

# Vocational Education and Sustainable Development: Exploration of the application of ESG Framework in Vocational Curriculum Design

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**Abstract:** Driven by the Global Sustainable Development Goals, vocational education faces an urgent need to integrate into the environmental, Society and Governance (ESG) framework. This paper discusses the practical application of ESG concept in vocational curriculum design, from curriculum goal setting, teaching content development to evaluation system construction, and puts forward the innovative path of integrating the concept of sustainable development into vocational education. Research shows that by strengthening the cultivation of environmental awareness, social responsibility and governance ability in curriculum design, vocational education can not only improve the comprehensive quality of students, but also promote the strategic role transformation of vocational colleges in sustainable development. This paper provides theoretical support and practical guidance for educational policy makers and vocational education institutions.

**Keywords:** vocational education; sustainable development; ESG framework; curriculum design; and environmental awareness

## 1 Introduction

### 1.1 Research background and significance

At present, the world is facing multiple challenges such as climate change, resource depletion and social inequality. Promoting sustainable development has become the consensus of all governments and all sectors of society (United Nations, 2020). As an important way to train technical talents, the goal of vocational education is not only to meet the needs of the industry, but also to play a key role in cultivating social responsibility and awareness of sustainable development (UNESCO, 2017). The ESG (Environment, Society and Governance) framework provides an innovative theoretical perspective and practical path for vocational education, which can help educational institutions to integrate the concept of sustainable development in curriculum design and implementation, so as to cultivate comprehensive talents with both professional ability and sustainable development literacy (World Economic Forum, 2021).

### 1.2 The relationship between vocational education and sustainable development

Vocational education plays a vital role in sustainable development, which is reflected in cultivating green skills, promoting social equity and promoting economic transformation. First of all, vocational education by adjusting the teaching content, the green technology, environmental management is closely related to sustainable development skills into the curriculum system, cultivate students environmental awareness and green skills, in meet the green economy demand for professional talents at the same time, help students better adapt to the development trend

of the future low carbon economy (UNESCO, 2012). Secondly, vocational education plays an important role in promoting social equity. By providing equal educational opportunities, vocational education provides learning and employment opportunities for more groups, especially the socially disadvantaged groups, reduces social differentiation and enhances the level of inclusive development. This fair education model not only improves the individual quality of their life, but also promotes social harmony and stability, laying the foundation for the realization of broader social progress (UNESCO, 2021). In addition, vocational education is an important bridge to promote the green transformation of the economy. At present, the world is changing from the traditional high-energy consumption model to a low-carbon economy model. Vocational education helps enterprises adapt to the emerging environmental requirements and market changes by cultivating the talents needed for the green economy. This mode of coordinated development of education and economy, Not only accelerated the rise of green industries, but also promoted the optimization of economic structure and the realization of sustainable development goals (Fang Yu et al., 2023).

### 1.3 Applicability of the ESG framework in vocational education

ESG is short for Environmental, Social, and Governance, which originated in the corporate space and aims to measure an organization's environmental protection, social responsibility, and governance performance. However, this framework also applies to the field of vocational education, providing a completely new perspective for vocational education curriculum design. The specific manifestations are:

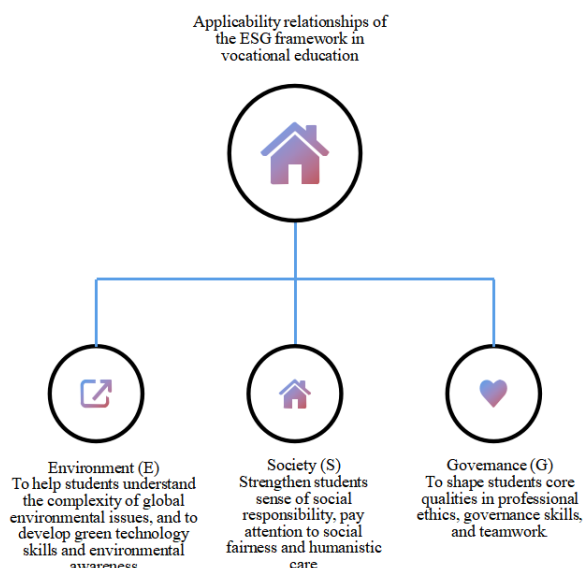


Figure 1: The applicability relationship of the ESG framework in vocational education

