Construction and Practice of “Tri-three Education” System Based on “Team Education”

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Abstract. “Tri-three Education” system was constructed bases on the guidance of “Team Education”. “Tri-three Education” system include “three overall education” in college (whole education, all-dimensional education, and overall course education), “three early education” about teachers (undergraduate join the team early, star the research early, and enter the laboratory early), and “three lever education” for students (bachelor, master and doctoral interact each other). The “Team Education” system is consisted of “Big college team, Small teacher team, and Tiny student team”. The advantages are obviously including the improved quality of education and Innovation results.

Introduction

Academician Wei Huang proposed the “Team Education” in School of materials science and engineering, Nanjing University of Posts & Telecommunications firstly. When he worked in Singapore and Fudan University, the original idea had been formed. The mature conception was implemented after he joined School of Materials in Nanjing University of Posts & Telecommunications. Meanwhile, the system was modified and developed.

In order to satisfy the requirement of advanced material industry, the education of innovative and practice talents become important increasingly. In School of Materials, Nanjing University of Posts & Telecommunications, high-level teacher team was constructed, and the innovative talents education in new materials area was implemented based on some advanced platform, such as emerging cross discipline (Organic photoelectronics) and some sci-tech innovation laboratories (key laboratories in provincial and national level). Since 2010, “Tri-three Education” system was completed gradually based on the guidance of “Team Education”. Many exciting outcomes have been finished in materials discipline construction and talent cultivation.

Advocating Advanced Ideas, Innovating Culture System

Establishing the Advanced Education Concept

We advocated “Team Education” concept, and incorporated the construction model of teaching and research teams in college to improve the quality of talent cultivation. The complete “Team
“Team Education” chain was formed which was constituted of three level teams. Talents are cultivated which accompanied by the construction of teaching and research teams. Based on the high-level teacher team and the individual advances, talents were cultivated with a lot of superiorities, such as, students can learn team culture deeply, utilize the advances from team, improve comprehensive quality, and enhance consciousness and capability of innovation.

Specifically, “Team Education” means when students entered the team, they can communicated with every member in team to obtain some concern and help not only in scholastic, but also in life and mentally. Especially for scientific research, students can learn some interdisciplinary knowledge including physics, chemistry, materials, and electronic to improve research interest and passion. After that process, the practical and scientific research ability of the students can be significant improved in college.

Establishing Complete Education System

![Diagram of “Tri-three Education” System Based on “Team Education”](image)

Construct complete “Tri-three Education” system based on the advanced “Team Education” concept. “Tri-three Education” system include “three overall education” in college, “three early education” about teachers, and “three lever education” in college.

Interacting Overall in College. Creating Favorable Environment

“Three Overall Education” in College (Whole Education, All-dimensional Education, and Overall Course Education)

Whole education means that every staff must take part in the process of talent cultivation. Every teacher act as director of undergraduate academically, and education assistant including administrative staff serve as part-time lead of the class. All above stuff can assist instructor improving ideological and political work, directing academic affairs, designing further, and guiding career.

All-dimensional education includes study, work, and life. Specifically, it contains specialty learning, student society, social practice, working part time, and mega-activities. Talent cultivation is implemented during the study course supported by the all college stuff.

Overall course education reflects in whole study career in college including honors day, welcome party, teacher meeting, course teaching, social practice, entrance counseling, careers guidance, job fair, graduation ceremony, and graduation party. All staff must participate and care every student.
Inheriting and influencing student in culture and spirituality of the team. Create a harmonious and worm FAMILY.

“Three Early Education” about Teachers (Undergraduate Join the Team Early, Star the Research Early, and Enter the Laboratory Early)

“The early bird catches the worm!” In the process of talent cultivation, every student must be distributed to the professional teacher when he just came in. The portioned teacher should indirect student in mind, scholastic direction, scientific innovation and start up business. Students are encouraged to join the team early for understanding disciplinary development trend and special requirement in the further. Meanwhile, research progress at home and abroad about respective research directions as well as specific research methods can also be understood adequately. Under the guidance of respective director, students enter the laboratory early to implement scientific and technological innovation practices. The enthusiasm of discovery science can be motivated during this curse, and the innovative consciousness and innovative ability can be improved simultaneously.

