

Construction of practical teaching system of applied colleges and universities based on cultivation of innovation ability

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Abstract

Applied talents with innovative ability are new talents urgently needed by the society at present. Applied colleges and universities are important places to train such talents. However, the talent training system and training mechanism of application-oriented colleges and universities are not perfect enough. The construction of a practical teaching system based on the cultivation of innovative ability conforms to national policies and social needs, and it is also the responsibility of The Times for young teachers to cultivate talents with professional ability, practical application ability and innovative ability. This paper analyzes the problems existing in the training of innovation ability in practical teaching in application-oriented colleges and universities, explores the construction of practical teaching platform with hardware and software platform, builds a practical teaching system for cultivating innovative talents, and reflects the responsibility and mission of The Times for young teachers in colleges and universities.

Keywords: innovation ability, practical teaching, applied colleges and universities, young teachers, teaching system

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1. Introduction

At present, the society is in short supply of application-oriented technical talents, especially those with innovative ability. In 2020, The State Council issued the Overall Plan for Deepening the Reform of Educational Evaluation in the New Era, pointing out that the establishment of application-oriented undergraduate evaluation standards should be explored, highlighting the cultivation of corresponding professional capabilities, practical application capabilities and innovative capabilities. In 2021, the Ministry of Education issued the Implementation Plan for the Review and Evaluation of Undergraduate Education and Teaching in Ordinary Colleges and Universities (2021-2025), pointing out that new application-oriented colleges and universities should focus on the cultivation of application-oriented talents, the cultivation of innovative ability, the service of regional economic and social development, and the highlighting of local characteristics. As one of the first batch of application-oriented universities in the country, Nanning University constantly explores ways and methods to improve the quality of training application-oriented talents. The practice teachers of Nanning University are mainly young teachers, and it is the responsibility and mission of young teachers to cultivate applied talents with innovative ability. This paper analyzes the problems existing in the practice teaching training of applied talents with innovative ability in applied colleges and universities, and proposes to build a practice teaching system based on innovative ability training.

2. Analysis of the current situation of cultivating innovation ability in practical teaching

It is the responsibility and responsibility of application-oriented colleges and universities to cultivate application-oriented and innovative talents. Young teachers are the pioneers of innovation ability training. However, there are still some problems in practice teaching and innovation ability training in application-oriented colleges and universities.

2.1 Teaching mode emphasizes theory and ignores practice

Application-oriented colleges and universities have been formally established in China for a short time, and most of them adjust the proportion of practical teaching based on the reference of academic colleges and universities. The concept of "emphasizing theory and neglecting practice" (Pan, 2023) cannot be fundamentally changed, and the academic mode has obvious trace in practical teaching methods, with teachers speaking on stage and students listening on stage. It cannot highlight the central position of cultivating students' innovation and application ability, stimulate the source power of students' learning, the effect of application ability and innovation ability is not ideal, and the vitality of young teachers cannot be fully demonstrated.

2.2 Insufficient allocation of practical teaching resources

In recent years, application-oriented colleges and universities have developed rapidly, but the allocation of practical teaching resources is obviously insufficient, the construction of practical teaching conditions in schools cannot keep up with the development of teaching requirements, and there is a phenomenon that some experimental and practical training projects cannot be opened (Sun, 2024), or the number of equipment and sets is insufficient, and teaching is going through the formalities, let alone the cultivation of operation application ability and innovation ability. The insufficient allocation of practical teaching resources also affects the growth of young teachers.

2.3 Insufficient depth of school-enterprise cooperation

Application-oriented colleges and universities need to train application-oriented and innovative talents closely related to social needs and enhance their ability in social practice. School-enterprise cooperation is an important way for schools to cultivate application-oriented talents. However, the demand of universities and enterprises is not closely related; Part of the school-enterprise cooperation is only reflected in internship, internship and employment, and the integration with the curriculum is not high (Xu, 2024), resulting in the training of talents even out of touch with social needs, and do not have the ability to innovate. At the same time, most young teachers in colleges and universities enter the platform after graduation from school, without industry working background, and are quite lacking in cultivating students' innovation ability and application ability. The lack of school-enterprise cooperation also affects the growth of young teachers.

