

College Students ‘ Ecological Environment Moral Education From the Perspective of Ecological Civilization

Renjun Yao, Chengdu Polytechnic, China*

Rola Ajjawi, Deakin University, Australia

ABSTRACT

This article discusses the ecological environment moral education of college students based on deep learning. This article first points out the concept of deep learning and the relationship between ecological civilization and college students’ ecological environment morality. Then, it expounds the latest concepts and achievements of ecological civilization in China, analyzes the deficiencies and reasons of current college students’ ecological moral education, and clearly points out the significance of strengthening college students’ ecological moral education based on in-depth learning. This article focuses on the main contents and principles of setting suggestions of the ecological environment moral education for college students. Finally, it gives the countermeasures for the ecological environment moral education of college students based on deep learning. It focuses on the theoretical realization of college students’ ecological environmental moral education from the perspective of deep learning, aiming at promoting the construction of ecological civilization.

KEYWORDS

College students, Deep learning, Ecological environment, Evaluation, Moral education

INTRODUCTION

Ecology is a long-term plan for the well-being of mankind and the future of nations, representing one of the most pressing issues facing the world today. As industrialization and urbanization accelerate in the human world, the pursuit of production methods exceed the ecological balance dictated by nature. This pursuit has caused serious environmental damage, such as air pollution (including smog weather, acid rain, and the rise of global temperatures due to greenhouse gases), deforestation leading to soil erosion, debris flow, and sandstorms, as well as water pollution like red tides. These environmental concerns have triggered serious survival crises (Fesmire, 2012).

Ecological civilization emerges as a reflection amidst this social backdrop. It is new relationship between man and the natural world—a core embodiment of sustainable development and a natural behavioral shift based on the laws of nature (Prakash, 1995).

Ecology is a systematic endeavor that involves the collective efforts of and integration of all of humanity’s resources. As the backbone of socialist construction, college students assume the

DOI: 10.4018/IJWLTT.336833

*Corresponding Author

This article published as an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>) which permits unrestricted use, distribution, and production in any medium, provided the author of the original work and original publication source are properly credited.

vital role of executors of this innovative concept. Environmental moral consciousness serves as the spiritual and ethical foundation for this new concept (Mitchell & Mueller, 2011). Genuine participation in the construction of an ecological civilization will occur only when people have a strong environmental mindset.

Carrying out environmental moral education, especially among contemporary college students, is an important method to cultivate their environmental moral awareness and practice the concept of ecological civilization (Arcury et al., 1986). As an elite cohort of socially perceptive young minds, these students can use their environmental moral values and ecological responsibilities to influence the sustainable development of an ecological civilization. Their vigor, leading-edge vision, comprehensive knowledge base, and keen social observation (Warburton, 2003) position them as future leaders across various industries post-graduation. Therefore, the implementation of ecological environment moral education in contemporary universities holds significance, fostering the promotion and adoption of ecological civilization principles across all walks of life (Caduto, 1998).

The fundamental essence of ecological civilization and ecological environment moral education align closely. Environmental moral education is an important foundation for building an ecological civilized society (Hansen & Svarverud, 2018). At its core, an ecological civilization lies in the pursuit of sustainable human development and an emphasis on the harmonious coexistence between man and nature. Similarly, the core of environmental moral education revolves around creating a conscious understanding among individuals to harmonize the relationship between man and nature through education, ultimately fostering an ecological civilization and balanced existence between man and nature (Žeber-Dzikowska et al., 2016). Therefore, there is a certain overlap between the two in their underlying concepts.

Environmental moral education initiatives support students in consciously abiding by ecological moral norms, encouraging them to fulfill responsibilities for maintaining balance and engaging in organized ecological activities. It also aims to cultivate their independent thinking abilities in dealing with human and environmental problems (Bowers, 2001). Thus, ecological moral education is a solid reserve of capable individuals, serving as the backbone for the development of an ecological civilization.

