Application and Practice of New Media in Forestry Science Popularization and Education

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Abstract. The classroom teaching revolution aims to enhance higher education quality by positioning classroom teaching as the core battleground. Based on the "Guidelines for Curriculum Ideology and Politics Construction in Higher Education," this paper reforms the "Forest Plants" course within the provincial high-level forestry technology group. The reform builds a robust teaching team, innovates methods, and optimizes resources, integrating ecological civilization elements and new media technology. Advanced technologies like digital platforms, big data, 5G, VR, and AR create immersive experiences, boosting student interest and participation. The goal is to cultivate high-quality forestry science professionals with the principles of "Lucid waters and lush mountains are invaluable assets" and "Protection first." Ideological and political education is embedded throughout the course, exploring new multi-dimensional evaluation methods to enhance students' skills and capabilities. This study uses industry-academia collaboration to update resources and construct a new teaching model, supporting high-standard planning, construction, and development in vocational education.

Keywords: Curriculum Ideology and Politics; New Media; Forestry Science Popularization; Classroom Revolution.

1   Introduction

In 2017, Education Minister Chen Baosheng initiated a "classroom revolution" to foster students' innovation and practical skills[1]. The 2020 "Action Plan for Improving Quality and Excellence (2020-2023)" extended this revolution to vocational schools, promoting deeper curriculum reform to cater to diverse student needs[2].

The classroom is the main battlefield for vocational education. This revolution drives high-standard planning, construction, and development of vocational colleges, making classroom teaching the primary channel for integrating ideological and political education. The reform aims to subtly and effectively integrate these elements into all teaching aspects, centering on students, stimulating their interest, and guiding deep thinking[3-5].

This study responds by leveraging the "Forest Plants" course in forestry technology, redesigning teaching teams, methods, and resources. It integrates new media science popularization and ecological civilization ideology, aiming to cultivate forestry science professionals who embrace "Lucid waters and lush mountains are invaluable assets" and "Protection first." This aligns with new trends in forestry science popularization and natural education, offering a new direction for vocational teaching models[6-8].

2   Background and Problem Statement

Since the 19th National Congress of the Communist Party of China, Xi Jinping's thoughts on ecological civilization have guided the development of forestry in Guangdong Province. As a leading forestry province with the most nature reserves in China, Guangdong has actively promoted high-quality natural education. The "14th Five-Year Plan for Forestry Protection and Development in Guangdong Province" (2021) emphasizes leveraging nature reserves, state-owned forest farms, and science venues to establish natural education bases and train versatile natural education personnel[9].

The original course content focused on traditional plant morphology, structure, and growth patterns, making identification complex and disconnected from ecological principles. Students memorized classifications without linking them to local plants, lacking regional context. Under the "14th Five-Year Plan," demand for forestry science and natural education talents has increased, but students with only traditional knowledge cannot meet industry needs for eco-guides with comprehensive skills.

New-generation students, born in the 2000s, are highly information-literate but disengaged by traditional resources. The course also fails to integrate new technologies like big data, 5G, VR, and AR. Traditional assessments do not combine ecological, cultural, and smart forestry concepts with plant identification skills, failing to analyze individual learning, personal differences, and adequately reflect student growth [10,11].

3   Problem-Solving Approaches

Ecological civilization construction is vital for China's development, with forestry science popularization showcasing its achievements. The 2019 State Council document emphasizes respecting, conforming to, and protecting nature, enhancing resource protection, ecological education, and integrated development with related industries. The 2020 "Implementation Opinions on Strengthening Forestry Science Popularization" by Guangdong authorities calls for a shared dissemination platform using integrated media methods and a multimedia resource library.

In response to new trends in forestry science popularization, natural education, environmental education, and smart forestry, the "Forest Plants" course adopts a student-centered approach. Anchored by Xi Jinping's ecological civilization thoughts, the course aims to train high-tech eco-guides. It focuses on "intelligence, systematiza-

tion, and differentiation" and integrates ideological guidance, work, courses, competitions, certifications, online and offline learning, and in-class and extracurricular activities in a dual-system school-enterprise collaboration. This comprehensive approach embeds ideological and political elements throughout curriculum standards, course design, and classroom teaching.

