Reflections on the quality improvement of undergraduate dissertations—based on the perspective of statistics reform

Yujie Lai*, Yibo Hu

School of Economics and Management, Xi'an Aeronautical University, Xi'an, China
*Corresponding author

Abstract: For undergraduate students of economics and management, statistics is a core course of the discipline and also an important course for cultivating students' research ability. The article establishes a statistics course system oriented to improve the quality of undergraduate thesis, proposes to add excellent thesis as a statistics teaching case, and fits the statistics course to improve the thesis selection and writing ability of undergraduate economics and management students by assigning professional survey report tasks and increasing statistical software practice. It provides support for reforming the statistics curriculum system and comprehensively cultivating innovative talents in economics and management from a new perspective.

Keywords: statistics, dissertation quality, teaching reform

1. Introduction

Statistics is a methodological discipline that collects, organizes and analyzes data and uses them to solve practical problems, and it has been listed as one of the core courses for economic and management majors by the Ministry of Education since 2002, and it has strong applicability [1]. The statistics course interpenetrates and complements other economic and management disciplines, and becomes an essential basic course [2].

In recent years, relevant scholars have conducted in-depth research and discussion on the teaching material system, teaching methods and practical applications of statistics courses, and some results have received wide attention. In 2015, Shuanzhu Li analyzed the teaching mode of statistics course from the perspective of adapting to students' characteristics [3]. In 2016, Dan Li and Rong Gong constructed a "project-driven" statistics course teaching system [4]. In 2019, Rongduo Liu and Xuehua Liu proposed the construction of statistics course oriented to improve students' research ability [5]. In 2019, Liu Rongduo and Liu Xuehua proposed the construction of statistics curriculum oriented to improve students' research ability [5]. In the past, scholars focused too much on the reform of the teaching process and materials of statistics, without fundamentally solving the fundamental problems of students' "unclear learning purpose" and "application of knowledge cannot be related to reality", which were also the core problems summarized by a large number of statistics educators in the previous period [6]. At the same time, some scholars initially proposed to further construct the graduation internship and graduation dissertation as the practical teaching system of statistics courses [7-8]. However, these ideas are only the authors' preliminary conceptions and do not dig and analyze them at a deeper level, let alone propose specific measures and methods.

Based on the above reasons, this paper reorganizes the problems in the teaching process of statistics in recent years, summarizes the core problems that cause the difficulties in promoting statistics teaching, and puts forward the preliminary ideas of teaching reform of statistics oriented to improving the quality of undergraduate dissertations.

2. The current situation and problems of statistics course teaching

2.1. Students' low interest in learning and poor learning effect

At present, a large proportion of students of economics and management in colleges and universities are students of liberal arts, with a relatively weak foundation in mathematics and a general

fear of complex formulas and abstract concepts, which leads to a poor overall learning effect of statistics for students of economics and management at present, and a great difficulty in mastering statistical knowledge and its application. It generally appears that the standard deviation of overall assessment scores is large, the overall distribution of scores is seriously skewed, and the course assessment results are unsatisfactory [9]. This is coupled with the fact that most students focus on their major courses and despise their basic courses causing students to generally burn out on statistics courses, have no interest in learning them, and fail to discover the importance of the fundamentals of statistics.

2.2. Outdated teaching methods and unreasonable content

The teaching mode of statistics in many undergraduate colleges and universities still stays on the memorization of theories and the derivation of formulas. In addition, many teachers only focus on paper examinations, not on statistical practice and application, not to mention the ability of students to apply the theoretical knowledge learned to solve real-world problems. As a result, students treat statistics courses as a course that can be passed by "rote memorization and simple calculation", many students do not fully understand the principles of statistical methods, and are unable to combine statistical methods with professional practice to use statistical methods to analyze practical problems. It is impossible to achieve the teaching purpose of the statistics course, which is to let students use statistical methods to analyze specific problems. This further causes a vicious circle of students' unclear learning purpose, low interest in learning, and unsatisfactory examination results in statistics courses.

2.3. Schools do not pay enough attention and are seriously lacking in teaching practice

In recent years, due to the reduction of professional course hours in colleges and universities, many colleges and universities, especially those specializing in economics and management, have seriously compressed the hours of statistics-related courses and even deleted statistics-related practical courses, so that the teaching of statistics has fallen into an awkward situation and can only barely carry out the teaching of theoretical courses without giving students the opportunity to practice, not to mention the learning and application of various statistical software. As a result, students do not have a deep understanding of the deeper ideas of statistics and do not have a firm grasp of statistical methods, and are unable to combine data analysis with statistical practical problems, not to mention innovative statistical methods.

3. The design of statistics course system oriented to improve the quality of undergraduate dissertations

It is easy to find that "students' learning purpose is not clear and the course teaching is not supported by practice" is the core problem of the teaching process of statistics courses, based on the above problems. In view of these problems, this paper puts forward a preliminary idea of teaching reform of statistics oriented to improve the quality of undergraduate thesis.

By reconstructing the statistics course system to combine the statistics course with the graduation dissertations of undergraduates in economics and management, the theory and practice of statistics will be involved in the graduation dissertations of undergraduates, and the purpose of improving the quality of graduation dissertations of undergraduates in economics and management will be achieved.

