

Investigation and Analysis on Feeling of Undergraduates Majoring in Biopharmaceutical After Thesis Defense

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To cite this article:

Fangdi Cong, Ping Li, Liyao Liu, Tao Li. Investigation and Analysis on Feeling of Undergraduates Majoring in Biopharmaceutical After Thesis Defense. *International Journal of Education, Culture and Society*. Vol. 3, No. 1, 2018, pp. 5-9. doi: 10.11648/j.ijecs.20180301.12

Received: November 28, 2017; **Accepted:** December 9, 2017; **Published:** January 12, 2018

Abstract: In order to make better practice teaching of undergraduate thesis, randomly selected a respondent group (28 students) to make an anonymous written questionnaire, which was entitled “Feeling after thesis defense”. And there was not any other restrictive requirement on them. The survey results were classified and analyzed from thesis design, research process and thesis accomplishment. It was shown that, though the survey objects encountered some difficulties and hardships in the practice activity, they had a greater degree of recognition on the importance of graduation thesis and the necessity of engaging in thesis work. And also they not only benefited from the help of teachers and students. But also they were trained and improved greatly in the comprehensive quality and ability in the activity, and so they were pleased for this. It is believed that this investigation will help the practice teaching of undergraduate thesis go up to a new stage.

Keywords: Undergraduate, Graduation Thesis, Practice Teaching, Investigation, Analysis

1. Introduction

The investigation on undergraduates is very necessary just after thesis defense. In this way, the practical teaching work can be improved more effectively and accurately. The undergraduate thesis is the last link of practice teaching activities during the course of undergraduate education and teaching. And also it is the test on effectiveness of education and teaching for four years, as well as the application of teaching knowledge in practice. Working on undergraduate thesis through thesis design, scientific research, paper writing and thesis defense can cultivate the comprehensive practical ability and the innovation-entrepreneurship quality of undergraduates in various directions [1]. Therefore, to well finish undergraduate thesis practice teaching is of vital importance, for the effective completion of training undergraduate talents, especially new engineering undergraduate talents, in colleges and universities [2].

In order to make better the practice teaching of undergraduate thesis, many universities and colleges do

much effort in many facets such as enhancing the construction of teaching staff, increasing the education funds, regulating the thesis proposal and decision, adjusting the practice time and improving the thesis evaluation quality, and reforming the thesis defense mode [3-5], etc. But these still are not enough to fully reflect the actual situation of undergraduate thesis in the process of practice teaching for the lack of opinions and suggestions from the undergraduates who completed theses. Therefore, an investigation on “Feeling after thesis defense” is carried out by randomly selecting one of respondent groups of biopharmaceutical specialty, 28 students, to write the answers in anonymous form after thesis defense. Based on the results (Table 1), the analysis is given on thesis design, research process and thesis accomplishment. It is pointed out that what are the success and the existed problems of practical teaching in undergraduate thesis, and also put forward some constructive suggestions.

Table 1. Results of investigation on feeling of undergraduate after thesis defense (28 students).

Categories / student number / feelings		Feelings			
		Important & necessary	Happy & joy	Difficult and hard	Unsuitable & dislike
Thesis design	Thesis proposal	3	0	2	1
	Literature search	8	0	2	0
	Programme design	5	0	2	0
	Time arrangement	3	0	2	0
Research progress	Experimental research	9	2	8	2
	Instrument operation	4	1	1	0
	thesis writing	9	1	3	1
Thesis accomplishment	Software usage	5	1	1	0
	Thesis defense	4	2	4	1
	Teacher guidance	7	5	0	0
Related aspects	Classmate help	6	4	0	0
	Getting exercise	11	10	0	0

Note: Because of the diversity of perception, the student number of longitudinal columns may be greater than 28 or less than 28.

