

Comparative Study on the Cultivation of Innovation Ability Between Chinese and American Undergraduates

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Abstract--Innovation is the soul of a nation's progress, and is also a person's lifeblood in study and work. Competition in today's society is the competition of creativity, but the mainstream of today's China's education mode is still taking exams, the university is no exception. But American colleges and universities always pay much attention to the cultivation of students' thinking ability and practical ability. Since the higher education reform movement, the United States has been to cultivate all-round development of innovative talents as one of the goals of education reform. This article starts from the perspective of the two countries' attitudes to the cultivation of the innovative undergraduate status and education concept, with emphasis on the important role of entrepreneurial ability and scientific research ability, and some suggestions on the improvement of China's education are provided finally.

Keywords: *innovation, undergraduates, comparison, China, America*

I. INTRODUCTION

A country must innovate in order to develop. Historical facts tell us that immobility is the main reason to limit a country's development, and constant innovation is the only choice for the country to survive in the fierce competition[1]. Innovation is the soul of a nation's progress, the core of economic competition, the inexhaustible driving force for national prosperity, and the permanent source of vitality for individuals in their study and work. The competition in today's society is not only the competition for talents, but also the competition for people's creativity. Although China attaches more and more importance to higher education, there is still a long way to go to cultivate a group of innovative undergraduates. Nowadays, China's education mode is still exam-oriented, which is not conducive to cultivating students' innovative thinking. American universities have always attached great importance to the cultivation of students' thinking ability and practical ability. Since the reform movement of higher education, the United States has taken the cultivation of all-round innovative talents as one of the goals of education reform [2].

President Xi Jinping pointed out at the 2018 national education conference that efforts should be made to build an education system featuring all-round training of morality,

intelligence, physique, beauty and labor, and to form a higher-level talent training system. Reform is the fundamental driving force for the development of education. Only by vigorously promoting the reform and innovation of the education system can we make our education better and stronger. Nowadays, Chinese education places too much emphasis on students' test scores and often neglects the cultivation of their abilities. Data analysis shows that Chinese students have strong ability to take exams, but poor practical ability, especially innovation ability, and there is a significant gap with the students in the United States and other western developed countries. Specifically, China's undergraduate scientific research activities started late, the penetration rate is low, and the effect is not significant, etc[3]. To get rid of this situation as soon as possible, it is necessary to strengthen the cultivation of innovative undergraduates.

II. THEORETICAL BACKGROUND

A. *The Concept and Significance of Innovation Capability*

Innovation ability is the ability to continuously provide new ideas, theories, methods and inventions with economic value, social value and ecological value, and to put forward new views and theories on the basis of previous conclusions [4]. For the individual, it is the embodiment of learning. Learning to use is a kind of ability, and one way of learning to use is innovation. The competition in today's society is the competition of people's creativity. Only by learning how to learn can we not be eliminated in the tide of social progress. For the country, cultivating a new generation with innovative ability is the inevitable requirement of historical development. "Innovate or die," says Thomas Peters, an American management guru. If a country wants to develop and take the lead in the world, it must cultivate innovative talents. A nation without innovative talents can only be a backward nation.

B. *The Main Possible Reasons for the Lack of Innovation Ability of Undergraduates in China*

In order to improve the innovative ability of undergraduates, we must pay attention to the cultivation of innovative ability and innovative thinking. However, the current situation of the cultivation of undergraduates' innovation ability in China is not

optimistic, and the following two possible reasons are listed.

1) The teaching content is broad and not targeted enough:

At present, many colleges and universities in China have too many courses and long courses. They fail to properly consider students' interests, maximize the use of time and resources, and lack pertinence. Teachers are more likely to make teaching plans according to the curriculum syllabus and training programs than to consider students' psychology and interests, and students are less likely to be fully engaged[5]. In addition, broad teaching content will lead to the problem of too fast teaching progress, which also leads to low enthusiasm of students in class. When students have not digested the content of the last class, the new knowledge will only become a burden. In addition, even in universities in China, the learning method is mainly based on doing exercises. In class, sample questions are explained, and students have to complete the knowledge points through a large number of exercises after class. Students' participation in class is not high, and doing exercises after class is difficult, which not only reduces the learning efficiency, but also reduces students' interest in learning [6]. How to teach is very important, but what to teach is sometimes more important. Any classroom needs to respect students' learning needs and learning rules, and how to obtain higher classroom benefits at a lower teaching cost is a question that needs to be pondered by Chinese education today[7].