3.1. Increasing excellent dissertation cases and expanding the range of dissertation topics

Generally speaking, the thesis work of undergraduate students in colleges and universities starts in the second half of the seventh semester and ends in the middle of the eighth semester (May every year), while students have to prepare for other tasks before graduation and face many issues such as employment pressure, so there is not much time left for students to write their dissertations, and many students' dissertations are made in a hurry, without enough time for thinking, especially the selection of topics. The topic selection is the most important part of the thesis, which is related to the completion of all the contents of the dissertation, but in fact, students and supervisors do not have enough time and energy to think about the topic selection. Therefore, the students do not think about the topic themselves, and the supervisor assigns the topic, and then the students do not know enough about the topic, and are in a passive and confused state, which finally results in a poor quality dissertation.

In view of the problems of short time and narrow scope of thesis selection for undergraduate students in economics and management, we can add the module of excellent dissertation case teaching in the statistics course system, combine with students' professional courses and professional characteristics, explore in depth the problems that can be solved by statistical methods in the field of professional academic research, develop students' knowledge, expand students' cognition of statistical analysis methods, and complete the transition from theory to application. In the statistics course system, we expand students' conceptions of professional research, guide them to develop scientific thinking, think deeply about academic problems in the professional field, think about professional problems that interest them in advance, have enough time to refine the problems, study them, and finally transform a professional problem into a thesis topic of choice. The topic chosen on this basis gives students longer time to think about refining and more space to improve their analysis, and also gives them more interest and enthusiasm to complete it.

3.2. Assigning survey report tasks to develop students' statistical analysis skills

A dissertation writing is a comprehensive training for students to apply the basic theories, professional knowledge and skills they have learned to study practical problems. Thesis writing not only examines the level of professional knowledge, but also tests students' ability to find problems, solve them and their ability to write, think logically and innovate, etc. These abilities are difficult to be improved fundamentally through short-term guidance of thesis supervisors.

Undergraduate dissertation writing and the usual course study are not mutually separated, the cultivation of undergraduate students' research ability and writing ability can be targeted to cultivate students' research ability and writing ability by adding a professional survey report module to the statistics course system in order to achieve the purpose of improving the quality of undergraduate dissertations of economics and management students. At the beginning of the course, the total task is given to students, and it is made clear that students should complete the task so that they can learn with a problem-solving mentality, and while increasing their interest in learning statistics, as the content of the statistics course deepens, students are urged to continuously complete and enrich the survey report from statistical design, statistical survey, statistical collation to statistical analysis, and students are guided to use more effective and more scientific methods to study problems and elaborate ideas.

It deepens students' understanding and mastery of statistical methods, and eventually they complete their written reports in a standardized writing style to improve students' scientific writing ability and better improve their ability to apply statistical methods. It allows students to enter the writing process of professional academic papers and reports in advance to enhance their ability to collect data and analyze problems, and to accumulate writing experience in the course process. Once students enter the thesis writing process and complete the topic selection, they can enter the state of dissertation writing more quickly and can also effectively improve the quality of the dissertation.

3.3. Utilizing statistical software combined with data analysis to improve the quality of graduation thesis

The research ability of undergraduate students is generally weak. They often write statements with hollow and general contents and more empty slogans owing to the lack of prior accumulation and the desire to finish the thesis in a short period of time. They have not gone through field research, nor have they collected relevant real financial information from front-line enterprises, and they lack the ability to analyze and solve practical problems by applying the professional knowledge they have learned, so the research is not very meaningful.

In recent years, the proportion of quantitative analysis methods used in the dissertations of undergraduate economics and management students in colleges and universities has increased year by year, especially the proportion of using statistics-related analysis methods has increased significantly, but it is mainly descriptive statistical analysis and common simple regression analysis, all of which are only elementary statistical contents. A small number of students can master multivariate statistical analysis methods such as factor analysis and principal component analysis, but these methods are all learned with the help of instructors or through the Internet after the students have determined the topic for their dissertations, and most of the energy during the dissertation writing period is spent on the use of software and learning of methods, without much energy for in-depth analysis and sculpting of the dissertation as a whole, which, on the contrary, reduces the quality of the dissertation.

However, the statistical software that many students need to use during the writing of their thesis and the statistical methods that they need to master can be fully implemented by adding a statistical practice module to the statistics course system, so that students can have a certain understanding of common statistical software and be familiar with the analysis methods commonly used in the thesis of undergraduate economics and management students, which not only expands the direction of students' topic selection, but also saves the time and energy of self-learning statistical software and analysis methods. Through the statistics course, students are required to master the use of the most basic SPSS software and Eviews software as well as the implementation of general statistical methods, and even the teaching of State software or R software can be added, together with the introduction of relevant economic models, which can effectively enhance the mastery of econometric analysis software of undergraduate economics and management students and directly improve the quality of the dissertation of undergraduate economics and management students. It will expand students' ability to analyze problems and make them more confident to finish their dissertations with high quality.

4. Conclusion

Statistics course plays a pivotal role in the process of cultivating the research ability of undergraduate economics students, especially in the era of big data, the ability to use and analyze data has been paid more and more attention.In this paper, with the orientation of improving the quality of dissertations of undergraduate students in economics and management, we reshape the statistics course system, propose to increase the cases of excellent dissertations, expand the range of topics for dissertations, assign the task of survey reports to cultivate students' statistical analysis ability, and use statistical software combined with data analysis to improve the quality of dissertations.   The whole process of statistics course is involved in the graduation dissertation from topic selection to writing, so as to effectively improve the quality of the dissertations of undergraduate students majoring in economics and management in a purposeful and targeted way. It explores the reform of the statistics course from a new perspective, gives full play to the characteristics of the statistics course itself, and enhances the importance of the statistics course.

Acknowledgements

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