**Environment (E):** Help students to fully understand the complexity of global environmental issues, including key issues such as climate change, biodiversity reduction, energy crisis, and pollution control (UNESCO, 2017). Students should not only master relevant scientific knowledge and policy frameworks, but also be familiar with the development and application of green technologies, such as renewable energy technology, low-carbon manufacturing technology and intelligent environmental protection solutions (World Economic Forum, 2021). At the same time, schools should actively cultivate students' awareness of environmental protection, encourage them to practice the concept of sustainable development in their daily life, and integrate environmental protection into all aspects of study, work and life, so as to become the future leaders in promoting green transformation (UNEP, 2020).

**Society (S):** Pay attention to enhance students' sense of social responsibility, so that they can pay attention to their personal development, but also actively participate in the cause of social equity and humanistic care (UNESCO, 2018). Education should guide students to pay attention to social issues such as vulnerable groups, social inequality, public health and cultural diversity, and cultivate their sense of responsibility to serve and improve the society. In addition, schools can enhance students practical ability and empathy through voluntary service, social practice projects and case teaching, so as to promote them to become responsible and warm social citizens and contribute to the building of a more equitable and inclusive society (OECD, 2019).

**Governance (G):** Dedicated to shaping students core qualities in professional ethics, governance skills and teamwork, to help them adapt to the needs of modern workplace and social organizations (World Economic Forum, 2021). In terms of professional ethics, education should focus on cultivating students sense of integrity, the spirit of the rule of law, and respect for multiculturalism (UNESCO, 2017). In terms of governance ability, schools need to strengthen students learning and practice in the areas of organizational management, problem solving and decision making, and improve their ability to manage complex affairs at

different levels. At the same time, it pays attention to the cultivation of teamwork skills. Through project cooperation, simulation practice and communication training, we can help students learn to cooperate efficiently and stimulate innovative thinking, so that they can be qualified for the leadership role and collaborator status in the team in their future career (OECD, 2020).

By embedding the ESG concept into vocational education curriculum design, students can not only improve their professional ability, but also enhance their understanding and practical ability of sustainable development, enabling their future career development.

## 2 Analysis of the sustainable development and the current situation at home and abroad

### 2.1 The convergence between sustainable development goals (SDGs) and vocational education

The Sustainable Development Goals (SDGs) proposed by the United Nations point out the direction for global social, economic and environmental development. In particular, goal 4 "Ensure inclusive and equitable quality education" and goal 13 "Action on Climate Change", which are highly compatible with vocational education (United Nations, 2015). As a key way to train technical and skilled personnel, vocational education plays an irreplaceable role in tackling climate change, promoting economic transformation and achieving social equity (UNESCO, 2017). The integration of SDGs into the vocational education curriculum can provide students with the dual value of skills and sustainability, enabling them to not only meet market needs, but also actively participate in global sustainability initiatives (UNEP, 2020).

### 2.2 Analysis of vocational education curriculum design at home and abroad

In recent years, domestic vocational education has made remarkable progress in the promotion of policies, but there are still problems such as the disconnection between curriculum content and industrial demand, and the insufficient coverage of sustainable development education (Ministry of Education of China, 2021). Curriculum design pays more attention to skills training, but is relatively weak in the systematic cultivation of environmental protection, social responsibility and governance ability. In contrast, some foreign developed countries, such as Germany, the "dual system" education model, closely combines vocational education with the actual needs of enterprises, and pays attention to the cultivation of students in social responsibility and environmental awareness (OECD, 2020). Through comparative analysis of the current situation at home and abroad, it can provide reference for improving the vocational education curriculum system and explore how to better integrate the ESG framework into the vocational education curriculum.