In realizing an ecological civilization, the synergy of science, technology, and effective organization stands as indispensable tools, necessitating human intervention. Education in ecological environmental principles for college students can cultivate professionals who are equipped with the necessary skills and talents. These individuals, after assuming roles across various sectors and having undergone thorough training in ideology and expertise, are of great value in promoting green development and contributing to the construction of an ecological civilization within different industries (Hu et al., 2022).

Deep learning, as it is understood, requires students to delve into self-awareness and societal comprehension from a cognitive perspective. This approach breaks through the limitations and constraints of traditional educational concepts, empowering students to apply their knowledge to practice by solving relevant issues rooted in their own understanding, thus forming their own perspective (Blenkinsop, 2012).

Environmental moral education is a conduit to transplant beautiful moral and ethical concepts between individuals into the realm of human-nature relationships within the campus environment. It guides people to assume the responsibility and rational obligation of protecting nature (Bryndin, 2019). College students, as change agents, can realize the practice of an ecological civilization by mobilizing those around them.

Ecological moral education is an inclusive education for all mankind, unrestricted by space and time. It holds important value, especially among young college students, stimulating profound and comprehensive study while instigating practice. Ecological moral education is a lifelong practice, enriched with evolving nuances. For contemporary college students, it is paramount to actively engage in the pursuit of advanced ecological environmental knowledge and continually improve their

environmental moral compass. This active involvement will contribute to building a resource-saving, environmentally conscious society (Ying et al., 2022).

This article centers on the moral education regarding the ecological environment for college students. First, it points out the concept of deep learning and its relationship with the ecological environment morality among college students. Then, it expounds on the latest ideas and achievements of ecological civilization within China, conducting an analysis of the existing deficiencies and underlying causes of current ecological moral education among college students.

The focus of this article revolves around the main contents and principles essential for suggesting effective strategies in ecological environment moral education for college students. Finally, it presents the countermeasures aimed at enhancing the ecological environment moral education of college students, grounded in the principles of deep learning.

OVERVIEW OF DEEP LEARNING

Deep learning is a new teaching concept, centered on teachers innovating instructional methods that stimulate students' cognitive development and skill cultivation. This method guides students to effectively analyze curriculum content through independent, critical thinking and exploration. It aims to instill robust disciplinary thinking within students while further improving their abilities for independent exploration and comprehensive practical ability (Lee et al., 2017). Compared with traditional indoctrination teaching, deep learning significantly amplifies the educational function. The comprehensive implementation by educators empowers students to form a strong sense of autonomy, allowing students to participate with more enthusiasm in in-depth exploration of the curriculum. This approach ensures that the constructed curriculum learning system excels in both efficiency and quality (Zhang et al., 2023).

The most important role of deep learning is to cultivate students' learning capabilities, encouraging active participation in knowledge acquisition and mining, thereby providing more possibilities for students to solve problems. Fundamental to students' learning and life is a foundation of strong moral quality. Deep learning not only helps students acquire knowledge but also improves their comprehensive development, facilitating the gradual formation of exemplary moral traits during the learning process. It builds correct moral awareness, aligning with the educational goal of enhancing morality and character.

Deep learning places emphasis on independent learning, paying attention to the integration and penetration of multidisciplinary knowledge through various channels. By transcending other mechanical learning approaches, it forms an active attitude toward knowledge acquisition, fostering robust learning methodologies, and improving students' core competencies. Thus, it forms positive ideological and moral attributes.

CHINA'S RECENT ECOLOGICAL CIVILIZATION THEORY

China has long prioritized the innovation and construction of the ecological civilization concept. As early as 2003, it introduced the scientifically developed concept of "people-oriented" and "harmony between man and nature." Following the 18th National Congress of the Communist Party of China (CPC), the CPC Central Committee put forward the "five in one" framework, including ecological civilization construction across political, economic, cultural and social domains (Gare, 2010). On many occasions, the CPC Central Committee emphasized that "ecological environmental protection is a cause that will benefit the present and the future" (p. X).

In the final analysis, ecological civilization centers on the relationship between man and nature, with man occupying a dominant position in its construction. The idea of ecological civilization revolves around the principles of "respecting nature, conforming to nature, and protecting nature." Respecting nature is manifested in maintaining the integrity and stability of nature (Zhou, 2021). Nature is an

interconnected whole, encompassing human beings, serving as the foundation and space for all life forms. The quality of the natural environment will affect human living conditions, necessitating the transformation of natural conditions into sustainability habits.