2.4 Lack of innovative education in practical teaching

At present, most of the experimental and practical training projects are set up in accordance with the requirements of the textbooks, mainly with verification and design, which are obviously insufficient in stimulating students' exploration ability and cultivating students' innovation ability (Cui, Yang, & Zhang, 2023). There are few large-scale comprehensive experiments and practical training projects that can cultivate students' innovation and application ability, and fewer teachers guide students to carry out innovative experiments and practical training. Today, with the rapid development of technology, strong innovation ability is needed to support the progress of technology. Students should invest a lot of time in practical operation and innovative design experiment and training projects to find a better design scheme. The fundamental way to solve the above problems is to reform the practical teaching mode and build a practical teaching system based on the cultivation of innovative ability. Give full play to students' subjective initiative and creativity in practical teaching, stimulate students' innovative consciousness of active exploration, cultivate students' technical innovation ability, theory and practice ability, and improve students' comprehensive quality. Young teachers actively grow up, do a good job in the vanguard of training innovative talents, and take the responsibility of training talents.

3. Basic structure of practical teaching system

The construction of practical teaching system based on the cultivation of students' innovative ability includes two parts: hardware platform construction and software platform construction, and its architecture diagram is shown in Figure 1.

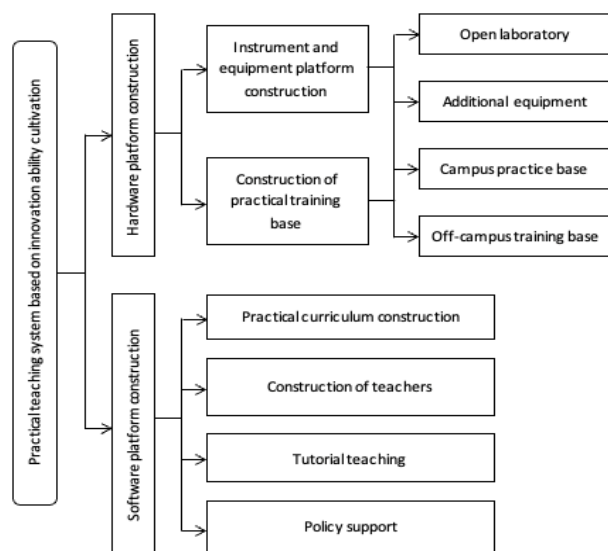


Figure.1 Architecture diagram of practical teaching system based on innovation ability cultivation

4. The main measures of practical teaching reform

Practical teaching is an important way to cultivate students' innovative ability. A perfect practical teaching system includes hardware platform and software platform. The hardware platform is the basic carrier of students' experiment and training, and the software platform is the educational concept and cultural environment supporting the hardware platform to play its role. The following will introduce the practical teaching system based on innovation ability cultivation from the hardware and software platform.

4.1 Hardware platform construction

The hardware platform of practical teaching includes the construction of experimental and training room in school and the foundation construction of practice and training outside school.

4.1.1 Construction of campus experiment and training room

Students' applied innovation ability needs to be cultivated in the experiment and practice training. Students can gradually master professional knowledge, master professional skills and cultivate innovation ability by designing various schemes, constantly exploring and experimenting in the experiment and practice training. To build an on-campus experimental training platform, it is necessary to strengthen the exchange and study among schools, visit and investigate the laboratory construction of relevant universities in China, combine the regional economic development of Guangxi with the demand for application-oriented innovative talents of relevant enterprises, formulate the laboratory hardware construction planning plan and implement the laboratory construction project according to the guiding professional norms of colleges and universities. Fully open the laboratory, so that students can get the maximum practical exercise in the laboratory. Young teachers actively participate in the construction of laboratories, and participate in the design, exploration and innovation of experimental training projects.

