

# Teaching Research on the Training of Students' Innovative Thinking Ability Based on Maker Education Concept

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**Abstract:** In information economy era, training innovative talents is an important step for high speed development of country. Education is an important way to training innovative talents, and the effective cultivation of students; innovative ability is an important symbol of the success of education. Innovative thinking is the basis of innovation ability, we must first improve innovative thinking ability in order to improve innovation ability. In the field of education, middle school is the key step for students to learn diverse thinking, especially innovative thinking. The objective of this paper is to study this step and how can we help students improve their innovative thinking ability.

**Keywords:** Maker education concept; Students; Innovative thinking; Ability training

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## 1 Introduction

The original meaning of "maker" is to point out people who have interests and hobbies, try to turn their ideas into reality. The purpose of maker is to improve children's practical ability and thinking ability. Maker education is close to the combination of maker culture and STEAM education. Enhance students' creativity through project-based learning and using of digital tools according to students' interests. Encourage the sharing and promotion of high-quality education in interdisciplinary problem solving, teamwork and innovation. Today, due to the rapid development of science and technology, the

content and form of education are also keep updating. Youngster is willing to accept knowledge and display subjective creativity. Today's education should be facing the future, and lay the foundation for the skills that youngster required in the future.

## 2 The origin of maker education

The "creator" comes from the economic field as a production method, also known as "creator economy". The economic growth of creators is based on the progress of science and technology such as the internet and a lot of material resources. In the field of education, people have a strong demand for rich and diverse high-quality education resources. With the development of science and technology and the gradual development of educational resources, people hope that education can meet the personalized development needs of each student. This provides an opportunity for the integration of creators' movement and education. The movement of customers can be interpreted as "Internet +DIY". With the support of information technology such as internet, everyone can access all the nearby resources and realize the information sharing among different parties. Maker education should be a form of education in accordance with the spirit of the creator and the law of education. It should spread the spirit of education freedom, openness, democracy, collaboration, innovation, practice, exploration and sharing, use information technology to train people with creative characteristics<sup>[1-2]</sup>.

## 3 The connotation of maker education

Maker education is committed to train students' creativity and practical ability. The diversity of

innovation determines the diversity of the creator's education, which not only teaching student small inventions and small works. In other words, the spirit of innovation includes continuous development, dare to take risks, dare to challenge, pursuing truth, being good at thinking and emphasize on collaboration. The ability of innovation can also be reflected through keen awareness, close observation, continuous focus and knowledge. These thoughts and abilities are impossible for being trained by using small robots and 3D printers<sup>[3]</sup>.

Maker education is not the privilege for minority people. Maker education is developed by culture of democracy, freedom, openness and sharing. The effect of maker education does not depend on advanced technology and equipment, but depends on whether the education is innovative, executive and shared. It contains the spirit and idea of the creator, even if there is no advanced tool, it will not interfere the high-quality creator education.

Maker education is not isolated from knowledge education. It is not only based on knowledge, but also emphasizing to the deepening and creation of knowledge, so it is not additional education. Maker education focuses on coordinating the purpose of knowledge education, the structure of knowledge content, and even the role of teachers. This is not only a technical problem, but also a change in educational ideas, which goes beyond the scope of maker curriculum. Maker education is committed to emphasizing people's academic status and values, transforming students from slaves of knowledge to masters of knowledge.

Maker education is actually a kind of systematic education idea, the goal of education is to train out a person with creative spirit and quality.

## **4 Training students' innovative thinking ability**

### **4.1 Create situation and stimulate innovation consciousness**

Training students' imagination and creativity is an important target and task of education in China. Traditional education lacking novelty and creativity, provided only mechanical education for students, classroom education therefore losing its vitality. In order to improve the efficiency of information technology education, it is necessary to establish the concept of producer education and create educational

environment. The creation of situation must be novel and mobile, as to adapt to the active characteristics of students, stimulate their creative consciousness and stimulate their imagination. For example, in PPT learning, students can develop innovative thinking by creating electronic newspapers and computer works. In the creation process, how to determine the unique theme, how to organize the scene and how to optimize the layout, students have opportunity to bold try for achieve creativity and improve creative thinking ability.