Conforming to nature requires adherence to its laws, acknowledging its self-repair capacity. However, excessive demands of human beings have depleted this restorative ability. Aligning with nature involves fully respecting and harnessing its self-repairing ability, protecting the sustainable reproduction and growth of all creatures, and exercising human initiative in tandem with natural adaptation, thereby actively building an ecological civilization and harmony with nature (Gare, 2017).

The adage “Lucid waters and lush mountains are invaluable assets” is an evocative metaphor encapsulating the value of ecological civilization. It reflects the relationship between social and economic development and civilization (Cheng et al., 2022).

From a dialectical point of view, it is necessary to deny the traditional concept of “developing first and recovering later” and criticize the approach of “ecological conservation” that ignores economic development. Instead, it advocates for a hand-in-hand relationship with both aspects complement each other—where protecting the natural environment occurs concurrently with economic development, fostering vigorous economic growth while protecting nature. This perspective expounds on the unified relationship between human social attributes and natural attributes, emphasizing the relationship between development and protection.

The goal of ecological civilization construction lies in fostering a shared societal view—the development of an ecological people’s livelihood view shared by the people.

A sound ecological environment is the most equitable public good and holds significance for the well-being of communities. As society develops and living standards improve, there has been a transition from “seeking survival” to “seeking ecology”—a shift “looking forward to food and clothing” to “looking forward to environmental protection.” This transformation highlights the elevated value of the ecological landscape in the hearts of the people, where environmental issues have increasingly become important aspects of daily livelihoods.

CURRENT STATUS OF ECOLOGICAL MORAL EDUCATION FOR COLLEGE STUDENTS

Ecological moral education focuses on cultivating a concept of ecological ethics centered on the harmonious coexistence between humans and nature. This educational approach incorporates teachings on ecological responsibility, rational consumption, and sustainable development, aiming to instill in learners a correct understanding of ecological protection. The objective is to consciously abide by the basic principles of ecological moral behavior and norms. Thus, it fosters the development of good habits consistent with the preservation of the ecological environment and supporting a moral civilization.

In recent years, the construction of an ecological civilization has become an important topic in the field of environmental ethics. However, the moral education focused on the ecological environment in higher education is still in its development stages, notably evidenced in the following aspects (see Figure 1):

1. **Knowledge Gap:** College students’ often lack knowledge around the environment, impeding their recognition of the important significance and effective ways to protect the environment.
2. **Gap Between Awareness and Action:** While contemporary college students express admiration for those who protect nature, their actions may not consistently reflect this sentiment. Instances of trampling on lawns and wasting food persist despite disdain for those who use wild animals for illegal profits.

Figure 1. Current situation of ecological environment moral education of contemporary college students

<i>Current situation of ecological environment moral education for Contemporary College Students</i>	
<p>△ <i>Lack of environmental knowledge</i></p> <p>△ <i>Lack of specific environmental protection actions</i></p> <p>△ <i>Relevant courses are missing or less set</i></p> <p>△ <i>The form of the course is relatively simple</i></p> <p><i>Existing problems</i></p>	<p>☆ <i>Lack of corresponding courses in Colleges and Universities</i></p> <p>☆ <i>Lack of full-time teachers in environmental moral education</i></p> <p>☆ <i>College students lack awareness of environmental protection</i></p> <p><i>Reason</i></p>

3. **Curriculum:** The lack or scarcity of relevant courses in colleges and universities makes it difficult to produce profound educational impacts. Current methods rely on policy propaganda and appeals.
4. **Limited Course Diversity:** Relatively monotonous course offerings fail to effectively guide students to participate in environmental conservation actions.

