Research on the Role of Science and Technology Innovation Competitions in Enhancing the Comprehensive Ability of Liberal Arts Undergraduates

Jin He*, Yulu Bi, Xi He

School of Grammar and Economics, Wuhan University of Science and Technology, Hongshan District, Wuhan City, Hubei Province, China

*corresponding author.

Keywords: Competition; Undergraduate; Innovation; Comprehensive ability

Abstract: In-depth scientific and technological innovation achievements are an important reference for considering the comprehensive literacy of graduates. Science and technology innovation competition can effectively promote learning, teaching and innovation with competitions. It is an important starting point for improving the comprehensive ability of liberal arts university students. However, the lack of high-quality competitions for liberal arts majors, the limited knowledge of liberal arts students themselves about science and technology innovation competitions, and the lack of professional teacher guidance for liberal arts participating projects hinder the enthusiasm and scope of liberal arts undergraduates to participate in the competition. It is necessary to enrich the discipline competition system, build a team of professional tutors and construct a competition service platform to truly realize the "three-wide education".

1. Introduction

In-depth scientific and technological innovation achievements are an important reference for considering the comprehensive literacy of graduates. Science and technology innovation competition can effectively promote learning, teaching and innovation with competitions. It is an important starting point for improving the comprehensive ability of liberal arts university students. How to view the participation of liberal arts undergraduates in science and technology innovation competitions and how to improve the ability of liberal arts undergraduates to participate in science technology innovation competitions? The author used questionnaires and interviews to survey students and teachers of liberal arts majors in various universities.

2. Current situation of undergraduate students in liberal arts participating in science and technology innovation events

As shown in Table 1, 81% of the university students were interested in participating in science and technology innovation competitions, 33.7% of them had participated in science and technology innovation competitions during their university years, and 90.8% of them said they were willing to participate in science and technology innovation competitions if they had the opportunity. In the interviews, most of the teachers and students appreciated and encouraged undergraduates in liberal arts to participate in science and technology innovation competitions, and thought that it was significant for undergraduates to participate in science and technology innovation competitions. However, the survey also found that there are still some problems with liberal arts undergraduates participating in science and technology innovation competitions.

Table 1 Status of participation of undergraduate students in the competition.

Project	Interested in participating in the competition	Have participated in a competition	Willing to participate in the competition
Percentage	81%	33.7%	90.8%

  DOI: 10.25236/assah.2021.011

2.1. Lack of high-quality competition projects in liberal arts majors

The unbalanced layout of the levels and types of science and technology innovation competitions is likely to bring about an imbalance in the cultivation of innovative talents among majors and bring the risk of structural imbalance to the future talent supply [1]. From the distribution of the current more influential competitions, the science, agriculture and medicine categories account for most of the competitions funded by the Ministry of Education, while the humanities and social science categories are relatively few, and even in comprehensive competitions such as *Internet plus* and *Challenge Cup*, the percentage of winning liberal arts categories is relatively low. This gives us two hints: ①Are there any deficiencies in the competition projects for liberal arts majors in China? In the layout of competition projects, there seems to be a gap in the science and technology innovation competition projects that can give full play to the advantages of liberal arts undergraduates; ②Due to the lack of award-winning achievements with high recognition of gold content, there must be some deficiencies in the input of subject competition resources and institutional support for liberal arts majors. Will this form a vicious circle?

2.2. Liberal arts students have limited knowledge of science and innovation competitions

Undergraduates of liberal arts in universities have a low level of participation in science and technology innovation competitions, and there is a contradiction between their enthusiasm for participating in competitions and their limited personal abilities. On the one hand, students are eager to show themselves and show a positive and active mental state; on the other hand, they have a fearful and hesitant attitude towards their participation in science and technology competitions, their main role is insufficient, the courage and ability to engage in practice are lacking, and the consciousness of independent innovation is also lacking. There are also some students who participate in science and technology innovation competitions for the utilitarian purpose of winning prizes, as well as for the future evaluation of prizes and merits, and to keep their studies abroad, not because they are interested in the content of science and technology innovation competitions, or because they want to broaden their horizons, their knowledge and improve their scientific research ability.