4.1.2 Off-campus practice and training base construction

Off-campus practice and training base is one of the important places for students to cultivate their application ability and innovation ability. Only by entering the first-line production enterprises can they really integrate into the actual needs of society. At present, Nanning University has built more than 200 off-campus practice and training bases, such as ZTE Corporation, Guangxi Construction Engineering Group, iFlytek Corporation, Gaobo Software Institute, Guangxi Zhuang Autonomous Region Urban and Rural Planning and Design Institute and other enterprises. Application-oriented colleges and universities should carry out comprehensive enterprise research and in-depth study on the needs of enterprises for talents, and carry out in-depth cooperation with enterprises in the aspects of talent training program formulation, experimental and practical training project design, student internship and practical training employment, graduation design guidance, expert lectures, school-enterprise cooperative scientific research, enterprise real projects, teachers' temporary training in enterprises, etc. The school can truly train applied innovative talents for local economic development and social needs. Young teachers go to enterprises for temporary training, use their own knowledge to solve technical problems for enterprises, learn professional skills from enterprises, and lay the foundation for better training applied innovative talents.

4.2 Software platform construction

The construction of software platform includes the construction of practical teaching course system, the construction of double-qualified teachers, the construction of tutorial teaching system and the construction of related supporting policies.

4.2.1 Construction of practical teaching curriculum system

The practical teaching course plays a very important role in improving students' practical ability, knowledge

mastery ability and innovation consciousness. To establish the practical course system scheme for each major of the University of Applied Technology, it is necessary to increase the practical content of the course, design more creative and innovative practical projects, and increase the design and comprehensive experimental training projects on the basis of balancing theoretical courses and practical courses. For example, in the building materials experiment course, after the basic experiment, students can conduct exploratory experiments in small groups, guide students to consult literature, determine new experimental schemes, choose building materials by themselves, and set the types and proportions of materials without limitation, and use experimental reports and analysis reports as project results. Improve students' ability of exploration, innovation, creation, literature review, hands-on operation, thinking, teamwork, writing articles and so on (Yan, 2024). Young teachers are the main force of the reform of the practice teaching curriculum system, and should actively explore the creative and innovative practice teaching curriculum system, and be the pioneer of the cultivation of innovation ability.

4.2.2 Construction of double-qualified teachers

To cultivate innovative applied talents in applied colleges and universities, a strong team of double-qualified teachers who understand both theory and professional skills are needed. Therefore, it is necessary to change the educational concept of young teachers and return to the cultivation of students' innovative ability and application ability. It is necessary to study the ways to cultivate and establish a double-qualified practical teaching team mainly composed of young teachers by exploring talents from enterprises to teach in schools, training school teachers to take temporary positions in enterprises, cooperating with enterprise projects in schools, and participating enterprise talents in teaching. First, through training, exchange, visiting enterprises and other ways to change the traditional teaching concept, establish the teaching concept of teacher innovation and practice, and cultivate the spirit of responsibility of young teachers; Second, colleges and enterprises should cooperate deeply to cultivate the application ability of young teachers; Third, introduce "double-qualified" teachers and send teachers to enterprises to exercise and improve the practical ability and innovation ability of teachers. The establishment of young teachers mainly with young vitality, exploration spirit, innovative consciousness of the dual teacher team.

4.2.3 Construction of tutorial teaching system

Research on the establishment of a pilot tutorial teaching system, that is, undergraduate students start to implement a tutorial teaching system with a tutor leading 5-8 students, and students participate in the whole process of the teacher's project research, carry out relevant experimental and practical training projects under the guidance of the teacher, study the improvement direction of the project and explore innovative design directions. The tutor consolidates the students' theoretical knowledge through subject meetings, exchange guidance, academic lectures and other forms. According to the tutor's requirements, the students design cutting-edge, design, innovative and comprehensive experimental and practical training projects, and the students follow the teachers to practice in enterprises. Comparing the effect of traditional teaching mode and tutorial teaching mode, comparing the improvement of students' ability, forming a perfect tutorial teaching system.

4.2.4 Relevant support policy construction

To carry out practical teaching reform needs the support of relevant policies, in order to fully mobilize the active participation of teachers, enterprises, students, administrators and other social forces. Actively guide teachers to participate in the discussion of the reform of practical teaching mode, actively participate in the real project of the enterprise, participate in the temporary training of the enterprise, participate in the practical teaching guidance system, and go to the transformation of double-teacher teachers; Research and formulate relevant systems to attract enterprises to participate in the practical teaching of the school, actively set up off-campus practical teaching bases, and train application-oriented talents with innovative ability needed by the school; Formulate relevant systems to encourage students to actively carry out the exploration of practical experiments and training projects, so that students can actively participate in practical projects and love the design, creation and innovation of practical projects. To mobilize the enthusiasm of all parties, young teachers

should fully join in the wave of cultivating students' innovative ability through practical teaching.

