Discussion on Topic Selection and Experiment of Postgraduates

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ABSTRACT

In view of the lack of innovation in the papers written by some graduate students, this paper briefly introduces some good practices of training graduate students, including topic selection and experiments. The purpose is to cultivate the rigorous academic attitude and pursue the first-rate spirit of innovation, and to continuously improve the creativity and academic level of graduate students.1

INTRODUCTION

We reviewed some papers of graduate students every year, and we found that a lot of papers lack of innovation. Although some students have done a lot of research work, they are not good at summing up, comparing and improving, which lead to the fact that papers are just a pile of workload, it is difficult to find innovative results. Some students put forward their own ideas and methods, but in the experiment part, they just through the case study or testing to show that their method is effective, lack of comparison with other methods, it is also difficult to reflect its innovation.

According to Baidu Wikipedia, the creativity refer to improve or create new things in a given environment, guided by existing patterns of thinking that are different from conventional or ordinary ideas, using existing knowledge and materials, and these things can obtain some beneficial effect.

Guided by existing patterns of thinking that are different from conventional or ordinary ideas, using existing knowledge and materials, improving or creating new things in a given environment, in the light of idealized needs or in order to meet the

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needs of society, The act of obtaining some beneficial effect. Its point is to create new things or to improve what is already there. Graduate students are the new force of high-level talents in the future. It is very important for their professional development to cultivate their innovative consciousness, innovative ability and the pursuit of first-class spirit.

This paper discusses some experiences from topics and experiments.

**TOPIC SELECTION**

Topic selection is the first step for graduate students to engage in research, and it is a very important learning step for them. A good selection of topics will undoubtedly help to produce valuable results. Dr. Longbo Huang of Tsinghua University believes that the following factors should be taken into account in selecting the topic[1]. First, we should have a strong interest in scientific research issues, second, choose a "good" scientific research problem, and third, scientific research topics should be feasible. Prof. Xinbing Wang of Shanghai Jiaotong University believes that interest is the source of scientific research, and he has always followed the principle of letting students choose topics according to their interests[2]. To sum up, I think we should pay attention to the following aspects:

**Choose the Right Subject for Yourself**

Only with interest can produce motivation creative results. Every major and every research direction has a wide range of research fields, one can’t study everything, and the topic is to find a suitable entry point. There are generally two options. One is to combine the actual scientific research projects. Discuss these projects with students, and find which students are interested. Of course, the tutors also have to examine the students' knowledge background to see if they can afford to these projects; the other way is to choose topic independently with their personal interests. Consider your knowledge structure, work, study experience, and research interests.

**Extracting Scientific Problems worth Studying from Literature**

Having chosen a topic does not mean that you can begin your research. You still need to continue to look for valuable scientific issues. For example, if you want to study software defect prediction methods, you should find out what other problems are also worth studying in software defect prediction, that is, to find your breakthrough points. How? One way to do this is to read more literature. American tutors have put forward very high requirements for both my research project and that of his doctoral students. They require us to study the relevant literature one by one. Not only to understand how others do it, but also to understand how they evaluate their results, that is to say, to master the criteria and methods of evaluation, which
should be understood at the beginning of the study, because the results of subsequent experiments should also be judged by these criteria.

The Theoretical Significance and Practical Value of the Subject should be Equally Emphasized

Some domestic tutors and students pay more attention to the practical value of the subject, but less to the theoretical research. They are more interested in solving problems, but lack the spirit and motivation to pursue the first class. American graduate student guidance teachers attach great importance to theoretical research. Even engineering problems should be raised to the theoretical level. Not only to solve the problems, but also to put forward better methods that the predecessors did not have in theory.

The Subject should be Moderate in Difficulty and Scale

The difficulty of the subject is relative, which should be analyzed in the light of your knowledge background and research time. If you need to use a large amount of knowledge that you are not familiar with, and this knowledge is difficult to master in a limited period of time, then this kind of subject is difficult for you. In addition, the subject should not be too big, or it will be difficult to study in depth. Generally emphasize "small topic, big article", aiming at a certain point, do it thoroughly, will have better harvest.

EXPERIMENT

American scholars attach great importance to experimental results, and theoretical results are generally verified by experiments. Therefore, experiment is also a very important part of scientific research. The correct experiment and accurate experimental data play an important role in improving innovation ability and academic level in the process of carrying out study and research in combination with equipment.

Importance of Experimental Data

One American tutor said that experimental data are sometimes more important than methods, with data it can be analyzed in a variety of ways to extract valuable information, but only methods without data support can only be castles in the air. There are two main sources of data, one is to collect historical data by a certain method, and the other is to produce new data through experiments. Both sources are important, and require to be designed carefully and collected, analyzed patiently to ensure the accuracy of the data. At the same time, the experimental data is best
obtained through special equipment or laboratory standards, universal equipment to ensure the validity of the data.

**Be Good at Discovering Laws**

The purpose of the experiment is to find out the rules and find something in common. First, think hard, think more about why, why the results of the experiment is like this? How is it different from expectations? Which part of the link might have a problem? Analyze more. Sum up more. Discover essence through phenomenon. Opportunity only favor prepared mind. Second, have certain technical reserve. Master the common analysis method, such as the statistical method, the machine study method and so on. For different data, the results obtained by using different methods will generally be different, we should make more comparative analysis, and then choose the best method.

**To Persevere**

The process of experiment cannot be smooth sailing. Most people have experienced failure in the course of the experiment. The experimental results are not always as smooth as expected as well. It is often necessary to sum up experiences and lessons, constantly improve and adjust experimental methods, environmental conditions or operating procedures, and carry out experiments repeatedly. As long as we persist, there will be good returns.

**REFERENCES**