## 3 Case analysis

### 3.1 A typical case of ESG practice in domestic vocational education: a green skills course of a college in Jiangsu Province

A college in Jiangsu province takes environmental sustainable

development as its core goal, actively explores the innovative model of combining vocational education with green industry, and integrates the concept of sustainable development into the design and implementation of vocational courses. The university has set up a professional curriculum system for green manufacturing, clean energy, ecological agriculture and other fields, and developed forward-looking teaching resources according to the industrial needs, so as to cultivate technical talents who meet the requirements of green economic development. In terms of curriculum design, the college adheres to the concept of "integration of industry and education, school-enterprise cooperation", and has established close cooperative relations with local governments and related enterprises. The local government provides policy support and industry guidance for course development to ensure that the course content matches the regional economic development strategy; the enterprise provides technical equipment case resources and training base to create real career scenarios for students. Through this cooperation mode, students can be exposed to cutting-edge green technology application scenarios in the learning process, including the installation and maintenance of clean energy equipment, and the planning and implementation of green agriculture projects, which greatly improves students' ability to understand and apply professional knowledge.

Results: It has trained a group of technical talents to meet the needs of green economy. The employment rate of course graduates in the new energy industry reaches more than 80%.

**3.2 Typical case of ESG practice in foreign vocational education: dual system education and sustainable development in the German vocational education system**

Germany's dual vocational education system is famous for its unique joint training mode of enterprises and schools, which

provides strong support for the combination of vocational education and the concept of sustainable development through the high integration of theory and practice. In this system, students, on the one hand, receive systematic theoretical education in schools, and on the other hand, conduct practical operation in enterprises, so as to comprehensively improve their professional ability and practical application ability. In recent years, Germany has further integrated the concept of environment, society and governance (ESG) into the dual vocational education system, laying a foundation for cultivating inter-disciplinary talents with both sustainable development consciousness and vocational ability. In terms of technical education, the German vocational education system pays attention to the concept of energy conservation and environmental protection throughout the curriculum design. For example, in the vocational education of the machinery manufacturing industry, the course content covers the design and optimization of energy-saving and environmental protection equipment, and the technology development of the efficient utilization of resources. While learning traditional mechanical manufacturing skills, students master how to use new technologies to reduce resource consumption and environmental pollution. The enterprise practice link provides students with a wide range of application opportunities, such as participating in the research and development, installation and debugging of green equipment in actual projects. Through this learning path, students can not only master the advanced industrial technology, but also have a deep understanding of its sustainable development application price in the exhibition

Results: Students have a deeper understanding of sustainable development. The development of the green industry in Germany has benefited from the transfer of such vocational education talents.

**3.3 Comparison of successful experiences and shortcomings**

**Table 1: ESG comparison table in domestic and foreign vocational education**

| Dimension         | Domestic practice   | Foreign practice  |
|-------------------|---|---|
| Environment(E)    | Focus on the course design of green technology and ecological agriculture; many practical links, but insufficient technical depth.              | Emphasize the combination of technology research and development and practice; green skills are highly compatible with the industrial system. |
| Society(S)        | Focusing on local social issues and increasing employment rate through school-enterprise cooperation, but cultivation of social responsibility. | Focus on the cultivation of social responsibility in professional ethics and teamwork courses.  |
| Administer(G)     | Schools lead the curriculum development, the enterprise participation is limited, and the governance mechanism is relatively single.            | Enterprises are deeply involved in curriculum development, and the school and the enterprise governance mechanism are highly coordinated.     |
| Overall advantage | Talent training meets the needs of local industries and has a strong employment orientation.  | Theory and practice are closely combined, and they pay attention to the global vision and sustainable development.                            |
| Overall lack of   | The concept of sustainable development is not permeated enough, and the course content needs to be deepened.                                    | The course is more difficult and has relatively high requirements for the students.   |

The practice of domestic and foreign vocational education under the ESG framework provides valuable experience for promoting sustainable development. Domestic education focuses on the combination with the local economy, while foreign education has more advantages in the integration of ideas and system improvement. In the future, vocational education can play a greater role in sustainable development by strengthening international exchanges and cooperation and integrating successful experiences both at home and abroad.

**4 ESG framework embedded in career course strategy analysis**

**4.1 Assessment of the impact of the ESG framework on vocational curriculum design**

Research shows that the integration of the ESG framework into vocational curriculum design has profound effects on curriculum content, teaching model and student development goals.

