International Journal of Science and Engineering Applications
Volume 13-Issue 08, 62 – 65, 2024, ISSN:- 2319 - 7560
DOI: 10.7753/IJSEA1308.1013

Research on the Construction of Experimental Practice Teaching System in College Continuing Education

Li Xuhai
Changzhou Vocational Institute of Engineering
School of Continuing Education, 213164
Changzhou, China

Abstract:This paper explores the construction of an experimental practice teaching system in higher education continuing education. Recognizing the critical role of lifelong learning and the evolving demands of modern society, this research proposes a comprehensive framework for integrating experimental practice into continuing education programs. By developing a cross-disciplinary, integrated, and incremental experimental system, the study aims to enhance students' practical skills and innovative thinking. The methodology includes careful design of hands-on projects, incorporation of advanced teaching tools, and collaboration with industry to provide real-world training. The preparation phase focuses on understanding students' learning situations, building rich online resources, and designing engaging classroom activities. The research underscores the importance of continuing higher education in fostering personal development, meeting societal needs, and promoting social justice. The proposed system not only enriches the content of practical teaching, but also bridges educational resources with the needs of various industries, thereby contributing to the sustainable development of society.

Keywords: College continuing education, experimental practice teaching, general research

1. INTRODUCTION

In the context of continuing education, the implementation of value guidance is more important. By shaping and strengthening the values of lifelong learning, it can not only stimulate the learners' internal motivation and promote their personal ability, but also provide solid talent support for the sustainable development and progress of society. In the context of the ever-changing times, the society's demand for knowledge and skills is changing with each passing day. The continuing education of colleges and universities has appropriately responded to this demand, becoming a bridge and link, closely linking educational resources with social needs. With its unique flexibility and openness, it connects the actual needs of various fields of society and provides professional talents and continuing education opportunities for different industries. With the rapid development of the economy and the continuous upgrading of industries, specific fields have higher requirements for professional skills. The continuing education of colleges and universities conveniently provides a platform for upgrading and replacement, so that employees can update their knowledge structure in time and maintain their competitiveness. Continuing education is not only to meet the needs of personal development, but also to adapt to the rapid changes and progress of the entire society. Through the development of continuing education, individuals can achieve the self-improvement, obtain more career development opportunities, and improve their social status and quality of life. In addition, continuing education can also promote social harmony and stability, provide more high-quality talents for the society, and promote the progress of various social undertakings. Especially in the current context of globalization and informatization, the speed of knowledge update is accelerating, the skill requirements are increasing, and the importance of continuing education is becoming more and more prominent. Through effective value guidance, learners' sense of responsibility and mission can be enhanced, so that they can participate in continuing education more actively. Colleges and universities play a vital role in this process. They should not only provide the high-quality educational resources and services, but also help learners establish correct learning concepts and career development goals through various forms of publicity and guidance. At the same time, colleges and universities should also actively cooperate with all sectors of society to jointly promote the development of continuing education and contribute to the construction of a learning society. In short, continuing education plays an irreplaceable role in cultivating the concept of lifelong learning, improving personal abilities, and promoting social development. The importance of its value guidance is becoming increasingly apparent. In the current era of rapid development of information technology, the form of continuing education is also constantly innovating and changing. The popularity of online education platforms enables learners to obtain knowledge resources anytime and anywhere, breaking the time and space limitations of traditional education. Through online courses, webinars, virtual laboratories and other methods, learners can flexibly arrange their study time and improve their learning efficiency. In addition, continuing education also provides customized training programs through cooperation with enterprises and industry associations to meet the special needs of different professional groups. This flexible and diverse education model makes continuing education closer to reality, more targeted and effective.

Continuing education also plays an important role in promoting social equity and inclusiveness. By providing diverse learning opportunities and channels, continuing education helps those who have missed traditional education for various reasons regain the opportunity to learn and realize their personal value. At the same time, continuing education also focuses on cultivating learners' comprehensive qualities and innovative abilities, helping them to continuously break through themselves in their careers and achieve higher career goals and life ideals. This not only enhances personal

happiness and sense of accomplishment, but also injects new vitality and motivation into the development of society.

