

University- Creative Industry Linkages in Art and Design Higher Education: Insights From Indonesia and Taiwan

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This article presents a study of the university-industry linkages in art and design higher education, focusing on the collaborative efforts between universities and the creative sector in Indonesia and Taiwan. Using a qualitative approach, in-depth interviews and literature reviews were conducted. An automated content analysis of seven semi-structured interviews with lecturers, designers, and the government stressed the importance of university and industry linkages. This study found that despite the prevalent practice of industrial cooperation with universities in the Indonesian higher education system, challenges persist in effectively connecting graduates with employment opportunities in the creative industry sectors. In response, the Indonesian government and universities have implemented policies to support collaboration programs to address these challenges. Conversely, Taiwan has recognized the potential of its creative industry assets to create a promising market and has placed significant value on the benefits derived from industry-university collaboration. Consequently, Taiwan has proactively developed its creative industries, receiving substantial encouragement and support from the local government.

Keywords: university-industry linkages, arts and design, higher education, Indonesia, Taiwan

INTRODUCTION

The creative industry in Indonesia includes many economic activities, which are expected to develop and become opportunities for job creation and new economic power. In Indonesia, there are 16 sectors of the creative industries, culinary, craft, fashion, publishing; performing art; television and radio; photography; music; fine art; architecture; advertising; film, animation, and video; app, and game development and design. With its rich cultural diversity, Indonesia has a legit foundation to start its creative

industry. The emergence of creative industries in Indonesia fosters a favorable economic environment, encompassing substantial contributions to the GDP, promoting business innovation, and utilizing renewable resources.

The concept of 'creative industries' gained prominence in policy and industry circles when the UK Labour government, under the leadership of Minister Chris Smith in 1998, along with the Department for Culture, Media, and Sport (DCMS), initiated efforts to highlight its significance (Hartley et al., 2012). The significance of creative industries in promoting economic well-being has been recognized to grow substantially, with advocates asserting that "human creativity stands as the ultimate economic asset" and that "twenty-first-century industries rely increasingly on the generation of knowledge through creativity and innovation" (Florida, 2022; Landry & Bianchini, 1995).

In general, during 2011-2016, the number of creative economy workers continued to increase, with an average growth rate of 4.69% per year. In line with this, the share of the creative economy workforce also tends to increase, until in 2016, it reached 14.28%; in other words, around 14 to 15 people out of 100 work in the creative economy sectors (Sub-Directorate of Labor Statistics of the Republic of Indonesia, 2017). Along with developing this creative industry, new opportunities should arise for the creative professional, resulting in an increased chance of higher education institutions with creative industries-related majors to meet the needs of graduates who can support the industry.

However, more rapid growth of the creative industry is needed to guarantee optimal recruitment of universities' creative industry-related significant graduates. For instance, art and design graduates are the intended focus of this study; the workforce share number (1,22%) is very least (Central Bureau of Statistics, 2018). This percentage (1,22%) is divided into eight other sectors, putting the art and design sector in the lowest four rankings. Despite the continuous growth of the creative industry, it has yet to successfully enhance employment opportunities for arts and design graduates. In the 2020-2024 Strategic Plan, the Ministry of Education and Culture maps some of the problems faced by higher education in Indonesia. The highlighted problem suspected that cause the low level of learning outcomes in higher education is standard linkage with business and industries, as seen by the low involvement of industry in curriculum preparation at polytechnics and universities and the need for a structured apprenticeship program. Hence, graduates' competence needs must be more relevant to the needs of businesses and industries (Ministry of Education and Culture, 2020).

In particular, it is evident that university-industry collaboration are prone to value conflict not only in research but also in education and job training (Hillerbrand et al., 2019). This circumstance is attributed to the perceived inadequacy of learning outcomes. Despite design education's ongoing journey to establish clear parameters and standards, there remains a need for further efforts to justify and address the perceived lack of credibility it sometimes faces (Keedy on Heller, 1998). Expanding this aspect has led to a broader scope for the entire academic community as it strives to explore how it can significantly impact without compromising its long-standing commitment to excellence in teaching and research. Society's leaders possess a valuable resource, serving as a public good and offering expertise to tackle intricate issues and generate solutions (Earnshaw, 2017).

