Teaching Reform and Exploration of Business Intelligence Course under the Background of Carbon Peaking and Carbon Neutrality

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Abstract: This paper explores how to reform the teaching of business intelligence course in the context of "Carbon Peaking and Carbon Neutrality". With the continuous development of the social economy, low-carbon and environmental protection have become the themes of the times. It is of academic and practical value to cultivate future citizens with a sense of social responsibility and convey energy-saving and emission-reduction awareness, sustainable development concepts, and practice green low-carbon concepts to students through various forms, which is consistent with course ideological and political education and contributes to the achievement of "carbon peaking" and "carbon neutrality". Meanwhile, digitization has brought more opportunities and challenges to business intelligence. Therefore, in teaching reform, we should focus on enhancing students' professional application ability and environmental awareness to better meet social needs. We should timely follow up on the reform of professional courses, incorporate participation in the "carbon peaking" and "carbon neutrality" action into the business intelligence course training framework, integrate it into professional course construction, stimulate the social responsibility of college students, make contributions to achieving China's "carbon peaking" and "carbon neutrality" goals, maintain global ecological security, cultivate future citizens with social responsibility, and combine course content to convey energy-saving and emission-reduction awareness, sustainable development concept, and practice green low-carbon concept to students, which is consistent with course ideological and political education, introducing environmental protection concepts and low-carbon thinking, cultivating students' environmental awareness, and promoting sustainable development.

1. Introduction

The concept of carbon neutrality involves reducing carbon emissions through measures that address both emission reduction and the adoption of new renewable energy sources. In addition, it also involves negative emissions projects to offset the carbon already released into the atmosphere, thus achieving zero or even negative emissions [1,2]. The Chinese Ministry of Education has encouraged higher education institutions to offer carbon neutral general education courses and

integrate carbon neutral concepts and practices into talent training systems by issuing the Action Plan on Carbon-Neutral Scientific and Technological Innovation in Institutions of Higher Learning. Furthermore, it has supported the development of new engineering disciplines and encouraged universities to jointly establish carbon neutral professional technical talent training programs with research institutes and leading enterprises. This is aimed at fostering high-level and innovative talent with skills that span diverse fields and industries, while also promoting cutting-edge research that can shape the future of science and technology. Against the backdrop of China's sustainable development strategy and its commitment to achieving carbon peaking by 2030 and carbon neutrality by 2060, it is crucial to instill the "carbon peaking and carbon neutrality" goals into every university course. This is particularly important in professional courses, where it can help to improve contemporary university students' understanding of national strategies and their awareness of ecological civilization [3].

We study focuses on the integration of the "carbon peaking and carbon neutrality" concept into the Business Intelligence course, with the aim of cultivating future citizens with a strong sense of social responsibility. Through various forms of instruction, such as promoting the awareness of energy conservation and emissions reduction, advocating for sustainable development, and practicing green and low-carbon concepts, this course aligns with the ideological and political education for students. By doing so, it contributes to the achievement of China's carbon peak and carbon neutrality goals. This research has significant academic and practical value.

2. The Significance of Integrating "Carbon Peaking and Carbon Neutrality" into "Business Intelligence Course"

The Business Intelligence course instructs students in the fundamental theories, methods, and application of data mining and business intelligence in decision-making, emphasizing the integration of theory and practice to optimize business operations and decisions. It represents a fusion of business value and management and covers complex teaching content that spans various disciplines, such as database, intelligent computing, and machine learning [4]. The course includes data mining algorithms such as classification, association rule mining, and clustering as well as enterprise management theory. Equipping students with solid foundations in both theoretical research and practical application, the course prepares them for future endeavors in related fields.

Chinese higher education institutions are presented with an opportune moment to implement "carbon peaking and carbon neutrality" strategies, advance the new development philosophy, and actively promote low-carbon lifestyles and the awareness of energy conservation in all social domains. They must reflect on China's new development landscape, establish strategies that serve China's developing needs, and invest in the creation of highly trained professionals capable of adapting to these environments. Given the foregoing, a valuable and vital strategy is to promote the fusion of Business Intelligence course with circular economic principles, sustainable development doctrine, and low-carbon concepts to instill appropriate knowledge and capability. This strategy will help prepare an innovative group of application-oriented professionals with exceptional competence and aptitude for solving engineering problems while providing sound theory guidance essential to procuring the requisite technological specialists for the future of China [5-9].

