

Curriculum design and teaching method under ecological education concept

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Abstract: The concept of ecological education is a kind of education concept that pays attention to students' all-round development, cultivates innovative spirit and practical ability, and closely links education with society and environment. Under the guidance of this concept, curriculum design and teaching methods need to be comprehensively optimized and innovative. This paper mainly introduces the application of ecological education concept in curriculum design and teaching methods, as well as the development direction and possible challenges of ecological education in the future.

1. Introduction

1.1. The concept and importance of ecological education

Ecological education is a form of education that aims to promote environmental protection and sustainable development. It emphasizes the interdependence between the environment, society, and economy, and aims to help learners develop the concepts and skills of environmental protection and sustainable development, in order to promote harmonious coexistence between humans and nature. Ecological education emphasizes the study of the multidimensional spatial and multi-environmental systems that determine the production, existence, and development of education. Student, teacher, and teaching environment are the main influencing factors, with students as the primary factor and teachers as the leading factor. The interactivity, openness, and integrity of the teaching environment largely determine the harmony and sustainable development of ecological education[1].

Ecological education has a very significant meaning in today's society. Firstly, ecological education can help people establish awareness of environmental protection and promote sustainable development. Ecological education can help people realize the importance of environmental protection, stimulate awareness of protecting the environment, cultivate a sense of cherishing and protecting natural resources through learning ecological knowledge, start from small things, and take responsibility for environmental protection. Through ecological education, people can understand the importance of the natural environment and the impact of environmental protection on the future of mankind. This helps people form a lifestyle and habits that are environmentally friendly, thereby promoting sustainable development.

Secondly, ecological education can promote innovation and development. Ecological education encourages students to think innovatively and use scientific methods. Students need to understand the

complexity of environmental issues and cultivate problem-solving abilities. Cultivating innovative thinking can help students propose innovative solutions in the field of environmental protection and promote the development of the environmental protection cause. Ecological education encourages people to participate in environmental protection actions and enhance environmental awareness through practice. At the same time, it also emphasizes the cooperation and common development of various sectors of society to achieve the goal of sustainable development.

Thirdly, ecological education emphasizes the harmonious coexistence between humans and nature, requiring people to maintain a sense of awe towards the natural world. This kind of education can cultivate students' ecological morality, enabling them to learn to respect nature, cherish life, and pursue the harmonious development between humans and nature. Ecological education encourages people to participate in environmental protection actions, enhancing environmental awareness through practice. At the same time, it also emphasizes the cooperation and common development of all sectors of society to achieve sustainable development goals. In summary, ecological education is of great significance for promoting environmental protection and sustainable development. It not only influences individual beliefs and behaviors but also promotes ecological awareness and participation in the entire society.

1.2. The key role of curriculum design and teaching methods in ecological education.

Course design and teaching methods play a crucial role in ecological education. Ecological education emphasizes holism, coordination, and sustainability, which differ greatly from traditional education. The ecological education concept emphasizes that education should follow its natural course, respecting the natural processes and laws of things. The content, approach, and methods of education should be conducive to the natural development and growth of learners[2].

Firstly, in terms of curriculum design, ecological education requires that the arrangement of course content be closely connected to the natural environment and social reality, emphasizing the comprehensiveness, interdisciplinary nature, and practicality of the course content. Therefore, curriculum design needs to be guided by ecological principles, focusing on cultivating students' ecological awareness and ecological literacy. In terms of the arrangement of course content, ecological knowledge, ecological consciousness, ecological ethics, and other related topics should be integrated, and through various forms such as classroom teaching and practical activities, help students understand and grasp ecological knowledge, and cultivate their ecological literacy.

Secondly, the teaching methods also need to pay attention to the ecological concept. In classroom teaching, case analysis, discussion, exploration and other teaching methods can be used to guide students to learn and explore independently, cultivate their ability to think independently and solve problems. At the same time, practical teaching methods can also be adopted to organize students to participate in ecological conservation practice activities, such as environmental protection volunteering activities, environmental monitoring, etc., so that students can experience and feel the importance of ecological conservation in practice.

In addition, the role of the teacher cannot be ignored. Teachers need to possess ecological concepts and ecological knowledge and be able to flexibly apply various teaching methods and means. They guide students to establish correct ecological concepts and cultivate their ecological literacy. Meanwhile, teachers need to continuously learn and update their knowledge to adapt to the constantly changing ecological environment and educational demands.

In conclusion, curriculum design and teaching methods play a crucial role in ecological education. Only through scientific and reasonable curriculum design and teaching methods can the goal of ecological education be truly achieved, and new generation talents with ecological awareness, ecological literacy, and innovative abilities be nurtured.

