The Combination of Scientific Research and Teaching Promotes the Cultivation of Students' Practical Ability

Bin Xiao, Hui Li
Naval University of Engineering Wuhan, China

Abstract—The way of integrating scientific research and teaching is of great significance in college education, which can not only vivid teaching atmosphere, stimulate students' interest in learning, but also cultivate students' innovative ability and practical ability. This paper analyzes the realization path of the combination of scientific research and teaching from three aspects: the introduction of scientific research results into classroom teaching, the introduction of scientific research results into practice teaching, and the introduction of scientific research results into professional textbooks.

1. INTRODUCTION

In today's increasingly fierce competition in science and technology in the international society, it is an urgent task for colleges and universities to improve the quality of college education and cultivate all-round and high-quality talents. Colleges and universities are not only the holy land of teaching, but also the main force of scientific research. Teachers should undertake the dual tasks of teaching and scientific research. In the actual work, many teachers can not deal with the relationship between the two correctly, resulting in not only unfavorable to the personal development of teachers, but also unfavorable to the improvement of the quality of education in colleges and universities[1]. In fact, scientific research and teaching are not simply contradictory relations, but can integrate and promote each other.

2. THE SIGNIFICANCE OF COMBINING SCIENTIFIC RESEARCH AND TEACHING

Humboldt, a famous German educator, advocates the idea of "teaching through research" and "unity of teaching and research", the key of which is to do a good job in the combination of teaching and teaching. Teaching assumes the function of general education and professional training, and scientific research assumes the function of discovering new knowledge[2]. Among them, teaching is the foundation and the core, and scientific research is the extension and development of teaching. Scientific research results are formed in the process of scientific research. The new results and new theoretical system formed by integrating theoretical knowledge, technical methods and project research contents and gradually improving them are of great guiding significance for the development of professional fields and students' knowledge learning. It not only provides students with a summary introduction of specific theories, operational techniques, methods and processes, research objects, possible achievements, relevant conditions and experience, but also provides students with cutting-edge knowledge in the current professional research field and provides important guidance for students' learning space. In addition, the high-quality teaching of the teachers has cultivated high-quality and high-level innovative talents, providing a steady stream of fresh forces for scientific research[3].

First, cultivate students' ability to innovate and practice. As the subject of knowledge learning in teaching activities, the key to teaching is to give full play to the initiative of students in the teaching process and cultivate their practical ability and innovative spirit. In the course system of equipment procurement management, some courses are highly theoretical and the content of relevant professional knowledge is relatively abstract. If only traditional cramming teaching method is adopted in teaching, it is difficult for students to digest and understand relevant knowledge points, and it is difficult for teaching to achieve the expected effect. If the scientific research results formed by the teachers in the process of scientific research are flexibly combined with the teaching content, applied to classroom teaching, and integrated into the hot research issues or the latest progress and development trend of the discipline, a lively learning atmosphere can be created, and it is easier to stimulate the students' learning interest and desire for knowledge, so as to mobilize the students' learning initiative[4]. It is beneficial to cultivate students' innovative thinking and practical ability, and further improve the learning effect. Therefore, scientific research results should be incorporated into the corresponding knowledge points of classroom teaching from the perspective of cutting-edge, practical and comprehensive, concretized, systematic and simplified, and integrated into a complete teaching system. This is to guide students to understand and master the knowledge points, improve their practical
skills and master relevant theoretical knowledge on the basis of understanding the basic theories of the course. It plays an important guiding role to achieve the ideal teaching goal.

The second is to improve the level of faculty research. If the faculty focus on scientific research, it may become more and more narrow in the field, which is not conducive to its long-term development. In teaching practice, teachers can not only integrate the knowledge and skills learned from books in teaching, improve their own theoretical level, and find the gap between theory and practice, but also stimulate students' innovative thinking through high-quality teaching, and bring more inspiration to teachers' scientific research in the collision of ideological sparks, so as to promote the improvement of scientific research level[3].

Third, we will promote the quality of education. College education must be the education of knowledge innovation, and knowledge innovation comes from scientific research. However, it is difficult to cultivate compound talents to meet the needs of the current society only by classroom education. At present, there are many limitations in college education, which are reflected in the following aspects: first, the teaching system is rigid, classroom education is mainly based on "should", lack of deep-level communication and interaction, and cannot adapt to the requirements of The Times; Second, the teaching material system is backward, the updating speed of teaching materials is slow, and it cannot keep up with the forefront of The Times. Some teaching materials have not been updated for decades, and some advanced research results have not been timely included in teaching materials. Third, the management system is insufficient, at present, many schools pay too much attention to scientific research ability in the selection of teacher titles, and there is a situation that scientific research is light teaching[6-8]. The root cause of these problems is that there is no clear relationship between scientific research and teaching, and there is opposition and estrangement between them, and there is no good integration. In this regard, we must accelerate the combination of scientific research and teaching to form a benign situation in which scientific research results promote the improvement of education quality and colleges and universities cultivate high-quality talents to promote the development of scientific research.