2) China's traditional teaching model has not yet changed:

Chinese traditional teaching pattern is formed in history, is formed in the specific cultural background, is to accept type teaching mode, "the teachers speak, the students listen"[8], the teacher in charge of the class, but now, the construction of an innovative country makes this kind of teaching mode can't adapt to the needs of the development of the modern university. China's traditional teaching mode has not yet changed and has also become an obstacle to the cultivation of innovative talents[9]. Under the traditional teaching model, students' thinking becomes standardized and knowledge becomes lifeless. When everyone has a standard answer, is the significance of education really reflected? The answer may be no. In addition, many students learn for the sake of scores from the point of view of points as heroes[10]. They cannot do what they want to do and even lose the hope of learning and even life in the cruel competition.

III. MATERIAL AND METHOD

Both China and the United States are major countries in education, but the differences in educational culture, educational system and evaluation institutions are caused by the differences in historical development[11].

A. The United States' Capacity for Innovation

The undergraduate innovative talent cultivation program in the United States is based on the principle of "independence and autonomy". The university does not impose mandatory regulations. The curriculum is not only based on the needs of the society, but also on the interests of students. In 1986, New Jersey enacted the state university autonomy act, which was the first attempt to expand the autonomy of public universities. According to the act, the public college board has the power to

determine the curriculum and majors of the university, and to establish new specialties, departments and colleges that are consistent with the academic level of the university or are approved by the state[12]. In addition, universities offer a wide range of elective courses, from the humanities to technology to entertainment[2]. Some courses, which are regarded as irrelevant or even less advocated in China, are also regarded as broadening students' knowledge and helping to stimulate their sense of innovation. In addition, American undergraduate education emphasizes general education, and the undergraduate stage lays a comprehensive foundation, so that after four years of college, the undergraduate can become a trained talent in all aspects [13].

Richard Levin, former President of Yale university, believes that teaching method is the main factor restricting the development of students' innovative ability. Students need to develop the ability of independent thinking and critical thinking, rather than blindly accept. American teaching is mainly heuristic and inductive. Teachers are willing to let students ask questions. Small-class teaching mode also enables teachers to take care of every student[14]. Individualism is very important in American culture. Everyone is unique and should have unique thinking.

B. The China's Capacity for Innovation

The major setting of colleges and universities in China is basically regulated by the state and cannot be changed at will, which, to some extent, limits colleges and universities from forming their own professional styles and is not conducive to the development of students' interests. We study hard for 12 years, all the efforts turn into the final college entrance examination, but when we are satisfied with the results but cannot choose our own satisfaction of the profession, will inevitably doubt: Are our efforts have been due to the return? What's worse, many students enter the major they don't like in order not to "waste" the score, and they can't let go of it all the time, which eventually leads to the weariness of learning. At present, some universities have carried out pilot reform in the cultivation of innovative undergraduate talents, which is mainly reflected in the expansion of professional foundation and the broadening of professional scope, namely, enrollment in large categories[15]. Major enrollment allows students to first experience the differences and connections between different majors. With one or two years to choose, students can have a deeper understanding of whether they really like a certain major. Its advantages are obvious. But because the development time is short, the shortcoming is also obvious. Students need to learn more courses, and these courses are often required at the professional level, which greatly increases the workload of students and also causes psychological pressure. Therefore, it is necessary to find a training mode suitable for China in long-term practice.

In China, teaching is mainly based on lecturing, and the class content is centered on textbooks. Teachers are particular about strict logic, clear and rigorous[5]. From primary school on, the purpose of homework seems to be to master the answer template, and students gradually become to learn for the sake of learning, fully accept and understand all knowledge points in order to get high scores, but rarely think about questioning. A

survey shows that 13.8 percent of primary school students, 5.7 percent of junior high school students, 2.9 percent of senior high school students and even fewer college students raise questions in class[16]. Doesn't this phenomenon just reflect the drawbacks of China's teaching methods?

IV. DISCUSSION

China's undergraduate scientific research activities started late, the penetration rate is low, the effect is not significant. In addition to basic classroom participation, the teaching model of combining teaching and scientific research has been adopted by many American colleges and universities. Scientific research is no longer the patent of postgraduates, and more and more undergraduates are involved in scientific research. American research universities integrate teaching and research, which is beneficial for students to change from the receiver of knowledge to the explorer[17]. Since the reform of undergraduate education in the 1980s, undergraduate scientific research activities in the United States have entered a period of vigorous development, with gradually mature operation mechanism, increasingly sufficient capital investment and more and more undergraduate scientific research activities. For example, Stanford university, state university of New York and other universities launched "Stanford undergraduate research opportunities", "undergraduate research program" and so on, encouraging students to directly participate in the research work.

In recent years, some colleges and universities in China have made a lot of attempts and changes. For example, under the guidance of teachers, students carry out research learning activities such as thesis writing and translation of foreign language materials, so as to gradually cultivate students' innovation ability. These explorations are undoubtedly of great significance, but there is still much room for progress in terms of the scope and form of development. In addition to a small number of colleges and universities, most colleges and universities lack awareness of innovation ability training[18]. Exam-oriented education is still the mainstream, with more emphasis on knowledge than ability.

