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Original Paper

Research and Practice of Innovation and Entrepreneurship Education in Petroleum Colleges Based on OBE Concept

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Abstract

Deepening the research on the topic of "Research on the current situation of innovation and entrepreneurship practice among college students and analysis of response strategies" is of great value to the healthy operation and coordinated development of college students, higher education institutions, the whole society and the country, and plays a positive role in creating the excellent trend of mass entrepreneurship and innovation in the whole society. It plays a great role in promoting the optimization and adjustment of the economic and industrial structure, the rationalization of market resources, the increase of employment opportunities, the improvement of employment quality and the improvement of people's living standards. At the same time, combined with the support of sociology and related innovation and entrepreneurship theories, the study from a new perspective provides a theoretical basis and practical guidance for university students to participate in innovation and entrepreneurship activities, and provides certain reference value for further in-depth study of social innovation and entrepreneurship development work.

Keywords

OBE concept, innovation and entrepreneurship education, university students, higher education institutions

1. Introduction

In recent years, with the acceleration of the country's economic transformation and upgrading and industrial restructuring, China's petroleum industry is constantly facing new challenges and opportunities. However, the traditional education model often focuses on the inculcation of theoretical knowledge and lacks the cultivation of practical skills, making it difficult to meet the current demand for high-quality innovative and entrepreneurial talents in the petroleum industry. The OBE

(Outcome-Based Education) concept is a modern educational philosophy that emphasizes student-centred education and focuses on cultivating students' practical skills, innovation and entrepreneurship, it is highly compatible with the needs of innovation and entrepreneurship education in petroleum institutions. The adoption of the OBE concept in the study and practice of innovation and entrepreneurship education in petroleum colleges and universities not only contributes to theoretical innovation and conceptual innovation, but also helps to promote practical innovation and improve the quality of education and teaching. Therefore, the research and practice of innovation and entrepreneurship education in petroleum colleges and universities based on the OBE concept has important theoretical value and practical application.

In today's era of globalisation, information technology and knowledge-based economy, all industries are in urgent need of high-quality talents with innovation and entrepreneurial abilities. The petroleum industry, one of the pillars of the national economy, also needs a large number of outstanding talents with practical skills, innovation and entrepreneurial spirit. However, there are many problems with the current innovation and entrepreneurship education in petroleum colleges and universities, such as the lack of practical teaching and outdated teaching methods, which prevent them from effectively training talents who meet the requirements of the industry. According to relevant statistical data, the number of higher education graduates in China will be about 10.76 million in 2022, but the relevant employment resources are limited, which means that there is a need to deepen the reform of innovation and entrepreneurship education in colleges and universities, to carry it through the whole process of talent training, to improve the education system, to innovate the training mode and to improve the guarantee mechanism, to continuously promote the reform of innovation and entrepreneurship education, and to cultivate more innovative and brave innovative and practical This will help China's social stability and sustainable economic development, improve people's production and living standards, and achieve the goal of building a modern and powerful country. Therefore, this study aims to explore the innovation and entrepreneurship education model based on the OBE concept in petroleum colleges and universities, and to improve its education quality through practical verification, so as to promote education and teaching reform, improve the level and quality of talent training in petroleum colleges and universities, and better meet the industry's demand for high quality, innovative and entrepreneurial talents. Specific research objectives include: exploring the application of the OBE concept in innovation and entrepreneurship education in petroleum colleges and assessing its applicability; studying the current situation and problems of innovation and entrepreneurship education in petroleum colleges to provide reference for further education and teaching reform; constructing a teaching model and education evaluation system suitable for innovation and entrepreneurship education in petroleum colleges to realise the implementation of innovation and entrepreneurship education objectives; exploring in practice the innovative and entrepreneurial education based on the OBE concept-based innovation and entrepreneurship education in petroleum colleges and universities, and propose improvement measures; summarize experiences and inspirations for the future development of

innovation and entrepreneurship education.

