



A New High-Level Course Construction Model: Control of Atmospheric Pollutants

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Abstract: A new high-level course construction model, known as the "1234" model, was proposed in the course of "Atmospheric Pollutant Control" to enhance the level of course construction. A four-element support platform was built, encompassing faculty team development, teaching reform, textbook selection, and teaching case studies. This model serves as a reference and provides an implementation path for various courses to undertake high-level construction.

Keywords: New course construction, Four-element support platform, Teaching case.

1. Introduction

Building a high-level course can effectively promote the improvement of students' training quality. It is one of the effective ways to make innovative breakthroughs and explorations in the course construction model [1-2]. A high-level course should emphasize "research", "refinement", and "integration". Highlighting "research" means that the course should have a high level and depth, reflecting not only the advanced nature of the teaching content but also the innovation in teaching methods, assessment methods, and evaluation methods. Highlighting "refinement" means that the course should go through a process of "squeezing out water" and transform "watered-down lessons" into "golden lessons" [3-5]. Highlighting "integration" means that the course should focus on cross-integration between disciplines: transcending disciplines, fields, and boundaries, and comprehensively promoting course construction innovation and quality.

Focusing on the key aspects of "research", "refinement", and "integration", this paper innovatively develops the "1234" new course model for "Atmospheric Pollutant Control" as an illustrative example. It systematically implements the course construction from four dimensions: establishing the faculty team with "three persistence", reforming teaching methods with "three emphases", selecting textbooks based on "three principles", and integrating teaching cases and ideological cases through "double integration". These efforts contribute to a comprehensive enhancement of the course level.

2. Course Construction Model

This course undertook its construction from four aspects: establishing a faculty team with "three persistence," reforming teaching methods with "three emphases," selecting textbooks based on "three principles," and integrating teaching cases and ideological cases through "double integration," thereby contributing to a comprehensive upgrade of the course level.

Firstly, the faculty team was built with "three persistence," continuously promoting innovation in its construction.

- Adhering to a clear value orientation, we focused on constructing morality within the team. This involved consolidating the teaching team's consensus to reflect a common value pursuit, promoting moral cultivation education, highlighting teachers' dedication to work and learning, reverence for morality and beauty, enhancing their ideological and professional ethics level, and implementing a system where mentors are primarily responsible for graduates' education, motivating them to guide graduates' growth and success, academically and in life.



- Adhering to celebrity guidance, we focused on team cultivation. This involved enhancing the overall quality of the team through lecture guidance from teaching celebrities, implementing the "teacher ability improvement plan" through school and college platforms to cultivate an innovative teaching team, promoting the growth and success of young teachers through "workshop" studies and "senior teachers helping new teachers", and strengthening horizontal communication and cooperation with sister universities through the construction of a "virtual teaching and research room".
- Adhering to concept innovation, we focused on the transformation of functions. This involved using "Internet + education" to update technical and educational concepts, change educational paradigms, and promote the digital transformation of education and teaching. We also aimed to change teachers' functional positioning from "explaining" and "imparting" to mobilizing students to "think with their own minds", guiding them to "walk into, understand, analyze, discriminate, think, question, and even subvert", and improving their cognitive and inquiry abilities. Additionally, we aimed to weaken teachers' function of "knowledge dissemination" and strengthen their function of "knowledge creation", highlighting their unique role in "improving students' quality, shaping their personality, and cultivating their innovation". Finally, we aimed to train teachers to "turn from knowledge producers to knowledge builders, from teaching managers to learning leaders, from course lecturers to course developers".

Secondly, the reform of teaching methods focuses "three emphases", the implementation of "all-factor classroom revolution" to create a "golden lesson".

- To further promote "classroom reform", we will focus on change from three dimensions: concept, model, and evaluation. Firstly, we will promote the change of ideas through three shifts: "changing to student-centered", "changing to results-oriented", and "changing to the cultivation of students' quality and ability". Secondly, we will promote the transformation of the model through three shifts: "teaching and learning equal importance", "offline + online mixing", and "three-dimensional and dynamic curriculum education". Lastly, we will promote evaluation reform through three transformations: "process + effect", "teach well + learn well", and "evaluation + feedback + continuous improvement".
- To focus on interaction, we will prioritize cultivating students' interest in learning and fostering teacher-student interaction. We will create an immersive learning environment that is problem-oriented and build a "learning community" between teachers and students. This approach aims to enhance student engagement and promote a collaborative and interactive learning experience.
- Attention to detail is crucial in effective teaching. Before the start of each new class, we should allocate 5 minutes for three important activities. Firstly, we should review and recap the content of the previous class to reinforce learning. Secondly, we should address any questions from students, which serves as a process of "reviewing old knowledge and learning new", "knowledge internalization", and "teacher-student interaction". Lastly, we should introduce new learning content through careful course design to ensure seamless connections between teaching topics. This attention to detail helps to create a more engaging and effective learning experience for students.

Thirdly, to improve the support of the textbook for the teaching quality of the course, we should select textbooks that adhere to the "three principles".

- When selecting teaching materials, it is important to prioritize their quality and highlight their unique characteristics. We should focus on new engineering and innovative forms of teaching materials, giving priority to planning materials, excellent materials, and quality materials. Additionally, we should explore the educational function of these materials.
- We should have an objective view of the role of teaching materials. A textbook should not only be seen as an important reference but also be recognized for its limitations. Teachers should "transform" the reference textbook by incorporating the latest academic achievements, supplementing, improving, or even correcting any deficiencies to ensure the accuracy of the teaching content.
- We should adhere to the principle of "one main and multiple auxiliary". Teachers should designate the main reference materials and, based on the course content, recommend some auxiliary materials for students to read after class.

Lastly, teaching cases and ideological and political cases "double integration" refers to the integration of practical teaching cases with ideological and political elements in education. This approach actively promotes "three full



education", which emphasizes the importance of integrating ideological and political education into the entire teaching process, across all disciplines, and throughout the entire educational experience.

- Using the "ideological and political + professional" case in course teaching can effectively cultivate students' ability to solve practical pollution purification engineering problems while also fostering their ideological qualities such as good family feelings, enthusiasm for environmental protection, scientific spirit, institutional autonomy, dialectical thinking, and ecological civilization. This approach is conducive to cultivating high-level professional innovative talents that are urgently needed by the country.
- By integrating ideological and political education with professional education, we can provide students with a comprehensive educational experience that prepares them for success in their careers and as responsible members of society.

3. Conclusion

Taking the course "Air Pollutant Control" as an example, this paper proposes a new course construction model that incorporates "one fundamental", "two positions", "three characteristics", and "four innovations". This model emphasizes the importance of building a strong faculty team through "three persistence", reforming teaching methods with "three emphasis", constructing teaching materials based on "three principles", and establishing a teaching case base with "double integration". By implementing this model, we can provide effective support for improving the level of curriculum construction and enhancing students' learning outcomes in the field of air pollutant control.

4. Acknowledgment

The authors wish to thank Shandong Province Graduate Education Quality Teaching Resource Project (SDYKC2023103 and SDYAL2023110) and Key Project of Undergraduate Teaching Reform Research in Shandong Province (Z2023100 and Z2023102) for their support of this study.

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