

Innovative Education Promotes the Teaching of Computer Basic Courses

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Abstract: Efficiently cultivating students' innovative ability is an important historical mission facing higher education workers. Combining with the practice of basic computer teaching in colleges, this paper expounds how to teach students how to teach students in teaching from five aspects: updating educational concepts, creating problem situations, implementing problem-based teaching models, giving full play to students' subjectivity and innovation, and combining theory with practice. The cultivation of innovative ability and innovative spirit provides new ideas for the implementation of innovative education in education and teaching.

With the rapid development of science and technology and the rapid development of the knowledge economy, there are higher requirements for the innovation ability of talents. Therefore, in the professional teaching of students, special attention should be paid to the cultivation of students' innovative ability. In recent years, the teaching of basic computer courses in universities has focused on cultivating students' innovative ability, which not only enables students to learn to think independently, but also lays a scientific ideological foundation for their future development into innovative talents.

1. Practice and Development of Computer Education and Teaching Reform

Every stage of the research and development of computer education and teaching in Colleges and universities is accompanied by the rapid development of new computer technology and modern educational technology. The continuous development of new ideas and methods in education and teaching has put forward new topics and goals for talent training and education and teaching quality. Computer education teaching research should first make systematic planning and design from the aspects of teaching content, textbook construction, teaching methods, curriculum system, training program, teaching evaluation, engineering education professional certification, etc. it focuses more on the talent training program and improving teaching quality, from classroom teaching and experimental teaching to network assisted teaching, MOOC / SPOC online course construction and

mixed teaching, Carry out exploration research and practice at all stages. In fact, education should be people-oriented. The deep integration of information technology and education and teaching has brought about changes in the field of education. The most direct reflection is the structural changes in classroom teaching methods and educational concepts.

At present, OBE (output based education) output oriented education model has been widely valued and applied in China. Its basic idea is to transform the traditional teaching centered education model into a learning centered education and teaching model, so that learners can change from passive audiences to active learning subjects, which is conducive to mobilizing their subjective initiative in learning. OBE design mode is usually adopted in mixed teaching practice, which generally includes setting classroom teaching achievement goals for learners, organizing teaching activities to achieve corresponding ability goals, formulating scientific and reasonable evaluation indicators, obtaining various data in the teaching process, and making statistical analysis with the help of software tools to build and form a teaching quality assurance system.

In the future, computer education is not only the update and reform of education and teaching contents, but also the combination of "Internet + education", "Ai + education", "VR + education" and other intelligent IT education and learning means, to stimulate the learning motivation of learners, enhance innovative thinking and creativity, and thus improve the overall learning quality.

2. Establish a new Educational Concept and Put Innovative Education in the First Place

Innovative education has been identified as an important goal of classroom teaching in colleges and universities, which also applies to computer science students and course teaching. Different from the traditional teaching, which spreads knowledge, innovation education emphasizes the cultivation of students' basic ability and quality of innovation and entrepreneurship. Innovation and entrepreneurship ability is one of the basic abilities that students need to have that has been valued and recognized by everyone in recent years. Therefore, in the formulation of teaching plans and the implementation of the teaching process, teachers need to take how to cultivate students' innovation and entrepreneurship ability as an important part of teaching, and in classroom teaching and after-school learning arrangements, provide appropriate innovation and entrepreneurship education for innovation and entrepreneurship education. time guarantee and adequate teaching support.

Innovation education is the education of cultivating innovative talents, which aims at cultivating students' innovative spirit and practical ability. Teachers must establish new educational concepts and fully understand the importance and necessity of innovative education in modern higher education. In the teaching of basic computer courses in universities , it is not only necessary to cultivate students' good values, world outlook and dialectical thinking habits in the modern information environment, and to improve their interest in learning ; Create psychological conditions for students' innovative activities.