2. Necessity of Guidance and Encouragement in Thesis Design

2.1. Investigation on Feeling of Thesis Design

In the teaching plans of undergraduate specialities, generally the practice teaching of undergraduate thesis is arranged in the last term, namely after the courses of special theory teaching and experimental teaching ended. For the teaching of thesis, the first stage is the thesis design mainly including three aspects, i.e. thesis proposal, literature search and programme design. In terms of the three aspects (Table 1), it is shown that the number of students who thought these were important are 3, 8 and 5, respectively. But no one was interested in them. There were 2 students felt difficulty in every aspect, and there was one who deemed that it was unnecessary to carry out thesis proposal.

2.2. Analysis on Difference of Feelings

The practice teaching activity of graduate thesis is very different from the theory and the ordinary experimental teaching. It is the comprehensive utilization of theoretical knowledge and practical skills, has great change in ways and means of practice, and sometime needs much new knowledge to be understood for undergraduates due to the demand of thesis proposal. Some students thought thesis design important and necessary for the characteristics of thesis in time arrangement and practice activity, and the novelty of students on this practical activity. However, most of thesis proposals were assigned by teachers or under the guidance of teachers owing to the limitation of activity time and research foundation of them. It was the result that the proposal thesis topic rarely could be fully recognized by them. Once selecting the thesis topic, undergraduates usually showed some enthusiasm for that much new professional information would be received when they processed the literature retrieval, but also show confusion and difficulty in the formulation of research programs due to the lack of independent research experience. Therefore, there were the above results of investigation on them in the thesis design.

2.3. Suggestions on Thesis Proposal

The mentioned investigation and analysis indicate that it is very necessary to properly guide students in discipline specialty and stimulate the interest of them in scientific research in the stage of graduation thesis design. In the face of the design of graduation thesis, what they lack is the understanding on the research direction, and the ability of literature retrieval and research scheme design. In order to make up this 'short board', teachers are required to point out the important scientific significance and research value of relevant research directions, and guide students to understand the thesis topic on the existing basis of them in discipline speciality. During the guide process, the teachers must link thesis proposal with the reality of undergraduates in speciality, and cause them recognize the important value of the proposal thesis topics and know that they can solve the scientific problems in the proposal topic by the ability themselves so as to stimulate their interest, avoiding the proposal thesis topics too wide and too large. In addition, with the help of the Project of College Students' Innovation and Entrepreneurship, the students' interests and ability in scientific research can be effectively cultivated and then smoothly guided to enter the stage of thesis design.

3. Reducing Difficulty in Research Process

3.1. Investigation on Feeling of Research Process

The research process includes time arrangement, experimental research and instrument operation, which is the core and foundation of graduation thesis practice. The experience of undergraduates in this stage is very rich. From the investigation results in the stage of experimental research (Table 1), in terms of time arrangement, three students thought it important, no one enjoyed in it, and two students felt it difficult. On the experimental research activities, nine students thought it important, two students experienced it happy, eight students felt it difficult and hard, and two students deemed the research inappropriate and showed disgust. In the operation of

large-scale instruments, four students felt important in mastering skills of instrument operation, one student enjoyed in instrument operation, and also there was one student felt difficult in operating them.

3.2. Analysis on Feelings of Experimental Research

The practice teaching of undergraduate thesis is commonly arranged in the last term in which undergraduates have not only to finish graduation thesis but also to find a job for them [6-8]. Therefore, in the time arrangement, a few students realized that the experimental research needed enough time and the reasonable arrangement of time was important, but no one was very optimistic, and even a few students felt that there was a certain difficulty at the time arrangement. Nevertheless, in the experimental activities, many people still attached great importance to the experiments and actively participate in the experimental researches. They experienced the happiness of independent thinking and independent completing experimental operation. Surely, some students encountered various difficulties, felt the hardships of scientific research, and even felt boring or resentment in the experimental studies due to the inevitably comprehensive application of knowledge and skills as well as the necessarily innovative research activity. But under the help of teachers and classmates, and the persistence themselves, they eventually completed the experiments and obtained some results. For large-scale instrument operation, due to differences in the experimental content, only a few students operated instruments frequently thought instrument operation important. So some individuals mastering instrumental operation enjoyed, and some other individuals distressed due to poor operation skill.

