



A Preliminary Exploration of Legal Education Methods in the "Electrical Engineering Technology" Course

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Abstract. "Electrical Engineering Technology" is one of the key professional courses for undergraduates majoring in Electrical Engineering and Automation at our university. To fully leverage the educational function of the course and align with its inherent characteristics as well as the future career development needs of students, this study explores teaching methods that integrate legal education into professional knowledge during the course instruction. Based on an analysis of the challenges in cultivating legal literacy within engineering curricula, several approaches to concurrently advance course teaching and legal education are investigated. Using practical legal issues in the field of engineering technology as a starting point, specific methods for integrating legal education into professional course instruction are discussed from three perspectives: disseminating legal knowledge, cultivating legal thinking, and enhancing the ability to apply legal principles in practice. The aim is to strengthen the legal awareness of both teachers and students, improve students' capacity to recognize, understand, and address legal issues in their professional field, embed the concept of comprehensive rule of law into specialized classroom instruction, and cultivate a new generation of technical professionals who are knowledgeable about the law, abide by it, understand it, and can apply it effectively.

Keywords: Professional Courses, Rule of Law Education, Integration, Electrical Engineering Technology.

1 Introduction

The report of the 19th National Congress of the Communist Party of China proposed accelerating the construction of a culture of rule of law and enhancing the fundamental legal literacy of all citizens. University students are the primary force in building socialism in the future and important practitioners in constructing a country governed by the rule of law. Against the backdrop of comprehensively advancing the rule of law, strengthening legal education for university students and enhancing their legal literacy have become crucial aspects of higher education [1]. Currently, legal education for science and engineering students is primarily carried out through both on-campus and off-campus approaches. On-campus cultivation mainly relies on courses such as "Ideological and Moral Cultivation and Legal Foundation" and other elective courses in law.

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Professional courses constitute the largest portion of the time science and engineering students spend during their academic years and form the foundation for their further studies and future careers [2]. How to integrate elements of legal education into such courses through the curriculum ideological and political system is a question worthy of in-depth consideration. Taking the "Electrical Engineering Technology" course in the Electrical Engineering and Automation major as an example, this paper explores methods to integrate professional knowledge with legal education. The aim is to encourage students to internalize the awareness of the rule of law and incorporate law-abiding and law-application behaviors into their professional activities, thereby better implementing the requirements of building a country governed by the rule of law in their studies, work, and daily life practices, and fostering socialist builders with a higher level of legal literacy.

The primary objective of engineering professional courses is focused on cultivating students' professional knowledge and skills. In many cases, there is a lack of quantitative or explicit articulation of goals related to enhancing legal literacy [3]. During the teaching process, due to the typically tight schedule of professional courses and the high density of knowledge and skills that need to be imparted and practiced, the incorporation of legal elements in the classroom is often minimal. Additionally, many instructors of engineering courses have professional backgrounds that differ significantly from legal expertise, lacking relevant specialized knowledge, which makes it challenging to implement targeted legal education. These factors contribute to insufficient integration between the cultivation of legal literacy and the transmission of professional knowledge and skills in engineering courses. Thus, there is a need for dedicated research and exploration to address this issue.

2 Exploration and Attempts to Integrate Professional Knowledge with Legal Education in the Electrical Engineering Technology Course

2.1 Taking Educational Simulation Software as an Opportunity to Popularize Legal Knowledge Related to Engineering and Technical Issues

During the teaching process of the Electrical Engineering Technology course, students are required to use simulation software called "Multisim" to learn circuit parameter calculation methods. This is a widely used software in the industry, and its installation packages can be obtained from various forums and cloud storage services. While students are aware of such sources, many have a vague understanding of legal knowledge related to computer software protection and fail to recognize that "using software outside the scope of its license" constitutes an "infringement" [4], which can lead to serious consequences.