First of all, the adjustment of curriculum content makes education put more emphasis on the integration of environment, society and governance. Students not only need to master traditional professional skills, but also understand how to apply the concept of green technology, social responsibility and effective governance in practice.

**Table 2: Assessment table of the impact of the ESG framework on vocational curriculum design**

| Domain  | Change the content  |
|---|---|
| Multi-dimensional expansion of the course content | The ESG framework guides the expansion of vocational courses from pure technical skills training to multiple fields, including environmental protection, social responsibility and professional ethics. The course content is more diversified and comprehensive, providing students with a more comprehensive learning experience. |
| Innovation of teaching mode                       | Driven by the ESG concept, more attention is paid to the combination of practice and theory in curriculum design, especially through real case analysis, interdisciplinary cooperation and simulation practice projects, to enhance students ability to solve practical problems.   |
| Upgrading of students training objectives         | Through the introduction of the ESG framework, students need not only to master professional skills, but also to develop a global vision and awareness of sustainable development to lay a broader foundation for future career development.  |

## 4.2 Education quality and employ ability improvement after integration into ESG

With the integration into the curriculum design of vocational education, the quality of education and students employ ability have been significantly improved. The introduction of ESG has not only improved the depth and breadth of the course content, but also promoted the education system to pay more attention to the cultivation of students comprehensive quality, including the ability of green technology, social responsibility and professional ethics. Through the multi-dimensional teaching mode and practical links, the students professional skills have been strengthened, and they also show a stronger competitiveness in dealing with practical problems and adapting to the needs of the workplace. The next section will further explore how the ESG framework can specifically improve the quality of education and provide a broader growth space for students employ ability.

**Improvement in education quality:** It have found that the introduction of ESG framework has significantly improved the overall quality of vocational education. In the learning process, students pay more attention to the analysis and solution of practical problems, especially in terms of green technology, social inclusiveness and governance ability. Through the participation of real cases and practical projects, students learning results are more close to the real needs, and the theoretical knowledge is more solid.

**Enhancing employ ability:** The ESG curriculum is close to the needs of green economy, social innovation and modern corporate governance. ESG-educated students show greater competitiveness in the job market, especially in emerging industries such as new energy, green manufacturing, and sustainable agriculture. Data show that the employment rate of course graduates integrated with

ESG concept is generally higher than that of traditional vocational education students, and they show stronger adaptability and innovative spirit in the workplace.

## 4.3 Strategies for the continuous improvement of vocational education

In order to further optimize the integration of vocational education and sustainable development, a series of strategies can be adopted. First of all, deepen the integration of industry and education, promote the cooperation between vocational education institutions, enterprises and those of the government, and ensure the synchronous update of educational content and industrial demand through joint curriculum development and resource sharing. Secondly, improve the curriculum system, dynamically adjust the curriculum according to the industry trend and social needs, especially strengthen the teaching depth of green technology and professional ethics, to improve the comprehensive quality of students. Strengthening the practice link is also the key. By increasing the practice projects and case teaching related to ESG, students can provide them with more opportunities to apply skills in real scenarios and improve their ability to solve practical problems. In addition, to improve the level of teachers, through training and international exchanges, to help teachers to master the ESG concept and its application methods, to build a high-quality teaching team. Finally, a scientific evaluation mechanism should be established to regularly monitor course effects and student development to provide data support for continuous improvement. By implementing these strategies, vocational education will play a greater role in cultivating talents with both technical ability and sustainable development literacy, and provide stronger support for the sustainable development of society and economy.

# 5 Conclusion and suggestion

## 5.1 Conclusion

This study discusses the application of ESG framework in the design of the quality of education and sustainable development ability, found that the ESG framework course pay more attention to environmental protection, social responsibility and corporate governance, comprehensive technical skills and sustainable development concept, effectively improve the students knowledge depth, comprehensive ability and employment competitiveness, especially in the field of green economy and emerging industries. However, the construction of teacher training, policy support and evaluation system still needs to be further improved to fully realize the potential of the ESG framework in vocational education.

