Research on Scratch Curriculum Ideology and Politics from the Perspective of STEAM and Maker

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Abstract. Curriculum Ideology and Politics is a new requirement put forward by the party and the state in China, which is of great significance for cultivating high-quality talents with correct values. With the development of information technology, STEAM and Maker education have become hot spots. Because STEAM and Maker have a lot in common, they can integrate. At present, there are problems in the teaching of Curriculum Ideology and Politics, such as fixed content and insufficient flexibility. This paper aims to explore a mode of Curriculum Ideology and Politics under the concept of STEAM and maker education to solve these problems. Taking the 'Scratch' course in primary schools as an example, Chongqing red elements are incorporated into each teaching project to promote the realization of 'three perfections' education.

Keywords: STEAM · Maker · Curriculum Ideology and Politics

1 Introduction

Since the 18th National Congress of China, General Secretary Jinping Xi has repeatedly stressed the need to cultivate new people of the times who can shoulder the great responsibility of national rejuvenation for the party and the country, which coincides with the essence of Curriculum Ideology and Politics. Chongqing has six cultural systems. The revolutionary culture is the most distinctive feature of the city. Therefore, Chongqing's red revolution culture can provide a lot of discoverable elements for ideological and political teaching. Through teaching, we achieve the vision of carrying forward the red spirit and inheriting the red gene.

This paper analyzes the possibility of integration of STEAM and Maker education concepts. Meanwhile, it constructs a teaching model of STEAM, Maker, and Curriculum Ideology and Politics. Based on this teaching model, this paper explores a practical path of ideological and political teaching in the Scratch curriculum, the ideological and political elements mainly derived from the red revolution culture in Chongqing [1]. Curriculum Ideology and Politics supported by STEAM and maker education concepts

can quietly influence students' behavior, ideology, and consciousness. This paper wants to put forward a new direction and reference for the ideological and political construction of the curriculum.

2 Problems in Curriculum Ideology and Politics

2.1 The Ideological and Political Elements Are Generalized and the Way of Ideological and Political Integration is Stiff

The ideological and political elements are generalized and the way of ideological and political integration is stiff. Curriculum Ideology and Politics is conducive to students to establish a correct world, life and values outlook. But when teachers carry out teaching, there are often problems such as generalization of ideological content, ideological and political elements integrated into the knowledge of 'raw', 'hard' and other issues. The generalization of ideologic and political teaching elements is particularly evident in science and engineering, where curriculum ideological and political is often equated with the implantation of scientific spirit and engineering concepts in the course. These problems not only lead to poor acceptability of students but also make students feel disgusted and resistant to the learning of this class.

2.2 Students Lack Endogenous Motivation

Contemporary students have access to smart devices, so students have access to a lot of online cultures. In the network culture, all kinds of garbage culture may 'brainwash' students, even appearing the tendency of value identity diffusion and spiritual emptiness. Primary and secondary school students are still in the stage of development of thinking, so they are easily affected by various information. Hence, teachers need to provide immediate ideological guidance and help students to develop good moral character.