To address students' misconceptions, relevant legal education was integrated into the course. The teacher assigned a video-based task requiring students to first learn about the software installation process. The teaching resource used here was the "educational

version" provided by the company for learning and research purposes, which is one of the legitimate ways to access and trial commercial software. After students downloaded and installed the software from the specified website following the video instructions, they encountered limitations related to usage duration and project scale during its application. At this point, some students raised the question of why not use the full version available on other websites. Seizing this opportunity, the teacher explained the legal rights associated with commercial software, clearly pointing out that using pirated software constitutes an "infringement." Real-life cases were used to help students understand the harms of such behavior and the legal consequences they must bear, thereby achieving the goal of disseminating legal knowledge.

Particularly, in the work processes of engineering professionals, there is often a need to use specialized software, and infringement disputes arising from this are common. Therefore, at the beginning of students' professional learning, it is necessary to explicitly address this prominent legal issue. From a technical perspective, students should be guided on how to apply for trial versions of software, purchase legitimate copies, and distinguish between the boundaries of academic research and commercial use. This subtle cultivation of legal awareness and dissemination of legal knowledge, when integrated into professional courses in connection with practical issues, can leave a deeper impression on students and enhance the effectiveness of education.

2.2 Preliminary Cultivation of Legal Thinking for Engineering and Technical Issues Based on Course Content

For engineering students, the coupling of engineering technical issues and legal problems often arises in various mandatory national and industry standards, as well as regulations and specifications related to product safety and quality. Understanding these issues requires both profound professional knowledge and sharp legal awareness. In professional courses, training in legal thinking should be integrated with the knowledge being taught.

In the Electrical Engineering Technology*course, an important concept is "power factor," which is a key and challenging topic in the teaching process and a critical indicator of concern in various regulations within related fields. After explaining the concept of power factor and its calculation methods in class, a practical issue was introduced: "the rapidly developing LED lighting equipment in recent years." LED light sources have significant energy-saving advantages, and their market scale continues to expand. Accordingly, countries have successively issued corresponding national standards, regulations, and laws to establish technical barriers and entry thresholds for LED light sources [5]. These regulations impose different requirements on the "power factor" of LED light sources. During the teaching process, comparing these requirements helps deepen students' understanding of the concept of "power factor." At the same time, students are guided to gain a preliminary understanding of how "standards, regulations, and laws" constrain and guide product design, production, and sales. Only by complying with these regulations can products enter the corresponding markets. Technical and legal issues are thus tightly coupled within products. Based on this, technical professionals in China also need to proactively address such "standards competition," propose

their own norms and standards, and fully utilize legal means to participate in international competition.

2.3 Preliminary Cultivation of Legal Practice Capabilities for Engineering Technical Issues Based on Skills Training

The ability to engage in legal practice is the manifestation of applying legal knowledge and legal awareness into action. For engineering students, legal practice is not merely an abstract concept but a concrete necessity that emerges in various professional contexts. Throughout their academic and future career trajectories, engineering students frequently encounter issues related to legal practice across multiple dimensions. These include, but are not limited to, contract disputes arising from collaborative projects, intellectual property matters concerning patents and copyrights, safety concerns associated with equipment operation and workplace environments, as well as labor and social security issues when they enter the workforce. Given the complexity and diversity of these legal challenges, enhancing students' legal practice capabilities requires leveraging multiple educational approaches that integrate legal training into technical curricula. Within professional courses, targeted legal practice activities can be preliminarily carried out based on skills training. This integration not only reinforces technical knowledge but also cultivates legal awareness from an early stage, preparing students for the interdisciplinary demands of modern engineering professions.

In the Electrical Engineering Technology course, a foundational experimental module titled "Motor-Relay Control" is included. The key focus and primary challenge of this module lie in mastering how to control the operational process of motors using specialized equipment such as relays, contactors, and other control devices. Students must understand the principles of electromagnetic induction, circuit design, timing sequences, and safety mechanisms. To deepen their understanding of the control process and, at the same time, provide students with a preliminary grasp of patent-related legal content and the writing characteristics of legal documents such as patent specifications [6], the instructor adopts an innovative pedagogical strategy. Specifically, the instructor guides students to systematically summarize and organize the operational procedures of the motor-relay control experiment into a structured document modeled after a "Patent Specification for Invention." Within this document, the "Technical Solution" section requires students to describe the experimental system in precise, clear, and logically ordered language, including the components, connections, and functions of the relay-based control system. The "Specific Implementation" section then explains, step by step, the operational procedures involved in starting, controlling, and stopping the motor, while also addressing potential failure modes and safety precautions. Through this carefully designed writing exercise, students are encouraged to meticulously analyze the entire experimental system and process from both technical and legal perspectives. They learn to translate hands-on technical operations into formal written descriptions that meet legal documentation standards. Additionally, through this process, students receive preliminary training in legal practice. They learn the conventions of legal documents, such as clarity, completeness, objectivity, and avoidance of ambiguous language.