2. Curriculum design under the concept of ecological education

In the concept of ecological education, curriculum design should focus on the integration of holistic, comprehensive, practical, sustainable, and individualized principles, in order to help students better understand the operation of ecosystems and the importance of environmental protection, cultivate their comprehensive thinking ability and practical operational ability, and promote their cognitive and emotional development.

(1) Course objectives: The course objectives under the concept of ecological education should focus on the all-round development of students, cultivate their ecological awareness, innovative spirit and practical ability, and pay attention to the cultivation of students' emotions, attitudes and values.

(2) Course content: The course content should be closely related to the student's life and environment. Marxism believes that "people create the environment, and the environment also creates people." [3] Schools should strengthen the construction of campus ecological environment and fully tap into the educational function of campus environment. The course content covers multiple fields such as natural sciences, social sciences, humanities and arts, emphasizing the integration and connection of knowledge. The course design should focus on the integration of disciplines and guide students to comprehensively apply the thinking methods of these disciplines to solve ecological problems, and emphasizing practicality and inquiry, guiding students to pay attention to the ecological environment and sustainable development.

(3) Course implementation: Course implementation should focus on the subjectivity and exploratory nature of students, and adopt various teaching strategies and methods, such as project-based learning, cooperative learning, self-directed learning, etc., to cultivate students' innovative thinking and practical abilities. At the same time, curriculum implementation should establish connections with communities, families, businesses, and other aspects, fully utilize social resources, and provide students with broader learning and practical space.

(4) Course evaluation: Course evaluation should adopt multiple evaluation methods, including formative evaluation, summative evaluation, self-evaluation, etc., emphasizing the comprehensiveness and impartiality of evaluation. The evaluation content should focus on students' knowledge, skills, emotions, attitudes, values, and other aspects, while also emphasizing their sustainable and personalized development.

(5) Teacher professional development: Under the concept of ecological education, teacher professional development should focus on cultivating teachers' ecological awareness and sustainable development ability, improving their scientific and humanistic literacy, so that teachers can better guide students to pay attention to the ecological environment and sustainable development.

In short, the curriculum design under the concept of ecological education should focus on the comprehensive development of students, the integration and connection of knowledge, practical exploratory learning, social connection, and the comprehensiveness and impartiality of evaluation, aiming to cultivate students' ecological awareness, innovative spirit, and practical ability, and promote their sustainable and personalized development.

3. Teaching methods under the concept of ecological education

The teaching methods under the concept of ecological education should focus on the subjectivity, exploration, practicality, and cooperation of students, aiming to cultivate their innovative thinking and practical abilities, and promote their comprehensive development. Here are some specific teaching methods:

(1) Exploratory teaching: Exploratory teaching refers to a teaching method in which students, under the guidance of teachers, independently explore problems, acquire knowledge and skills through observation, experimentation, thinking, discussion, and other methods. This teaching method

can stimulate students' interest in learning and exploration spirit, cultivate their observation ability, thinking ability, and practical ability.

(2) Collaborative learning: Collaborative learning refers to a teaching method in which students complete learning tasks in groups or teams through collaborative learning, mutual assistance, and mutual inspiration. This teaching method can cultivate students' spirit of cooperation and teamwork, improve their communication skills and confidence.

(3) Autonomous learning: Autonomous learning refers to the teaching method in which students independently complete learning tasks through self guidance, self-restraint, self-evaluation, and other means. This teaching method can cultivate students' self-learning and self-management abilities, improve their learning effectiveness and quality.

(4) Project based learning: Project based learning refers to the teaching method in which students learn knowledge and skills through completing a practical project or problem under the guidance of a teacher. It is a teaching model formed based on constructivist learning theory, with the aim of solving practical problems and developing projects in real situations, enabling students to master more knowledge and apply it in practice[4]. This teaching method can cultivate students' practical ability and innovative thinking, improve their project management ability and problem-solving ability.

(5) Case teaching: Case teaching refers to the teaching method in which teachers guide students to analyze and solve problems by analyzing real cases. This teaching method can help students understand real problems and situations, improve their analytical and problem-solving abilities, and also cultivate their case analysis and management skills.

In short, the teaching methods under the concept of ecological education should focus on the subjectivity, inquiry, practicality, and cooperation of students, aiming to cultivate their innovative thinking and practical abilities, and promote their comprehensive development. Different teaching methods have different applicable scopes and targets. Teachers should choose appropriate teaching methods based on the actual situation of students and teaching content to achieve the best teaching effect.

