



# Research on the Teaching Mode of “Promoting Learning and Teaching Through Competition” Take the School of Electronic Information Engineering of Hankou University as an Example

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**Abstract.** Subject competition is an effective way to cultivate students’ practical ability and innovation ability. At the same time, the application of competition works as teaching examples in the teaching process can effectively promote the improvement of teaching effect. Taking the School of Electronic Information Engineering of Hankou University as an example, this paper explores the teaching mode of “promoting learning through competitions and promoting teaching through competitions”, which provides a new idea for training application-oriented talents.

**Keywords:** Discipline competition · Promoting learning through competition · personnel training

## 1 Introduction

In the current higher education, campus teaching alone cannot realize the transformation of knowledge from words in books to practical experience. Therefore, “promoting learning through competition” has gradually attracted the attention of applied university teachers. The teaching mode of “promoting learning through competition and promoting teaching through competition” refers to the combination of the curriculum teaching of local undergraduate colleges and the actual needs of society, the integration of the needs of the industry and employers with daily teaching, the practical improvement of students’ skill level and practical ability through participating in professional related skill competitions, and the enhancement of the applicability, inclusiveness and universality of the teaching process to achieve the integration of competition and teaching, and the integration of learning and competition [1]. The teaching mode of “promoting learning through competitions and promoting teaching through competitions” will not only improve and exercise students’ skills, but also promote teachers’ quality and professional level, which is of great practical significance.

## 2 Research on the Needs of Target Students

Through the method of random sampling, the real needs of 433 students from the School of Electronic Information Engineering of Hankou University were investigated, and 433 valid questionnaires were obtained (see the Table 1).

**Table 1.** Statistical results of surveyed college students

Grade	Number of questionnaires	Number of valid questionnaires	Percentage	Effective percentage
Freshman	97	97	22.4	22.4
Sophomore	101	101	23.3	23.3
Junior	123	123	28.4	28.4
Senior	112	112	25.9	25.9

According to the survey, the proportion of students who choose to participate actively in discipline competitions is close to 75%, and the proportion of students who do not want to participate is less than 10%. In addition, about 15% of the students' attitude is indifferent. In the survey on the advantages of participating in the discipline competition, more than 90% of the surveyed students think it is beneficial to the exercise of practical ability, more than 70% think it is beneficial to the subsequent employment, about 65% think it can increase their knowledge and broaden their horizons, and less than 2% think it is not beneficial. In the survey of the disadvantages of participating in the relevant competitions, more than 60% of the students think there is no harm, about 30% of the students think it takes up more time after school, and about 10% of the students think that the gold content of the competition is not high and that winning the prize is not helpful. Through investigation, most students believe that participating in discipline competitions is conducive to curriculum learning and future employment, and their intention to participate is obvious. This also fully shows that the target student group is completely consistent with the teaching reform goal of "promoting learning and teaching through competitions" in terms of learning needs. The curriculum reform of "promoting learning and teaching through competitions" will further stimulate students' interests, improve learning effects and improve teaching quality [2].

### 3 The Implementation of the Teaching Mode of "Promoting Learning and Teaching Through Competition"

The College of Electronic Information Engineering of Hankou University (hereinafter referred to as "the College") takes discipline competition as an important means to cultivate application-oriented talents, and incorporates it into the college's education and teaching reform and discipline construction. In daily teaching, the college organically combines college students' discipline competitions with teaching links. By organizing students to participate in discipline competitions, it can not only stimulate students' understanding of basic theoretical knowledge of the major, improve students' innovative practical ability and team cooperation ability, but also inject vitality into teaching practice links and promote teaching reform through competition training. It has formed a teaching mode of "promoting learning through competitions and promoting teaching through competitions" with discipline competitions as the carrier.

At present, the college has formed discipline competition activities focusing on the National Undergraduate Innovation and Entrepreneurship Training Plan, the "Youth

Creation” Undergraduate Innovation and Entrepreneurship Competition, the Hubei Physics Experiment Innovation Design Competition, the “Internet plus” Innovation and Entrepreneurship Competition, the National Undergraduate Computer Design Competition, etc., to promote learning through competition, stimulate students’ practical interest, inspire students to explore actively, and cultivate practical ability. Promote teaching through competitions, mobilize teachers’ enthusiasm for thinking, constantly reform teaching methods and improve teaching quality.