## 5.2 Proposals of the policy makers

It is suggested that the application of the ESG framework in vocational education should be comprehensively promoted by improving policy support, promoting the integration of industry and education, and establishing an evaluation mechanism. Specifically, it includes the introduction of incentive policies such as curriculum development funding, special funds for green skills training and incentive mechanisms;; formulating measures to promote school-enterprise cooperation, such as tax incentives and cooperative project funding, to enhance the depth of production and education integration; building a scientific evaluation system and integrating



the implementation effect of ESG concept into the assessment to ensure the effective implementation and continuous optimization of policies.

### 5.3 Future research direction

Future research should focus on the construction of a multi-dimensional evaluation framework, industry customization research, international comparative analysis, and the combination of technology and education. Specifically, it includes the development of evaluation tools covering environment, society and governance,

comprehensively monitoring the implementation effect of ESG framework in vocational education; exploring the needs of industries for green skills and social responsibility in different industries, and designing more targeted courses; comparing the successful practices in the integration of vocational education and sustainable development, and refining the experience applicable to local; studying the application potential of intelligent technology and online education in ESG framework to promote the innovation and optimization of vocational education.

## Reference

- [1] United Nations. (2020). The 2030 agenda for sustainable development. United Nations. <https://sdgs.un.org/2030agenda>
- [2] UNESCO. (2017). Education for sustainable development goals: Learning objectives. United Nations Educational, Scientific and Cultural Organization. <https://unesdoc.unesco.org/ark:/48223/pf0000247444>.
- [3] World Economic Forum. (2021). The future of jobs report 2021. World Economic Forum. <https://www.weforum.org/reports/the-future-of-jobs-report-2021>.
- [4] UNESCO. (2012). Sustainable development and education: A framework for action. United Nations Educational, Scientific and Cultural Organization. <https://unesdoc.unesco.org/ark:/48223/pf0000216269>.
- [5] UNESCO. (2021). Education for sustainable development: A blueprint for action. United Nations Educational, Scientific and Cultural Organization. <https://unesdoc.unesco.org/ark:/48223/pf0000385409>.
- [6] Fang Yu, Li Xing, & Wang Qiang. (2023). Research on the coordinated development path of vocational education and green economy transformation. Research on Vocational Education in Fujian Province, 8 (3), 45-58. <https://fzghb.fspt.edu.cn/info/1034/1353.htm>
- [7] OECD. (2019). Education for inclusive societies: The role of education in promoting social inclusion and equity. Organisation for Economic Co-operation and Development. <https://www.oecd.org/education/education-for-inclusive-societies.htm>
- [8] OECD. (2020). The future of work: Embracing the challenges of the 21st century workforce. Organisation for Economic Co-operation and Development. <https://www.oecd.org/future-of-work/>
- [9] NEP. (2020). Embracing sustainable development goals: The role of education and innovation. United Nations Environment Programme. <https://www.unep.org/resources/report/embracing-sustainable-development-goals>
- [10] UNESCO. (2017). Education for sustainable development goals: Learning objectives. United Nations Educational, Scientific and Cultural Organization. <https://unesdoc.unesco.org/ark:/48223/pf0000247444>
- [11] UNESCO. (2018). Rethinking education: Towards a global common good? United Nations Educational, Scientific and Cultural Organization. <https://unesdoc.unesco.org/ark:/48223/pf0000266346>.
- [12] World Economic Forum. (2021). The future of jobs report 2021. World Economic Forum. <https://www.weforum.org/reports/the-future-of-jobs-report-2021>
- [13] OECD. (2020). The future of work: Embracing the challenges of the 21st century workforce. Organisation for Economic Co-operation and Development. <https://www.oecd.org/future-of-work>
- [14] UNEP. (2020). Embracing sustainable development goals: The role of education and innovation. United Nations Environment Programme. <https://www.unep.org/resources/report/embracing-sustainable-development-goals>
- [15] UNESCO. (2017). Education for sustainable development goals: Learning objectives. United Nations Educational, Scientific and Cultural Organization. <https://unesdoc.unesco.org/ark:/48223/pf0000247444>
- [16] United Nations. (2015). Transforming our world: The 2030 agenda for sustainable development. United Nations. <https://sdgs.un.org/2030agenda>
- [17] The Ministry of Education of China. (2021). China Vocational Education Development Report: Challenges and Opportunities in the New Stage. China Education Press.