2. OBE Concept and Its Application in Innovation and Entrepreneurship Education

OBE refers to the concept of student-centred education, or Outcome-based Education, which emphasises that the curriculum should be designed in terms of student learning outcomes to ensure that students acquire the necessary knowledge and skills to achieve the set learning objectives. This educational philosophy advocates that education should focus on the development of students' abilities and skills, rather than simply allowing students to memorise and master knowledge. the OBE philosophy emphasises that students should be the main subjects of learning, and that the teacher's task is to provide students with an appropriate learning environment and resources, and to provide guidance and support according to students' learning progress and needs. features of the OBE philosophy include: firstly, it is student-centred, emphasising students' The OBE concept is characterised by: firstly, it is student-centred, emphasising student ownership and assessment of learning outcomes; secondly, it focuses on the development of students' learning abilities and skills, emphasising practical and applied aspects; thirdly, it focuses on the assessment of learning outcomes rather than the assessment of course content; fourthly, it emphasises the flexibility and diversity of the teaching and learning process to meet the different needs and learning styles of students; fifthly, it emphasises the coherence and continuity of the curriculum, i.e. the knowledge and skills of various subjects should be articulated and The core of the OBE concept is to enable students to actively participate and bring their abilities into play in learning, and to achieve self-development and growth.

Therefore, the OBE concept has important application value in innovation and entrepreneurship education. Firstly, the OBE concept emphasises the development of students' competencies and skills, which can help students master practical innovation and entrepreneurship knowledge and skills, so that they can better cope with future career challenges. Secondly, the OBE concept focuses on the evaluation of learning outcomes, which can more objectively assess students' performance and outcomes in innovation and entrepreneurship education and provide more targeted guidance and assistance to students. In addition, the OBE concept emphasises the flexibility and diversity of the learning process, which can provide students with a freer and more flexible learning environment and resources, thus better stimulating their innovative and entrepreneurial potential. Finally, the OBE concept emphasises the consistency and continuity of the curriculum, which can help students establish a systematic knowledge system of innovation and entrepreneurship, form a complete chain of innovation and entrepreneurship education, and improve students' comprehensive quality and innovation and entrepreneurial ability. At the same time, the OBE concept has a number of significant differences compared to the traditional education model. Firstly, the traditional education model focuses on the transfer of knowledge, while the OBE concept focuses on the achievement of learning outcomes. While the traditional education model emphasises students' mastery of course content, the OBE concept focuses more on students' ability to apply the knowledge and skills they have learnt to

solve practical problems. Secondly, the traditional education model is a teacher-centred teaching model, while the OBE philosophy is a student-centred teaching model. Under the traditional education model, the teacher is in control of the content and the pace of learning, whereas under the OBE philosophy, the teacher plays more of a guiding and supporting role, allowing students to actively participate in learning and mastering knowledge and skills. In addition, while the traditional education model places emphasis on paper-based learning, the OBE philosophy is more practical and application-oriented, encouraging students to take the initiative to explore and practice. Finally, the assessment approach of the traditional education model focuses on the accumulation of examination results and credits, while the assessment approach of the OBE philosophy focuses on the achievement of learning outcomes and the development of application skills. In conclusion, the OBE concept is very different from the traditional education model in terms of teaching methods, assessment methods and learning outcomes. The OBE concept emphasises students' motivation and practicality, which is more in line with the needs of modern society for talents. Therefore, it is of great significance and value to apply the OBE concept to innovation and entrepreneurship education.

3. Analysis of the Current Situation of Innovation and Entrepreneurship Education in Petroleum Colleges and Universities

Innovation and entrepreneurship education is an important part of university students' education, of which the history of innovation and entrepreneurship education in petroleum colleges and universities can be traced back to the 1980s of the 20th century. At that time, due to the changes in the domestic and international oil market and the growing demand, the oil industry had an increasing demand for talents. In order to meet this demand, some petroleum colleges and universities began to explore innovation and entrepreneurship education in order to cultivate petroleum engineering talents with innovative and entrepreneurial spirit and practical ability. As the country promotes higher education reform and the demand for talent training continues to rise, innovation and entrepreneurship education in petroleum colleges and universities has received more attention and support. In recent years, the state has strengthened its policy guidance and resource support for innovation and entrepreneurship education, and petroleum colleges and universities have actively responded to the state's call to strengthen the construction and practice of innovation and entrepreneurship education. At the same time, with the continuous development and changes in society, the requirements of the petroleum industry for talents are also being upgraded, and innovation and entrepreneurship education in petroleum colleges and universities is also being adjusted and improved to meet the development needs of the industry and society. At present, innovation and entrepreneurship education in petroleum colleges and universities has formed a complete education system and training model, including the provision of basic innovation and entrepreneurship courses, the promotion of practical teaching, the strengthening of school-enterprise cooperation and the support of innovation and entrepreneurship practice projects. The implementation of these measures has provided a more comprehensive and systematic guarantee for the

cultivation of petroleum engineering talents, and is also conducive to promoting innovation and development of the petroleum industry.

