Journal of Electronic Research and Application, 2024, Volume 8, Issue 3
http://ojs.bbwpublisher.com/index.php/JERA
ISSN Online: 2208-3510
ISSN Print: 2208-3502

Teaching Design and Implementation of the Electrical and Electronic Technology Course Based on Teaching Ability Competition

Xiayida Maxue'er

Xinjiang Agricultural University, Urumqi 830052, China

Corresponding author: Xiayida Maxue'er, Hida_Xia@163.com

Abstract: The teaching ability competition is a vital method for stimulating teachers' enthusiasm and enhancing their teaching skills. This approach has gained increasing attention from colleges and universities in recent years. The competition focuses on evaluating teachers' capabilities in designing and implementing lessons, encouraging the exchange of new educational ideas and high-quality teaching methods. Reforming the teaching of Electrical and Electronic Technology courses based on insights from teaching competitions can significantly improve teaching quality. This paper explores the teaching design and implementation of the Electrical and Electronic Technology course, drawing on the principles of teaching ability competitions. First, it analyzes the existing problems in teaching this course. Then, it highlights the significant benefits that teaching competitions bring to the course. Based on these insights, the paper proposes practical strategies aimed at enhancing students' interest and practical skills, thereby promoting innovative developments in teaching Electrical and Electronic Technology.

Keywords: Teaching ability competition; Electrical and Electronic Technology; Course instructional design; Colleges and universities

Online publication: June 14, 2024

1. Introduction

In the context of the deep integration of informatization and industrialization, Electrical and Electronic Technology is a fundamental course for engineering majors. The quality of its teaching directly impacts students' mastery of professional skills and their future career development. The teaching ability competition serves as a crucial platform to test and enhance teaching quality, playing a significant role in promoting the reform of Electrical and Electronic Technology courses. Organized by the Ministry of Education, the national teaching ability competition requires teachers to adhere to national professional teaching standards and emphasizes the construction of an effective educational mechanism. This competition is highly significant in encouraging the renewal of teaching methods [1]. Therefore, this paper aims to analyze the positive impact of the teaching ability competition on the teaching of Electrical and Electronic Technology courses. It proposes

relevant teaching design and implementation strategies to improve the course's teaching quality and enhance students' comprehensive skills.

2. Current problems in the teaching of the Electrical and Electronic Technology course in colleges and universities

Firstly, students' interest in learning is often low. The abstract and complex nature of the knowledge points in Electrical and Electronic Technology causes many students to struggle, leading to a gradual loss of interest and motivation. Additionally, some teachers rely on traditional, uninspired teaching methods, which further contribute to student boredom.

Secondly, there is an imbalance between theory and practice in the current teaching of Electrical and Electronic Technology courses. Excessive emphasis is placed on theoretical instruction, while practical operation is often neglected. This imbalance results in students mastering theoretical knowledge but lacking competence in practical applications. Electrical and Electronic Technology, being a highly practical subject, requires a balanced approach where theoretical study and practical skills complement each other. However, the current teaching system predominantly focuses on explaining principles, formulas, and theorems, with insufficient opportunities for hands-on practice and real-world application. Consequently, students, despite understanding theoretical concepts, struggle to effectively apply their knowledge in practical scenarios.

3. Significance of the teaching ability competition to the teaching of the Electrical and Electronic Technology course

Firstly, the teaching ability competition is beneficial for assessing the quality of teaching. Through a series of rigorous system designs, the competition provides a platform for teachers to demonstrate their teaching proficiency and innovation. Participants are required to showcase their teaching concepts, designs, methods, and effectiveness, necessitating deep reflection and careful preparation based on the actual circumstances of Electrical and Electronic Technology courses. This process allows teachers to gain a more intuitive understanding of their strengths and weaknesses, enabling them to refine their teaching methods and ultimately enhance the quality of their instruction [2].

Secondly, the teaching ability competition promotes the "three education" reform which encompasses teachers, teaching materials, and teaching methods. This competition not only evaluates the teaching proficiency of teachers but also emphasizes the innovative use of teaching materials and methods. The jury, typically composed of industry experts and scholars with extensive teaching experience and deep professional knowledge, objectively and fairly assesses the performance of participating teachers. Their evaluations and feedback provide valuable insights and suggestions. These recommendations serve as crucial references for teachers to enhance their teaching quality, update, and reform teaching materials, and ensure that teaching content is closely aligned with industry needs and social development [3].

4. Teaching design and implementation of the Electrical and Electronic Technology course based on teaching ability competition

4.1. Clarifying the guiding spirit of the competition and revising the talent training program

The Guidance on Undergraduate Talent Training Program from the Ministry of Education clearly emphasizes

that education and teaching should align with national standards, skill competitions, and industry design, while also considering regional economic development and social demands to formulate effective talent training programs. As a significant event in the education sector, the teaching ability competition offers valuable reference and guidance for the teaching design and implementation of Electrical and Electronic Technology courses. Teachers should focus on understanding the guiding principles of the competition and develop appropriate talent training programs per these guidelines [4].