2. THE PROPOSED METHODOLOGY

2.1 Build a cross-cutting, integrated, and step-by-step experimental system

The practice link is the core link of engineering courses and the key link of new engineering talent training. The setting of practice projects and content is very important. The designed experimental content should not only cover basic courses and professional knowledge, but also be combined with practical engineering problems. According to the talent training goals and engineering background of this major, and following the systematic and progressive nature of knowledge, the teaching team of the author has designed a multidisciplinary and step-by-step experimental teaching system, including practical projects such as course experiments, course design, engineering training and innovative experiments. Through the careful design and continuous optimization of the practical teaching content, the experimental platform integrating multiple courses plays a "bridging" role in the practical teaching system. In the process of practical teaching, it is crucial to focus on cultivating students' hands-on ability and innovative thinking. Experimental teaching is not only a verification of theoretical knowledge, but also an important way for students to understand and master engineering methods. To this end, in the design of experimental courses, we particularly emphasize the autonomy and creativity of students in practical operations. For example, in the course design stage, students need to independently complete the whole process from scheme design, experimental implementation to result analysis, which not only exercises their comprehensive ability, but also improves their ability to solve practical engineering problems. In order to better achieve the goals of practical teaching, we have also introduced a variety of advanced teaching tools and technologies. For example, the application of virtual simulation experiment platform enables students to perform complex experimental operations in a virtual environment, which improves the efficiency and safety of experimental teaching. In addition, we also encourage students to use modern information technology, such as big data, artificial intelligence, etc., to solve complex problems encountered in the experiment. This diversified teaching method not only enriches the content of practical teaching, but also stimulates students' interest in learning. In the engineering training link, we focus on cooperation with enterprises, invite industry experts to participate in teaching, and provide real engineering projects as training content. Through close cooperation with enterprises, students can be exposed to the latest engineering technology and application cases, which enhances their practical experience and employment competitiveness. In addition, we also encourage students to put forward their own innovative ideas during the training process and try to apply them to actual projects, so as to cultivate their innovation ability and engineering practice ability. Innovative experiments are an important part of the practical teaching system. We encourage students to boldly try and actively explore new methods and technologies during the experiment. In order to support students' innovative activities, we provide rich experimental resources and guidance, establish open laboratories and innovation studios, and students can freely choose experimental projects of interest and conduct independent experiments under the guidance of tutors. Through this open experimental teaching model, students' independent learning ability and innovation ability have been significantly improved.

2.2 Experimental teaching preparation stage

The first stage of hybrid experimental teaching is the experimental preparation stage of teaching design combined with the characteristics of experimental courses and learning characteristics. First, conduct a learning situation analysis. Learning situation usually refers to all information that affects students' learning effects. It requires teachers to not only investigate the existing cognitive and demand levels of the main students, but also analyze and adjust the survey reports. Only by accurately grasping the students' learning level, ability and habits can we design teaching plans in accordance with their aptitude and carry out teaching activities in a targeted manner. Secondly, build sufficient online course resources. Teachers prepare relevant course experimental outlines, experimental projects and equipment software operation videos according to the training plan and course teaching system planning, integrate and optimize project case libraries, micro videos, electronic courseware and references according to the "two sexes and one degree" standard, and reconstruct and improve the existing professional experimental course teaching resources. Finally, it is the design of teaching activities. According to the analysis of the learning situation, the most suitable online and offline teaching methods are designed to stimulate learning interest, which will achieve twice the result with half the effort in cultivating students' abilities.

In the experimental preparation stage, teachers need to further understand the individual differences of students and analyze the difficulties and challenges they may encounter in the learning process. This not only includes the mastery of knowledge points, but also covers students' learning attitudes, motivations, and technical skills. Through questionnaires, interviews, classroom observations, and other methods, teachers can fully grasp students' learning situation, so as to better meet students' personalized needs in teaching design.

Secondly, the construction of online course resources is an important part of hybrid experimental teaching. Teachers should use multimedia technology and online platforms to create rich and diverse learning resources. By making high-quality teaching videos, interactive courseware, and online quizzes, students can get more support in pre-class preparation and post-class review. In addition, teachers can also use online forums and discussion areas to communicate and interact with students in a timely manner and answer questions they encounter in the learning process. This online and offline teaching mode not only improves teaching efficiency, but also enhances students' learning experience.

In addition, when designing experimental courses, teachers should focus on the combination of practicality and innovation. By setting challenging experimental projects, guide students to apply what they have learned in actual operations, and cultivate their hands-on ability and innovative thinking. For example, in experimental teaching, some open experiments and comprehensive experimental projects can be introduced to allow students to solve practical problems in a real engineering context. This not only improves students' practical ability, but also stimulates their creativity and independent learning ability.

