

“Children + Intellectual Creation” Information Technology Interdisciplinary Course Design Based on Innovation and Talent Training

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Abstract: Childhood is a golden period for the development of students’ innovative qualities. It can solve the shortcomings in the cultivation of innovative talents in China and change the dilemma of the shortage of high-level innovators in the long term on cultivating a sense of innovation, innovative spirit, and a foundation for the development of innovative ability. This paper is based on the cultivation of innovative preparatory talents, with the overall development target of student kindergartens and elementary schools for nine years, and the design of the information technology interdisciplinary course “children + intellectual creation” as a breakthrough. From the three dimensions of innovation awareness, innovative spirit, and innovation ability, this paper designs the “children + intellectual creation” course goals, course structure and content, classroom evaluation, etc., and sorts out strong teachers to form the foundation of “children + intellectual creation”; Promote collaboration and develop the “children + intellectual creation” wing; Promote collaboration and show the “children + intellectual creation”; The four implementation strategies, such as “children + intellectual creation”, are expected to enlighten the interdisciplinary course design of information technology based on the cultivation of innovative preparatory talents.

Keywords: Innovative talents; Course system; Children + intellectual creation; Kindergarten; Elementary school

1. Introduction

National leader emphasized in the report of the 20th National Congress of the Party that it is necessary to insist that science and technology are the primary productive force, talent is the first resource, and innovation is the first driving force. Childhood is a golden period for the development of students’ innovative qualities. It can solve the shortcomings in the cultivation of innovative talents in China and change the dilemma of the shortage of high-level innovative talents in the long term on cultivating a sense of innovation, innovative spirit, and a foundation for the development of innovative ability. Through the construction and implementation of a “children + intellectual creation” course system based on the cultivation of innovative preparatory talents, it will greatly enhance students’ ability to implement projects, cooperate and communicate, and critically and creatively, thus laying a solid foundation for the cultivation of innovative talents.

2. Concept definition

2.1 Innovative candidates

Innovative talents refer to talents who have a sense of innovation, innovative spirit, ability to innovate, and can achieve innovative results. Talents ready to innovate refer to children and young people who initially have a sense of innovation, innovative spirit, and ability to innovate at the basic education stage. The goal of cultivating innovative talents is to cultivate students’ sense of innovation, innovative spirit and ability to innovate through methods and methods that meet the characteristics of education development in the new era and students’ cognitive rules, and lay the foundation for them to become innovative talents who can actively innovate, solve problems, and promote social progress.

2.2 “Children + intellectual creation” course based on innovation to prepare talents

The “Children + intellectual creation” course, which is based on the cultivation of innovative and prepared talents, is a child-centered, interdisciplinary theme integrated course conducted in “kindergarten+elementary school”. The “Children + intellectual creation” course system combines the characteristics of children’s cognitive development with the development needs of the new era. Through a real learning

environment and activities, children’s interest and creativity are stimulated, students’ ability to solve unknown and complex problems is cultivated, and students’ potential and creativity in innovative fields is demonstrated.

3. Construction of a “Children + intellectual creation” Course Based on Innovation and Preparation of Talents

3.1 “Children + intellectual creation” course goals

The goal of the “Children + intellectual creation” course, which is based on the cultivation of innovative talents, is to cultivate children with an initial sense of innovation, innovative spirit, and ability to innovate at an “early age”. The course goals are divided into three levels: sense of innovation, spirit of innovation, and ability to innovate. First, innovation awareness refers to the ability to observe, discover, understand, and grasp the value of new ideas, new technologies, new products, etc. Its Level 2 dimensions are divided into innovation observation, innovation discovery, and innovation understanding. Second, the spirit of innovation refers to the courage, will, and ideals to innovate expressed in the process of implementing the ability to innovate. Its Level 2 dimensions are divided into the courage to innovate, the will to innovate, and the ideal to innovate. Third, the ability to innovate refers to the ability to transform a sense of innovation into innovative practice. Its Level 2 dimensions are divided into practical innovation, cooperative communication, critical thinking, and problem solving. The goals fully take into account the learning needs, ability levels and interests of students in each academic segment. The goals are specific, measurable, and achievable, and are interrelated and supported by the entire course system.

