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Research on "Undergraduate Tutorial System" Mode of College-Enterprise Cooperative Education

-- Take the Electronic Information Science & Technology Major of Jining Normal University for Example

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Abstract

This paper presented practical solutions and suggestions for the problems encountered in the process of implementing the undergraduate tutorial system of college-enterprise cooperative education in local colleges on the premise of giving full play to the talent and resource advantages of both sides. These solutions and suggestions have achieved good results in education through examination in teaching practice and application, and also promoted effective implementation of the college-enterprise cooperative education of the electronic information science & technology major in this university.

Keywords

Undergraduate tutorial system; college-enterprise cooperative education; mode research.

1. Introduction

Today the undergraduate tutorial system in overseas universities represented by Harvard University, Oxford University, McGill University, etc., has grown relatively mature with much novelty, diversity and effectiveness: for example, Cambridge University implements "versatile teacher" tutorial system which gives comprehensive guidance to students in terms of ideology, study, work and life; Oxford University implements "expert mode" tutorial system which mainly provides targeted professional guidance to students from the tutor's research direction; Oxford University implements the tutorial system characterized by dormitory which makes tutor a real good mentor and friend to student[1]. However, the tutorial system didn't start in China until the 21st century when a group of universities represented by Peking University, Tsinghua University and Zhejiang University began to implement undergraduate tutorial system in some faculties and have made preliminary achievements so far[2]. With the implementation and development of the tutorial system at home and abroad, in the context of the emerging engineering education times the research on the new mode of college-enterprise cooperative education—undergraduate tutorial system which is suitable for local universities can help inspire students' innovative thinking and cultivate their innovation consciousness, further promote the implementation of college-enterprise cooperative education in local universities and, more importantly, have certain theoretical value and research significance to the close integration of production, study and research.

A. Implementation status and problems of the "undergraduate tutorial system" mode

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Undergraduate tutorial system mainly guides students in ideology, study and life based on individuality by establishing a "learning guide" relationship between teacher and student. It has been widely applied in China as a new teaching mode and has been playing a more important role which is irreplaceable by other teaching modes especially in the process of college-enterprise cooperative education. Therefore, the department undergraduate tutorial system was implemented on the undergraduate students of electronic information science and technology major based on the cooperative education by Jining Normal University and Qingdao Software Park for this undergraduate major based on the traditional credit system and class organizational system according to school administrative measures. The following problems are encountered during the implementation:

a. Tutor selection and employment mechanism is not perfect. The current tutoring system only applies to the selection and employment of on-campus tutors but imperfect for the college-enterprise cooperative education mode characterized by three-year study in school and one-year internship in enterprise. Students only have on-campus tutor during the first three years in school but no off-campus tutor in the last year's internship and there are no selection and employment mechanism for such tutor. Instead, such work is done by on-campus tutor by remote guidance which is very difficult. This will inevitably form a "free" mode of internship which is not conducive to further development of the students' innovation ability.

b. Two-way selection mechanism between teacher and student is absent. The current tutoring system only allows students to choose their tutor according to the tutor's information, but tutors are not entitled to choose their students. This is not helpful for building a good mutual understanding between teacher and student and introducing the resource competition consciousness.

c. Division of responsibilities is not clear. The current tutoring system failed to define the respective responsibilities of tutor, class adviser and specialized course teacher, which may not only lead to overlap and dislocation of the three jobs but also leave "vacuum" zones. The tutors "seem to have done anything in all aspects, but also seem to have done nothing, and everyone is of no difference", which will not take the advantages of the tutoring system.

B. Improvement of the "undergraduate tutorial system"

In the context of the college-enterprise cooperative education, we should face the existing condition of our school according to the department's talent training objectives, faculties, teaching and research status, students' quality levels, human and financial resource allocations and so on, combine the undergraduate tutorial system in the elite cultivation mode with the credit system in the popular education mode and explore the current undergraduate tutorial system. To achieve a good implementation effect and keep the implementation plan constantly improved, the existing problems must be studied and solved.

a. Employment of double tutors. On the basis of the original tutorial system implementation plan, consult with Qingdao Software Park to employ enterprise technical experts that not only hold engineer qualification certificate but also have reasonable knowledge structure, know the rules of education and are willing to keep close contact with students as off-campus tutors. During the three-year study at school students will be guided by on-campus tutor and receive two-week internship trainings at school by off-campus tutor on a regular basis; during the one-year internship in enterprise, students will be mainly guided by off-campus tutor with the assistance of the on-campus tutor. This will facilitate the cultivation of innovative, application-oriented talents.

b. Two-way selection between teacher and student. The implementation of the undergraduate tutorial system relies on selective cooperation between tutor and student as the two subjects of the implementation. Tutor and student may easily establish a close tutoring relationship through frequent contact or may not get along well with each other due to disparity in

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personality or interests, etc. A case of conflict once happened in Oxford University, in which the student even run away from university[3]. Therefore, it is necessary for the tutor and student to set up an information channel between each other before establishing a tutoring relationship and build a two-way selection mechanism on this basis to facilitate the enhancement of the resource competition consciousness.

c. Clear division of responsibilities. As far as our school is concerned, the present tutorial system is not a "master key", but only a beneficial complement to the credit system and class organizational system, so we must determine the roles of the specialized course teacher, the class adviser and the tutor, make clear and rational division of their responsibilities and focus on issues which they are good at. Specialized course teacher will help students master specialized knowledge and supervise them in obtaining specialized theories; on-campus tutor will help students improve practical abilities, guide them in making learning plan and direct them to complete independent design by strengthening training guide; off-campus tutor will encourage students to experience professional roles for the purpose of enhancing their practical operation ability; and class adviser is responsible for the ideological and political education, supervising their daily life and helping with the mental adjustment.