3. Methods of Integrating "Carbon Peaking and Carbon Neutrality" Concept into "Business Intelligence" Course

To integrate the "carbon peaking and carbon neutrality" concept into the Business Intelligence course effectively, certain strategies should be employed, beginning with the modification of the training plan, teaching syllabus, and tasks, while preserving the fundamental theoretical instruction

of business intelligence [10]. Top-level planning and design should also be facilitated to ensure the inclusion of certain parts of the course's teaching content and modes adoptable to match society's requirements for carbon neutrality development, thereby emphasizing the trendiness and contemporary character of the course.

Following this, it is crucial to modify the traditional teaching format and adjust teaching ideologies to integrate the discussion and assimilation of knowledge on carbon neutrality with traditional teaching, thereby enhancing the effectiveness of classroom teaching and realizing the all-encompassing educational goals of "carbon-based" instruction.

Building a sustainable development viewpoint is another crucial step in gradually improving the evaluation system and creating a campus culture that encourages "energy conservation and carbon emission reduction, with everyone taking responsibility" [11-13]. Ultimately, students and teachers should partake in carbon neutrality relevant educational and innovation entrepreneurial practices through instruction and participation.

4. Strategies for Incorporating the "Carbon Peaking and Carbon Neutrality" Goals into the "Business Intelligence" Course

4.1. Adapting the Training Objectives to Assist Social Progression

Carbon neutrality's success is tied to the strengthening of energy conservation and carbon emission reduction efforts across various sectors. Incorporating awareness of energy conservation practices and low-carbon lifestyle in the training goals of specialized courses align with the new engineering talent training programs. Examining the inclusion of low-carbon and environmentally friendly concepts into the teaching process of "Materials Chemistry" courses creates a vibrant learning atmosphere for students, encouraging them to spread the word about low-carbon lifestyles to the wider society [14-16]. Furthermore, it is a useful tool in shaping students' correct perceptions of the world, emphasizing the need for students to develop an interest in carbon neutrality and, consequently, plan their careers better during their university education. Leveraging academic research and institutional strengths to implement low-carbon concepts in the teaching environment is an excellent demonstration of the complementary relationship between teaching and character building, ensuring that the students understand the significance of environmentalism. Such an approach not only helps to spread the message of low-carbon and sustainability but also encourages students to pursue "lifelong learning" opportunities to achieve high-quality developmental outcomes and become proactive contributors to China's forward march towards a greener future.

4.2. Reforming Teaching Ideas and Strengthening Practice Link

To attain the desired degree of flexibility in teaching modes, it is crucial to reform the teaching ideas and modify traditional teaching modes dominated by teachers, thus enabling students to become active participants. Doing so necessitates an emphasis on the integration of information technology and instruction, promoting varying classroom teaching modes both online and offline. The reformed teaching methodology should focus on students as the primary audience, recognize the importance of guidance and inspiration, and emphasize students' active participation to improve their learning motivation and efficiency. Specifically, it is important to closely focus on the theme of "carbon peaking and carbon neutrality", by organizing academic research activities between the primary teaching team and professional course lecturers. New syllabi, teaching materials, and multimedia resources should be adjusted in line with this theme. Furthermore, harnessing the collective strength of the teaching team will elevate the overall effectiveness of these courses. For instance, when introducing the Business Intelligence system architecture and data warehouse management, it is

advisable to pose the question, "Traditional business data management is characterized by high-energy consumption and low utilization [17]. With the rapid development of database technology and hardware storage technology, how can we achieve carbon peaking and carbon neutrality in the future?" to draw students into thinking deeply and become interested in the course. The subsequent discourse should, from the conventional data management method, cleaning up to storage awareness, teaching logic relation and the key technology's application philosophy. From the perspective of "carbon peaking and carbon neutrality", students can analyze the future while discussing green management and low-carbon application concepts. First of all, "pre-class preview", "classroom teaching", and "summary" are crucial to mastering any course. Likewise, in teaching the Business Intelligence course, environmental pollution, energy conservation, and emissions-related issues can be highlighted in every chapter, encouraging students to research and compile various literature to develop problem-solving skills, supporting application-oriented learning objectives. During class, there should be more interactive sessions that allow students to participate actively. In groups, students can make reports and presentations on knowledge points relating to the theme of "carbon peaking and carbon neutrality", encouraging interaction and discussions among themselves and with other classmates. Teachers can supplement by reviewing and summarizing the key points learned. This method strengthens students' knowledge comprehension and reinforces their understanding of the concepts. After class, it is essential to ask students to systematize their knowledge, combine it with practical situations, and comprehend the significance, timeliness, and urgency of creating a proper sustainable development view. Students should wholly grasp the connection and connotation between people and the harmonious coexistence of nature, as well as the significance and practice of sustainable development.

