

Research on the Construction of Off-Campus Internship Bases for Creative Design of Electrical Product Packaging

Zhang Ren

Zhejiang DongFang Polytechnic, Wenzhou, Zhejiang, 325000, China

Abstract: Off-campus internship bases serve as a crucial bridge connecting art and design majors in higher education institutions with industrial practice, playing an irreplaceable role in cultivating applied and innovative packaging design talents. Currently, the electrical product packaging industry is facing transformation demands toward greenization, intelligence, and branding, which imposes higher requirements on the practical capabilities and innovative thinking of design talents. Focusing on the creative design of electrical product packaging, this paper is based on industry research data (N=326 electrical and packaging enterprises, 112 art and design majors in colleges and universities). Starting from the necessity of constructing internship bases, it analyzes the existing problems in the current construction process, explores a base construction model of "university-enterprise collaboration and integration of production and education", and proposes targeted construction strategies. This study aims to provide reference for the sustainable development of off-campus internship bases for art and design majors in higher education institutions.

Keywords: Electrical Product Packaging; Creative Design; Off-campus Internship Base; Integration of Production and Education; Talent Cultivation.

1. Introduction

With the transformation and upgrading of China's manufacturing industry, the market competition for electrical products has become increasingly fierce. According to data from the China Packaging Federation, the scale of China's electrical product packaging market reached 1.28 trillion yuan in 2023, a year-on-year increase of 7.3%. Among this, the proportion of green packaging rose to 38.6%, and the smart packaging market grew at a rate exceeding 20%. As the "first visual business card" of a product, packaging not only fulfills basic functions such as product protection and facilitating transportation but also serves as a crucial carrier for enterprises to convey brand concepts and enhance product added value. Creative design of electrical product packaging requires balancing functionality, safety, environmental friendliness, and visual aesthetics, which demands design talents to possess both solid professional theoretical foundations and rich industrial practical experience. [1]

Traditional classrooms for art and design majors in higher education institutions have a disconnect between theory and practice. Surveys indicate that most majors do not offer practical courses related to electrical product packaging, and some students lack exposure to real projects during internships. Off-campus internship bases, however, can provide students with authentic industrial scenarios, helping to improve their practical and innovative capabilities. As an important platform for university-enterprise cooperation, strengthening the construction of such internship bases holds significant practical significance for enhancing the quality of talent cultivation and promoting the in-depth integration of production and education. [2]

2. Necessity of Constructing Off-Campus Internship Bases for Creative Design of Electrical Product Packaging

2.1. Meeting the Industry's Demand for High-Quality Design Talents

Currently, the electrical product packaging industry is developing toward green environmental protection, intelligent interaction, and personalized customization. Based on a survey of 326 electrical and packaging enterprises, the core competency requirements of enterprises for design talents are shown in Figure 1:

Enterprises require compound talents who not only master packaging design theories and are familiar with material technologies but also can conduct creative design in combination with market demands. However, the survey shows that only 28.5% of enterprises believe that college graduates can quickly adapt to job requirements, and 63.8% of enterprises report that graduates have problems such as insufficient practical capabilities and lack of understanding of cutting-edge industrial technologies. Off-campus internship bases provide students with opportunities to access cutting-edge industrial technologies and real projects, enabling them to understand the design specifications, production processes, and quality standards of electrical product packaging in practice, and cultivate their engineering thinking and market awareness, thereby meeting the industry's demand for high-quality design talents. [3]

2.2. Improving the Talent Training Quality of Art and Design Majors in Colleges and Universities

The core goal of art and design majors in colleges and

universities is to cultivate design talents with innovative spirit and practical capabilities. Through a comparative analysis of students' ability improvement before and after the

construction of internship bases (see Table 1), the significant role of internship bases in talent training can be seen:

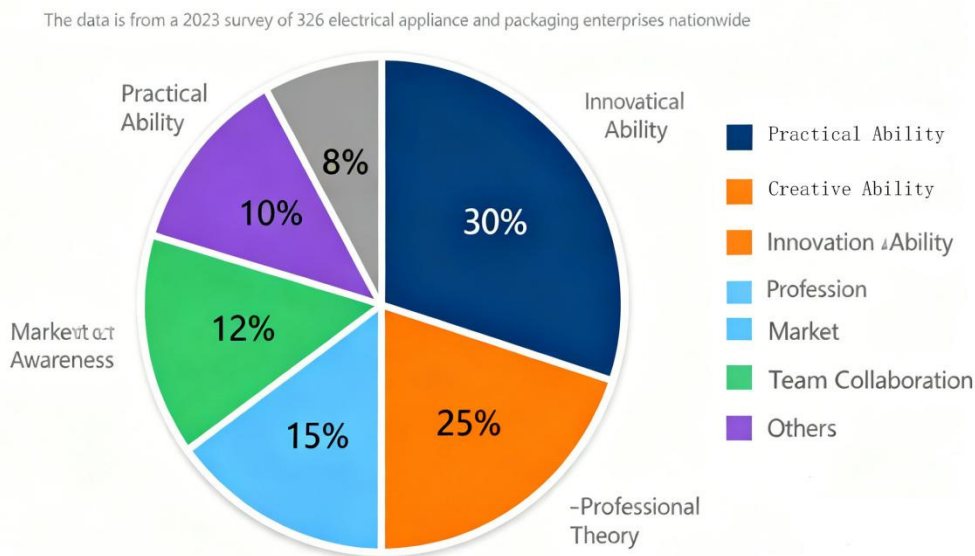


Figure 1. Proportion of Core Competency Requirements for Design Talents in the Electrical Product Packaging Industry
 Note: Data are derived from the 2023 National Talent Demand Survey of Electrical and Packaging Enterprises (N=326)

Table 1. Comparison of Students' Ability Improvement Before and After the Construction of Internship Bases (N=528)

Competency Dimension	Average Score Before Development (10-point Scale)	Average Score After Development (10-point Scale)	Improvement Rate
Practical Operation Ability	4.8	7.9	64.6%
Project Collaboration Ability	5.2	8.1	55.8%
Innovative Design Ability	5.5	7.6	38.2%
Industry Adaptability	4.3	7.8	81.4%
Problem-Solving Ability	5.1	8.0	56.9%

Note: Data are derived from the competency assessment of students from art and design majors of 5 colleges and universities before and after internships, covering the 2021-2023 graduating classes.

As an extension of classroom teaching, off-campus internship bases can make up for the deficiencies of traditional teaching models. By allowing students to participate in real electrical product packaging design projects, they can integrate theoretical knowledge learned in class—such as graphic design, structural design, and materials science—with practice, thereby improving their ability to apply knowledge and solve practical problems. Meanwhile, guidance from corporate mentors during internships helps students identify their own shortcomings, clarify learning directions, and further enhance their professional literacy. [4]

2.3. Promoting University-Enterprise Collaborative Innovation and Industry Development

Off-campus internship bases serve as an important link for university-enterprise cooperation, enabling resource sharing and complementary advantages. Data show that the conversion rate of packaging design innovation achievements of cooperative enterprises and the growth of scientific research funds of cooperative universities is significantly higher than those of non-cooperative entities. Universities provide technical and creative support for enterprises, while enterprises assist universities in teaching and scientific research reforms. University-enterprise collaboration not

only enhances the competitiveness of enterprises' products but also promotes technological progress and innovative development of the electrical product packaging industry.

3. Problems Existing in the Construction of Off-Campus Internship Bases for Creative Design of Electrical Product Packaging

3.1. Insufficient Depth of University-Enterprise Cooperation and Single Cooperation Model

Based on a survey of 89 off-campus internship bases for electrical product packaging design across the country, 62.9% of these bases adopt a "nameplate-only" cooperation model, while merely 18.0% have achieved in-depth industry-university-research integration. Some university-enterprise collaborations remain superficial, lacking substantive content—enterprises typically only provide students with basic internship positions, where students are mostly engaged in auxiliary work and rarely gain access to core design projects or production processes. The survey indicates that only 23.6% of interns can participate in enterprises' core design projects, and 37.5% are mainly responsible for auxiliary tasks such as document organization and sample handling during their internships. Additionally, universities and enterprises lack sufficient collaboration in formulating talent training programs, designing curriculum systems, and facilitating teacher exchanges. This disconnect between internship content and classroom teaching prevents the in-depth integration of production and education.