4. Application Strategies of Ecological Education Concept

The application strategy of ecological education concept is multifaceted, requiring schools to reform and innovate from multiple perspectives in order to better cultivate talents with sustainable development capabilities.

(1) Schools should widely carry out ecological education and publicity activities: through media, social media platforms, schools and other channels, popularize ecological knowledge, advocate green lifestyles, and call for everyone's participation to enhance public awareness of ecological protection and sustainable development.

(2) Transforming teaching values: Ecological teaching values reflect the sustainable growth of students' lives. Teachers should aim to cultivate free and dynamic "ecological people" as their ultimate teaching goal. Therefore, we must follow the laws of ecological nature, respect the individual differences of students, teach according to their aptitude, and cultivate them into socialist builders and successors with rich personalities.

(3) Schools should integrate ecological education into their curriculum system: focus on cultivating students' environmental awareness, ecological literacy, and values of sustainable development in curriculum settings. Strengthen multidisciplinary education and teaching, encourage students to participate in ecological protection and practice activities, and cultivate them to become promoters of sustainable development.

(4) Improve the relationship between teachers and students: Ecological education focuses on equal communication between teachers and students, as well as between students. In the teaching process,

teachers should treat each student equally and democratically, respect their personality, emotions, and thoughts, and establish a new type of democratic, harmonious, and equal relationship between teachers and students.

(5) Create a green educational environment: Schools should strive to create a beautiful campus environment, allowing students to feel the beauty and preciousness of nature. Plants, flowers, trees, small ponds, and environmental slogans can be planted on campus, allowing students to feel the beauty of nature and the value of life. At the same time, various environmental protection activities can be carried out, such as garbage sorting, tree planting, etc., allowing students to personally feel the importance of protecting the environment.

(6) Innovative teaching methods: Ecological education requires innovative teaching methods. Traditional cramming teaching methods should be abandoned, and new teaching methods such as inquiry-based, cooperative, and project-based methods should be adopted to enable students to become the masters of learning. At the same time, modern information technology tools such as online teaching and multimedia teaching can be used to improve teaching effectiveness and quality.

(7) Strengthening the practical link: Ecological education should focus on the practical link. Students should be involved in the protection of the ecological environment, and through practice, they can deepen their understanding and grasp of ecological knowledge. Students can be organized to participate in environmental protection volunteer activities, field practice and other practical activities, so that they can discover and solve problems in practice.

(8) Developing teachers' ecological literacy: Teachers are the key to implementing ecological education. It is necessary to strengthen the training and development of teachers, improve their ecological literacy and environmental awareness. Teachers can participate in relevant training courses, seminars, etc., so that they can understand the latest ecological education concepts and methods. At the same time, experts and scholars can be invited to schools to give lectures and exchanges, so that teachers can have a deeper understanding of the connotation and significance of ecological education.

In short, the application strategies of the ecological education concept should focus on transforming teaching values, improving teacher-student relationships, and creating a green educational environment. These strategies help cultivate students' ecological awareness, comprehensive literacy, and environmental behavior skills, and promote their all-round development.

5. Conclusion and Outlook

(1) The application of ecological education concepts in curriculum design and teaching methods.

The application of ecological education concepts in curriculum design and teaching methods is mainly reflected in the following aspects:

First, curriculum design. Under the guidance of the concept of ecological education, the school has comprehensively optimized its curriculum design. By integrating resources both inside and outside the school, the school has established a moral education curriculum system based on ecological experience, with cultural experience and emotional health as the main themes, combined with moral education activities such as lectures, research trips, and investigations, to maximize the use of moral education resources. This system focuses on students' personal experience and practical activities, highlighting experiential moral education.

Second, teaching methods. The teaching methods under the concept of ecological education focus on students' personal experience and practice, independent learning and thinking ability, communication and interaction, as well as the cultivation of free thinking and creativity. Through experiential teaching, inquiry teaching, interactive teaching, and open teaching methods, students are guided to actively participate in classroom learning and improve teaching effectiveness. Through the application of these methods, students' learning enthusiasm is enhanced, and their independent

inquiry consciousness and innovative spirit are cultivated.

Thirdly, student development. The application of ecological education concepts helps to cultivate students' ecological awareness, comprehensive literacy, and environmental behavior ability, and promotes their all-round development. Through understanding scientific knowledge about the natural environment and conducting environmental education, students can better understand and protect the environment. The application of ecological education concepts is most significantly reflected in students, improving their comprehensive quality and practical ability, as well as their independent inquiry consciousness and innovative spirit.

Fourth, teacher development. The application of ecological education concepts also promotes the professional growth of teachers. When organizing activities, teachers need to constantly learn and study new educational theories and methods, which helps improve their teaching and learning levels. At the same time, through interaction and communication with students, teachers can better understand the needs and characteristics of students, providing better conditions for teaching students according to their aptitude.