### **4.2 Create a harmonious atmosphere for students to relax learning**

The so-called creator refers to those who use their own hands to bring out creativity. The core idea of maker education is to training people who are good at hands on ability and fully realize their own ideas. It's usually in a relaxed atmosphere where the creators develop their creativity because they always getting concern and encouragement. Students like to have fun and do what they like to do. They often release their innovation from the process of playing. The "play" mentality allows creators to release their imagination and creativity. In order to implement the concept of relaxation and fun in basic information technology education, teachers must guide students to develop their own personality and develop their potential. Only in a pleasant and comfortable learning environment can make students relax, think positively and exert their creativity. Teachers have a deep understanding of academic conditions, understand students' psychological characteristics, design teaching environment closely related to life, select teaching content according to students' learning needs, design teaching links, and provide students with rich learning materials. In this way, it not only make students love the games, but also promote the formation of students' ability to innovate information technology.

### **4.3 Play a leading role and training innovative thinking**

The theme of information technology has high operability and practicability, students therefore also need to have a sense of innovation. The important way to train students innovation is using the task orientation to guide the students. In information technology education, students can transform their creativity into specific work design to reflect the

ideas of creators. In order to guide students to play a creative role, teachers need to design assignments and projects suitable for their actual needs, and innovate their teaching mode. Students may not only master the key points of practical operation, but also enable them to experience the core meaning of information technology in the process of operation and practice. It stimulates students' enthusiasm for project innovation, updates the existing way of thinking, and gives new meaning to the work. For example, students can use Power Point presentations to create and complete the creative design of dance programs for children's day school celebrations when studying content related to "conducting demonstrations". First of all, we need to focus the creative analysis of tasks. After the teacher has set up the creative homework, it is necessary to guide the students to complete the specific analysis of the homework, and divide the assignment into several smaller assignments or completion steps. The students were divided into three groups to complete the choreography and design through the special design. Secondly, we need to pay attention to the creative design of work function. After analyzing distribution, it is necessary to creatively design different functions of distribution. For example, teachers can guide students to design different animation effects and background music to prepare specific works. The whole course is helpful to train students' innovative ability and improve their practical ability<sup>[3]</sup>.

#### **4.4 Organize collaboration activities to improve innovation ability**

Reflecting creative design through works is the important purpose of producer education, students can effectively train practical skills through their work. Because creativity of individual person is always limited, group's wisdom can usually achieve better creative results, teachers should focus on the individual differences of students in teaching methods, understand students' hobbies and professional spirit, allow students to interact with each other to give full play to the unique advantages of different students. The teacher guides the students to practice in groups. The students cooperate and share, and inspire each

other to complete the accumulation of knowledge. For example, in "making electronic newspapers and magazines" activity, students are grouped according to their hobbies and professional knowledge. In the process of collaboration, each group was clearly identified, different students working on different tasks. Art lovers collect paintings and styles. Students with strong design and writing skills are responsible for writing, while students with music expertise are responsible for designing music for their works. The overall layout of the work is completed by students with professional editing knowledge. Works not only penetrate into the students' creative design, but also become more perfect through collaboration. Building a sense of collaboration among students.

## **5 Conclusion**

The core of maker education is to train students' innovative thinking and ability, encourage and support students to actively carry out creative exploration and learning. During the process of education, students can find problems, solve problems in the process of inquiry, gradually learn skills, effectively improve their ability to solve problems, and always maintain the enthusiasm for exploration and innovation. In order to provide more innovative talents for the country and society, we should deeply explore the curriculum system and development mode of creator education, actively train the entrepreneurial culture of universities, train the creativity and innovation ability of each student.

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