3 The Integration of STEAM and Maker Education Concepts

3.1 STEAM Education

The STEAM educational philosophy originated from STEM education in the United States [2]. It is a comprehensive education that covers science, technology, engineering, mathematics, and the arts. Bybee states that STEAM education should promote students' understanding of how things work and their level of use of technology; Chinese scholars generally believe that the essence of STEAM education is interdisciplinary education. STEAM education embraces the three core concepts of subject integration, problem-solving, and technology empowerment [3]. In the teaching process, teachers integrate multidisciplinary knowledge into teaching, while students complete projects through independent learning and peer cooperative inquiry learning. Students enhance their practical ability and innovative spirit in project-based learning (PBL). Figure 1 shows the structure of STEAM education.
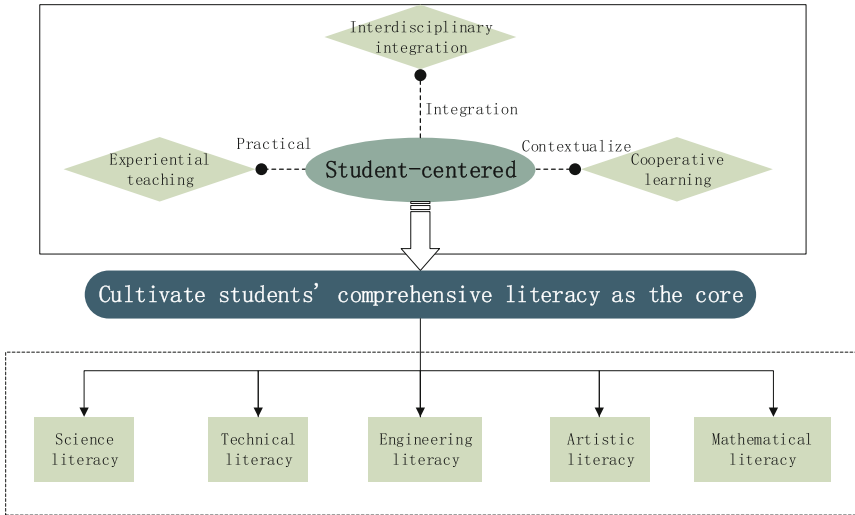
Fig. 1. The core idea of STEAM education

3.2 Maker Education

Maker education originated in the maker movement. A maker is a person who has an innovative idea and actively explores innovative ideas in practice. Halverson and Sheridan argue that maker education is an educational model for nurturing innovative talent. Halverson believes that maker education is rooted in constructivist pedagogy [4]. As can be seen in Fig. 2, there are three main core elements of makers: cocreation space, creative activities, and makers. Maker education advocated student-centered, innovative education, project learning, experiential education, and DIY teaching concepts. It claims to be based on project teaching to achieve the purpose of improving the overall quality of students [5].

4 The Education Model of Curriculum Ideology and Politics Under the Vision of STEAM and Makers

4.1 Relationship Model of STEAM, Maker, and Curriculum Ideology and Politics

STEAM education focuses on comprehensive literacy. It is committed to training practical and logical individuals, training team cooperation talents for society, and creating a nation and country with rapid development and strong governance. As shown in Fig. 3, the core of maker education is to realize maker spirit and cultural atmosphere. It is committed to cultivating self-improvement and open individuals, training collaboration talents for society, and creating a strong nation and country. The Curriculum Ideology and Politics aim at cultivating talents with political identity and social service consciousness. STEAM, maker and curriculum ideology, and politics are the new directions of national education reform. Thus, the integrated education of the three can cultivate high-quality talents who are patriotic, dedicated, and innovative for the country.
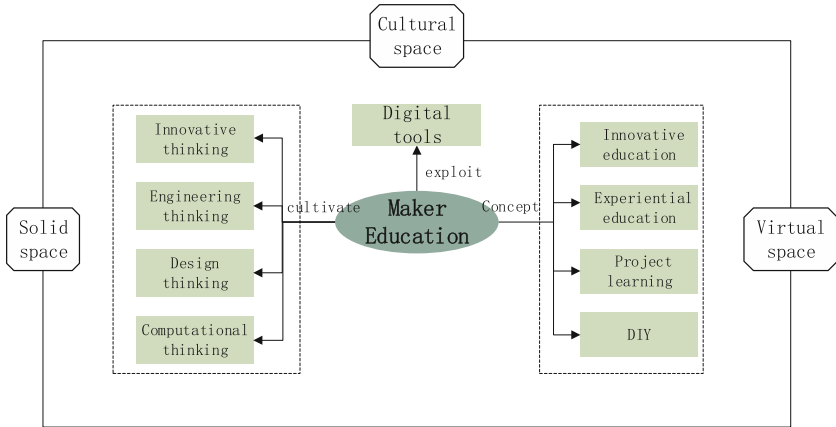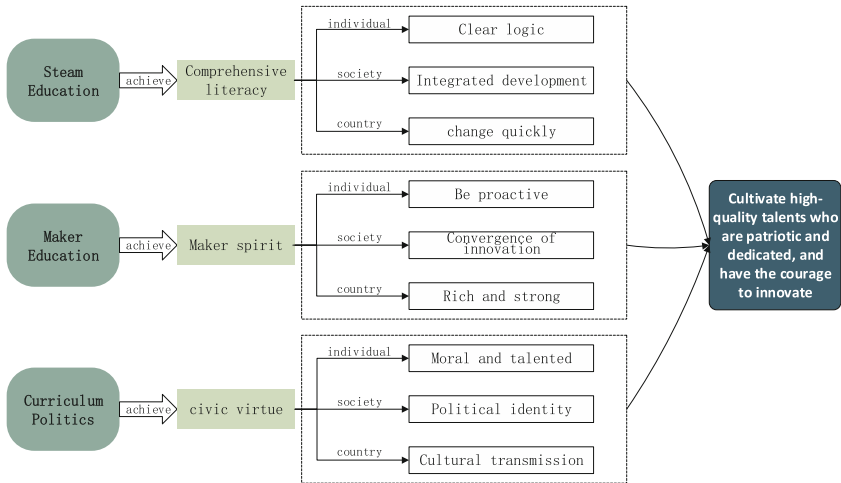
Fig. 2. The core idea of Maker education