3.2. Imperfect Management Mechanism of Internship Bases

Due to the differences in management systems and interest demands between universities and enterprises, the management of internship bases often lacks an effective coordination mechanism. In the survey of universities and enterprises, 45.3% of the universities hold the view that "it is difficult to keep abreast of students' internship dynamics in real time", and 56.7% of the enterprises believe that "the investment in internship guidance is disproportionate to economic benefits". Specific manifestations are as follows: Universities exercise relatively loose management over intern students, with communication with them less than once a week on average; enterprises lack a professional team of internship supervisors. 68.2% of the enterprise internship supervisors have not received systematic teaching training, and their guidance methods are quite random. In addition, the assessment and evaluation mechanism of internship bases is inadequate. Only 31.5% of the bases have established quantitative assessment standards, and most bases take the "internship report" as the sole evaluation criterion. They lack a scientific evaluation of students' practical abilities and innovative achievements, which makes it difficult to ensure the internship effect.

3.3. Disconnection Between Internship Content and Industry Demands

The internship content of some universities still remains at the level of traditional packaging design, which has a considerable gap with the development trend of the industry. As shown in Table 2, there is an obvious imbalance between the application of cutting-edge technologies in the current electrical product packaging industry and the coverage rate of such technologies in the internship content of universities:

Table 2. Comparison of the Coverage Rate Between Cutting-edge Industry Technologies and University Internship Content

Cutting-Edge Industry Technologies/Concepts	Industry Application Rate	Coverage Rate in University Internships	Gap Value
Application of Green and Environmentally Friendly Packaging Materials	78.5%	32.6%	45.9%
Intelligent Packaging Technology (Anti-counterfeiting, Traceability)	46.3%	11.8%	34.5%
Personalized Custom Packaging Design	62.7%	23.4%	39.3%
Lightweight Design of Packaging Structures	81.2%	40.7%	40.5%
Compliance Design for Cross-Border E-Commerce Packaging	53.6%	15.2%	38.4%

Note: Data on the proportion of industry application are derived from the enterprise survey (N=326), and data on the coverage rate of internship content are from the university survey (N=112).

During internships, students mainly learn traditional design methods and production processes, with little exposure to cutting-edge industry content such as green packaging materials, smart packaging technologies, and personalized customization. As a result, graduates struggle to quickly adapt to the industry's development needs after graduation. The survey shows that 72.3% of enterprises report that new recruits require 3-6 months of training to independently complete work tasks.

3.4. Weak Teaching Staff and Insufficient Practical Teaching Capabilities

Most teachers in art and design majors of universities lack industrial practical experience. The survey indicates that only 29.6% of university teachers have more than 3 years of working experience in the electrical product packaging industry, and 65.8% of teachers are mainly engaged in theoretical teaching, with insufficient in-depth understanding

of the actual design processes, production technologies, and market dynamics of electrical product packaging. When guiding students' internships, they find it difficult to provide professional practical guidance, which affects the internship effect. Meanwhile, although corporate mentors have rich practical experience, they lack systematic teaching methods and skills. 58.9% of corporate mentors state that they "are not familiar with university teaching rules and struggle to effectively guide students," making it challenging to carry out standardized practical teaching.

4. Strategies for Constructing Off-Campus Internship Bases for Creative Design of Electrical Product Packaging

4.1. Building a Deeply Integrated University-Enterprise Cooperation Model

Establish a university-enterprise collaborative talent cultivation mechanism: Universities and enterprises jointly formulate talent training programs and optimize curriculum settings based on the development needs of the electrical product packaging industry. Integrate enterprise practical projects into classroom teaching, offer core courses such as "Creative Design of Electrical Product Packaging," "Green Packaging Materials and Technologies," and "Smart Packaging Design Practice," and invite corporate mentors to participate in classroom teaching (accounting for no less than 30%), realizing the organic integration of theoretical and practical teaching.