### **3.1 Do a Good Job in Entrance Education**

Under the guidance of subject competition, stimulate students’ interest in learning and do a good job in entrance education. The college introduces the subject competition projects to the students through the introduction of the freshmen’s major. At the same time, it holds an exhibition of excellent works of the college every academic year to show the winning works of the college’s subject competition team to the freshmen, and selects excellent students to explain the works in detail, so that the students can be attracted by the professional works quickly after entering the college. At the same time, they are aware of the scope of application of professional knowledge, and clear the importance of the subject competition for personal ability improvement, So that the consciousness of discipline competition is gradually integrated into the students’ daily learning process. Under the guidance of subject competition, stimulate students’ interest in learning and do a good job in entrance education. The college introduces the subject competition projects to the students through the introduction of the freshmen’s major. At the same time, it holds an exhibition of excellent works of the college every academic year to show the winning works of the college’s subject competition team to the freshmen, and selects excellent students to explain the works in detail, so that the students can be attracted by the professional works quickly after entering the college. At the same time, they are aware of the scope of application of professional knowledge, and clear the importance of the subject competition for personal ability improvement [3], So that the consciousness of discipline competition is gradually integrated into the students’ daily learning process. The college also actively encourages students to enter the discipline competition training team organized by the college for further study of professional skills after learning professional skills courses, which greatly stimulates students’ interest in learning professional knowledge.

### **3.2 Improve Learning Atmosphere**

Take the competition selection as an opportunity to improve the learning atmosphere. In the process of organizing students to participate in the discipline competition, the college actively carries out the competition selection activities in the college. During the preparation of the competition selection, students can discuss the competition topics with each other to form a relationship of competition and cooperation; Through mutual learning and communication, all teams have formed a good situation of catching up with each other and promoting learning. In the class or dormitories, the students who participate in the competition to select their learning motivation have imperceptibly influenced the surrounding students who have low learning initiative to actively participate in the study.

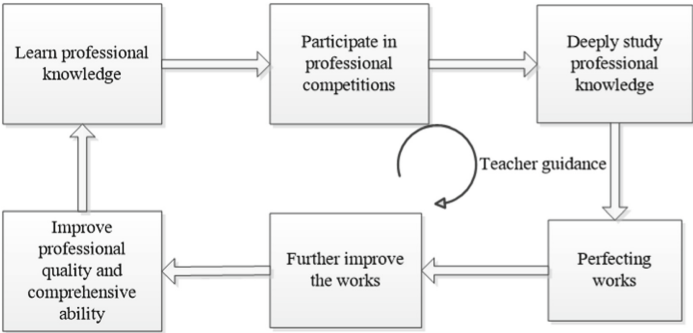
Finally, it effectively changed the learning atmosphere of the college and improved the learning atmosphere.

### **3.3 Improve Students' Independent Innovation Ability**

Take discipline competition as the practice carrier, build excellent classes, and improve students' independent innovation ability. The excellent class of the college was established in April 2016, which is a special class focused on the college. The focus of the excellence class is to cultivate students' independent learning ability, integrate student competition, hands-on practice, electronic production, innovation and entrepreneurship, better stimulate students' interest in learning the major, improve students' innovation and entrepreneurship, and cultivate a group of high-quality outstanding talents for the society. During the construction of excellence classes, the College, relying on the "Innovation and Entrepreneurship Practice Base of the School of Electronic Information Engineering", organized and guided students to actively participate in various discipline innovation competitions at all levels, encouraged students in excellence classes to form interdisciplinary and cross grade student discipline competition teams, and assigned experienced and competent instructors to guide students, so as to exercise their practical and innovative abilities in discipline competitions. In the process of practice, the trinity teaching mode of teaching, training and competition is adopted to integrate the process of independent innovation into the whole process of students' learning, which is strengthened and consolidated in training and competition, further improving the innovation ability, and providing a good environment for students' independent innovation [4].