At present, innovation and entrepreneurship education in petroleum colleges and universities has achieved certain results, but there are also some problems and challenges. Firstly, due to the specificity and complexity of the petroleum industry, the content and form of innovation and entrepreneurship education in petroleum colleges and universities need to be closer to the actual situation. However, some institutions have the problem of disconnect between theory and practice in practical teaching, lacking practical, relevant and forward-looking teaching content, resulting in graduates facing greater difficulties in adapting to the actual work. Secondly, there is also a certain shortage of teachers for innovation and entrepreneurship education in petroleum colleges. The oil industry, with its high technological content and rapid development, requires a faculty with rich practical experience and professional knowledge. However, the teaching staff of some institutions lack practical experience and the spirit of innovation and entrepreneurship, and are unable to guide students well in practical teaching. In addition, the evaluation mechanism of innovation and entrepreneurship education in petroleum institutions also needs further improvement. The existing teaching evaluation system is mainly performance-oriented, and the evaluation of students' innovation and practical ability is relatively simple, which cannot fully reflect students' comprehensive ability and innovation and entrepreneurial ability.

The existence of these problems not only hinders the development of innovation and entrepreneurship education in petroleum colleges, but also limits the ability of students in innovation and entrepreneurship and the enhancement of their competitiveness in the market. Therefore, comprehensive strategies and measures are needed to address these issues from multiple perspectives. For example, schools can introduce practical cases and corporate practice courses to strengthen the link between teaching and practice and improve students' innovation and entrepreneurship skills. At the same time, schools can also strengthen their faculty by hiring professionals with experience in entrepreneurship and marketing to increase the teaching resources and experience of teachers. In addition, schools can strengthen cooperation with other disciplines and industries to broaden students' horizons and ideas and improve their overall quality and competitiveness. Finally, schools can establish an evaluation system for innovation and entrepreneurship education, and regularly assess and provide feedback on students' innovation and entrepreneurial abilities and market competitiveness to promote continuous improvement in teaching and students' abilities. In general, petroleum institutions have made some progress in innovation and entrepreneurship education, but still need to face more challenges and improvements. In the future, petroleum institutions should strengthen the updating and improvement of teaching contents, improve the level of the teaching staff and the evaluation mechanism, so as to give better play to the role of innovation and entrepreneurship education and inject new vitality into the development of the petroleum industry.

4. Design and Practice of Innovative Entrepreneurship Education in Petroleum Colleges Based on the OBE Concept

The design principles of innovation and entrepreneurship education in petroleum institutions based on the OBE concept include: student-centred, focus on developing students' comprehensive abilities, strengthen practical teaching, focus on evaluation and feedback, as well as ensure the quality and effectiveness of education. These principles aim to establish a student-led, practice-oriented and student learning-focused education model that helps students achieve a holistic approach to knowledge, skills and innovation. This model of education needs to focus on active student participation and self-reflection, as well as the integration of practical and real-world projects, providing students with more opportunities and space to realise their potential.

Meanwhile, here are some examples of OBE-based innovation and entrepreneurship education in petroleum institutions: the "Innovation and Entrepreneurship Education" course offered by the School of Petroleum and Chemical Engineering at Sun Yat-sen University. The course aims to develop students' innovative thinking and practical skills through independent learning, classroom discussions, practical work and teamwork. The teaching methods used in the course include case studies, simulation experiments, enterprise visits and creative competitions, which can effectively stimulate students' enthusiasm for innovation and entrepreneurship and their practical skills. The Innovation and Entrepreneurship Practice Base at the School of Petroleum Engineering, China University of Petroleum (East China). This practice base provides a series of innovative and entrepreneurial training courses and practical activities, including business plan writing, market research, team building and business model design. Through participation in the practical activities, students are able to gain hands-on experience and practical experience to better understand and grasp the essentials of innovation and entrepreneurship. Southwest Petroleum University's Petroleum Engineering School's "Double Innovation" education programme. The programme is student-centred, with a focus on practice and reflection, and encourages students to participate in a variety of innovative and entrepreneurial activities to improve their overall quality and innovative capabilities by building a platform for "dual innovation" education. The programme also focuses on collaboration with enterprises to translate students' innovations into practical applications, enhancing students' innovation and entrepreneurship skills and competitiveness in employment.