Co-construct industry-university-research cooperation platforms: Universities and enterprises jointly establish R&D centers or design studios to conduct joint research on hot issues and technical difficulties in the electrical product packaging industry. In the past three years, a packaging design studio co-founded by a university and 3 leading electrical enterprises has completed 27 horizontal projects,

obtained 15 patents, with a student participation rate of 85%, and the relevant achievements have been transformed into over 20 million yuan in economic benefits for the enterprises. Students can participate in industry-university-research projects to enhance their innovative capabilities and scientific research levels in practice. Meanwhile, the industry-university-research platforms can provide technical support and creative design services for enterprises, achieving mutual benefit and win-win results between universities and enterprises.

Carry out order-based talent cultivation: Universities sign talent training agreements with enterprises to cultivate design talents with specific skills oriented to the enterprises' job requirements. For example, a university cooperated with an electrical enterprise to set up an "Order-Based Class for Packaging Design." The enterprise participated in the entire process of enrollment, training, and assessment. Students signed employment agreements upon admission and directly entered the enterprise after graduation. The employment rate of students in the order-based class reached 100%, and the enterprise satisfaction rate was 92.3%, effectively solving the enterprise's talent shortage problem.

4.2. Improving the Management Mechanism of Internship Bases

Establish a university-enterprise joint management team: Composed of relevant responsible persons from universities and enterprises, the team is responsible for the daily management and coordination of internship bases. Clarify the responsibilities and rights of both parties, formulate documents such as the "Internship Base Management System" and "Student Internship Operation Procedures." Universities are responsible for students' theoretical guidance, safety education, and performance evaluation, while enterprises provide practical venues, equipment, and positions to ensure the smooth development of internship work.

Table 3. "Three-Dimensional" Assessment and Evaluation System for Student Internships

Assessment Dimension	Assessment Indicators	Weight	Assessment Subject	Assessment Methods
Internship Attitude	Attendance, Work Initiative, Team Collaboration	20%	Enterprise Mentor(s)	Daily Records, Monthly Evaluation
Practical Ability	Mastery of Job Skills, Project Completion Quality	50%	University-Enterprise Joint Evaluation	Practical Operation Assessment, Project Outcome Review
Innovative Achievements	Innovation in Design Schemes, Patents/Award Records	30%	University-Enterprise Joint Evaluation	Achievement Presentation, Expert Review

Strengthen the construction of the internship supervisor team by implementing a "dual-mentor system": University teachers with rich practical experience are responsible for students' theoretical guidance and daily management, while technical backbones and design experts from enterprises with more than 5 years of industry experience undertake practical guidance and project training. Conduct no less than 4 training sessions for university-enterprise mentors every year to improve their teaching and guidance capabilities. Meanwhile, improve the "three-dimensional" internship assessment and

evaluation system (see Table 3), comprehensively assessing students from three dimensions: internship attitude, practical capabilities, and innovative achievements. The assessment results serve as the basis for internship scores and a reference for enterprise recruitment. Conduct a comprehensive evaluation of the internship base construction effect every two years to promptly identify and improve problems.

4.3. Optimizing Internship Content to Align with Industry Development Needs

Incorporate cutting-edge industry technologies and concepts: Based on the development trends of the electrical product packaging industry, integrate cutting-edge content such as green packaging, smart packaging, and personalized customization into internship teaching. Cooperate with enterprises to develop internship textbooks, introduce the latest design cases and technical standards, and enable students to understand the latest design concepts, material technologies, and technical methods. For example, set up training modules such as "Application of Degradable Packaging Materials" and "RFID Smart Traceability Packaging Design" during internships to enhance students' industry competitiveness.

Increase practical project training: Allow students to participate in the entire process of enterprises' actual electrical product packaging design projects, from market research, creative conception, and scheme design to prototype production and production follow-up. In the past three years, students at a certain internship base have participated in 136 electrical product packaging design projects, of which 82 have been put on the market. The average design remuneration per student reached 3,500 yuan, effectively cultivating students' project management capabilities and teamwork skills. Meanwhile, encourage students to conduct innovative design based on market needs, establish an "Internship Innovation Award Fund," and commend and reward outstanding design achievements.