Chinese undergraduates have poor classroom interaction ability and low questioning ability. Academic innovation is impossible without freedom of thought. The difference in classroom interaction ability does not appear in the undergraduate stage. From primary school to middle school, the enthusiasm of Chinese students to speak in class declines with the growth of age. Chinese students are passive and seldom take the initiative to answer questions, let alone raise them. American students are highly motivated in class. They are willing to express their opinions and teachers encourage students to speak up. The reasons for this difference may be the difference in history and culture and the difference in educational philosophy[19]. In an environment that advocates authority, it is difficult for Chinese students to be willing to put forward their own ideas. However, American education pursues students with problem consciousness and individual development education. The differences in the early educational environment result in the differences in the classroom performance of Chinese and American undergraduates. In fact, Chinese students have strong learning

ability and can achieve excellent results in various discipline competitions. Therefore, it cannot be said that Chinese education is wrong. However, at a time when innovative talents are in great demand, Chinese education still needs to make changes in cultivating students' ability to question and innovate.

V. SUGGESTION

A. Reform of Higher Education

The ways for enhancing innovation capabilities ranging in scope from curriculum reform to learning modules for individual courses [20]. In the new era, innovation and entrepreneurship education with Chinese characteristics is the new requirement of higher education reform. We should adhere to the socialist thought with Chinese characteristics to guide the direction of innovation and entrepreneurship education, adhere to innovation in educating and educating innovative people, and improve the quality of talent training in colleges and universities[21]. As a new way of talent cultivation in colleges and universities, the mode reform of innovation and entrepreneurship education will be the focus of innovative talent cultivation in colleges and universities.

At present, there are still many problems in innovation and entrepreneurship education in Chinese universities. From the policy level, first of all, the support mechanism is not perfect[22]. Relevant departments do not pay enough attention to the education of innovation and entrepreneurship. They do not invest much money and lack necessary technical advisers, making it difficult for students to have the idea of innovation and entrepreneurship, and even if they do, it is difficult to get professional guidance. In addition, the policy attraction strength also needs to improve. Many students are put off by the high threshold of innovation and entrepreneurship and the small discount. From the university level, innovation and entrepreneurship resources have not been well used. Innovation and entrepreneurship education teacher is short, education curriculum is not perfect. Many courses fail to enable students to have an in-depth understanding of the knowledge related to innovation and entrepreneurship, but simply explain cases. The content is empty and abstract, which is not conducive to the formation of students' innovation and entrepreneurship thinking.

B. Combination of Theory and Practice

"The paper come eventually feel shallow, must know this matter to practice", learning can not be limited to the acquisition of knowledge points textbooks, put what you have learned into practice is more important[23]. The ultimate goal of learning is to use new ideas, combine knowledge with practice, and apply what we have learned to promote innovation[24], for example, as an intern for the students to visit the enterprises or the enterprise can not only see the surface of things, be good at communication with the head, understand enterprise operation mechanism and the differences and similarities between each enterprise and the different enterprises have a certain understanding, to form their own thinking: What are the reasons for the success of the enterprise? What are the causes of business failure [25]? If you start your own business, what need to pay special attention to? Big data platform can also be used to obtain information and analyze

data[26]. Successful examples of enterprises in the classroom are always far away from us. Only when we experience them can we have the most direct feeling. The thinking of innovation and entrepreneurship is not formed in the classroom, but formed in my own thinking after having a certain degree of understanding of the relevant situation.

C. Establishment of a Free, Relaxed and Harmonious Learning Environment

Only when teachers and students are equal can the classroom atmosphere be active. Teachers who can put themselves at the same level as students are more welcomed by students and the rate of classroom interaction is higher. Although the starting point of "a strict teacher produces excellent students" is correct, it is worth thinking whether the expected effect can be achieved. When teachers fully respect students and treat them as friends, students can truly put aside their fears and increase their interaction with teachers. In Chinese class, the students often said, his problem was not well prepared and not too bashful to publish their views, and teachers for a heated discussion on the academic issue of scene is not common, but it is very different in the American classroom. The difference is largely from culture, the authority of Chinese culture is deeply rooted in the hearts of every people, when teachers can change will directly leads to a change in classroom enthusiasm.

VI. CONCLUSIONS

To test the cultivation quality of college students, it mainly depends on whether they can make contributions to scientific and technological progress, social development and other aspects, and whether they can make certain contributions is inseparable from the innovation ability of college students. To cultivate innovation ability of undergraduates is not only good to our personal developments in the future, but to the nation's overall future innovation strength. Therefore, all colleges and universities should strengthen the cultivation of innovation ability, learning the way of training that has been proven effective and learning from other countries in order to find suitable ways for our own national conditions of undergraduates' innovative ability training mode, to provide talent support for constructing a creative country.

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