3 Approaches to Enhancing the Legal Literacy of Professional Course Teachers

To embody the spirit of the law in professional courses and cultivate students' legal awareness of knowing, abiding by, and applying the law, it is essential for instructors of professional courses to continuously enhance their own legal literacy and influence students' behavior through both their words and actions, as instructors serve as role models in the classroom and their attitudes toward legal norms, ethical standards, and regulatory compliance directly shape how students perceive the importance of law in engineering and technical fields; the most important aspect is for teachers to firmly establish the socialist concept of rule of law and resolutely become loyal upholders and practitioners of the socialist rule of law with Chinese characteristics, a foundational commitment that requires not only ideological conviction but also practical adherence to legal principles in daily teaching, research collaborations, and institutional governance, because only when teachers genuinely respect and apply the law in their own professional conduct can they credibly inspire the same values in their students. Building on this ideological and ethical foundation, legal literacy can be improved through the following three interconnected approaches, each targeting a different dimension of professional development—knowledge acquisition, experiential learning, and pedagogical application—while collectively reinforcing the teacher's capacity to integrate legal education into technical curricula. First, strengthening self-learning: professional course teachers should engage in targeted legal knowledge learning, utilizing various methods such as self-study, centralized training, and online learning to accumulate legal expertise and solidify their theoretical foundation, and given the rapid evolution of laws related to intellectual property, data security, contract law, occupational safety, and environmental regulations, teachers must proactively update their understanding of relevant statutes and judicial interpretations, with self-study involving reading legal textbooks, reviewing patent laws, or analyzing case summaries from court databases, centralized training programs offered by universities, legal departments, or industry associations providing structured learning opportunities, and online platforms offering courses on technology law, engineering ethics, and regulatory compliance further enabling flexible, continuous education, so that by systematically building this theoretical base, teachers become better equipped to identify legal issues embedded in seemingly purely technical content. Second, accumulating practical experience through professional activities: professional course teachers can take advantage of opportunities such as undertaking research projects, participating in school-enterprise cooperative education programs, and temporary work assignments to extensively gather legal activities and typical cases related to their field, and by actively engaging in tasks such as contract signing, intellectual property applications, technology transfer agreements, and equipment procurement negotiations, they can personally experience how the law operates across all aspects of professional activities; for instance, when collaborating with industry partners, teachers encounter nondisclosure agreements, licensing terms, and liability clauses—each offering a real-world lesson in contract law, when filing patent applications for laboratory innovations, they learn about novelty requirements, claim drafting, and infringement risks, and temporary assignments in companies or legal aid

centers further immerse teachers in workplace disputes, safety regulations, and dispute resolution mechanisms, thereby enhancing their ability to handle legal issues with confidence and practical wisdom, moving beyond abstract knowledge to actionable competence.

4 Conclusion

Timely incorporating legal education into the teaching of professional courses is of great significance for enhancing students' legal literacy, enabling them to consciously apply legal and regulatory provisions to regulate their behavior in professional activities, and fostering a civic awareness that respects the law. The methods introduced in this paper for integrating "basic legal knowledge education, cultivation of legal thinking, and training of legal practice skills" into the teaching of the "Electrical Engineering Technology" course in the Electrical Engineering and Automation major help students understand the fundamental framework of commonly used laws and regulations in professional activities, recognize the necessity and importance of combining professional knowledge with legal principles, promote the learning of professional knowledge and the development of professional skills, and explore a beneficial path for aligning legal education with professional courses to achieve synergistic effects. In the specific implementation process, teachers need to strengthen their own legal literacy and thoughtfully integrate these elements through well-designed curricula, avoiding rigid indoctrination to achieve optimal outcomes.

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