Research Ethics

When we talk about research ethics, every researcher knows that it is an important issue in daily research activities. But many researchers feel fuzzy about this topic, little literature introduces the principles and guidelines to follow. The purpose of this summary is to collect the opinions in the training course, to bring out the principles of research ethics, and to provide some basic rules in the scope of engineering and science research.

IEP[1] gives a definition of "Ethics" as moral philosophy, which is a branch of philosophy that involves systematizing, defending, and recommending concepts of right and wrong conduct. In other words, ethics aims to establish a system of moral principles and the rules of conduct recognized in respect to a particular class of human actions or a particular group, culture, etc.

In scientific context, the aim of research ethics is to define a guideline and a set of principles, which permits the researchers to respect the others' research findings and intellectual properties in the existing research literature.

1. Authoring of research publications

The authoring of research publications refers to the definition of the name, the number and the order of authors when publishing a scientific paper. The authoring is principally based on the researchers' contributions to the paper. However, it is hard to find out a clear and recognized rule to follow, sometimes it has confusion and argument for the authoring issue.

Generally, the first author is considered as the person who contributes most significantly to the paper. His/her contributions include providing the original idea, giving a systematic literature review, analyzing the research problems, proposing new solutions and/or methods, implementing the propositions, summarizing the results, predicting future developments, and drafting the paper etc.

Moreover, a corresponding author is request for a scientific paper. The corresponding author is the coordinator between the author team and the refereed committee of journals or conferences. He/she contacts editors and/or reviewers during the peer-review process in order to answer the reviewers' questions and to improve the quality of paper. As the representative of the paper, the corresponding author communicates with the public for presenting the idea, listening to the comments and the questions, and developing potential collaborations. The corresponding author can be the first author, but also can be another person. The corresponding author is usually the person who provides the necessary research environment to conduct the research (funding, facilities, people etc.). He/she should take the responsibility of the paper to insure the research findings to meet scientific requirements and ethics regulation.

Additionally, we can add other persons to the authors list up to their individual contributions. But we should avoid "over-authoring", each author in the list should have significant contributions to the paper. Someone just provides some suggestions or ideas to improve the quality of paper, we can acknowledge him/her in the end of paper rather than put his/her name in the authors list. And we should notice that the "cross-authoring" for the purpose of increasing number of publications is strictly forbidden.

[1] Internet Encyclopedia of Philosophy

2. Sharing of research ideas/proposals/preliminary research results

The sharing of research ideas is necessary in today's research activities. There exist a lot of opportunities to exchanges the research ideas, such as seminars, conferences, workshops, even a small coffee break. We might get some interesting ideas from such opportunities, but we do remember to acknowledge the source of ideas when publishing the research findings issue from them.

Besides, when we want to make further exploration on the research ideas or results issue the confidential documents, such as projects proposals, preliminary research results, we should ask for the permissions of the idea/result holder.

Another issue is that when we want to use the figures and tables that already published, besides we need to cite their references, legally, we need to ask for the permissions of publishers.

3. When/what is enough to publish

Generally thinking, we publish when we got promising results. But do we publish only when we got the "good" results? Of course not! We do research because we want to know the truth. So we can publish if we are sure of finding something helps us moving closer to the truth. That means even we got bad results, but if we know why it is bad, and how to get a right direction making closer to the truth in future developments, we can publish and share the results.

Concerning what is enough to publish, it is a question of the quality and quantity of research findings. The quality is to prove that the research findings have significant advancements compared to current research. The quantity is that the findings should include proposing/implementing/validating the idea.

4. Experiment data/subjects handling

It is forbidden to imagine and fabricate data/subjects for any purposes. Raw data/subjects from any experiments will never perfectly fit your research expectation. The phenomenon and the trend behind data/subjects are the focus on research, not the data/subjects itself.

We should notice that, in order to compensate the lack of real experiment data, it happens often to simulate the data/subjects, for example in questionnaire survey. But the data simulation should follow scientific rules or methods (uniform distribution of input data set). The experiment results cannot absolutely be simulated in order to meet the expectation.

5. Social impact of research

It is obvious that research has interactions to the surrounding environments. Their relationships are illustrated in Figure 1. The impacts of research to the environment elements, including nature, science, government, society and establishment, will be detailed as follows.

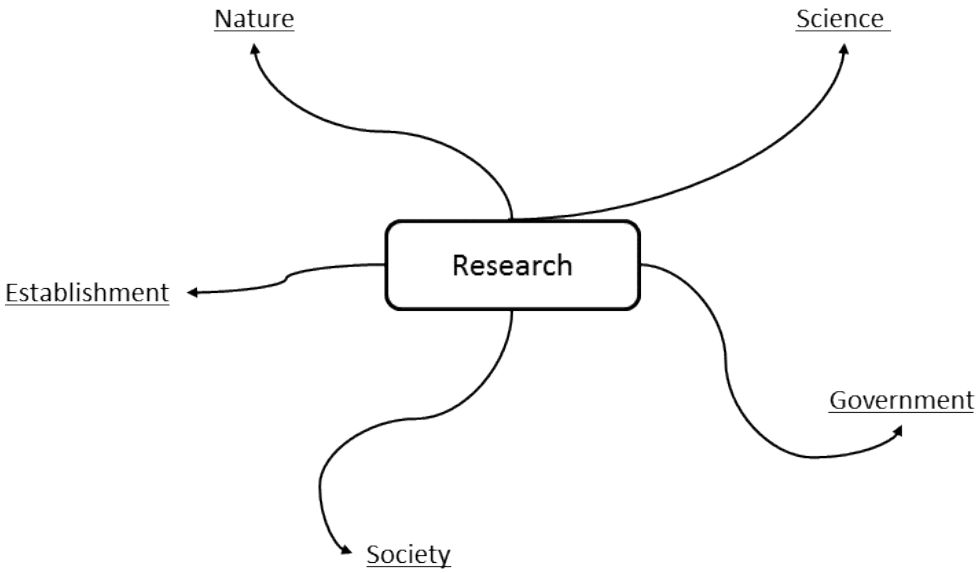

Figure 1: Interactions between Research and Environment

- Research VS Nature: do not harm the nature , environment friendly, sustainable development
- Research VS Science: contribute to the progress of science
- Research VS Government: good return on research investment, contribute to economy and defense
- Research VS Society: make technological evolution, improve the quality of life, service to public
- Research VS Establishment: increase competitiveness of education, teaching, reputation

For conclusion, we should keep in mind that research should have a spirit of fairness and good sense. The research findings should be based on solid and confident experimental data/subjects. Last but not least, research should be open to take others' critics and opinions.

In addition, Concordia University has its own process to be followed to ensure the compliance and ethical integrity of all research. Moreover, the publisher Elsevier discussed the ethics issue in research & publication, which focus the contributions of researchers to the health and future of society.

For more information, please refer to

http://oor.concordia.ca/services/researchethicsandcompliance/

http://www.ethics.elsevier.com/