Carry out interdisciplinary internships: Creative design of electrical product packaging involves multiple disciplinary fields such as graphic design, structural design, materials science, and marketing. Interdisciplinary internships can be carried out to allow students majoring in art and design to cooperate with students majoring in materials science, marketing, etc., to complete design projects. For example, an internship base organized an interdisciplinary team to complete the packaging upgrade project of an electrical brand: art and design majors were responsible for visual and structural design, materials majors for environmentally friendly material selection, and marketing majors for market research and positioning. The project results were highly recognized by the enterprise, effectively cultivating students' interdisciplinary thinking and comprehensive capabilities.

4.4. Strengthening the Construction of Teaching Staff to Improve Practical Teaching Capabilities

Encourage teachers to engage in enterprise practice: Universities formulate relevant policies to encourage teachers of art and design majors to take temporary positions in enterprises, requiring teachers to have no less than 6 months of enterprise practice experience every 5 years, which is taken as an important basis for professional title evaluation and performance assessment. In the past three years, 18 teachers from a certain university have taken temporary positions in electrical packaging enterprises, participated in 32 enterprise projects, and published 25 practical papers, effectively improving their practical teaching capabilities. Meanwhile, teachers can bring actual enterprise cases back to the classroom to enrich teaching content and improve teaching

quality.

Employ enterprise experts as part-time teachers: Invite enterprise design experts and technical backbones to serve as part-time teachers in universities, teaching courses, guiding internships, and graduation projects. A certain university has hired 12 enterprise experts as part-time teachers, with an average annual teaching workload of 480 class hours, guiding more than 60 graduation projects, of which 15 have won provincial or higher-level design awards, effectively broadening students' horizons.

Carry out university-enterprise teacher exchange activities: Regularly organize teaching seminars, academic exchanges, and other activities between university teachers and enterprise mentors, no less than 2 times a year, to share teaching experience and industry dynamics. Establish a university-enterprise teacher sharing platform to realize the interconnection of teaching resources and industry resources, and improve the teaching capabilities and professional literacy of both parties.

5. Conclusion

The construction of off-campus internship bases for creative design of electrical product packaging is an important approach to improving the talent training quality of art and design majors in universities and promoting the in-depth integration of production and education. Currently, the construction of internship bases faces problems such as insufficient depth of university-enterprise cooperation, imperfect management mechanisms, disconnection between internship content and industry needs, and weak teaching staff. By adopting strategies such as building a deeply integrated university-enterprise cooperation model, improving management mechanisms, optimizing internship content, and strengthening the construction of teaching staff, these problems can be effectively solved, promoting the sustainable development of internship bases.

Acknowledgments

Ministry of Education's Employment-Oriented University-Enterprise Cooperation Program: Research on the Construction of Off-Campus Internship Bases for Creative Design of Electrical Product Packaging (2025041050899).

References

- [1] Pan, C. Y., Tan, K. Y., Li, J. F., et al. (2025). Construction and Teaching Practice of "Production Internship" Bases for Chemical Products Used in the Mold Industry--Taking Guangdong Xinpeng Chemical Industry Co., Ltd. as an Example. *Die & Mould Manufacturing**, 25(05), 15-18.
- [2] Gong, B. J., & Li, X. (2024). Construction of Off-Campus Internship Bases for Ceramic Product Design in Application-Oriented Universities. *Ceramic Studies**, 39(06), 106-109.
- [3] Guo, X. F., Li, Y. W., & Ye, H. S. (2021). Teaching Design of Film and Television Aerial Photography Production Courses. *Electronic Technology**, 50(08), 52-54.
- [4] Pan, J. Q., Zheng, K., Cao, Y., et al. (2020). Research on the Construction of Off-Campus Internship Bases for Computer Majors in Local Universities Under the Background of Emerging Engineering Education. *Computer Knowledge and Technology**, 16(22), 125-126.