The identified challenges in ecological civilization education for college students demonstrates the need for rectification, as they significantly impact the advancement of moral education concerning the ecological environment in higher education. A fundamental reason is the lack of corresponding environmental moral curricula in colleges and universities. For contemporary college students, as the successors of future society, the integration of corresponding courses is imperative to instill a strong sense of responsibility and competence in environmental protection. While China has incorporated environmental moral education into the national basic education curriculum, the lack of dedicated curriculum for college students threatens to affect the cultivation of talent.

The lack of full-time environmental ethics education teachers directly affects course offering. Cultivating a team of highly qualified educators remains critical to nurture college students with excellent environmental ethics and comprehensive environmental protection knowledge. However, China's current reliance relies on instructors for environmental ethics education undermines the effective cultivation of ecological talents. Moreover, the lack of environmental protection awareness of among college students remains a key factor. At present, specialized education dominates college curricula, emphasizing employment hotspots and other factors over environmental protection, leading to a disregard for environmental issues among students.

SIGNIFICANCE OF STRENGTHENING ECOLOGICAL MORAL EDUCATION BASED ON DEEP LEARNING

For effective ecological moral education in colleges and universities, the curriculum must fully embrace its educational function and improve students' humanistic quality. To realize the educational function, guiding students to explore the value of ecological moral education is imperative. This approach aims to bolster students' core competencies and elevate their environmental awareness.

Ecological moral education for college students extends beyond more knowledge acquisition in ecological civilization. It encourages students to investigate its root causes, fostering a developmental mindset that aligns with societal progress with critical thinking. This approach aims to cultivate accurate ideals and values.

At its core, ecological and environmental moral education guides students to closely connect with the economy, infuse cultural life, actively participate in environmental protection practices, and

gradually adopt a sustainable worldview, life perspective, and value system. Therefore, it is necessary to guide students to deep learning experiences in this new era.

The moral education of ecological environment for college students is the main link to cultivate the architects of ecological civilization, carrying both theoretical and practical significance of equal weight. Theoretically, the construction of ecological civilization and fostering harmony with nature are inevitable choices of human development. Strengthening ecological moral education of college students is the only way to solve both the current environmental crises and future constructions (Dong et al., 2020).

The construction of ecological civilization is the key content of citizens' moral construction, the inevitable requirement of social and historical development. It represents a blueprint for behavioral planning and moral standards essential for individuals upon their integration into broader public social life. Furthermore, it represents the imperative coexistence between human beings and nature. As a part of nature, unceasing demands by human beings on nature will lead to the continuous destruction of the ecological environment, ultimately endangering the living conditions of human beings. At the same time, it serves as a critical measure to address the continuous deterioration of the environment.

Ecological moral education for college students not only trains professionals with management and science but also improves harmony between humanity and nature. This educational endeavor fosters a symbiotic relationship between humans and the natural world.

Strengthening the ecological moral education of college students holds immense practical significance. First, it promotes the nation's sustainable development. Following various industrial revolutions, from agricultural to industrial economies, humans now face the ecological civilization economy. By nurturing successors educated in ecological problems, ancient ecological issues faced by civilizations like Babylon and Loulan fade into history. Cultivating these successors is critical for the country's sustainable development. Notably, in the contemporary world, the competition between nations is directly tied to the competition for talent.

Second, it also contributes to enhancing the national quality. The education surrounding the ecological environment for college students influences the creation of a positive social atmosphere and bolsters national environmental awareness and ecological consciousness.

Amidst the comprehensive development of ecological civilization construction, the focus on ecological moral education for college students has attracted much attention, unveiling certain limitations in traditional teaching modes. Ecological moral education, being a multifaceted discipline, extends beyond conventional ideological and moral education—it encompasses the nurturing of the soul. To advance this education, schools should consolidate the theoretical basis of ecological moral education while empowering students' active engagement in the learning process. It's crucial to constantly improve teachers' ecological moral quality and foster a robust campus ecological culture.