Secondly, the course content should be revised and perfected around the "carbon peaking and carbon neutrality" goals, with more weight given to knowledge modules containing data analysis, recycling, and reuse of results, algorithm ideas for energy-efficient computing, and new energy applications. This approach allows the Business Intelligence course to cover various aspects. Furthermore, as new approaches and technologies in Business Intelligence continue to emerge, the course will cross with many other professional disciplines [8]. Students with a background in e-commerce should focus on mastering economic theory knowledge and data analysis skills while applying their knowledge effectively in project practice. Simultaneously, teachers should be encouraged in studies on energy-saving and emission-reducing innovative technologies in Business Intelligence case studies and e-commerce application areas. This approach will create better results that can benefit teaching and research, becoming a self-sustaining cycle.

Thirdly, as the future backbone of society, university students are poised to lead the world trend and can advocate for more actions and policy changes to address the world's climate and environmental challenges. This is a valuable reserve that will facilitate the realization of environmental sustainability and a shared future for mankind [10]. Therefore, it is imperative to launch extensive practical teaching activities on "carbon peaking and carbon neutrality". For instance, organizing various themed events that provide students with a platform to share and exchange their practical experiences on "carbon peaking and carbon neutrality" will foster a campus environment that strongly advocates for green, low-carbon principles. Additionally, through social welfare activities and initiatives, students can develop good lifestyle habits, instill a consciousness of energy conservation and emission reduction, and become advocates for low-carbon lifestyle choices. Moreover, launching a carbon neutrality initiative and establishing an eco-friendly student organization can promote lectures, seminars, competitions, etc. that focus on the theme of "carbon peaking and carbon neutrality", thereby fostering a green campus culture and offering students various multi-dimensional forms of participation. Importantly, on the basis of the existing academic competitions and various levels of innovation projects, universities can continue to encourage and

finance students to carry out innovative entrepreneurship activities around issues related to carbon neutrality, such as "energy conservation and emission reduction", "comprehensive utilization of resources", "green manufacture", and "catalytic environmental protection", thus stimulating their subjective initiative. Lastly, students and faculty should be encouraged to pay attention to carbon neutrality issues and actively participate in promoting carbon neutrality-related public welfare activities and project transformation. By doing so, it not only showcases individual and institutional social responsibility, but also guides students to seize the opportunities of the times and realize their own low-carbon values.

4.3. Optimizing the Evaluation System and Establishing a Sustainable Perspective

Universities are currently implementing carbon neutrality actions almost "from scratch", so it is necessary to introduce the concept of sustainable development to evaluate the degree of achieving the "carbon peaking and carbon neutrality" goals in the implementation of the "Business Intelligence" course, and then establish a comprehensive evaluation system. In addition, universities should guide teachers and students to participate extensively in carbon neutrality actions based on their positioning and local economic transformation situation, deploy relevant policies, and effectively coordinate research, teaching, and logistics services to enhance the integrity of the university's "carbon peaking and carbon neutrality" goals formulation, implementation, and evaluation system.

5. Conclusions

In the context where the country has made "carbon peaking and carbon neutrality" a strategic decision, young students should combine the overall strategy of ecological civilization construction and the "carbon peaking and carbon neutrality" goals to continuously improve their environmental awareness and ideological and political moral cultivation. We should keep up with the professional teaching reforms, and include participation in the "carbon peaking and carbon neutrality" action in the business intelligence course framework, integrating it into professional teaching, and stimulating the social responsibility consciousness of university student groups to contribute to achieving the goals of "carbon peaking and carbon neutrality" in China and maintaining global ecological security. We should cultivate future citizens with a sense of social responsibility and convey awareness of energy conservation and emission reduction, sustainable development, and green, low-carbon principles to students through course content, consistent with ideological and political education. In this way, we can contribute to achieving the "carbon peaking and carbon neutrality" goals and make a difference.

Acknowledgments

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