3. THE WAY OF COMBINING SCIENTIFIC RESEARCH AND TEACHING

The training goal of the professional direction of equipment procurement management is to train equipment procurement management talents who "understand equipment, can manage, have a solid foundation of economic theory, and have excellent procurement management business". This training goal requires that in the teaching process, we must put the training of students' innovative thinking ability, the application of professional knowledge and the ability to adapt to the army post in the central position[9]. Due to the background of economics and management in the major of equipment procurement Management, the classroom teaching of most of its courses is highly theoretical and some knowledge points are abstract, which is not conducive to students' understanding. One of the representative courses is "Equipment Procurement Information Management". This course mainly teaches the basic theories and methods of information management, the management of equipment procurement information resources[10], and the analysis, design, development and implementation of equipment procurement information system. It is an important professional basic course closely combined with the practice of equipment procurement management. The teaching content of this course contains the basic principles of database, the basic principles of information system design, software development methods and other theoretical and abstract content, as well as the database management system, data model design, procurement information system practice and other practical links that require high innovation ability and practical ability of students.

How to make a good connection between the content of theory teaching and the content of application practice, and fully guide the students to exert their learning initiative in the teaching process, is a key issue that needs to be dealt with in the course of teaching. The teaching team that undertakes the course construction and teaching tasks attaches great importance to the combination of scientific research and teaching work, actively transforms the latest scientific research results into teaching resources, and applies them to teaching in a timely manner. The textbook "Equipment Procurement Information Management" used in this course is compiled by summarizing the scientific research results of the laboratory and combining the characteristics of the course teaching. Among them, the contents of "database principle", "information model design" and "equipment procurement information system application" are taught in experimental courses combined with actual cases of scientific research projects, and good teaching effects are received[11]. Timely summing up the experience of combining scientific research and teaching and studying the teaching methods of economic management courses based on the transformation of scientific research results will help to implement the teaching of other courses in this major, promote the organic integration of scientific research results and teaching resources in the major, and further promote the improvement of teaching quality.

The main ways of combining scientific research and teaching in the course construction of "Equipment Procurement Information Management" to promote the cultivation of students' practical ability include:

3.1. Scientific research results are introduced into classroom teaching

Classroom teaching is a two-way interaction between teachers and students. Teachers interact with students through heuristic teaching, teach cutting-edge scientific research results and research methods, and timely enrich the latest research results into teaching, teach students. After class, teachers will provide scientific research
results such as academic papers as reference materials for students to read and think about, and provide relevant teaching materials for curriculum construction. In this way, not only the course content is rich, but also effectively improve the interest of students and obtain good teaching results. While conducting classroom teaching, guiding students to participate in various scientific research activities and organizing students to participate in some scientific research work within their capacity will help expand the breadth and depth of undergraduate teaching, cultivate students’ academic interest and creative thinking ability, and improve teaching quality.

For example, the teaching team will refine and summarize the actual business of military equipment procurement management and related information management methods acquired in the scientific research process, form business norms, business flow charts, data models and management cases that can be applied to teaching, and apply the knowledge system taught in the course to teaching, so that the theoretical knowledge and practice of classroom teaching can be integrated. Knowledge permeates each other, improves the knowledge structure of students well, and guides students to learn independently.

3.2. Scientific research results are introduced into practical teaching

The characteristics of the students in the major of equipment procurement management are solid learning foundation, strong thirst for knowledge, and generally strong interest in professional courses, but there are also situations where they have little contact with the actual situation of the army and the job, do not understand the status quo of military equipment procurement management, and learn professional courses "on paper". Therefore, it is necessary to strengthen the training of students' practical skills in practical teaching links such as experimental courses and professional design, promote the digestion and understanding of professional theoretical knowledge through practice, and enhance the adaptability of students to future positions.

In view of this feature, the course teaching team extracted the typical business in the typical system from the scientific research results formed over the years, and summarized and designed the equipment procurement information management case base, involving multiple business scenarios such as procurement plan management, procurement budget management, procurement contract management, and procurement project management, covering multiple links such as the analysis, design and development of the equipment procurement information system. These cases are respectively used in case teaching, homework, experiment class, course design and other practical teaching links. Through the multi-directional application of these cases, it has well promoted the students' grasp of the actual situation of the military equipment procurement management, the digestion and absorption of the course knowledge context, and the improvement of the application practice ability[12]. The teaching team has also developed an experimental platform for equipment procurement information management, which provides a practical training environment with business simulation ability for teaching. In the course experiment and simulation practice courses, students can simulate the business processing of equipment procurement management through the simulation training platform, which can well help students get familiar with the actual business, consolidate the knowledge, and realize the smooth transition from school to work.