Based on an improved undergraduate tutorial system, we can form a "3+1" three-dimensional teaching mode by combining the "secret weapon" of Oxford University and Cambridge University for talent developing—tutorial system[4] and the "dual-system" vocational education mode[5] initiated by Germany. During the three years at school, students will complete their study plan, project-based learning and research, project participation and research, independent project design, etc.; during the one-year internship in enterprise, they will complete post exercise, practical project practice, occupational imitation experience and fixed position practice, so as to complete effective implementation of the full-course, all-around and three-dimensional "3+1" tutorial system for college-enterprise cooperative education by recognizing, imitating and experiencing such learning process. The technical route is shown in Figure 1:

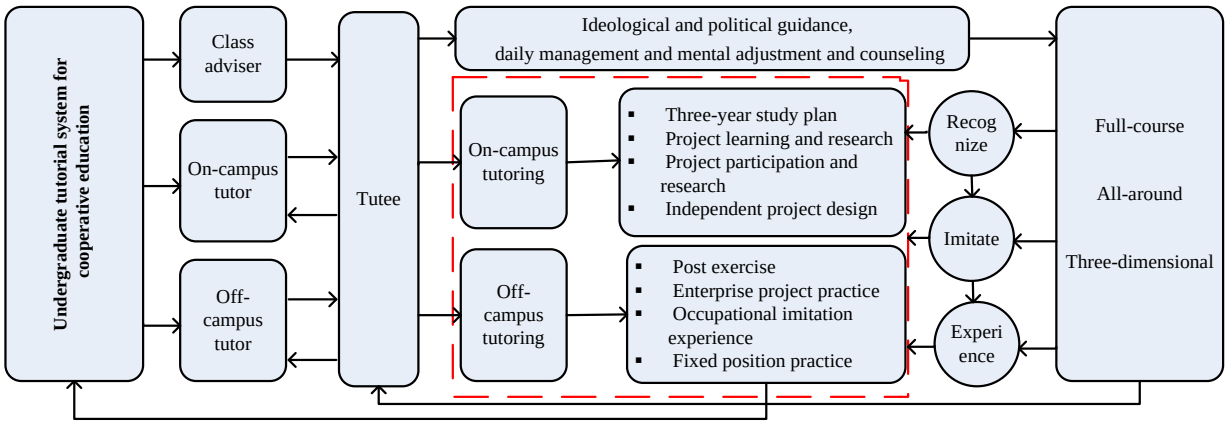

Figure 1. Technology Roadmap of Undergraduate Tutorial System Mode

C. Implementation effect of the "3+1" undergraduate tutorial system

Under individualized guidance of the tutor, students not only improved their learning interest, exerted their subjective initiative and became the real master of study, but also obtained the ability to complete certain project design independently. After the improvement, compared with previous students of this major, for example, the 30 students of the 2016 experimental class achieved these new results in the past one year: won one second and one third prize in the College Students Robotics & Computer Application Competition, successfully applied for 8 college students innovation and entrepreneurship programs, including 5 district level ones and

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3 school level ones, published 1 paper and was granted 1 patent. Through constant improvement and revision of the undergraduate tutorial system for electronic information science & technology major of this department and its effective implementation, good cooperative education and teaching results had been achieved. Tutors and students gradually built a close and harmonious relationship by communication and became good teacher and helpful friend of each other. Tutors clearly divided their responsibilities, cooperated with and learned from each other. On-campus and off-campus tutors complemented each other in terms of theory and practice. This could not only apply the tutors' scientific achievements into practice and create market value, but also help enterprise solve practical problems and bring profit. Such integrated undergraduate tutorial system for college-enterprise cooperative education will achieve the triple win of "college, enterprise and education" that closely integrates "production, study and research"!

2. Conclusion

Based on the original tutorial system implementation plan for the electronic information science and technology major of this department, enterprise technical experts meeting our conditions were hired as off-campus tutors, which perfected the tutor selection and employment mechanism; realized mutual selection between tutor and student, improved the qualities of tutors and students by enhancing the competition consciousness and eliminating the inferior and achieved optimum proportion and tacit cooperation between tutor and student; defined the responsibilities and specific work of specialized course teacher, class adviser and tutor, not only avoided overlap of work and energy waste, but also filled in "blind areas", constituted the "ability guide", "learning guide" and "occupational guide" basic education mode and formed the full-course, all-around and three-dimensional "3+1" tutorial system college-enterprise cooperative education mode.

By actively exploring the undergraduate tutorial system for college-enterprise cooperative education, problems discovered in the implementation of the tutorial system for the cooperative major of our university and Youngsoft were solved in time. Through four years of implementation of the college-enterprise cooperative tutorial system, "zero distance" job taking was basically achieved. Practice showed that this research facilitated effective implementation of the college-enterprise cooperative education in our electronic information science & technology major and provided a reference for similar majors of other universities in implementing the college-enterprise cooperative education.

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