In order to ensure the effectiveness of hybrid experimental teaching, teachers also need to constantly reflect and improve

their teaching. By collecting students' feedback and understanding their feelings and suggestions during the learning process, teachers can adjust teaching strategies and methods in a timely manner and optimize teaching content and resources. At the same time, teachers should also actively participate in teaching research and exchanges, share experiences and results with peers, and jointly explore the best practices of hybrid experimental teaching.

Hybrid experimental teaching should also focus on the cultivation of students' abilities and the improvement of their comprehensive qualities. By designing a variety of teaching activities, such as group discussions, project cooperation and competitions, students' teamwork spirit and communication skills can be cultivated. At the same time, teachers can also combine actual cases to carry out interdisciplinary experimental projects, broaden students' knowledge horizons, and cultivate their comprehensive application capabilities. This comprehensive quality cultivation will lay a solid foundation for students' future career development.

In order to further enhance the teaching effect, project-based learning (PBL) can be integrated into hybrid experimental teaching. Project-based learning drives students' learning through actual projects, which can significantly improve students' participation and learning enthusiasm. In this process, students need to solve real engineering problems and apply the knowledge they have learned to design and implement projects. This learning method not only cultivates students' engineering practice ability, but also improves their critical thinking and problem-solving ability.

In order to ensure the quality of experimental teaching, teachers should also conduct teaching evaluations regularly. Through questionnaires, course feedback and classroom observation, understand students' evaluation of teaching content, teaching methods and teaching effects. According to the evaluation results, teachers can adjust teaching strategies in time, optimize teaching content and methods, and ensure the continuous improvement of teaching quality.

In the process of experimental teaching, teachers should focus on cultivating students' scientific research ability. By guiding students to participate in scientific research projects, let them master the methods and skills of scientific research in the actual scientific research process. Teachers can provide certain scientific research guidance to help students complete scientific research projects, thereby cultivating their innovation ability and scientific research quality.

2.3 The important practical significance of carrying out continuing education based on colleges and universities

Colleges and universities play an important role in continuing education, providing the society with high-quality learning and training opportunities, and promoting social development and progress. Among them, colleges and universities are not only the main form of continuing education, but also play a very important role and effect in promoting the development of continuing education. As an important base for academic research and talent training, colleges and universities can combine academic research results with continuing education to provide the society with cutting-edge academic knowledge and practical experience, which has important practical significance and value for the development of education and the development of different industries. Colleges and universities can cooperate with local enterprises to carry out continuing education projects combining industry, academia and research based on actual conditions.

The role of colleges and universities in continuing education is not only reflected in the imparting of knowledge, but more importantly, in cultivating learners' innovation ability and practical operation ability. Colleges and universities have rich teaching resources and scientific research strength, and can provide learners with courses that combine theory and practice. Through continuing education projects, learners can be exposed to the latest research results and technical applications, which not only improves their professional quality, but also increases their competitiveness in the workplace.

Colleges and universities can make full use of their strong faculty and scientific research equipment to carry out diversified continuing education and training projects. For example, colleges and universities can offer short-term training courses, online courses and special lectures to meet the needs of learners at different levels. Through these various forms of continuing education activities, learners can constantly enrich themselves after work and keep up with the pace of the times. At the same time, colleges and universities can also regularly organize expert lectures and academic exchange activities to help learners broaden their horizons and grasp the latest trends in the industry. Colleges and universities also play an important social service role in continuing education. Through continuing education projects, colleges and universities can cultivate a large number of high-quality professionals for the society and meet the needs of various industries for high-skilled talents. Especially in the context of the current economic transformation and upgrading, college continuing education can provide talent support for emerging industries and promote regional economic development. For example, in the fields of information technology, artificial intelligence, new energy, etc., colleges and universities can use continuing education projects to cultivate professional talents for these cutting-edge fields and promote industrial technological progress.

In addition, colleges and universities can also play the role of bridges and ties in continuing education and strengthen school-enterprise cooperation. Through close cooperation with enterprises, colleges and universities can understand the actual needs of industry development and design training courses in a customized manner. This not only helps to improve the pertinence and effectiveness of continuing education, but also provides high-quality talent support for enterprises. Colleges and universities can also carry out research combining industry, academia and research through cooperative projects to solve practical problems for enterprises and promote technological innovation and industrial upgrading.