3.3. Scientific research results are introduced into professional teaching materials

Textbook construction is an important support for curriculum construction, and textbook is an important embodiment of the transformation of teachers' professional knowledge. Scientific research results are teachers' deep understanding of professional knowledge, and through the integration of teachers, scientific research results can be introduced into teaching materials suitable for students. In terms of content, the introduction of scientific research results into teaching materials is conducive to better analysis and elaboration of concepts and theories that are difficult to understand, highlighting the chapter focus, reflecting the frontier of professional knowledge and the process of professional knowledge research, and reflecting the scientific thinking mode of teachers. In terms of quality, it has the characteristics of strong applicability and advanced by clarifying the teaching objectives of textbooks and strengthening the training of students' learning and thinking ability. The transformation of scientific research results into teaching materials is the performance of scientific research serving teaching. Teachers' construction of teaching materials is not only beneficial to teaching, but also lays a solid foundation for further scientific research in the future.

By summarizing the results formed in the process of scientific research, the course teaching team has formed the relevant requirements and management methods of equipment procurement information management, equipment procurement information management business process, business model and information structure, equipment procurement business information system application and other aspects of materials. Based on the above materials, it compiled the chapters of equipment procurement information resource management, equipment procurement information system analysis and design, and equipment procurement management system application, and designed the perfect experimental content of equipment procurement information management, so as to pay equal attention to the theory and practice of the textbook, and the learning and application of the knowledge point complement each other, and received good teaching effects.
4. IN THE COURSE OF TEACHING, WE SHOULD STRENGTHEN THE THINKING OF COMBINING SCIENTIFIC RESEARCH WITH TEACHING

We still have a long way to go to achieve the organic combination of scientific research and teaching and effectively promote the cultivation of students' practical ability. We should deeply grasp the relationship between scientific research and teaching, adhere to the teaching as the center, focus on the theme of improving the quality of teaching, organically combine scientific research and teaching, explore a new mechanism for the deep integration of scientific research and teaching, and ultimately achieve the goal of improving students' ability to apply practice and innovation[13].

First, establish a mechanism for the integration and interactive development of teaching and research. With discipline construction as the leader, personnel training as the core, and academic exchanges as the supplement, teaching and research should promote mutual advancement and coordinated development. The effective operation of this mechanism not only needs to be designed from the top, but also needs to introduce specific policies to make it effective and concrete. First of all, in terms of system design, specific laws and regulations should be introduced to clarify the specific methods, management systems, reward and punishment measures for the integration of scientific research and teaching, so as to enhance the compulsion and feasibility of the integration of scientific research and teaching at the institutional and operational levels. Secondly, we should strengthen the publicity and guidance of the integration of scientific research and teaching. Through the guidance, teachers can realize the superiority of this way at the ideological level, and enhance the consciousness and initiative of integrating the two education.

Second, focus on improving the quality of training students. In the teaching process, teachers should impart to students the scientific quality, scientific research methods and scientific spirit necessary for scientific research, cultivate students' ability of inquiry learning, provide students with opportunities to engage in scientific research and innovation activities as much as possible, and gradually establish a new mechanism for cultivating innovative talents[14]. In this way, the students' graduation project selection is not only targeted and realizable, but also exercises the students' ability to integrate what they have learned in class into practice. At the same time, the teachers complete the scientific research project in the process of guiding the students, thus achieving a win-win goal. This way not only changes the traditional teaching methods, stimulates the students' thirst for knowledge, but also improves the relationship between teachers and students, from "dominating" to "leading", and becomes the cooperator of students' study and research.

Third, establish a scientific and reasonable teacher evaluation mechanism to promote the coordinated development of teaching and scientific research. In the evaluation, different criteria should be adopted for different subjects and different types of teachers. In the evaluation method, it is necessary to combine quantitative evaluation with qualitative evaluation, and evaluate the scientific research activities of teachers more objectively, scientifically and comprehensively from the two aspects of quantity and quality[15]. At the same time, the integration of teaching and scientific research should be taken as an assessment item, such as whether the teacher is reading the text in the classroom or using the latest research to enrich the classroom education content, whether the student participates in the faculty research project and other indicators into the comprehensive evaluation system of the faculty, urging the faculty to organically integrate scientific research and teaching.

Fourth, establish a coordinated teaching and research incentive mechanism. To establish a series of incentive mechanisms to encourage teachers' enthusiasm in teaching and scientific research, coordinate the contradictions between teaching management and scientific research management, and establish a scientific incentive mechanism for teaching and scientific research is more conducive to the overall improvement of teaching and scientific research level[16]. Encourage teachers to organically combine teaching and scientific research, reward good work, and promote good experience to learn, so that teachers no longer have to be burdened with teaching and management trifles all day long and have no energy to invest in scientific research or only focus on scientific research projects and ignore teaching, both in the organic integration to achieve a win-win situation.

5. INTRODUCTION

The combination of scientific research and teaching plays an important role in promoting the quality of education in colleges and universities. From the reality, whether it is colleges or teachers, many people have not formed this awareness. By analyzing the significance of the integration of teaching and scientific research, this paper analyzes the specific path of integrating scientific research results into classroom education, practical teaching and professional textbooks, and puts forward relevant opinions and suggestions based on the actual situation of current colleges and universities, so as to provide reference for the research on the combination of teaching and scientific research. However, at the specific operational level, it is also necessary to introduce effective policies and measures in combination with the actual situation of the unit to prevent the occurrence of acclimatization.

REFERENCES