Table 1: “Children + intellectual creation” Course Goals Based on Fostering Innovative Talents

Level 1 dimension	Level 2 dimensions	Overall description
Sense of innovation	Innovation observation	Awareness of innovation refers to the ability to observe, discover, understand, and grasp the innovative value of new ideas, new technologies, new products, etc.
	Innovative discoveries	
	Innovative understanding	
Innovative spirit	Courage to innovate	The spirit of innovation refers to the innovative courage, will, and ideals expressed in the process of implementing innovative abilities.
	The will to innovate	
	Innovative ideals	
Ability to innovate	Practical Innovation	The ability to innovate refers to the ability to transform a sense of innovation into innovative practice.
	Cooperative communication	
	critical thinking	
	Problem Solving	

Based on the overall goal of the “Children + intellectual creation” course to train innovative talents, the author sets goals and implementation suggestions according to kindergartens, lower elementary schools, middle elementary schools, and upper elementary schools. Each academic level is divided into three levels: sense of innovation, spirit of innovation, and ability to innovate. The “sense of innovation” in the kindergarten class sorts out target rules and implementation suggestions from the three perspectives of “innovation observation,” “innovation discovery,” and “innovation understanding.” For example, in the “Innovative Observation” section, the goal rule is to cultivate young children’s sensitivity to the surrounding environment and be able to observe and describe novel things in the environment; the implementation proposal is to organize observation activities to guide young children to observe changes and innovations in the natural world, places of life, daily activities, etc. The “innovative spirit” of kindergartens sorts out target rules and implementation suggestions from the three perspectives of courage to innovate, will to innovate, and ideals to innovate. For example, the “Will to Innovate” goal rules are to cultivate young children to relentlessly pursue innovation and cultivate their perseverance and determination to overcome difficulties; the implementation proposal is to design challenging activities with a certain level of difficulty, encourage young children to persevere in solving problems, and stimulate their enduring interest and investment in innovation. Kindergartens’ “ability to innovate” sorts out goals, rules, and implementation suggestions from the four perspectives of practical innovation, cooperative communication, critical thinking, and problem solving. The goal rules of “problem solving” are to cultivate young children’s ability to analyze problems and find solutions, and encourage them to propose innovative solutions when faced with problems; the implementation proposal is to organize exploratory games and activities to encourage young chil-

dren to find various ways and methods to solve problems, and guide them to experiment and reflect.

At the lower level of elementary school, that is, in the first and second grade, according to the overall goal of the “Children + intellectual creation” course, which is based on the training of innovative preparatory talents, the goals have been raised on the basis of the specific goals and implementation recommendations of kindergartens. The goal rules for the lower elementary school level, such as the “Innovative Observation” section of “Innovation Awareness,” are to cultivate students’ ability to carefully observe and keenly perceive the surrounding environment and things; the implementation proposal is to guide students to be able to observe, describe, and record surrounding things and phenomena, discover fresh and interesting points in them, and express their own observations. The goal rules of the “will to innovate” section of elementary schools, such as the “innovative spirit,” are to cultivate students’ will and perseverance to explore and pursue innovation; the implementation proposal is to help students maintain a positive attitude in the face of difficulties and challenges during the teaching implementation process, persist in experimentation and exploration, be brave in accepting failure, and learn and grow from it. For example, the goal rules of the “problem solving” section of “innovation ability” are to cultivate students’ ability to analyze problems and find solutions, and encourage them to propose innovative solutions when faced with problems; the implementation proposal is to organize exploratory games and activities to create an environment where students can analyze the causes and key points of problems, propose various solutions, and be able to evaluate and select the best solutions for implementation. In the next middle and upper grades of elementary school, suggestions suitable for the implementation of each academic level are also put forward in accordance with progressive and detailed requirements.

3.2 “Children + intellectual creation” Course Structure and Content

Under the guidance of the overall goal of the “Children + intellectual creation” course, which is based on the cultivation of innovative and prepared talents, the structure and content of the “Children + intellectual creation” course is designed. The course is divided into school segments. The number of lessons for each topic in kindergarten is 1 lesson; the number of lessons for each topic in the first and second grade of elementary school is 2 lessons; the number of lessons for each topic in the third and fourth grade of elementary school is 3 lessons; and the number of lessons for each topic in the fifth and sixth grade of elementary school is 4 lessons. The content is based on the goals and implementation suggestions for the primary school and kindergarten segments of the “Children + intellectual creation” course based on innovation and preparation of talents, and design the specific content of the corresponding school segments. For example, the kindergarten section design is shown in Table 2.