These cases show that the practice of innovation and entrepreneurship education in petroleum colleges based on the OBE concept can not only improve students' overall quality and practical ability, but also promote the cultivation of students' innovation and entrepreneurship spirit and innovation and entrepreneurship awareness. At the same time, these practice cases also provide reference and reference for the practice of innovation and entrepreneurship education in other petroleum institutions.

5. Conclusion

Innovative entrepreneurship education based on the OBE concept in petroleum colleges and universities can effectively improve students' innovative and entrepreneurial abilities, practical skills and comprehensive quality, as well as improve their employment competitiveness, which is a feasible and effective education model. In order to achieve this goal, the design of OBE-based innovation and entrepreneurship education needs to follow certain design principles, such as setting up individualised curricula according to students' needs and interests, emphasising practical teaching, and focusing on the full use of educational resources. In addition, in order to better evaluate the quality and effectiveness of this education model, corresponding evaluation indicators need to be developed, including the evaluation of students' innovative and entrepreneurial abilities, practical skills, comprehensive quality and employment competitiveness, as well as the evaluation of the rationality of the curriculum, teachers' teaching abilities and the full use of educational resources. However, innovation and entrepreneurship education in petroleum colleges and universities still faces some problems and challenges in practice, such as insufficient teaching ability of teachers, insufficient educational resources and lack of practice platforms, which need to be continuously improved and enhanced. Therefore, further in-depth research and discussion are needed as a way to promote the development of innovation and entrepreneurship education in petroleum colleges and universities based on the OBE concept.

In the future, innovation and entrepreneurship education in petroleum colleges will also be guided by the OBE concept, with more emphasis on cultivating students' practical skills and innovation spirit, promoting students' personalised development and independent learning, and establishing an innovation and entrepreneurship education model with industry characteristics. With the emergence of new technologies and new industries, the petroleum industry will also continue to change and innovate, and innovation and entrepreneurship education in petroleum colleges will be constantly updated and improved to meet the industry's demand for talents.

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References

Wu, Y. Y., Bi, L. L., Zhao, X. M., Ma, Y. P., & Tian, M. M. (2020). Application of OBE concept in higher vocational English teaching. *China Higher Education Research*, *5*, 111-112.

Hu, J., & Ren, H. W. (2020). The practice of OBE concept in teaching basic machinery courses in colleges and universities. *Chemical Engineering University*, *34*(4), 32-35.

Zhang, X. Y., Fu, C. H., Xie, Q. P., & Chen, B. (2021). Research and practice of vocational and technical education model of metallurgical engineering based on OBE concept. *China Technical Education*, *1*, 98-101.

Liu, T., Li, F., & Zhao, Y. (2021). Exploration of graduation design under the OBE concept of

engineering majors in higher education institutions. *Science and Technology Innovation and Application*, *2*, 89-90.

Liu, Y. H. (2021). Exploration of financial accounting teaching based on OBE concept. *Education and Teaching Forum*, *7*, 34-35.

Liang, W. H., Li, Y. Y., & Zeng, W. B. (2021). The construction and practice of e-commerce curriculum system based on OBE concept. *Modern Educational Technology*, *2*, 12-15.

Xu, Z. M., & Wei, G. T. (2020). Exploring the reform of the curriculum system of physical education under the OBE concept. *Physical Education and Science*, *7*, 76-78.

Zhang, X. D., Huang, N. B., & Wang, Y. P. (2020). Exploring the application of OBE concept in petrochemical education and teaching. *Journal of China Institute of Petrochemical Education*, *3*, 41-44.

Li, J. Y., & Wang, X. M. (2016). Exploration and practice of innovative entrepreneurship education in petroleum higher education institutions. *Journal of e-learning*, (06), 106-107.

Wang, L. M., & Liu, Z. S. (2015). Exploration and practice of innovation and entrepreneurship education in petroleum higher education institutions. *Modern education technology*, (01), 100-102.

Zhang, Z. Q. (2018). Exploration on the construction of quality assurance system of innovation and entrepreneurship education in petroleum higher education institutions. *Journal of Higher Education*, (04), 132-135.