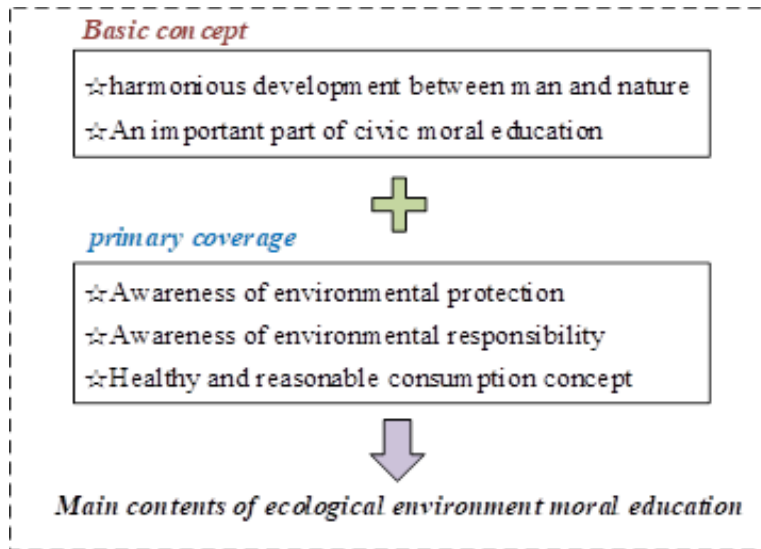
Under the concept of deep learning, teachers must innovate teaching methodologies, expand instructional content, broaden students' intellectual horizons, and improve their understanding of relevant subjects. This approach aims to establish commendable moral attributes within the learning process, laying a solid foundation for achieving the goal of ecological civilization construction.

ECOLOGICAL ENVIRONMENT MORAL EDUCATION FOR COLLEGE STUDENTS

Figure 2 illustrates the main components of ecological environment moral education for college students, encompassing basic ideas and educational contents. Through this educational approach, students can understand the developmental concept of harmonious coexistence between man and nature.

China's transition into a prosperous society comes with new developmental requirements under contemporary historical conditions. Notably, Marx's ecological philosophy emphasizes the unity of humanity and nature, a fundamental feature of the Marxist view of nature. According to Marx, all socio-economic and ecological behavior stems from human agency guided by certain ideas.

Figure 2. Main contents of ecological environment moral education



College students, as the talent reserve of national development, establish ecological environment morality education. Environmental moral education plays an important role within civic moral education, indispensable for improving moral character. Environmental morality is the core value for modern society's future-facing social transformation. Thus, environmental moral education shoulders the natural responsibility of transforming the relationship between man and nature.

Enriching the content of eco-environmental education includes encouraging environmental protection consciousness. Recognizing that the environment is the foundation for all life forms, it becomes imperative to acknowledge that protecting it is essential for self-preservation. Firmly establishing the awareness that our survival and progress depend on the natural environment is pivotal. Excessive demands from the environment could lead to our downfall, underscoring the importance of environmental awareness education, constituting the core of eco-environmental education.

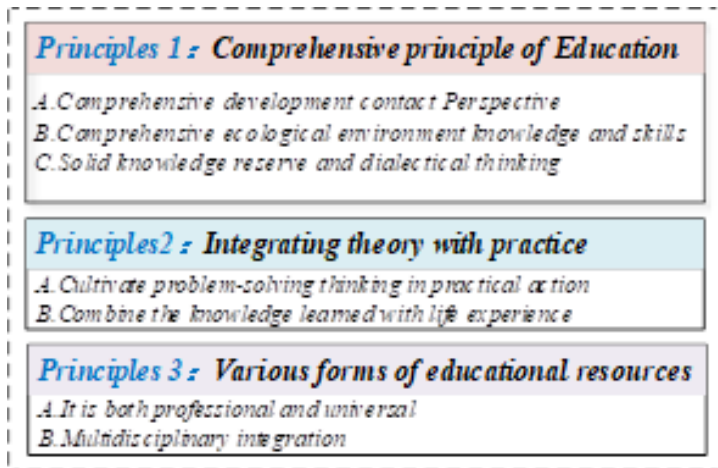
In real life, there is often a misconception that the environment belongs to everyone, leading everyone to believe their personal behaviors have minimal impacts. This perspective, however, is very flawed. It is vital to establish a strong sense of social responsibility, treating environmental issues as one's own responsibilities. This approach is fundamental to the well-being of future generations.