3.3. Suggestions on Experimental Research Activities

In view of the experimental time, experimental ability and instrument operation level of undergraduates, it is necessary to reduce the difficulty of the research work in order to ensure the successful completion of the thesis. In the arrangement of time, under the guidance of the teacher, students should learn to arrange the experimental time reasonably and flexibly. For example, the batch of experiments could be increased if mastering the basic experimental techniques and the conditions permitted. And the experimental content for the next time could be previously designed during the period of waiting for the experimental results. And also the students could help each other to complete the experiments cooperatively if the experiments of them are related, etc. In the process of experimental practice, undergraduates should consult the instructor in time or ask classmates for help in an open mind, and in this way train the innovative thinking and experimental ability of them. As to the operation of large-scale instrument, provided there was an opportunity, undergraduates should not only learn the basic operation of the instrument, but also learn to deal with the common problems appeared in the operation, which might be very necessary for future professional work.

4. Complex Feelings in Finishing Thesis

4.1. Investigation on Feeling of Finishing Thesis

Finishing thesis is comprised of writing thesis, software usage and thesis defense (Table 1). About the response of undergraduates to writing thesis, nine students realized the importance of writing papers, one student felt very happy, three students had a sense of hardship, and one student showed disgust. Writing thesis generally involves some drawing software, such as Excel, Origin and ChemDraw, etc., besides usage of Word operations. In terms of the use of software, five felt it important, one was interested in it, and one had difficulty in using software. The thesis defense is a comprehensive activity showing research results and self-expression ability, and then the feelings of undergraduates on it are also complex. Four students thought that the process of thesis defense was important, two students were delighted for their excellent performance in defense, four students felt very hard because of inadequate preparation or poor performance, and one student took negative and offensive emotions because all those related aspects were not ideal.

4.2. Analysis on Reason of Complex Feelings

In the process of writing thesis, how to write abstract and text, and to cite reference literature, all were unprecedented activities for undergraduates. How to organize research data organically? The importance was self-evident. So many undergraduates realized its importance and attached great importance to it. But in the writing process, they had differences in the experimental data selection and the corresponding organization ability, very few wrote thesis paper smoothly and had a sense of joy, a few ever encountered some difficulties, and very few expressed disgust to the requirement of thesis in style and the repeated revisions on text. Because the drawing software could make the experiment data more intuitive and effective, so some of students considered them very important and seriously use them in writing thesis paper. A small number of students mastered the software operation and highlighted the results with software, and then enjoyed in software operation. Still there were very few students who had difficulty in using the software. As for thesis defense, some students felt very necessary in generous manners, proper speak speed, calm state of mind, prominent statements and accurate answers. Some of them performed better in defense and felt it happy. But some undergraduates were hard in defense for the inadequate preparation, nervousness, and poor performance in stating contents and answering questions, and therefore a few of them had a negative feeling.

4.3. Suggestions on Finishing Thesis

In order to smoothly complete the undergraduate thesis and effectively improve the skills in defense, teachers should strengthen the guide to them, and strictly require undergraduates timely recording and collecting experimental data in the experimental stage, in addition to strengthen the

teaching of literature retrieval and graduation thesis design in the early stage. Accordingly a phased experimental report must be written regularly by referring to the articles in journals, and also the experimental results must be reported to guide teachers with PPT so as to exercise writing and speaking ability. At the stage of thesis writing, they should strictly write the manuscripts and repeatedly revise them in accordance with the style of thesis required by university. At the same time, they were urged to pay attention to the use of operation software, and refine on the chart quality and the drawing techniques. Before the thesis defense, organizing a number of undergraduates previously simulated thesis defense for one to two times. By the means, the guide teachers guided them how to hierarchically highlight the presentation of research content and methodically stress the key parts, and also teacher properly put forward some problems and let them give pertinent answers.