5. Effectiveness of practical teaching in Nanning University

Nanning University has been committed to the training of applied and innovative talents for a long time, keeping up with the needs of society, and cultivating a large number of applied talents with innovative ability for the society, and achieved good results.

5.1 Application of practical teaching information management platform

The self-developed practice teaching information management platform of Nanning University was put into use in 2019, realizing the standardization of practice teaching management, the sharing of resources, the opening of laboratories, the development of innovative projects, the double selection of teacher-student projects, the innovative design of teacher-student projects, the appointment of laboratory equipment and other functions, and contributing to the training of young teachers and application-oriented talents with innovative ability.

5.2 Research on practical teaching platform of "Four truths and five combinations"

In practical teaching, Nanning University adopts the "five truths and four combinations" (Ren, 2022) of "true project, true environment, true learning, true doing, teacher-student cooperation, teacher-student cooperation, teacher-student cooperation, teacher-teacher cooperation, teacher-teacher cooperation" to carry out practical teaching, and has achieved great results.

5.3 Achievements of school-enterprise cooperation platform

Nanning University has long been committed to the development of industry-university-research cooperation and education, and has conducted school-enterprise cooperation with a large number of large construction enterprises, such as the establishment of industrial colleges with ZTE Corporation, IFlytek Corporation of Science and Technology, Gaobo Software Company, and school-enterprise cooperation with Guangxi Construction Engineering Group and Guangxi Hualan Geotechnical Company. Every year, students go to enterprises for internship, practical training and employment more than one-third of the total number of students. In close cooperation with enterprises, the application ability and innovation ability of young teachers and students have been qualitative leap.

5.4 Double division team growth

Training applied talents with innovative ability needs a large number of teachers with innovative ability and application ability, young teachers bear the brunt. Nanning University has long cultivated a large number of young teachers through school-enterprise cooperation, teachers' temporary job training in enterprises, social practice training, exchange learning, project research and other ways, making them double-qualified teachers with solid theoretical foundation and practical ability (Li, 2023). At the same time, a group of high-quality talents are introduced from enterprises to form a strong practical teaching team. At present, there are more than 200 double-qualified teachers in Nanning University, and more than 90% of them are young teachers under the age of 45, which lays a solid foundation for the school to train applied and innovative talents.

6. Outlook

Training applied talents with innovative ability is the responsibility of The Times for applied colleges and universities, and it is also the responsibility of The Times for young teachers in colleges and universities. China is in the period of rapid development of science and technology, in the face of changes in the world pattern and the problem of "bottleneck", each young person has his own mission, colleges and universities are an important position of talent training in the new era, and must undertake the task of training applied talents with innovative

ability. It is believed that with the joint efforts of the country, society and universities, the young generation of college teachers will grow up quickly, have the courage to take on important responsibilities, and train more outstanding talents needed by the country and society.

7. Reference

- Cui, Y., Yang, J. J., & Zhang, Y. (2023). Exploration of practical teaching modes in application-oriented universities under the background of industry-education integration. *Shaanxi Education (Higher Education)* (04), 44-46.
- Li, X. F. (2023). Research on the collaborative management mechanism of practical teaching ecosystems in application-oriented universities. *Shanxi Youth* (07), 169-171.
- Pan, S. B. (2023). Exploration of practical teaching reform for electronic information majors in local application-oriented universities. *Cai Zhi* (30), 97-100.
- Ren, H. H. (2022). Construction of a practical teaching system for software engineering majors in application-oriented universities under the background of emerging engineering disciplines. *Office Automation* (20), 30-32.
- Sun, Y. (2024). Exploration of the construction path for industrial colleges in application-oriented universities based on practical teaching innovation. *Education Informatization Forum* (02), 87-89.
- Xu, Y. (2024). Research on the construction of a practical teaching system in application-oriented universities. *Henan Economic Herald*, 012.
- Yan, Y. B. (2024). Construction of a practical teaching system for mathematics majors in application-oriented universities under the background of industry-education integration. *Journal of Nanyang Normal University* (05), 93-97