4   Implementation Process and Methods

4.1   Aligning with Industry Development, Restructuring Teaching Content

To address the insufficient integration of professional content with the "Two Mountains Theory" and the issue of outdated content, a multidimensional integration approach is implemented to restructure teaching modules.

Aligning with industry demands and guided by the principles of ideological leadership, integration of work, courses, competitions, and certifications, theoretical and practical integration, and multi-dimensional integration of in-class and extracurricular activities, the course content is restructured in response to new trends, standards, and modes in forestry science popularization and natural education. The original textbook content is deconstructed and restructured to meet the changing skill requirements of the industry.

The course integrates professional competency requirements in forestry science popularization and natural education, industry competitions, and certification standards into knowledge and skill points. Teaching modules are allocated reasonable class hours to support teaching objectives, strengthening the comprehensive development of moral, intellectual, physical, aesthetic, and labor education. Ideological and political elements related to ecological priority, traditional culture, rural revitalization, and smart forestry are incorporated into the content, adhering to the "Two Mountains Theory."
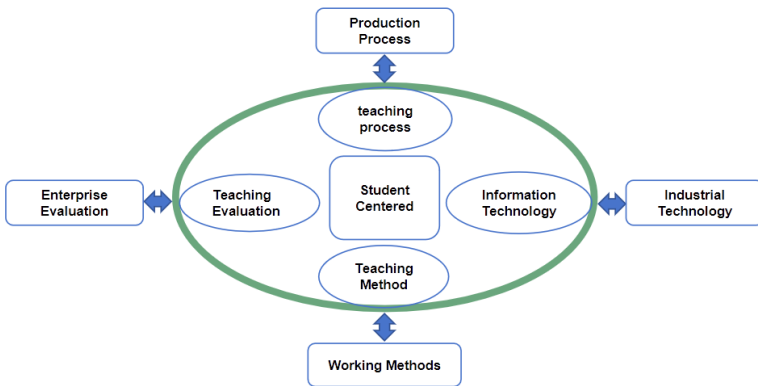
Fig. 1. Restructuring Teaching Content through School-Enterprise Collaboration

As shown in Figure 1, the course design centers on students, integrating teaching processes, evaluations, methods, and information technology with enterprise evaluations, production processes, work methods, and industry technologies. Based on the high-level professional group's talent cultivation program in forestry technology, and considering typical ecological types and related job tasks in Guangdong's forestry industry, the course content is divided into four main modules: identification of plants in national forest parks, identification of plants in mangrove reserves, identification of therapeutic plants in health forests, and identification of medicinal plants in forest economy. These modules are integrated with real enterprise projects, allowing students to experience the real tasks of the forestry industry in Guangdong in advance.

4.2   Deep School-Enterprise Integration, Updating Teaching Resources

To address the insufficient penetration of new media information technology and ideological resources, and the lack of engagement with current trends, the teaching reform is deepened by introducing enterprise digital platforms to update teaching resources and build a new media script resource library.

First, a dual-system teaching team is established, composed of in-school professional teachers and enterprise mentors. This team collaboratively participates in classroom teaching and develops teaching resources. Using the "Three Rings, Six Steps, Four Alignments" teaching strategy, information technology is integrated into the entire teaching process.

The "14th Five-Year Plan" national textbook "Botany" is used as the baseline. Based on real enterprise projects and the needs of eco-guide positions in forestry science popularization and natural education, combined with the "Danxia Mountain Plant Identification Competition" and "Science Popularization Explanation Competition" rules, as well as the "National Long-Term Development Plan for Natural Education (2023-2035)" new norms, the "Mangrove Nature Reserve New Media Science Guide" enterprise project is introduced. This collaboration results in new media teaching scripts closely aligned with job knowledge and skill requirements.

Leveraging provincial-level quality online open courses and resources from platforms like U-Class, a granular teaching resource library covering all course projects is developed for student use. This library includes diverse resources such as course standards, practical standards, micro-lectures on various knowledge points, and over 1,000 ecological tourism resource images. Additionally, a digital ecological arboretum resource library is built, where enterprise teachers and students jointly collect images of common plants in Guangdong, plant cultural designs, personified plant comics, and science guide scripts.