In order to further improve the effectiveness of continuing education, colleges and universities should also actively explore and apply modern educational technologies. Using the Internet and big data technology, colleges and universities can create online education platforms to provide flexible and convenient learning methods. Through online learning platforms, learners can learn anytime and anywhere, breaking the time and space limitations of traditional education. This flexible learning method not only improves learning efficiency, but also enhances learners' autonomy and enthusiasm.

3. CONCLUSIONS

The construction of an experimental practice teaching system in higher education is crucial to meet the dynamic needs of modern society. This research presents a structured approach that integrates multidisciplinary projects, utilizes advanced technologies, and emphasizes industry collaboration. The experimental system is designed to foster practical skills and innovative thinking among learners, making education more relevant and effective. The preparation phase, which includes a thorough analysis of student needs and the creation of various online resources, ensures that teaching activities are targeted and effective. Colleges and universities play a critical role in this process, offering rich educational resources and promoting lifelong learning. By providing flexible and inclusive learning opportunities, continuing education not only enhances individual capabilities, but also contributes to social progress and equity. The proposed framework demonstrates the significant impact that well-structured experiential education can have on both personal and societal development, and reinforces the value of continuing education in the modern era.

4. ACKNOWLEDGEMENT

Fund Project: Education Science Planning Project of Jiangsu Province in 2022 (Key project) : Research on the Comprehensive Reform Path of Higher Vocational Education Evaluation under the Appropriate Education Concept (Fund Number: B/2022/02/74)

5. REFERENCES

[1] Changfu, Yuan. "Governance Mode and Formation Mechanism of Continuing Education in Colleges and Universities from the Perspective of Stakeholders."

[2] Neuwirth, Lorenz S., Svetlana Jović, and B. Runi Mukherji. "Reimagining higher education during and post-COVID-19: Challenges and opportunities." Journal of Adult and Continuing Education 27, no. 2 (2021): 141-156.

[3] Ginese, Joseph M. "Motivation, Learning, and the Workplace: A Study of Community College Student Affairs Professionals and Continued Professional Learning." PhD diss., City University of New York Hunter College, 2024.

[4] Birmingham, Wendy C., Lori L. Wadsworth, Jane H. Lassetter, Tyler C. Graff, Evelyn Lauren, and Man Hung. "COVID-19 lockdown: Impact on college students' lives." Journal of American College Health 71, no. 3 (2023): 879-893.

[5] Titscher, Georg, Christoph Herrmann-Lingen, Georg Titscher, and Christoph Herrmann-Lingen. "Psychocardiological Training and Continuing Education Curricula." In Psychocardiology: A practical guide for doctors and psychologists, pp. 335-343. Berlin, Heidelberg: Springer Berlin Heidelberg, 2022.

[6] Wang, Hanbi, Aijun Sun, Zhiyuan Zhang, Jie Chen, Han Dong, Ying Zou, Wei Wang et al. "Investigation on the Different Needs of Practicing Doctors for Continuing Medical Education under the Three-Level Medical System in China." Clinical and Experimental Obstetrics & Gynecology 51, no. 3 (2024): 65.

[7] Chandra, Yamini. "Online education during COVID-19: perception of academic stress and emotional intelligence coping strategies among college students." Asian education and development studies 10, no. 2 (2021): 229-238.

[8] Cohen, Alison K., Lindsay T. Hoyt, and Brandon Dull. "A descriptive study of COVID-19–related experiences and perspectives of a national sample of college students in spring 2020." Journal of Adolescent Health 67, no. 3 (2020): 369-375.

[9] Olsen, Sheila Eileen. Extended TPB Framework to Understand Doctorates in Business Administration Intention to Participate in Online Continuing Education. Trident University International, 2022.

[10] Oducado, Ryan Michael. "Faculty perception toward online education in a state college in the Philippines during the coronavirus disease 19 (COVID-19) pandemic." Universal Journal of Educational Research 8, no. 10 (2020): 4736-4742.

[11] Forsetlund, Louise, Mary Ann O'Brien, Lisa Forsen, Leah Mwai, Liv Merete Reinar, Mbah P. Okwen, Tanya Horsley, and Christopher J. Rose. "Continuing education meetings and workshops: effects on professional practice and healthcare outcomes." Cochrane database of systematic reviews 9 (2021).