics of science in university environment extra for university students and extra for university teachers. For this project create an authors team, ensure financial funds and publish the book in sufficient number of copies. Same time ensuring the free version on the Internet.
3. In reviews of special and scientific works establish an obligatory item containing reviewer's statement expressing whether he has found or not found any ethic shortcomings in reviewed work.
4. On each university create university ethical science codex, like the codex for researchers (8) and (9), and reflect recommendations contained in the document (10). In these documents determine not only duties but also rights of authors.
5. On each university create special commissions for science ethics in order to judge events of unethical behaviour of students and teachers of the university in the field of science ethics.
6. For teachers and students of universities provide legal advice on complex issues of copyright.
7. More clearly and unambiguously define conditions for entitlement to co-authorship of professional and scientific works.
8. In periodicals edited by universities establish special columns for scientific critiques and support objective criticism in them.
9. Elaborate unified all-state guideline for punishing violations of copyright and science ethic rules.
10. From authors of manuals for elaborating publications, theses and dissertations require compulsorily incorporate a chapter on ethics of scientific work, publication and citation ethics, and also on copyright. As examples of such manuals we may present manuals (11), (12) and (14).
11. Promote electronic publishing of works from this subject like (15), (16) and (17).

#### **5 ICT and Internet versus science ethics**

Many problems of scientific ethics is associated with the mass use of ICT and scientific work. This issue merits specific research and is beyond the scope of this study. Based on current knowledge, we can say not only negative but also positive consequences of the information revolution. As examples of the most significant negative consequences are the following:

1. ICT enables fast finding and downloading information from Internet sources in the foreign language, which after translation into another language are difficult to identify. It seduces morally less advantaged individuals to plagiarism.
2. The same often leads to the download and use of information from the second hand, or further hand, instead from the original source, which is not available on the Internet.
3. Many authors cite only accessible electronic resources and ignore important work predecessors that are not available on the Internet.
4. Many information sources on the Internet are not sufficiently reliable and uncritical acceptance of information from them leads to scientifically unfounded conclusions.
5. When statistical processing of data using special computer programs we often encountered that users could not correctly interpret the results obtained.

The use of ICT and the Internet in scientific work, however, has many positives. As a few examples, we can cite:

- ICT allow for extremely fast retrieval of information from sources available on the Internet.
- ICT allow new, cost-effective ways of communication between scientists both nationally and internationally (e-mail, Skype, teleconferencing ...).
- ICT enables it to perform at their own workplace unenforceable experiments in remote laboratories, often involving expensive equipment.
- ICT allow you to quickly identify less sophisticated forms of plagiarism.
- ICT provides mathematical modeling and simulation of many of the experimental point of view of complex phenomena.
- ICT allows for improved, more visual and aesthetic present the results of scientific work.

## **6 The conclusion**

As follows from the above, issue of scientific ethics forms an important part of academic life at universities. It is very important in research activities, publishing activities, and even more in the education of new generations of scientists. Violations of scientific ethics takes many forms including some sophisticated and hardly guessable forms. After revealing it often has a negative response in the general public that is not always considered as a failure of individuals and is often generalized to the whole community of scientists. Thus scientific ethics deserves permanent care and adequate response of scientists communities to the violation of its rules. It should be also a very good prevention opposed to the moral failure of a small quantity of individuals which have been compromised prestige and reputation of the whole university, any workplace, and scientist at all.

*Final note:*

The authors do not claim to be complete exhaustion issue. They recognize the subjectivity of their own knowledge. Their aim was only to encourage a community of scientists to increase their autoimmunity against those who threaten by their dishonest conduct the prestige of scientists in the general public.

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