Table 2: Kindergarten class structure and content of the “Children + intellectual creation” course based on innovation and talent training

School class	Semester	Themes	Equipment and software	interdisciplinary
Kindergarten small class	Semester 1	Intelligent interaction for me	smart speaker	Information technology, language, society
Kindergarten small class	Semester 2	I’ll fill in the digital painting	Banbantong, digital coloring software	Information technology, art
Kindergarten middle class	Semester 1	I’ll play somatosensory games	Banbantong, somatosensory game console	Information technology, health
Kindergarten middle class	Semester 2	Plant friends, I’ll check	Mobile phone or tablet, plant recognition app or applet	Information technology, science
Kindergarten Master Class	Semester 1	I’ll measure the classroom items	Mobile phone or tablet, rangefinder app or applet	Information technology, science
Kindergarten Master Class	Semester 2	I’ll use the intelligent control	Smart speakers, smart bulbs, smart switches	Information technology, language, society

In the elementary school level, the “Children + intellectual creation” course for cultivating innovative talents is also designed with different topics according to the upper middle school levels. In the first and second grade of elementary school, according to the goals and implementation suggestions, I will recognize the four themes of Intelligent Literacy (first semester of the first year), AI painting, I will draw (second semester of the first year), AI Flying Flower Order (first semester of the first year), and I will draw three-dimensional graphics (first semester of the first year). Each topic was completed in two lessons. In the 3rd and 4th grade of elementary school, according to the goals

and implementation suggestions for the 3rd and 4th grade, Design Me is a 3D Little Tour Guide (3rd grade) and turning waste into treasure (4th grade). Each topic was completed in three lessons. In the 5th and 6th grade of elementary school, according to the goals and implementation suggestions for the 5th and 6th grade, I will study the design study theme (5th grade) and create a text that can be generated (6th grade). Each topic was completed in four lessons.

3.3 “Children + intellectual creation” Classroom Evaluation

The “Children + intellectual creation” classroom evaluations are all based on the design of student self-assessments and teacher self-evaluation forms based on the development dimensions of innovative and preparatory talents. Student self-assessment takes the form of student responses, student practice, student participation, and student effectiveness. Teacher self-assessment is implemented in the form of teacher organization, teacher guidance, teacher questions, and teacher reviews.

4.Implementation Strategy for the “Children + intellectual creation” Course Based on Students’ Innovative Development

4.1 Strong teachers form the foundation of “children + intellectual creation”

In order to ensure the effective implementation of the “Children + intellectual creation” course based on innovation and talent preparation, it is necessary to strengthen teaching staff building and enhance teachers’ “children + intellectual creation” teaching level and ability. The first is to strengthen teacher training, that is, organize “Children + intellectual creation” training courses for teachers on a regular basis, including training in course design, teaching methods, and evaluation methods to help teachers understand the latest educational concepts and teaching methods. The second is to establish a teacher exchange mechanism. In particular, to encourage exchanges and cooperation between kindergarten and lower elementary school teachers, share teaching experience and teaching resources, and jointly promote the improvement of teaching quality.

4.2 Diligent optimization solidifies the core of “children + intellectual creation”

The “Children + intellectual creation” course needs to be continuously optimized in practice to meet students’ age, interests, and ability characteristics to improve the quality and effectiveness of teaching. First, it is necessary to improve the course content, gradually improve the course content according to the age and stage of development of the students, and focus on cultivating students’ ability to innovate and practice. Course content should be adjusted and improved in a timely manner based on students’ feedback. Second, it is necessary to innovate teaching methods and adopt a variety of teaching methods, such as group cooperation, project-based learning, etc., to stimulate students’ innovative potential. Emphasis is placed on developing students’ independent learning and teamwork skills. Third, it is necessary to diversify evaluation methods and establish scientific evaluation methods based on student and teacher self-evaluation forms, such as platform-based developmental evaluation of students and evaluation of students’ learning achievements in units of academic years.

4.3 Promote collaborative exhibition of the “Children + intellectual creation” wing

The design and implementation of the “Children + intellectual creation” course requires collaboration with platforms, fields, and parents to expand course outreach and enhance the effectiveness of course implementation. The first is to promote cooperation with various contests and other platforms, so as to promote practice and practice to make students’ learning more valuable. The second is to promote links between school function rooms, reading rooms, campus culture, and actual campus scenarios and courses, so that classrooms can truly solve real-world problems in schools. The third is to promote home-school cooperation based on innovation to prepare talents. It is possible to establish home-school cooperation projects and carry out meaningful practical activities with parents, such as science and technology innovation competitions, social practice, etc., so that students can exercise their ability to innovate in practice. It also provides parents with an opportunity to understand their children’s learning situation.

5. Conclusion

A country is founded on talent, government thrives on talent, and industry is strong. To achieve the “Chinese Dream,” it is necessary to cultivate and develop innovative talents with an innovative spirit, sense of innovation, and ability to innovate. We have to see that currently there is still too little attention being paid to cultivating innovative talents at an early age, and that we still need to get more close and support from schools, families, and society. This paper is based on the “Children + intellectual creation” information technology interdisciplinary course design for the training of innovative talents. It is hoped to provide further research inspiration for teachers to train innovative talents in young age groups. It is hoped to provide further research inspiration for teachers to train innovative talents based on information technology disciplines.

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