As shown in Figure 2, different teaching and task segments are designed for before, during, and after the course. These segments aim to deepen students' understanding of knowledge points through new media technology.
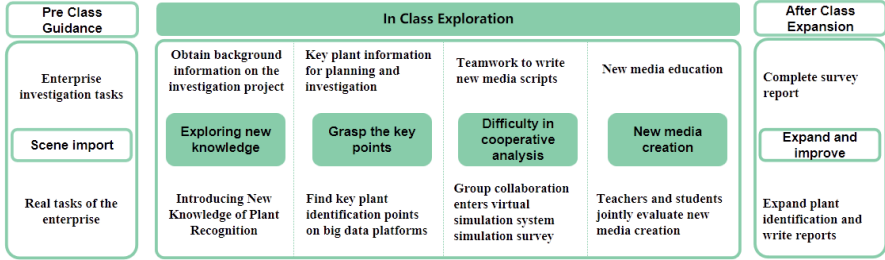
Pre Class Guidance	In Class Exploration				After Class Expansion
Enterprise investigation tasks	Obtain background information on the investigation project	Key plant information for planning and investigation	Teamwork to write new media scripts	New media education	Complete survey report
Scene import	Exploring new knowledge	Grasp the key points	Difficulty in cooperative analysis	New media creation	Expand and improve
Real tasks of the enterprise	Introducing New Knowledge of Plant Recognition	Find key plant identification points on big data platforms	Group collaboration enters virtual simulation system simulation survey	Teachers and students jointly evaluate new media creation	Expand plant identification and write reports

Fig. 2. Integrating New Media Technology into Teaching for Enhanced Understanding

On this basis, multiple new media short videos on plant guides are co-created by enterprises, teachers, and students, forming a new media teaching resource matrix on platforms like WeChat Video, Xiaohongshu, Bilibili, and Douyin. This encourages students to use their preferred new media channels to tell the "Chinese story of eco-logical protection."

4.3   Integrating Ideological Elements, Refining Evaluation Indicators

To address the low integration of ideological and political evaluation in teaching assessments and the lack of personalized evaluation, ideological points are integrated with knowledge and skill points, deepening the teaching evaluation.

Adopting a Comprehensive Evaluation Method: The Comet comprehensive evaluation method is used, based on real enterprise projects and the blended teaching model, following the "Three Rings, Six Steps" teaching method. Pre-class, evaluation data is collected through platforms; during class, participation in discussions, project simulation scores, self-evaluation, group evaluation, and teacher evaluations are combined to form process scores, achieving immediate evaluation and continuously motivating students to complete tasks. Post-class, project assignments are summarized and evaluated by in-school teachers and enterprise mentors. Ideological quality points are integrated with knowledge and skill points, achieving multi-dimensional, multi-subject, and full-process evaluation. Additionally, a value-added evaluation design includes a comprehensive evaluation score table, where students' performance in science competitions, natural education design competitions, and science volunteer activities are assessed, with innovation practice bonus points awarded, though total individual scores cannot exceed 100 points. The final score (100%) = formative assessment (60%) + summative assessment (30%) + value-added evaluation (10%).

5   Conclusions

Centered around Xi Jinping's thoughts on ecological civilization, this course incorporates curriculum ideology and politics in alignment with the latest standards and skills required for forestry protection, development, science popularization, natural education, and ecological guidance. The "Two Mountains Theory" is woven into the teach-

ing objectives, with course content structured to connect the teaching process directly with real-world production practices. This integration not only enhances professional skills and development but also fosters vocational confidence among students.

The course introduces advanced information technologies, including the Mangrove Cloud Viewing Platform and the Comprehensive Management Platform for Nature Reserves, along with original new media short videos produced by both teachers and students. The wealth of enterprise resources and original content significantly enriches the teaching materials, effectively addressing common teaching challenges. The use of self-produced short videos as educational resources empowers students to take ownership of their learning materials, increasing classroom engagement.

Additionally, we collaborate with Meizhou Tobacco Company to integrate new media technology into tobacco cultivation, technical guidance, and project training. By leveraging various new media technologies, we are better equipped to support rural revitalization initiatives within the tobacco industry.

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