When revising the talent training plan, teachers should closely focus on the core points of the competition to ensure that the teaching design of Electrical and Electronic Technology courses meets the competition's requirements. Firstly, clear curriculum objectives should be established, Teaching should adhere to the concept of "knowledge as the main line and application as the orientation," establishing reasonable goals that encompass knowledge, abilities, and literacy. The knowledge goals include understanding the concepts of Electrical and Electronic Technology, mastering its application methods, and comprehending its practical uses [5]. The ability goal includes the ability to analyze the knowledge of Electrical and Electronic Technology to solve practical application problems. To cultivate students' ability to obtain information, think, analyze, and summarize systematically. Quality objectives include stimulating students' motivation for autonomous learning and independent inquiry, cultivating students' scientific and rigorous, truth-seeking and pragmatic attitude, improving students' innovation and practice ability, and enhancing students' sense of responsibility [6]. Secondly, the curriculum system should be optimized. Teachers should develop a reasonable curriculum system based on national and industry standards, expanding the scope and focus of the major. This involves appropriately setting up public basic courses, professional basic courses, and professional core courses, adjusting the number of courses and the proportion of class hours, removing outdated and redundant content, and incorporating knowledge points related to new technologies and processes. This will make the course content more relevant and forward-looking.

In designing the course content, teachers should engage in dialogue with competition judges, industry experts, and enterprise representatives. Their valuable feedback and suggestions can help teachers better understand the development direction of Electrical and Electronic Technology courses, ensuring the curriculum meets societal needs effectively [7].

4.2. Building an innovative teaching staff and playing a role in promoting the competition

The number of participating teams in the teaching ability competition typically ranges from 2 to 4 members. These teams are often composed of teachers from the same college, cross-college teachers, and enterprise mentors, fostering effective cross-disciplinary collaboration and contributing to the development of an innovative teaching staff. Schools should leverage the teaching ability competition to build innovative teacher teams, focusing on the following aspects: The first aspect is promoting the innovative development of teachers through the teaching ability competition. The intense competition and rigorous evaluation process encourage teachers to continually reflect on their teaching ideas and methods, exploring new approaches to teaching. This environment of pressure and incentive is beneficial in stimulating teachers' innovative spirit and drive, helping them to continuously enhance their teaching skills and abilities [8]. The second aspect involves promoting the exchange of new educational ideas. During the competition, teachers from various colleges, universities, and backgrounds come together to discuss teaching challenges in Electrical and Electronic Technology courses. They share teaching experiences, broaden their horizons, and facilitate the exchange and integration of different ideas and methods. This fosters the innovative development of teachers [9]. The third aspect is to encourage active participation from teachers. Schools should motivate teachers to participate in the competition

actively, allowing them to enhance their teaching skills and abilities through the competition. Teachers should also be encouraged to strengthen communication and collaboration with other institutions and enterprises, introducing advanced teaching concepts and methods. This promotes the reform and innovation of Electrical and Electronic Technology course instruction. Schools should further encourage teachers to establish productive partnerships with industry experts and craftsmen, tailor talent cultivation initiatives accordingly, and enhance the effectiveness of talent training [10]. Fourthly, there is a need to strengthen teacher training. Schools should enhance training and guidance for teachers, assisting them in gaining a better understanding of the guiding principles and evaluation standards of the competition. This will enable teachers to leverage their strengths and showcase their unique characteristics effectively. Moreover, it is essential to establish a robust incentive mechanism to recognize and reward teachers who excel in the competition. This will serve to boost their enthusiasm and motivation to continue innovating in their teaching practices.

4.3. Balancing the ratio of practice and theory and emphasizing the development of practical skills

Relying on the teaching ability competition, schools must ensure a balanced proportion between practical and theoretical teaching while emphasizing the cultivation of students' practical skills. The essence of Electrical and Electronic Technology courses lies in hands-on practice, as true mastery of skills and knowledge can only be achieved through practical application. Teachers should emphasize the equal importance of theory and practice in Electrical and Electronic Technology teaching, ensuring a reasonable balance between the two. Theory serves as the foundation for practice, providing guidance and support, while practice extends and applies theory, deepening students' understanding and mastery of theoretical concepts. In instructional design, teachers should integrate theory and practice to complement each other, avoiding overemphasis on either aspect [11]. On the one hand, teachers should allocate sufficient time to theoretical teaching to ensure students acquire a solid foundational knowledge of Electrical and Electronic Technology. On the other hand, they should increase the proportion of practical teaching, facilitating hands-on learning through experiments, training, and other methods. This approach allows students to gain practical experience, enhancing their problem-solving abilities [12]. Participation in the competition enables teachers to learn from other institutions and adopt advanced teaching methods and techniques. By integrating competition requirements and standards into daily teaching practices, teachers can promote the reform and innovation of Electrical and Electronic Technology course instruction [13].

