

Discussion on Cultivating the Innovative Literacy of Chemistry Majors in Colleges and Universities Combined with the Tutor System

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Abstract: *In order to cultivate the innovative literacy of college students majoring in chemistry, the college student tutor system is introduced in this paper, aiming at the current situation and existing problems of college students' innovative literacy training, focusing on the innovative practice ability, teamwork ability and tenacious will literacy of college students. The advantages and significance of the tutor system in cultivating the innovative literacy of college students majoring in chemistry are also discussed.*

Keywords: *Tutor system, Majoring in chemistry, Innovative literacy*

1. Introduction

Talent is the first resource, and innovation is the first driving force. Innovation literacy, as the core literacy necessary for talents in the 21st century, is an inexhaustible driving force for national progress and social development. The essence of the cultivation of innovative literacy lies in the formation of innovative personality, the development of innovative thinking and the development of innovative practice [1]. This kind of cultivation idea breaks away from the traditional narrow practice of focusing on the cultivation of innovative skills, and has a leading role in scientifically promoting the cultivation of college students' innovative literacy. Relying on the advantageous disciplines of colleges and universities, focusing on developing students' innovative and practical ability, focusing on cultivating the spirit of pioneering and innovation, the ability of independent innovation, and perseverance are the key goals of higher education. In the year of 2021, General Secretary Xi Jinping emphasized during his inspection at Tsinghua University: Teachers should become great teachers, set an example for students to learn, work and be a person, and promote students to grow into people with all-round development [2]. Such a statement points out the significance and role of the college student tutor system in the process of cultivating college students' innovative literacy.

As an important science that promotes social development, chemistry has a very close relationship with human life and plays an important role in improving people's living standards and literacy. The progress of chemistry is inseparable from human scientific inquiry and the cultivation of innovative consciousness. Contemporary college students are the main body of scientific exploration and innovation in the future. However, at present, many students majoring in chemistry in ordinary colleges and universities in our country lack systematic training in the cultivation of innovation literacy. One of the important reasons is the lack of teachers' guidance. The college student tutor system provides an effective solution for the cultivation of innovative literacy of college students majoring in chemistry.

2. Situation Analysis

In recent years, with the expansion of colleges and universities, higher education has been changing from elite to popular, and the innovation literacy of college students is also declining year by year. At present, students majoring in chemistry in our country generally lack innovative literacy such as practical innovation ability, teamwork awareness and tenacious will literacy at the university stage.

2.1. Insufficient Practical Innovation Ability

With the continuous progress of the chemistry discipline, new knowledge and new theories of chemistry are constantly being updated, and the society has more and more demands for high-tech talents with active and innovative thinking. At present, many chemistry teachers in colleges and universities in our country still use the theory-based teaching method. There is a lot of theoretical knowledge in classroom teaching and less knowledge in practical teaching, which causes a serious disconnect between theory and practice, and students cannot further consolidate chemistry knowledge through practice. Theoretical knowledge in the classroom, in this case, seriously dampens the students' enthusiasm for learning, which leads to the lack of the necessary practical innovation ability of chemistry majors.

2.2. Weak Sense of Teamwork

Innovation is inseparable from collaboration, and the cultivation of teamwork awareness is an important part of the cultivation of college students' innovative literacy. Many contemporary college students come from only-child families, and they are more self-centered in their daily life and study, and lack the concept of team and collective. The exam-oriented education model they have experienced often pays more attention to students' individual ability and ignores the cultivation of teamwork awareness. In addition, schools pay more attention to cultural courses and ignore physical education and other disciplines that can cultivate students' team awareness [3]. The growth environment further leads to the weak awareness of teamwork among contemporary college students. At the stage of higher education, the practical courses of chemistry majors are mainly focused on the basic chemistry experiments for verification, which generally only need two students to cooperate, and as a result, the effect of this process in cultivating teamwork awareness is not obvious.