2.3. Liberal arts competitions rarely have professional teacher guidance

In addition to financial analysis and marketing, liberal arts projects often lack core technical support and the guidance of professional teachers in engineering technology. Students and teachers can only rely on their own theoretical knowledge and understanding to complete the competition, and the quality of their works is not guaranteed. Also, it is difficult to get good rankings, which seriously affects teachers' interest and restricts students' ability development. In addition, the current guidance for most liberal arts competition projects relies on teachers' automatic, spontaneous, and conscious enthusiasm, and there is no standardized professional guidance system.

2.4. There are still many obstacles to the development of innovation ability of liberal arts undergraduates

The inertia of traditional teaching and thinking needs to be changed. In addition, some liberal arts undergraduates are relatively loose in learning, lack the motivation for innovation, live a comfortable life, and lack the passion for innovation. Some teachers think that liberal arts undergraduates cannot meet the requirements of scientific research and events, and there is no need to spend time beyond their major studies, while some parents and students think that participating in science and innovation events will consume too much energy and is meaningless. The teachers' insufficient guidance for students to participate in science and technology innovation events, the lack of school resource investment and policy incentive guarantee, the overly rigid education of some majors, and the lack of innovative thinking cultivation all affect and limit the enthusiasm and scope of students' participation in science and technology innovation events.

3. The value of science and technology innovation competition to enhance the comprehensive ability of undergraduate students in liberal arts

The innovation-driven development strategy has been set as a basic national policy by the Party Central Committee [2], and education departments and universities at all levels are paying more and more attention to the cultivation of science and innovation quality, while employers are taking the in-depth science and innovation achievements as an important reference in considering the comprehensive quality of graduates.

3.1. Science and technology innovation competition is an important means to improve the innovation and practical ability of liberal arts university students

An important part of developing creative skills is to cultivate the spirit of questioning and improve hands-on skills. Science and technology innovation competitions often involve multiple disciplines, which can broaden the horizons of liberal arts students, broaden the scope of knowledge and enhance their creativity and imagination. In the process of guiding students to discover the "key, difficult and hot" issues in society, so as to summarize the "social pain points" and propose solutions. In the process, students can develop an interest in science and technology, a habit of academic inquiry and a contribution to social responsibility by acquiring knowledge through hands-on work [3]. This can cultivate students' awareness, thinking and ability of innovation, promote the organic combination of theoretical knowledge and practice, and enhance students' practical ability.

3.2. The science and technology innovation competition provides a platform for liberal arts university students to cultivate the spirit of collaboration and cooperation ability

Science and technology competition projects are often not completed by one person and need to rely on the strength of the team. Under the guidance of teachers, teams often combine the knowledge structure, interests, and abilities of each member and decompose the overall goal to each team member, so that each team member has his or her own role and responsibility, and then burst out the team's strength to make the maximum contribution to the team. The consistency of the goal of participation and the contribution of individuals to the team can make team members identify with each other psychologically, form a collective consciousness, and enhance the spirit of cooperation, communication, and collaboration.

3.3 The science and technology innovation competition improves the professional quality and employability of liberal arts university students

The results of science and technology innovation competitions are generally in four major categories: research reports, scientific and technical papers, patents, and competition works. The process of generating successful science and technology innovation categories provides undergraduate students in the liberal arts with opportunities for scientific research training, allowing students to enter the scientific research field of the major as early as possible, to contact and understand the frontier and development trends of the discipline, to understand the practical application of professional knowledge, to cultivate students' ability to connect theory with practice and work independently, to build core competitiveness and personal brand for employment, and to become talents who can adapt to market demand in terms of ideas, knowledge, methods, abilities and qualities.

4. Thoughts on the participation of liberal arts undergraduates in science and technology innovation events to enhance their comprehensive ability

4.1. Enrich the academic competition system and strengthen the academic atmosphere on campus

Formulate the management methods of the university's major creative training programs and competitions, improve and standardize the system of students' scientific and creative competitions.