4.4. Updating the teaching materials

Encouraging teachers to further optimize teaching content and update teaching materials is essential for ensuring that instruction aligns closely with real-world applications. In updating teaching materials, teachers should consider the following points: Firstly, integrate new knowledge and technology in the field of electrical and electronic technology. Teachers should continuously update and expand teaching content, incorporating the latest technical advancements and industry case studies. This ensures that students remain abreast of the most recent developments in Electrical and Electronic Technology [14]. Additionally, attention should be given to integrating interdisciplinary knowledge, combining Electrical and Electronic Technology with related fields, thereby fostering students' comprehensive application and innovation abilities. Secondly, prioritize the updating of teaching materials. Teaching materials serve as the foundation of instruction, directly impacting its effectiveness. Teachers should actively participate in the compilation and updating of teaching materials, revising and enhancing them based on feedback from teaching competitions and industry demands. It is important to strike a balance between theory and practice, emphasizing practical components such as experiments and training to enhance the operability of teaching materials [15].

5. Conclusion

The Electrical and Electronic Technology course holds significant importance within the realm of modern engineering technology. The rapid advancements in the engineering technology industry necessitate higher teaching standards from educators. The teaching ability competition serves as an effective means to support teachers in updating their teaching methodologies and enhancing the design and implementation of the Electrical and Electronic Technology course. In light of this, teachers should actively engage with teaching ability competitions, integrating advanced competition concepts into their teaching practices. They should also focus on revising talent training programs, developing their innovative teaching abilities, and striking a balance between theoretical and practical instruction. Enriching the teaching content of professional courses, fostering students' interest and practical skills, and fostering innovative development in Electrical and Electronic Technology course instruction are vital considerations for educators.

Disclosure statement

The author declares no conflict of interest.

References

[1] Hong Y, Ouyang J, Feng M, 2023, Teaching Design and Implementation of "Electrical and Electronic Technology" Course Based on Teaching Ability Competition - Taking "Power Factor Improvement" as an Example. Science and Technology Wind, 2023(34): 103–105.

[2] Hong J, 2023, Exploration on the Application of Mind Mapping in the Course of Automotive Electrical and Electronic Technology in Secondary Vocational Schools Under the Background of Dual Education, dissertation, Guizhou Normal University.

[3] Wang H, 2023, Based on PBL and BOPPPS Teaching Method Integration Model in Secondary Vocational "Electrical and Electronic Technology" Teaching Application Research, dissertation, Guizhou Normal University.

[4] Tang R, Yu P, 2023, Research on Teaching Reform and Innovation of Automobile Electrical and Electronic Technology Based on Vocational Post Demand Under the Background of "Class-Post Docking". Times Automotive, 2023(07): 53–55.

[5] Liu Y, 2023, Optimization Path for Electronic Technology Teaching in Vocational Schools. Academic Seminar Paper Collection of the Teacher Development Forum of Guangdong Teachers Continuing Education Association (II), 4.

[6] Lu Y, Chen S, Chen J, 2023, Teaching Strategy of Automobile Electrical and Electronic Technology Course Based on Hu Ge Teaching Mode. Guangxi Education, 2023(06): 148–151.

[7] Song C, 2023, Curriculum Reform and Practice Based on the Teaching Ability Competition of the National Vocational College Skills Competition. Automotive Maintenance and Repair, 2023(04): 66–67.

[8] He J, 2023, The Application and Research of OMO Blended Teaching Model in the Course of "Automotive Electrical and Electronic Technology". Times Automotive, 2023(04): 37–40.

[9] Zhang D, Xie Y, Shi H, et al., 2023, Exploration and practice of interaction mode between course teaching of chemical engineering and Chemical Engineering Design Competition. Journal of Shangqiu Normal University, 39(03): 88–90.

[10] Wu S, Chen X, Wu Z, 2023, College Teaching Mode Reform and Innovation, "To Promote Teaching and Learning." Science Wenhui, 2023(1): 56–58.

[11] Dong X, 2022, Exploration and Practice of Teaching Reform in the Course of "Integrated Circuit Application Technology" through the Integration of Vocational Courses, Competition and Certification. 2022 Collection of

New Reflections on Mechanical and Electrical Innovation and Integration of Industry and Education. Hubei Vocational and Technical College of Water Resources and Hydropower, 5.

[12] Zhong Q, Zeng L, 2022, Research on Promoting Curriculum Teaching Reform by Teaching Ability Competition: Taking the Course of Construction Engineering Measurement and Valuation of Guizhou Vocational and Technical College as an Example. Modern Vocational Education, 2022(43): 128–131.

[13] Liu F, Chen L, 2022, Research and Practice on the Reform of Vocational Education Curriculum Teaching from the Perspective of "Integration of Competition and Education" - Taking C Language Programming as an Example. Journal of Yangling Vocational and Technical College, 21(04): 82–87.

[14] Dong H, 2022, Thinking on the Promotion of Teaching Reform in the National Vocational College Skills Competition: Taking the Assembly and Maintenance Technology Competition of CNC Lathe for Example. Equipment Manufacturing Technology, 2022(10): 207–210.

[15] Gu Y, 2022, Practice and exploration of the "Three Education" Reform of Vocational Education Based on High-Quality Development: Case Analysis of the Entry of the Teaching Ability Competition of 2021 National Vocational College Skills Competition "Overhaul Intelligent Driving Assistance System". China Vocational and Technical Education, 2022(22): 72–82.