Fig. 3. Relationship model of STEAM, maker, and curriculum ideological and political

4.2 The Importance of Integrating STEAM and Maker Education to Carry Out Curriculum Ideological and Political

Thousands of years of foundation, talent for this. Human resources play an important role in the fierce international competition. Innovative young people with international competitiveness are the future of China. The integration of STEAM and Maker education is an effective way to cultivate high-quality comprehensive talents [6]. Curriculum ideological and political education is the practical need of educating people for the Party and the country in the new era. On the basis of fully understand the STEAM and the concept, the Chongqing outstanding red revolutionary figures, stories, spiritual and cultural can integration into the curriculum knowledge. It is not only improve the students'

interest in learning but also can arouse the students' moral quality, culture accomplishment and the ideal faith of reading. Therefore, it has a significant meaning in improving our competitiveness of talent.

4.3 Teaching Model of STEAM, Maker, and Curriculum Ideological and Political

As can be seen in Fig. 4. This model is divided into three stages of before class, in class and after class, teaching through the combination of online and offline [7]. Teachers and students to share each other in the whole process [8]. The knowledge points that fit with the elements of Chongqing Red Civics are explored in various aspects of teaching, so that ideological and political education can be carried out silently.

Before class: Teachers create micro-lesson videos, design classroom projects, and prepare teaching materials based on a thorough analysis of the lesson's knowledge points. Related micro-lessons, learning resources, and pre-class tests can be published in the online learning platform. Students can achieve the effect of pre-class prep through micro-lessons and related resources.

In class: Teachers closely follow the education concepts of makers and STEAM and use the intelligent platform to teach. Teachers integrate ideological and political elements into each link of teaching. They can carry out 'learning, doing and creating' education around the real situation, and guide students to innovate and cooperate. At the same time, students get project results after knowledge construction, project design, project production, test and analysis, development and innovation link.

After class: Teachers evaluate teaching from three dimensions: knowledge and skills, process and method, and emotional and attitudinal values. The evaluation methods are multi-form and diversified. Students' pre-class tests, exercises in class, project results, after-class tests, reports, questionnaires, and so on are all evaluation data sources.
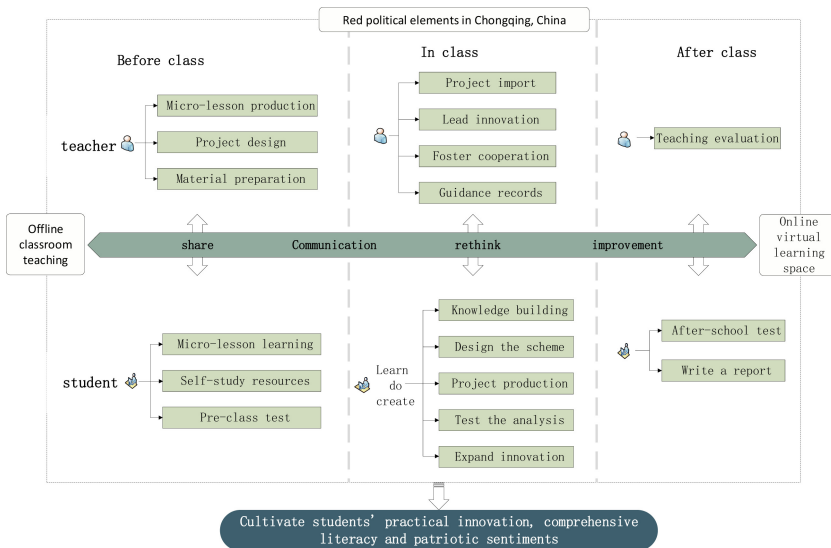