Based on the integration of event resources, systematically design and build an interconnected competition system for undergraduate students in liberal arts. To build a regular, grade-specific and focused campus science and innovation competition mechanism for all students, set up internal science and innovation competitions aiming at major domestic and international events, and actively organize students to participate in various competitions at all levels outside the university. Focus on creating 1-2 branded events according to majors, run through the five-level competition system of "academic, school, provincial, national, and international" according to the competition level, intervene and control in key aspects and time points of the competition. Recommend excellent works to participate in high-level competitions.

4.2. Build a professional mentor team to enrich the connotation of competition education

The concept of "three-wide education" advocates whole-person, whole-process and all-round education [4], and the science and innovation competition can also play its function of education, so as to promote learning by competition, cultivate innovative and entrepreneurial forces; promote teaching by competition, explore new ways of quality education; promote innovation by competition, build a new platform for transformation of achievements. By promoting education and teaching reform with competitions, integrating competition training skills with participating works, integrating the connotation of discipline competitions into education and teaching practice, combining professional learning and enriching students' competition knowledge, and integrating students' science and innovation competition projects into talent training system, innovation education is no longer an optional "embellishment" in talent training, but a mandatory requirement. For the science and technology innovation competition projects in liberal arts, we should not only promote the implementation in education and teaching to improve the practical ability of students, but also give resources to the leaders to drive the development of the overall faculty. Support instructors to participate in various kinds of competitions at all levels inside and outside the university, to participate in production practice, social investigation and important academic conferences at home and abroad, and to implement "project-oriented" guidance for university students' works, so as to continuously improve the academic quality and guidance level of competition instructors, and to serve for better guidance of students and create high-level competition works. At the same time, improve the existing evaluation thinking, reform the examination methods, encourage innovative students to stand out, and give innovation credits to students who participate in academic competitions and win awards, scientific and technological inventions, etc., so that students with outstanding performance in science and technology innovation competitions can be recognized in exemptions, awards and merit evaluations.

4.3. Build a competition service platform and integrate various resources of human and financial resources

In addition to the lack of good ideas and thoughts, university students often worry about information channels, project sources, and team formation when participating in various science and technology competitions, especially for projects that require interdisciplinary implementation. It is even more difficult to implement when students do not have enough knowledge and manpower. Coupled with the lack of necessary equipment, materials and intellectual support, many students' ideas are not put into practice. The construction of a competition service platform [5] can bring together university students participating in the competition, provide students with competition-type resources and experience guidance, and solve the practical problems encountered by university students in the process of participating in the competition. In the process of project development, it can obtain timely resources from all parties for participation, timely, comprehensive and systematic access to scientific research sites, training mechanisms and financial support, in order to break the siloed links, integrate information of each event, build a bridge of communication between teachers and students, link the forces of the school and society, work together for the development of science and innovation competitions on campus, improve the ability and level of organizing and hosting competitions, and form an event operation and guarantee system that is closely integrated with talent cultivation and mutually promoted.

5. Conclusion

The science and technology innovation competition for university students is an important part of the "three-wide education" and an important part of the talent cultivation work in universities. Taking the science and innovation competition as the guide, comprehensively promote the quality education of liberal arts undergraduates, and effectively improve the students' innovative spirit, entrepreneurial awareness, and innovative entrepreneurial ability. Ultimately, innovation leads to entrepreneurship, entrepreneurship to drive employment, and the science and technology innovation competition promotes a good situation in which students' comprehensive ability improves, which requires long-term and lasting exploration and innovation.

References

[1] Wu Haina. A Study of professional skills competition to promote the cultivation of multi-level innovative talents. A Management Watch, 2018, 704 (33): 119-120.

[2] Chen Kaiqi. On the development of copyright insurance in China Liaoning University, 2020.

[3] In Haiyan. Creating positive teaching situation to enhance students' internal experience middle school political teaching reference. 2019, (23): 47-48.

[4] Yuan Yingke. Constructing the “three-comprehensive”. Model with Three Patterns as Main Body higher education in China, 2020 (10).

[5] Ma Longlong, Yang Dayong. A study on real-time construction method of large event service platform. Tsinghua University Press, 2010.