A healthy and reasonable consumption view stands as a key cornerstone of ecological environment education. Consumption, unique to humans, demands attention. As a significant consumption group, college students advocate for civilized consumption, shunning comparisons with others. Instead, they champion green and moderate consumption, signifying a manifestation of ecological civilization values in another form.

PRINCIPLES OF ECOLOGICAL ENVIRONMENT MORAL EDUCATION FOR COLLEGE STUDENTS BASED ON DEEP LEARNING

Figure 3 illustrates the principles of ecological environment moral education for college students. The development of this education represents a significant stride toward supporting ecological civilization. To ensure the effectiveness and feasibility of education, adherence to the following principles is paramount:

Figure 3. Principles of ecological environment moral education for college students



1. **Comprehensive Education:** Adhere to the viewpoint of holistic education, upholding the perspective of interconnected and all-encompassing development throughout the process of education
2. **Integration of Theory and Practice:** Combining theory with practice, serving as an important method to actualize moral education within practice
3. **Use of Diverse Educational Resources:** Embrace various forms of educational resources and formats to ensure a well-rounded educational experience

These principles mean that a comprehensive view should be upheld throughout the educational process. Moral education should seamlessly link with subject knowledge and common sense, effectively cultivating the comprehensive knowledge and skills of college students. Issues with ecological environmental ethics involve all aspects of both natural and social sciences. Hence, educational attention should be paid to training students' comprehensive and multi-dimensional information judgment and problem-solving abilities.

Two core points of college students' environmental moral education include solid knowledge storage and dialectical thinking. These factors, when combined, adhere to the principle of comprehensive education. Integrating theory with practice is an important way to put moral education into practice. It involves guiding students to apply their environmental moral knowledge to real-world scenarios, fostering problem-solving abilities rooted in practical applications.

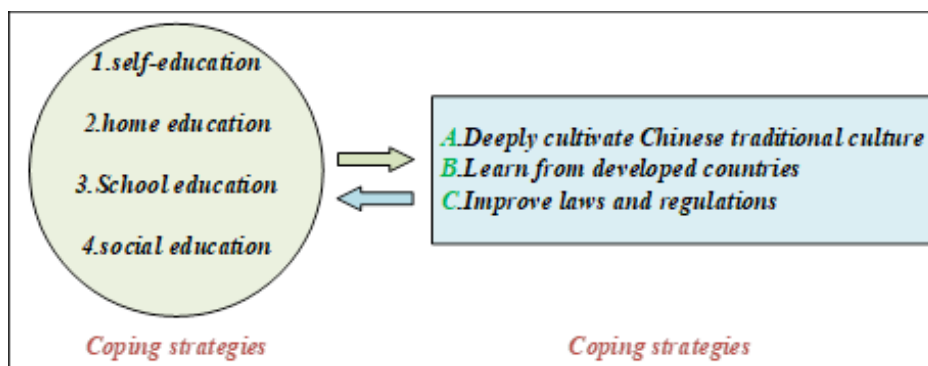
The nature of ecological civilization and environmental construction lacks a standardization blueprint. In practice, addressing these concerns requires a comprehensive analysis of the situation and devising solutions based on knowledge and life experience.

The ecological environment moral education of college students represents education of the new era. Unlike other disciplines, it encompasses both professionalism and universality. Therefore, to ensure that students can better accept and absorb education, it is imperative to adhere to the characteristics of a diverse range of educational resources.

COUNTERMEASURES OF ECOLOGICAL ENVIRONMENT MORAL EDUCATION BASED ON DEEP LEARNING

Figure 4 illustrates the coping strategies and implementation approaches for perfecting the moral education concerning college students' ecological environment, creating a complex problem of

Figure 4. Coping strategies and implementation approaches



includes education and practical applications. Studying its coping strategies and realization methods highlight the comprehensiveness and broad-ranging nature.

Strengthening college students' self-education is the foundation to address the moral education of ecological environment. This self-directed education is a cornerstone for internalizing external ideas. By deepening understanding and practicing the principles of deep learning, students can integrate ecological civilization ideals into their moral framework. This approach stimulates the intrinsic motivation to actively join in ecological civilization protection efforts.

