

Research on Cross-disciplinary Ecological Education Strategies in Universities during Digital Transformation Period

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Abstract

In the context of digital transformation, the realization of interdisciplinary ecological education in universities relies on the collaborative efforts of multiple elements such as curriculum design, innovation in teaching models, construction of digital resources, teaching evaluation, and improvement of teachers' capabilities. These elements are interdependent and together form a complete educational ecosystem, aiming to cultivate students' interdisciplinary comprehensive abilities and problem-solving skills in complex environments. This article explores the intrinsic connections and collaborative paths among these elements, providing theoretical references and practical directions for universities to promote interdisciplinary ecological education.

Keywords

Digital transformation; Interdisciplinary ecological education; Curriculum design; Teaching mode; Teaching evaluation

1. Introduction

In the practice of interdisciplinary ecological education, the relationships among curriculum design, innovation of teaching models, construction of digital resources, teaching evaluation, and improvement of teachers' capabilities are closely interdependent. These elements collectively form a comprehensive educational ecosystem, aiming to cultivate students' interdisciplinary abilities and their capacity to solve complex environmental problems.

2. Interdisciplinary Ecological Education System

2.1. Curriculum Design

Curriculum design is at the core of interdisciplinary ecological education and determines the content and direction of students' learning (Brown & Green, 2019). Dur-

ing the digital transformation period, universities need to re-examine their curriculum designs to meet the requirements of interdisciplinary ecological education. This means that the curriculum design needs to pay more attention to the integration of interdisciplinary content, such as organically combining the knowledge points of disciplines like biology, environmental science, economics and sociology to form an overall curriculum system. The purpose of doing this is to cultivate students' comprehensive abilities and enable them to have the capacity to solve complex environmental problems (Lee, 2018b).

2.2. Innovation of Teaching Mode

However, a well-designed curriculum alone is not sufficient to achieve the desired teaching effect. The innovation of teaching models provides an important guarantee for the effective transmission of course content (Zhong Shaochun et al., 2022). New teaching models such as blended teaching, project-based teaching and reverse classroom have broken the traditional single-subject teaching and promoted the cross-integration of knowledge. These models emphasize students' active participation and practice, which is conducive to cultivating students' innovative ability. For instance, blended teaching combines online self-study with offline discussions, enabling students to not only have the opportunity for autonomous learning but also engage in in-depth discussions with teachers and classmates in class. The relationship between curriculum design and teaching mode is reflected in how the curriculum objectives can be achieved through appropriate teaching methods. Only when the two work in synergy can the goal of cultivating students' comprehensive abilities be realized (Xing Lili, 2020).

2.3. Instructional Evaluation

Teaching evaluation is an important indicator for measuring educational effectiveness. In the digital environment, teaching evaluation needs to be more diversified and comprehensive. It should not only focus on students' mastery of knowledge, but also assess their comprehensive qualities in problem-solving, teamwork, and critical thinking. Such an evaluation method can better reflect the goals of interdisciplinary ecological education, which is to cultivate students' comprehensive abilities and their ability to solve complex environmental problems.

Teaching evaluation is an important part of the educational process. It not only measures students' learning outcomes but also reflects the effectiveness of curriculum design and teaching methods. A scientific and reasonable teaching evaluation system should be able to comprehensively assess students' knowledge acquisition, practical abilities, and comprehensive analytical skills, among other aspects of their qualities. This requires that the evaluation standards be closely integrated with curriculum goals and teaching methods to ensure that the evaluation results can truly reflect the achievement of educational goals. The feedback results of the evaluation

can also provide data support for further improvements in curriculum design and teaching methods.

2.4. Improvement of Teachers' Capabilities

Teachers are important participants in the educational process. During the digital transformation period, teachers need to continuously enhance their professional knowledge and teaching skills to adapt to new teaching models and resources. The professional development and innovation ability of teachers are directly related to the quality of interdisciplinary ecological education (Ambe & Agbor, 2014). Therefore, universities need to provide teachers with continuous training and development opportunities to help them master the latest educational concepts and technical means.

As the key implementers in interdisciplinary ecological education, the improvement of teachers' capabilities has a direct impact on curriculum design, the implementation of teaching models, the effective utilization of digital resources, and the accuracy of teaching evaluations. High-level teachers are not only capable of scientifically setting course objectives and innovating teaching models, but also can flexibly utilize digital resources and conduct effective teaching evaluations. Therefore, the improvement of teachers' capabilities is the foundation for the full play of other factors and an important guarantee for the development of interdisciplinary ecological education.

3. Digital Resource Construction

3.1. Benefits of Digital Resources for Curriculum Design and Content

The construction of digital resources is an indispensable part of modern education, especially in interdisciplinary ecological education. Digital resources such as online learning platforms, virtual laboratories, and digital textbooks provide significant support for the presentation of course content and students' autonomous learning. These resources not only expand the breadth and depth of the course content, but also enhance the adaptability and flexibility of the courses, making the integration among different disciplines easier. Therefore, the construction of digital resources must be closely integrated with the curriculum design to ensure that the resources can effectively support the realization of the curriculum objectives (Brett, 2020).

3.2. Combination of Digital Resources and Teaching Models

The effective utilization of digital resources cannot be achieved without an appropriate teaching model. Blended teaching, online learning communities and other models rely on the support of digital resources. Especially in ecological education, complex environmental issues and the imparting of interdisciplinary knowledge require abundant digital resources to assist teaching. Meanwhile, the innovative

teaching model has also, in turn, promoted the development and application of digital resources, making teaching more personalized and interactive. Therefore, a mutually reinforcing relationship has been formed between digital resources and teaching models, jointly enhancing the effectiveness of teaching.

3.4. Digital Resources Empower Teaching Evaluation and Teacher Development

Digital resources play a crucial role in the teaching evaluation of interdisciplinary ecological education. Through online tests, data analysis tools, and learning management systems, teachers can assess students' learning situations in real time and accurately. These tools not only provide immediate feedback to help students adjust their learning strategies, but also integrate data from multiple disciplines to conduct a comprehensive and integrated assessment, thereby enhancing teaching effectiveness and the scientific nature of evaluation.

Digital resources provide abundant support for the improvement of teachers' capabilities, especially in terms of teaching skills, interdisciplinary integration abilities, and data literacy. Through online learning platforms, virtual reality tools, and data analysis training, teachers can continuously update their knowledge and enhance their skills, thereby better integrating content from different disciplines and effectively utilizing student data, optimizing teaching practices and promoting the development of interdisciplinary ecological education.

4. Conclusion

In conclusion, in interdisciplinary ecological education, the four elements of curriculum design, innovation in teaching models, teaching evaluation, and improvement of teachers' capabilities are interrelated. Against the backdrop of digital teaching, they jointly form a mutually supportive educational ecosystem. Curriculum design provides direction for teaching, teaching mode offers a way for the effective transmission of content, teaching evaluation provides feedback on educational quality, and teachers' ability is the foundation for the effective implementation of all these elements. Only when these elements are coordinated with each other can the goal of cultivating students with interdisciplinary capabilities and the ability to solve environmental problems be achieved.

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