3. Build an Education System of "Internet + Education" and Innovative Talents Training

If modern higher education wants to train comprehensive talents with innovative consciousness and ability in the new era, and to achieve the desired knowledge structure and ability structure at different educational levels, it needs to study and establish different curriculum system structures and implement scientific and complete curriculum education and teaching systems. For example, based on the construction and sharing of Internet + education and teaching high-quality resources, a diversified and mixed teaching model centered on students' learning is constructed to enrich classroom teaching contents and forms and improve teaching quality. The basic process of its curriculum system and teaching construction is shown in Figure 1

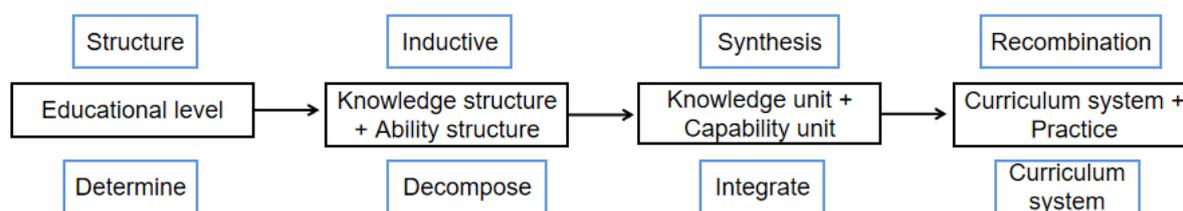


Figure 1: Basic process of building talent training target curriculum system and teaching construction

The teaching quality of computer education is reflected in talent training, which is to cultivate students' comprehensive quality ability to master computer science and technology, future learning and development ability, including the implementation of training programs, the comprehensive completion of teaching tasks and the comprehensive improvement of students' overall ability. Among them, the full completion of teaching tasks means that students can master the basic theoretical points and system application skills of computer science and technology related knowledge according to the training program and teaching syllabus. Special attention should be paid to the training of students' comprehensive quality and ability, rather than viewing the teaching task list as a one-way teaching and indoctrination of knowledge.

In many development processes of education, Internet + education is a powerful assistant to promote the cultivation of diversified and innovative talents. The Internet integrates many advantages of information technology education and can provide fast and effective teaching means, learning tools and Internet data; It can share rich and high-quality education and teaching resources and build a diversified and mixed teaching model centered on learning; Using the advanced educational technology of the Internet to assist teaching can also improve learning efficiency. In terms of the cultural inheritance and education of "teaching by words and deeds", the advantages of face-to-face communication in classroom teaching can not be replaced. Traditional education can use the advanced technical means and tools of Internet + education to design the educational objectives of talent training with a higher vision, promote the application of educational innovation ideas in practical teaching, so as to meet the needs of national development strategies, balance educational development We should do something in educational science research to improve the overall level of education.

4. Methods of Promoting Innovation Ability in Computer Basic Courses

4.1 Create Problem Situations to Stimulate Students' Desire to Innovate

Classroom teaching is the main position for acquiring knowledge and skills, and should be the cradle for cultivating students' independent thinking and innovative spirit. Creating problem situations in basic computer teaching in colleges can not only arouse students' strong thirst for knowledge, but also stimulate the excitement area of students' brains through endlessly changing scenes and pictures, creating favorable conditions for stimulating their creative thinking. Due to the rapid rise of computer science in the past two years, students have great enthusiasm for the study of

relevant courses, but some students show lack of interest in the study of relevant basic courses. If these are not handled properly, it will affect students' understanding and understanding of the entire subject. Innovation education is closely related to students' scientific research innovation and practical employment. If students are innovative in scientific research, they can publish papers, patents, software copyrights, etc., which will be of great help to their future studies and further studies.

4.2 Cultivate Students' Innovative Ability Through Problem-Based Teaching Mode

Using questions to open the minds of students' creative thinking is an important method to cultivate innovative ability. In the teaching of basic computer courses, we should pay attention to excavating the educational factors contained in the teaching materials, give full play to the main role of students through the problem-based teaching model, create a teaching situation that is loose, democratic, harmonious, equal, and full of innovative spirit, and follow the educational teaching. The rules of the design are targeted and inspiring questions to stimulate students' thinking of seeking differences. We must strive to play the leading role of teachers, create time and space for students to learn and research on their own, encourage students to dare to be unconventional, to explore new ways, to question, to imagine, to dare to break the rules and not stick to one pattern. For example, when teaching, ask questions for basic problems, let students learn and operate independently with problems, and teachers only guide and teach learning methods. A few minutes before the end of the class, the teacher will give an inductive presentation and a summary. Affirm the reasonable elements of different claims and opinions that arise when solving difficult problems. So as to inspire students' multi-directional thinking and cultivate their innovative ability.