Fifth, family education. The application of ecological education concepts has also indirectly influenced family education. When parents participate in school activities, they can gain a deeper understanding of the school's educational philosophy and ideas, and thus better cooperate with the school in family education. At the same time, through interaction and communication with their children, parents can better understand their children's growth needs and psychological characteristics, providing better conditions for establishing a more harmonious family relationship.

In short, the application of the ecological education concept in curriculum design and teaching methods has mainly resulted in optimizing curriculum design, improving teaching quality, promoting the development of teachers and students, and enhancing family education literacy. These achievements help cultivate students' ecological awareness, comprehensive literacy, and environmental protection behavior ability, promoting their all-round development. It also lays the foundation for promoting the sustainable development of school education.

(2) The future direction of ecological education development and the challenges it may face in curriculum design and teaching methods.

The future development of ecological education focuses on cultivating students' comprehensive qualities, including ecological awareness, environmental protection behavior ability, innovative thinking, practical ability, etc. This requires teachers to pay more attention to students' actual needs and interests in curriculum design and teaching methods, and to improve students' participation and learning effectiveness through diverse teaching methods and means. At the same time, with the continuous development of new technologies, ecological education in the future will pay more attention to promoting educational innovation by combining new technologies. For example, using artificial intelligence, big data and other information technology means to achieve personalized teaching and intelligent assisted learning, improve teaching effectiveness and students' learning experience. In addition, ecological education in the future will pay more attention to sustainable development and ecological civilization construction, and focus on cultivating students' sustainable development concept and ecological civilization awareness. This requires teachers to pay more attention to the penetration and integration of relevant knowledge and content in curriculum design and teaching methods, helping students better understand and practice the concept of sustainable development.

In terms of curriculum design and teaching methods, ecological education will face the following challenges:

Firstly, ecological education requires the integration of knowledge and skills from different disciplines, with an emphasis on interdisciplinary learning and practice. How to effectively integrate different subject contents and design meaningful teaching activities is one of the important challenges

facing ecological education. Secondly, ecological education focuses on students' participation and experience, and requires innovative teaching methods, such as inquiry-based teaching, cooperative teaching, project-based teaching, etc. How to choose appropriate teaching methods based on students' characteristics and needs and apply them flexibly is one of the important challenges facing ecological education. Thirdly, ecological education focuses on cultivating students' innovative spirit and practical ability. How to provide students with more practical opportunities and platforms, and how to stimulate students' innovative thinking and creativity, are important challenges facing ecological education. Fourthly, ecological education requires the establishment of a sound evaluation and feedback mechanism to assess students' learning outcomes and teachers' teaching effectiveness. How to develop scientific and reasonable evaluation criteria, and how to collect and analyze students' learning data and feedback to improve teaching and enhance students' learning effectiveness, are important challenges facing ecological education. Fifthly, the implementation of ecological education requires teachers to possess interdisciplinary knowledge and skills, as well as practical experience. How to cultivate teachers' professional qualities and abilities to meet the needs of ecological education is an important challenge facing ecological education.

In short, the future direction of ecological education development mainly includes paying more attention to the cultivation of students' comprehensive literacy, promoting educational innovation with new technologies, and focusing on sustainable development and ecological civilization construction. Challenges that may be faced in curriculum design and teaching methods include how to better integrate resources inside and outside the school, how to innovate teaching methods and means, and how to improve teachers' professional literacy and ability. Only through continuous exploration and innovation can we promote the continuous development of ecological education and cultivate more outstanding talents with ecological awareness and environmental protection behavior ability. The development of ecological education in the future will face many challenges, and it is necessary to constantly explore and innovate to meet the needs of the times and the development of students.

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References

- [1] Zhang Jing. *Teaching Strategies for College English Classroom Based on the Concept of "Ecological Education" in Education*, *Journal of Kaifeng Institute of Education*, 2013(4), 105-106.
- [2] Feng Ping, Chen Xia etc *Research on the Implementation Path of Curriculum Ideological and Political Education under the Ecological Education Concept - Taking the Course of "Econometrics" as an Example*, *Science and Education Guide* ,2022(24), 108-110.
- [3] Hao Lixin, Wu Xiangdong eds. *Research on the History of Marxist Philosophy*, Beijing: People's Publishing House, 2018:193.
- [4] Sarenqiqige. *Research on project-based teaching under the vision of cultivating applied talents*, *Journal of Inner Mongolia University of Finance and Economics*, 2023(6):59-62.