Fig. 4. Relationship model of STEAM, maker, and curriculum ideological and political

5 The Implementation of Scratch Curriculum Ideology and Politics Under the Concept of STEAM and Maker

5.1 Ideas for the Implementation of Curriculum Ideology and Politics

Chongqing has a long revolutionary tradition and a profound red cultural heritage. The red culture education can help young people inherit and carry forward the spirit of revolutionaries. Meanwhile, it can enhance patriotic feelings and strengthen the direction of socialism with Chinese characteristics. Hence, the Scratch course will select relevant elements of Chongqing's excellent revolutionary culture as the source of project materials and topics. After studying, students can master the basic operations of Scratch. At the same time, students are educated on the feelings of home and social responsibility so that it can enhance their historical consciousness and love of the motherland.

5.2 Curriculum Implementation Plan

Teachers upload learning resources and pre-course tests on the online learning platform before class. Students can master the basic knowledge. Teachers design project-based teaching cases around Chongqing's revolutionary culture and students practice and innovate in projects in class.

5.3 The Design of Ideological and Political Cases in the Curriculum

1) Bocheng Liu treated eyes
In 1916, Bocheng Liu was injured in a fierce. Later, in Linjiangmen, Chongqing, Dr. Walker performed as many as 20 operations without anesthesia. In this project, students should add three characters: Bocheng Liu, Dr. Walker, and Shuyu Liu. Meanwhile, according to the order of development of the story, students should write a small animation, requiring the storyline to be reasonable and compact. After studying, students can learn about his spirit of brave and perseverance.

2) Chongqing Opera House 'Eternal Life in the Fire - Red Rock Spirit Theme Concert'
In this case, students should add four background pictures about Sister Jiang and switch the background every 4 s; When the program starts, the host says: 'Hello everyone, the song that will play soon is Red plum blossom'; When pressing the buttons 1, 2, 3, 4, 5, 6, and 7 on the computer, respectively, the piano sound is emitted, come, mi, hair, instigation, pull, west. Under the influence of red songs, students can improve their cultural self-confidence and patriotic feelings.

3) The Battle of Baima Mountain to liberate Chongqing
Add the roles of the People's Liberation Army and the Kuomintang represent our side and the enemy, respectively. Use the left and right keys to control our Army; The enemy can move from top to bottom. If the bullet hits an enemy unit, a bullet explosion pattern

appears. If the enemy plane touches the plane, the game ends. After studying, students will adhere to the leadership of the Communist Party of China.

4) Chongqing Red Revolution Cultural Challenge

Students should add a person to write the question on the screen. Such as 'Marshal Liu was born in _____ District of Chongqing Municipality'. Besides, students should produce a game score statistics function and a dialog box at the bottom of the screen for entering the answers. When you enter a correct answer, the score increased by one, the 'answer correct' appears, and a victory sound appears; When you enter an incorrect answer, the score decrease by one, a 'Wrong Answer' appear, and an incorrect tone appears. After studying, students will enhance their sense of honor, disgrace, and mission.

6 Conclusion

Given the problems in the teaching process of curriculum ideological and political teaching in Chinese primary school courses, such as the generalization of ideological and political elements, difficulty in integrating ideological and political education, and so on, this paper proposes a Curriculum Ideology and Politics education model. This teaching model takes Maker and STEAM as educational concepts and integrates the Chongqing Red Revolution culture as teaching materials. Based on this teaching model, this paper designs the Scratch course's teaching cases to put forward new ideas and methods for the Curriculum Ideology and Politics in the primary school curriculum. However, the teaching mode has high requirements for the reasonable distribution of teachers' teaching content, and there may be an imbalance in the distribution of class content, resulting in the class situation of students cannot achieve the expected. In future work, we will further optimize the structure of our teaching model to reduce the complexity and make the model fit better.

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