5. Important Synergistic Effects of Related Aspects

5.1. Investigation on Related Feelings

In the completion of graduation thesis, there are also important synergistic effects in related aspects. Many students benefited from the teacher's enthusiastic guidance and the selfless help of classmates, and had very good exercise in the practice, so they expressed their gratitude to co-workers, and were pride of the work themselves. Seven students believed that the teacher's guidance was very important and necessary in the process of completing their own papers, and five students were glad and said they should thank teachers. Six students considered that the help of students was very important and four students were very happy for the so-called help from friends [9]. Eleven students said that they got a better exercise in search of literature, time arrangement, innovative thinking ability, practical ability, use of large equipment, software operation, thesis writing, expression and communication ability, and so on. Therefore ten students were very happy for that the graduation thesis activities might be helpful for their future study and work, owing to improvement in skill [10].

5.2. Analysis on Related Synergies

Undergraduate thesis practice is a relatively independent activity, which needs to be carried out under the guidance of teachers. In the face of difficulties, confusion and innovativeness of theses, students usually asked teachers for help. Under the guidance of teachers, they adhered to the study, overcame difficulties, realized innovation and accessed to the success of experimental research, during which they deeply experienced the teacher's kindness, patience and profound knowledge. In the meantime, there were selfless help from classmates and timely exchange in knowledge, skills and related aspects among them. And the students also showed mutual encouragement, and thus solved the problems

encountered in researches, overcame the impatience, and felt the love and warmth from teachers and classmates. In this kind of practice full of warmth, many students thought that it was a great exercise because of the increase of knowledge, the improvement of skills and the enhancement of psychological quality, and even the students sighed for the short time. Just because of the above reasons, no students behaved helpless and unhappy for benefit from the teacher-student help and the experimental exercise.

5.3. Strengthening Beneficial Synergistic Effect

The help of teachers and students is very beneficial, and it is natural for undergraduates to get exercise in practice. This is the synergistic effect in the practice teaching of graduation thesis, which needs to be appropriately strengthened. Communication between teachers and students should be comprehensive as far as possible, for instance interview, telephone, e-mail, WeChat and QQ and so on, so that students always feel the presence of teacher's guidance and help. The instructors also should exchange experience with each other, organize academic exchanges regularly, display problems, encourage speeches and make some comments. Relevant teachers or students who are in charge of Innovation and Entrepreneurship Projects should actively introduce scientific research experience, successful experience, thesis writing skills and strategies to improve their expression ability, etc. By this, it is to stimulate the interest of students in scientific research and help solve the practical problems in practice, so as to overcome the fear of emotions, train ability, and cultivate scientific and rigorous attitude towards scholarly research.

6. Conclusion

To make the investigation results closer to the actual, the investigation only gives the survey questions without any restrictions and requirements as soon as possible to enable everyone to write the most profound feelings truly. Although each person's feeling is not comprehensive enough, and in most cases, only a few people mentioned in each aspect and many did not mention, but the results are more real. By classifying and analyzing the results of the survey, it is found that students thought the thesis design important, but felt it difficult and therefore lacked of interest. Teachers should actively guide students to understand the value of research and encourage them to engage in scientific research activities with interest. For the experimental research, students also consider it important, but many students felt it difficult because of the limitations of experimental time and research basis themselves. Therefore, some undergraduate thesis needed to be reduced the difficulty in the premise of maintaining innovation. In the completion stage of undergraduate thesis, undergraduates knew the importance of writing and expression ability. The writing ability and the expression could be improved by requiring them to write regular test reports in accordance with the form of journals and holding informal defenses previously for one or two times. For the

teacher-student help and the exercise in completing thesis, they not only recognize that both are very important but also get more happiness and joy. The effect could be further strengthened through the full range of teacher-student communication and the scientific research training.

Acknowledgements

The work is supported by the Project of China Agriculture Science and Education Fund (NKJ201503043) and the Project of Guiding the Reform of College Teachers' Education (20170503).

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