### **3.4 The Competition Training Adopts the Tutorial Responsibility System**

In the process of competition guidance, the college has formed a positive knowledge transfer chain of "learning professional knowledge - participating in professional innovation competition - deeply learning professional knowledge - improving works - teacher guidance - further improving works - improving professional quality and comprehensive ability". As shown in Fig. 1, creating a good scientific and technological academic atmosphere. In the competition, the instructors play an irreplaceable role in the competition team. In the practice of turning innovative ideas into reality, students often have enthusiasm, fight alone, and lack effective guidance and team organization. The instructors have rich experience, which can help students overcome psychological barriers, form a professional team with complementary advantages, and give professional guidance; Students can make full use of the instructor's laboratory and scientific research equipment, with the help of the instructor's experience in scientific research, to maximize their competitiveness. Our school has provided professional instructors for each group of competition teams, who have always led the team to participate in the competition from the aspects of competition topic selection, physical production, plan preparation, defense skills, and the whole process of participation and responsibility.



**Fig. 1.** Benign knowledge transfer chain

**3.5 Promoting Teaching Reform**

Rely on subject competition to promote teaching reform. The traditional teaching mode will only learn for learning knowledge, and will explain according to theoretical knowledge and its practical application when explaining. The teaching mode of promoting teaching by competition is based on the combination of the application of theoretical knowledge and actual teaching during competition. Compared with traditional teaching, the design of teaching scheme and the use of teaching instruments have been re planned to rely on discipline competition to promote teaching reform. The traditional teaching mode will only learn for learning knowledge, and will explain according to the theoretical knowledge and its practical application when explaining [5]. The teaching mode of promoting teaching by competition combines the application of theoretical knowledge during the competition with the actual teaching, and has made a new plan for the design of teaching scheme and the use of teaching instruments compared with traditional teaching [6]. In the teaching process, the application of knowledge points in relevant competitions will be explained to students as an example, effectively improving students' interest in learning. For example, in the course of Principle and Application of Single Chip Micro-computer, when explaining the application of A/D conversion and temperature sensor, the second prize project of the 2018 Hubei University Students' Physics Experiment Innovation Design Competition, Multi function Temperature Controller, was taken as a typical example. While explaining the relevant principles to students, students can learn about the practical application of knowledge points from the competition project. The application of the teaching method of competition case method explanation was loved by students. At the same time, through the discipline competition, the interaction between teachers and students in teaching can be well strengthened, so that teachers can really play the role of students' guides, fully mobilize students' enthusiasm for learning the curriculum, guide students to carry out in-depth research step by step, improve students' hands-on practice ability, so that students can not only improve the learning effect, but also obtain the honor of winning the competition.

### **3.6 Promote the Construction of Teachers**

Take discipline competition as the practice carrier to promote the construction of teachers' team. Science and technology have made rapid progress and technology has been updated frequently. If teachers cannot always understand the theoretical framework of cutting-edge knowledge and only rely on the content of textbooks to impart knowledge to students, it is difficult to explain the content of knowledge to students thoroughly. At the same time, the content of textbooks is often updated slowly, which is out of touch with the actual production, and can not cultivate students' innovation ability and application ability. The improvement of teachers' ability will be seriously affected. The college attaches great importance to the construction of the guidance team, actively encourages teachers to combine teaching research with practical research, and combines classroom teaching with practical teaching. At the same time, it encourages teachers to seriously explore feasible innovative topics in the process of teaching, research and practice, and guides students to participate in competitions with relevant topics [7]. By guiding students to compete, teachers can see the shortcomings in the usual teaching process and the weak links of students' learning, which can lay a good foundation for the subsequent teaching reform. At the same time, when facing many problems raised by students in the competition, teachers can effectively promote teachers to think about problems, actively learn relevant professional knowledge, understand the current scientific and technological frontier, improve the knowledge system, constantly improve their professional level, and finally promote the growth of the faculty of the College, forming a group of teachers with both high-level professional knowledge and noble moral standards.