4.3 Make Full use of the Second Classroom to give Full Play to the Subjectivity and Innovation of Students

Students' subjectivity and innovation are inseparable, and innovation is the highest embodiment of subjectivity. Without arousing students' active learning desire, it is impossible to effectively cultivate students' innovative spirit and innovative ability. Therefore, it is necessary to create various innovative opportunities and encourage students to actively participate, so that the spark of their wisdom can be transformed into a prairie fire. Due to the limited time, the classroom teaching of computer basics in colleges focuses on mastering basic theories, training basic skills, and performing basic operations. The extracurricular is a vast world for students, allowing them to play freely and to the fullest.

Teachers should guide them consciously, extend and apply the knowledge learned in the classroom to extracurriculars, make the second classroom outside the classroom lively and become a useful consolidation and supplementary position for the knowledge learned in the classroom, so as to promote classroom teaching and learning, to achieve the effect of applying what they have learned, and effectively give play to the innovative advantages of students. For example, after learning the application of computer image processing software, organized students to set up an extracurricular photography interest group, introduced computer into the post-production of photography, and reprocessed the photos. It greatly improves the enthusiasm of students to learn computer knowledge and stimulates their innovative spirit.

4.4 Combining Theory with Practice, Consolidating and Developing Students' Innovative Ability

It is an effective method to cultivate students' innovative spirit and innovative ability to guide students to integrate theory with practice in a targeted manner, and to use the knowledge they have mastered to solve practical problems boldly and flexibly. In the process of solving practical problems, teachers can combine with competitions, and can also organize students to inspire each other's ideas through free debate, mutual exchange and other methods, so as to achieve the organic unity of solving practical problems and cultivating innovative ability.

At present, many competitions are organized for innovative education at the national level and at the university level, such as Internet + competition, innovation , entrepreneurship training plan, etc., as well as various special competitions, such as Challenge Cup, China Software Cup, Blue Bridge Cup, TI Cup The National University Biological Internet Design Competition, the Internet of Things Application Innovation Competition, the Intel Cup National College Student Software Innovation Competition, and the National College Student Artificial Intelligence Innovation Competition also include the innovation and entrepreneurship joint fund project in the latest industry-university cooperation and education project. Students directly participate in the competition, and combining theory with practice is a direct method to cultivate students' innovation and entrepreneurship ability. Teachers organize students to participate in competitions, which can not only effectively find a suitable foothold for innovation and entrepreneurship education, give students a certain time limit in the form of competitions, and stimulate students' enthusiasm for participation, but also have a better incentive effect on students because of the competition.

The combination of these theories with practice not only helps students understand and consolidate the teaching content, but also cultivates their imagination and intuition, consolidates and develops their innovative spirit and innovative ability by solving practical problems and applying what they have learned. The teaching of basic computer courses in colleges not only imparts computer knowledge to students, but also cultivates students' innovative ability. Teachers must use new educational concepts to develop new teaching ideas, create a relaxed and harmonious atmosphere of innovation, and strive to cultivate students into innovative talents needed by society, so as to better fulfill the historical mission entrusted by the times.

4.5 Comparison and Reference of Foreign Innovative Talents Training and Innovative Education

When it comes to the cultivation of innovative talents and innovation and entrepreneurship education, we have to mention the innovation and entrepreneurship education in the United States. As early as 1947, Harvard Business School opened the new enterprise management of university entrepreneurship education. After more than half a century of development, it has formed an innovation and entrepreneurship education system with the participation of the government, schools, social institutions and other subjects; It attaches importance to spiritual cultivation and value guidance, pays attention to internationality and openness, and has extensive industry university cooperation. Its construction and development experience not only has certain reference significance for deepening the innovation and entrepreneurship education reform in China, but also has practical reference significance for the education and teaching reform of computer education innovation and Entrepreneurship talent training in the new era.

Since 2018, the National Natural Science Foundation of China has specially opened up channels to support educational research, which enables traditional education science, information science, neuroscience and cognitive science to cross study education and promote the scientific development of education. The guidance of the national development strategy and the support of the fund policy

are of great significance to the integration of information science into educational research, and are opportunities and challenges for the innovative development of computer education research. To explore the new direction of computer education science research and jointly build an ecosystem of interdisciplinary and integrated education science research and innovative development, universities need to make joint efforts.

We should learn from the experience of educational innovation research and development at home and abroad, cooperate with educational enterprises and research institutions, and establish a high-level academic exchange platform for educational scientific research.