Additionally, strengthening family education is another pivotal approach. Students often inherit their temperaments from their parents. Parental ideologies and styles will shape the most primitive and profound moral character of their children, exerting a lasting influence.

School and social educations are also effective. Considering that college students spend most of their time in school and eventually enter the workforce, the school environment and work settings profoundly impact them. Establishing a strong ecological civilization environment within schools and society ensures effective moral edification for individuals as they join the workforce.

Diversifying pathways to realization involves initiatives like delving into Chinese traditional culture, finding inspiration for ecological civilization within its teaching, and drawing on the idea of harmony between man and nature. This also contributes to the construction of an ecological civilization by embracing advanced ideas and technologies from developed countries. Research on ecological environment education in western universities predates that of China, forming a complete set of management technologies and theories. Moreover, improving corresponding laws and regulations and enforcing requirements for ecological civilization construction through legal frameworks are imperative.

One example is the deep cultivation of Chinese traditional culture, finding wisdom and nourishment for ecological civilization from within its rich heritage. Learning from the principle of "unity of nature and man" within traditional thought contributes to the construction of ecological civilization. Similarly, embracing advanced concepts and technologies from developed countries offers substantial benefits. Western universities have a history of ecological environment education research, resulting in a complete set of management techniques and theories. Furthermore, enhancing relevant laws and regulations and employing legal mechanisms to enforce the requirements of ecological civilization represent crucial steps forward.

A comparative analysis between traditional teaching models and deep learning reveals some problems in traditional ecological moral education, such as insufficient curriculum provision, lack of professional expertise, and inadequate environmental awareness among students. Deep learning, when applied to strengthen ecological moral education, comprehensively improves both the theoretical

understanding and practical application. This is achieved through innovative teaching models, expanded teaching content, and improved perceptual abilities in students.

The integration of deep learning into ecological moral education not only consolidates its theoretical foundation but also strengthens students' engagement, fosters a positive campus ecological culture, and sets a solid foundation for achieving the goal of ecological civilization construction. Therefore, deep learning and strengthened ecological ethics education emerges as an important approach to advance ecological civilization construction. It also serves as an effective way to nurture college students, fostering excellent environmental ethics and knowledge.

CONCLUSION

This article focuses on the ecological environment moral education of college students as the research object. First, it introduces the concept of deep learning, clarifying its interconnection with college students' ecological environment moral education. The analysis includes an assessment of the deficiencies and intrinsic reasons behind the current state of ecological environment moral education among college students in China. It further highlights the significance of integrating deep learning into college students' ecological environment moral education, detailing the main content and suggested principles for such education. Finally, the article outlines the countermeasures and methodologies to realize ecological environment moral education for college students based on deep learning principles.

Ecological civilization, following agricultural and industrial civilizations, represents the latest form of a society in harmony with nature, playing an important role in fostering the sustainable development of human society. The goal of ecological moral education is to cultivate a consciousness of protecting the natural environment and ecological systems, creating a moral mindset. It aims to facilitate a harmonious coexistence with nature, reducing pollution and waste, ultimately achieving a mutually beneficial relationship between humans and the environment. This article discusses the theoretical feasibility of ecological environment moral education among college students from the perspective of deep learning. The next phase will involve comprehensive research combined with specific educational concerns to further explore this area.

DATA AVAILABILITY

The figures used to support the findings of this study are included in the article.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

FUNDING STATEMENT

This work was not supported by any funds.

ACKNOWLEDGEMENTS

The authors would like to show sincere thanks to those techniques that contributed to this research.