## **4 Practical Achievements of the Teaching Mode of “Promoting Learning and Teaching Through Competitions”**

### **4.1 Promoting Learning Through Competition, and the Learning Atmosphere of the College is Constantly Enhanced**

Through the organization and development of competition and selection in the college, students have formed a good situation of learning from each other and competing with each other; By changing the teaching method from the traditional way to the way to explain the application of knowledge points in relevant competitions to students as examples in the teaching process, students' interest in learning has been effectively improved; This series of changes have greatly improved the learning atmosphere of the college. In recent years, the class attendance rate of college students has been maintained at more than 90%, and has been praised by the supervision center for many times; The degree awarding rate of students has also been increasing, from 80% five years ago to 93% in 2022.

### **4.2 Students' Innovation and Entrepreneurship Ability Has Been Greatly Improved by Promoting Learning Through Competition**

The integration of subject competition into daily teaching activities fully arouses the enthusiasm, initiative and innovation of students, helps students to understand the development trend of subjects in a timely manner, can better cultivate students' teamwork and

communication abilities, improve their comprehensive quality, and cultivate a group of versatile talents [8]. In the past three years, the college students have won 160 provincial and above awards in various discipline competitions, 8 national undergraduate innovation and entrepreneurship training programs, 16 provincial undergraduate innovation and entrepreneurship training programs, 50 software copyrights, and 12 patents.

#### **4.3 Promoting Learning Through Competitions, and Students' Progress in Education and Employment Have Made Great Achievements**

Through the competition, students have the ability of practical employment and innovation in advance [9]. The college has emerged a group of students with strong learning ability and practical ability, which has formed a greater advantage in terms of entrance and employment. In the past three years, the postgraduate examination of students in the college has achieved good results, and the rate of postgraduate examination is among the best in the school. In terms of employment, in the past three years, the employment rate of graduates has exceeded 92%, of which more than 40 people have entered national enterprises and institutions such as the State Grid and provincial government agencies, achieving high-end employment.

#### **4.4 Promoting Teaching Through Competition, with Remarkable Achievements in the Construction of Teachers' Team**

In the process of guiding students in the competition, teachers can effectively promote teachers to think about problems by finding and solving problems, and actively learn relevant professional practice, so as to constantly mobilize teachers' enthusiasm for learning and improve the teaching level. In recent years, the college's teachers have constructed 4 school level characteristic courses, 11 school level teaching reform projects, 11 school level "golden lessons" construction projects, and 3 textbooks compiled by teachers themselves. At the same time, the teaching team of the college has been approved as a provincial excellent teaching team in 2019. In the past three years, a total of five teachers have won the honorary title of "Excellent Instructor" at the school level.

### **5 Existing Problems**

- (1) The participation enthusiasm of teachers is uneven. The competition instructors are mainly young teachers, and their overall enthusiasm is not high. The main reason is that young teachers have a large workload, and it is difficult to put too much energy into the competition; Secondly, the incentive policies and financial security related to the school competition need to be optimized, especially the relevance and limitations of the competition and the professional title evaluation, which has reduced the enthusiasm of young teachers to a certain extent [10].
- (2) The communication between schools and enterprises is insufficient, and the teaching objectives are inconsistent. The teaching mode of "promoting learning through competition and promoting teaching through competition" is in the experimental stage, and the implementation mode and scheme are constantly upgrading and

improving. However, enterprises and units change in real time with the direction of economic development, and the lack of communication between enterprises and schools leads to the backwardness of the implementation of related competitions and other activities.

## 6 Conclusion

Subject competition is an important channel to improve students' comprehensive quality and plays an extremely important role in the training of application-oriented talents. The practice shows that the mode of "promoting learning through competition and promoting teaching through competition" has made good achievements in the teaching reform and discipline competition of the college, and plays a very important role in cultivating high-quality talents with innovative thinking, innovative skills and innovative personality. However, how to effectively link subject competition with conventional teaching in a more comprehensive way, so that students can better apply what they have learned, and improve their ability to combine theory with practice and their job competitiveness, is still a problem that needs long-term research and practice.

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