“Three Lever Education” for Students (Bachelor, Master and Doctoral Interact Each Other)

Following the master and team, accompanying innovate project as bridge, Built the system of talent cultivation which composed by bachelor, master's and doctoral interacting each other under the platform of innovate industry-university-research cooperation base. Students apply for various innovative projects actively and accomplish through interaction among bachelor, master and doctoral. Learning from each other, complying and reinforcing each other which can run through the while process. Through the training of scientific research project, students can obtain the knowledge and operation which match well with their research direction and bring out the best in each other. The achievements can be reflected through discipline competition, academic report, thesis writing, and patent application. Stimulated by the “Team Education” concept, students are cultivated in the direction of innovation and diversification on the support of “three entire”, “three early”, and “three level” principle.

Relying on the Platform of Innovation. Improving Educational Culture

Opened Education Platform

During the implement curse of “Tri-three Education”, “Opened education platform” has been formed in our college containing time open, place open, and staff open. All of the research platforms including national and provincial level laboratories and synergetic innovation centers always open for all persons who has or would parted the relevant scientific research projects accompany by open and training freely. This policy guarantee the implement successfully of the “three entire”, “three early”, and “three level” principle.

“SCIENCE” Education Culture

Inject the scientific research environment with advocating for science and creativity into the building of educational culture in college to create a revolutionary educational concept - “SCIENCE” finally. It is the concentration of the “Team Education” concept which can be divided into seven parts: S - Skepticism, C - Curiosity, I - Industriousness, E - Ethics, N - Novelty, C - Confidence, and E - Enthusiasm. This slogan has been conserved as a motto in our college. College culture is very important which can act as soul for controlling situation, gathering strength, and displaying impression. Besides, it also has a large influence on the changing of the life and values of the students which exceed the affection from any course. College culture with positive, health, and progress can improve the character and behavior of the students. After the implement of the above advanced education concept, a series of achievement have been obtained and the influence of the college is improving among universities.
**Rich Achievements. High Social Recognition**

**Overall Participate. Widely Benefit**

Until Dec. 2017, there has recruited over 100 doctoral candidates, 1000 master candidates, and 1800 undergraduates in our college. More important, undergraduates were distributed to their respective mentor to take part in scientific research project when they joined the college. Extensive training on scientific research was carried out in the whole college to improve the innovation capability, practical ability, and comprehensive quality of the students.

**Break Out after Accumulate Continually. Rich Achievements**

There have a lot of advantages when students enter the term early, including enriching the knowledge of students, training innovation ability, enhancing the ability of innovation capability.

Achievement in academic competition: Since 2012, students have obtained 12 national first grade prizes containing “challenge cup” and energy conservation and emission reduction competition and 27 provincial discipline competitions.

Declaration of scientific research project: 5 in-service doctoral candidates have obtained financial assistance from National Natural Science Foundation successfully. Over 30 doctoral candidates and 20 master degree candidates have been sponsored by the Research and Innovation Plan for Graduate Students in Jiangsu Province. 15 students received the funding of NJUPT excellent doctoral program.

**Affect the Surrounding. Social Recognition**

The graduates are popular with enterprises and universities. In the latest 6 years, over 99 percent of the graduation and employment rate of the graduates are finished in undergraduate. The rate of take part in the postgraduate entrance exams are raising year by year: 23.5%, 24.6%, 27.5%, 28.3%, 33.2%, and 34.6%. Besides, a lot of students have been recommended to many China's top colleges to further study including University of Science and Technology of China, Fudan University, Shanghai Jiaotong University, Zhejiang University and Nanjing University. Many graduates have taken the lead in company or senior professional post in university.

We do our best to promote the overall innovation mentality, practical ability, and comprehensive quality finally, cultivate innovative talents who can adapt to the demand of economic and culture construction under the rapidly changing environment of science and market economic system. The power which can drive the speed and direction of development is attributed to our education feature -“Tri-three Education” system. Based on finding talent, respecting talent, and cultivating talents, this system promotes the path alone with the team of academician Wei Huang which respecting the frontier science and the master lead. We believe that this mode can provide a typical referential experience for cultivation of innovative talents in our country.

**Summary**

Based on the pattern of “Team Education”, extensive training on scientific research was carried out in the whole college to improve the innovation capability, practical ability, and comprehensive quality of the students. This experience can be popularized extensively in the higher education of China.

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**References**