REFERENCES

- Arcury, T. A., Johnson, T. P., & Scollay, S. J. (1986). Ecological worldview and environmental knowledge: The “new environmental paradigm.”. *The Journal of Environmental Education*, 17(4), 35–40. doi:10.1080/00958964.1986.9941424
- Blenkinsop, S. (2012). Four slogans for cultural change: An evolving place-based, imaginative and ecological learning experience. *Journal of Moral Education*, 41(3), 353–368. doi:10.1080/03057240.2012.691634
- Bowers, C. A. (2001). Challenges in educating for ecologically sustainable communities. *Educational Philosophy and Theory*, 33(2), 257–265. doi:10.1111/j.1469-5812.2001.tb00267.x
- Bryndin, E. (2019). Development of living floor spaces on the basis of ecological economic and social programs. *Resources and Environmental Economics*, 1(1), 1–8. doi:10.25082/REE.2018.01.001
- Caduto, M. J. (1998). Ecological education A system rooted in diversity. *The Journal of Environmental Education*, 29(4), 11–16. doi:10.1080/00958969809599123
- Cheng, H., Ma, P., Dong, G., Zhang, S., Wei, J., & Qin, Q. (2022). Characteristics of carboniferous volcanic reservoirs in Beisantai Oilfield, Junggar Basin. *Mathematical Problems in Engineering*, 2022, 1–10. doi:10.1155/2022/7800630
- Dong, F., Pan, Y., Zhang, X., & Sun, Z. (2020). How to evaluate provincial ecological civilization construction? The case of Jiangsu province, China. *International Journal of Environmental Research and Public Health*, 17(15), 5334. doi:10.3390/ijerph17155334 PMID:32722160
- Fesmire, S. (2012). Ecological imagination in moral education, east and west. *Contemporary Pragmatism*, 9(1), 205–222. doi:10.1163/18758185-90000223
- Gare, A. (2010). Toward an ecological civilization: The science, ethics, and politics of eco-poiesis. *Process Studies*, 39(1), 5–38. doi:10.5840/process20103912
- Gare, A. (2017). From sustainable development to ecological civilization: Winning the war for survival. *Cosmos and History: The Journal of Natural and Social Philosophy*, 13(3), 130–153.
- Hansen, M. H., Li, H., & Svarverud, R. (2018). Ecological civilization: Interpreting the Chinese past, projecting the global future. *Global Environmental Change*, 53, 195–203. doi:10.1016/j.gloenvcha.2018.09.014
- Hu, L., Razak, R. A., & Tan, Z. (2022). A narrative review of deep learning teaching models in high school EFL reading comprehension teaching design in China. *Journal of Positive School Psychology*, 6(9), 413–428.
- Lee, D., Kang, S., & Shin, J. (2017). Using deep learning techniques to forecast environmental consumption level. *Sustainability (Basel)*, 9(10), 1894. doi:10.3390/su9101894
- Mitchell, D. B., & Mueller, M. P. (2011). A philosophical analysis of David Orr’s theory of ecological literacy: Biophilia, ecojustice and moral education in school learning communities. *Cultural Studies of Science Education*, 6(1), 193–221. doi:10.1007/s11422-010-9274-6
- Prakash, M. S. (1995). Ecological literacy for moral virtue: Orr on [moral] education for postmodern sustainability. *Journal of Moral Education*, 24(1), 3–18. doi:10.1080/0305724950240101
- Warburton, K. (2003). Deep learning and education for sustainability. *International Journal of Sustainability in Higher Education*, 4(1), 44–56. doi:10.1108/14676370310455332
- Ying, H., Chengcai, T., & Rui, Z. (2022). Review of tourism ecological security from the perspective of ecological civilization construction. *Journal of Resources and Ecology*, 13(4), 734–745. doi:10.5814/j.issn.1674-764x.2022.04.018
- Żeber-Dzikowska, I., Chmielewski, J., & Wojciechowska, M. (2016). Ecological and environmental education in the ethical context. *Environmental Protection and Natural Resources/Ochrona Środowiska i Zasobów Naturalnych*, 27(2), 44–47.
- Zhang, B., Chandran Sandaran, S., & Feng, J. (2023). The ecological discourse analysis of news discourse based on deep learning from the perspective of ecological philosophy. *PLoS One*, 18(1), e0280190. doi:10.1371/journal.pone.0280190 PMID:36696455

Zhou, X. (2021). Ecological civilization in China: Challenges and strategies. *Capitalism, Nature, Socialism*, 32(3), 84–99. doi:10.1080/10455752.2020.1802497