5. Conclusions

Education is a complex system engineering, and computer education is not the persistence of a few people and several courses. If we do not face more new topics that need to be studied and explored, we will not be able to meet the urgent needs of the rapid development of the new era for the cultivation of innovative talents. Grasp the new opportunities of the national development strategy in the field of educational information science and technology research, jointly build an innovation ecosystem of computer educational science research, and jointly tackle key scientific problems in educational science research, so as to comprehensively improve the construction level of computer educational science research. The integration of information science and education science research must pool the new innovative force of interdisciplinary integration, so as to achieve substantive innovation and breakthrough, including the construction of industry, University and research, and the construction of new disciplines. It is necessary to face the new technologies and new topics of computer education in the new era, overcome bottlenecks, and overcome difficulties, so as to achieve substantive innovation and improvement.

References

- [1] Qian Qibin. *Exploration of Cultivating Students' Innovative Ability in Higher Vocational Computer Basic Teaching*. *China Science and Education Innovation Guide*. 2011(34). DOI:10.3969/j.issn.1673-9795.2011.34.182
- [2] Wang Haixia. *Cultivation of Students' Innovative Ability in Basic Computer Teaching*. *New Curriculum (Part II)*. 2015(05). DOI:CNKI:SUN:XKCS.0.2015-05-055
- [3] Xu Xinyan, Sun Bing. *Analysis of Cultivation of Computational Thinking Ability in Computer Basic Teaching in Colleges and Universities*. *China Electric Power Education*. 2014(05). DOI:CNKI:SUN:ZGDI.0.2014-05-060
- [4] Liu Sha. *Research on Computer Basic Teaching*. *Today Keyuan*. 2009 (16)
- [5] Sun Huijun. *Analysis on the Cultivation of Computational Thinking Ability in Basic Computer Teaching*. *China New Communication*. 2016 (02). DOI:10.3969/j.issn.1006-4222.2017.01.204
- [6] Liang Xiaoli. *A Brief Discussion on the Cultivation of Computational Thinking Ability in Computer Basic Teaching*. *Xue Weekly*. 2015(02)
- [7] Jin Rui, Dou Xiaolei. *Talking about the Reform of Basic Computer Teaching*. *Fujian Computer*. 2012 (03)
- [8] Li Siming, Chen Xiaodan. *Integrating Computational Thinking into Computer Basic Teaching*. *Modern Computer (Professional Edition)*. 2012(26). DOI:CNKI:SUN:XDJS.0.2012-26-014
- [9] Jiao Weiwei, Chu Zhiguang, Li Xin. *Research and Practice on Cultivation of College Students' Computer Application Innovation Ability*. *Chinese University Teaching*. 2014(06). DOI:10.3969/j.issn.1005-0450.2014.06.008
- [10] Dang Huanzhen. *Discussion on Basic Computer Teaching and Grade Examination in Higher Vocational Colleges*. *Caizhi*. 2010(16). DOI:CNKI:SUN:CAIZ.0.2010-16-184
- [11] Guo Lina. *Computer Basic Teaching and Cultivation of Students' Innovative Ability*. *Computer Knowledge and Technology*. 2017(36). DOI:CNKI:SUN:DNZS.0.2017-36-069
- [12] Wang Caixia. *Research and Practice on Teaching Content Reform of Basic Computer Courses*. *Journal of Yuncheng University*. 2016(06). DOI:10.3969/j.issn.1008-8008.2016.06.024
- [13] Li Zhi, Wang Cui. *Analysis of the Cultivation of College Students' Computer Application Ability*. *Communication World*. 2016(17). DOI:CNKI:SUN:TXSJ.0.2016-17-196
- [14] Sun Wenxin, Li Hongtao. *The Causes and Solutions of "Plateau Phenomenon" in Computer Skills*. *Journal of Xinxiang Institute of Education* 2008(01). DOI:10.3969/j.issn.1674-6511. 2008.01.033

[15] Shang Ying. *Research on the Application of Interactive Micro Courses in the Teaching of Computer Skills Courses in Secondary Vocational Schools*. *Knowledge Window (Teacher Edition)* 2022(04).

[16] Jiang Xiaohui. *Research on the Practice of Interactive Micro Courses in the Teaching of Computer Skills Courses in Secondary Vocational Schools*. *Modern vocational education* 2020(11)

[17] *The Rainbow always Shines "Thinking on Professional Teaching Reform under the Guidance of Secondary Vocational Computer Skills Competition."* *Tiantian love science (Education frontier)* 10 (2020)