2.3. Lacking of Tenacity

The demand for innovative talents in modern society is not only reflected in having excellent skills, but also in healthy psychology and strong will. The weak will literacy has become an important factor hindering the cultivation of innovative literacy of contemporary college students. The weak will of college students is mainly manifested in the lack of perseverance and perseverance to pursue ideals, fear of difficulties encountered in learning, and lack of ability to withstand setbacks. Many college students majoring in chemistry will embark on the road of scientific research after graduation, which requires them to have good innovation literacy, and the literacy of tenacity is an indispensable innovation literacy for scientific researchers. How to cultivate the tenacious will literacy of college students majoring in chemistry has become a very important educational topic to cultivate their innovative literacy and improve their comprehensive literacy.

3. Measures to Cultivate the Innovative Literacy of College Students Majoring in Chemistry Combined with the College Tutor System

For various colleges and universities, in the development of innovation, it should be adopted in the development of innovation, improve innovation, so that innovation competitiveness is improved, which is conducive to the process of our country's science and technology [4]. Through the analysis of the current situation, we found that the lack of innovative literacy of college students majoring in chemistry is mainly reflected in the lack of innovative practice ability, weak sense of teamwork and lack of tenacious will. In view of the above problems encountered in the process of cultivating innovative literacy, we propose a solution that combines the cultivation of innovative literacy of chemistry majors with the college student tutor system. Specifically, the following measures can be taken:

3.1. Participate in the Scientific Research Projects of College Tutors to Cultivate Practical Innovation Ability

A very important measure to cultivate the innovative literacy of chemistry majors is to cultivate students' practical innovation ability. Students can learn to use various information retrieval tools to consult domestic and foreign literature through participating in the research projects of their tutors, and improve the ability of literature inquiry, analysis and review, to cultivate students' ability to discover problems, have the courage to explore, and work hard to solve problems. Teachers with high professional titles and high academic qualifications generally have many projects of various special topics, which

provides a broad space for the project design and participation of chemistry students. The tutor's scientific research project can be divided into several sub-projects for students to complete, and at the same time use the school's existing experimental equipment or experimental projects under construction to develop technical products, etc., to stimulate students' curiosity, give full play to students' strengths, and actively guide and develop students' imaginations space to cultivate the innovative practice ability of chemistry majors [5].

Undergraduate tutors can also combine the characteristics of their own scientific research directions to encourage chemistry students to actively apply for provincial or national college student innovation and entrepreneurship projects, which not only mobilizes students' enthusiasm, but also improves students' practical innovation ability and cultivates their innovative literacy.

3.2. Undergraduate Tutors Lead the Cultivation of Teamwork Ability

Modern scientific research places great emphasis on teamwork. The higher education system in our country, whether it is the training goal, the curriculum system or the evaluation system, pays attention to the individual and ignores the cultivation of the spirit of teamwork. Chemistry majors actively participate in the scientific research projects of their tutors or apply for innovation and entrepreneurship projects for college students relying on the scientific research background of their tutors. In addition to a conscientious work style, an ordinary work attitude and a lofty ideal of striving for scientific research, they also need teamwork spirit. Scientific research itself is a arduous exploratory work. Whether there is a clear division of labor within the team and whether the time and tasks are reasonably allocated are the keys to the success or failure of scientific research [6]. The scientific research team led by the tutor can fully exercise the teamwork ability and group innovation ability of chemistry majors, and cultivate the innovation literacy of college students.

3.3. Undergraduate Tutors Lead the Cultivation of Tenacity and Will to Deal with Setbacks and Difficulties

Whether chemistry majors are engaged in scientific research work or enter a corporate position after graduation, the cultivation of tenacity is very important. The road of scientific research is not destined to be smooth sailing. In the process of participating in the scientific research projects of the tutors or the innovation and entrepreneurship projects of college students, in the face of boring experiments, there must be thoughts of giving up. For the difficulties and setbacks, the tutors can timely communicate with students, assist them to overcome difficulties, build confidence, and improve their tough will to deal with setbacks and difficulties.

4. Conclusions

The core connotation of innovative talent training is to develop students' innovative literacy, and the improvement of innovative literacy is an important part of the comprehensive ability training of contemporary college students. Aiming at the cultivation of college students' innovative practice ability, teamwork ability and tough will to deal with difficulties and setbacks, the college student tutor system has great advantages, which can improve the innovative literacy and comprehensive literacy of chemistry students, and help them adapt to the needs of contemporary society, providing a strong guarantee for being competent for jobs full of competition.

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