Notably, in Taiwan, creative small and medium enterprises (SMEs) and large enterprises view universities as resource-rich partners. Due to limited human resources, capital, equipment, and innovative research and development (R&D) models to support their commercial endeavors, SMEs often collaborate with academic institutes to fulfill their innovation requirements. Meanwhile, some large enterprises possess some R&D personnel but also engage with academic institutions to explore fresh ideas and expedite the R&D process (Tien et al., 2012). This mutual relationship creates an excellent university-industry link that leads to successful collaboration and sustainable development, benefits the university and industry, and affects the national economy.

The primary objective of this study is to examine the implementation of collaboration between the creative industry and universities in Indonesia and Taiwan. Although industrial cooperation with universities in the Indonesian higher education system is prevalent, challenges persist in effectively linking graduates with employment opportunities within the creative industry sectors. To address these challenges, the government and universities in Indonesia have implemented policies aimed at supporting collaboration

programs. In contrast, Taiwan has recognized the potential of its creative industry assets to create a promising market and has placed significant value on the benefits of industry-university collaboration. Consequently, Taiwan has proactively developed its creative industries, receiving substantial encouragement and support from the local government.

METHODOLOGY

This research uses interviews to gather data on how academia, designers, and government perceive the connections between universities and the creative industry. Interview analyzed with INVIVO for coding and grouping the transcripts. The interview was held online and involved the art and design lecturers from Universitas Negeri Yogyakarta, Indonesia, and the National Yunlin University of Science and Technology, Taiwan. We first establish a model based on the topics discussed in conversations with professionals from these three categories. Then, we interpret the resulting concept map to find answers to the research questions.

A qualitative research interview serves the purpose of gathering descriptions of the interviewee's life world and their interpretation of the meaning of the described phenomena. There are various methods to collect these descriptions, with face-to-face interviews being the most common. Additionally, telephone interviews have gained popularity. However, due to advancements in computer technology and the influence of factors like the recent pandemic, online interviewing using various computer-mediated communication (CMC) tools has been on the rise, offering advantages in terms of distance and cost-effectiveness. In structured and semi-structured interviews, the predominant format involves a question-and-answer approach, wherein the interviewer sets the agenda and maintains control over the information generated (Hollway & Jefferson, 2000). Within this framework, the interviewer exerts influence in three ways: by selecting the themes and topics, arranging the sequence of questions, and phrasing questions in their language (Bauer, 1996).

The candidates were extended invitations through email, along with the provision of an information sheet and consent details beforehand. The interviews were conducted remotely via Zoom, leveraging the automatic audio transcript and recording features. The interviews were conducted in both Bahasa Indonesia and English. It is worth noting that one participant used English. In cases where ambiguity arose, the interviewees were prompted to provide additional information and elaborate on their viewpoints. The transcript data underwent a cleanup process involving complete anonymization, rectifying transcription errors, and basic text processing. Additionally, any data related to the interviewer's dialogue was excluded. Observations were made from previous studies and relevant documents. It will examine any curriculum, system, and rules governing creative industry-university collaboration on art and design education in Indonesia and Taiwan.

RESULT AND DISCUSSION

Art and Design Education

Art and design undergo swift transformations as ongoing advancements in technology constantly challenge the methods of image and object creation. However, it's essential to recognize that art and design are not interchangeable but distinct and separate entities. They exist as one pair among many others. (Baynes in Thistlewood, 1990). It is common to come across the phrase 'art and design' as though the two disciplines were somehow fused. This is embedded within the organizational structure of many higher education institutions, where the art and design disciplines are grouped in the names of departments or faculties (Lyon, 2011).

Education plays a crucial role in art and design practice by imparting knowledge of the latest technologies and nurturing fundamental skills and literacy. In design education, instructors should provide a strategy relevant to each learner's style in design studio process (Demirbas et al., 2007). Designers and the field of design are often depicted as having a solid connection to buying and selling, appearing more explicitly commercial than other artistic disciplines. Through its close links with the economic system of

production and consumption, design is much nearer than its cultural neighbors - art, photography, music, and literature among them to the marketplace (Sparke in Lyon, 2011).

Design education in Indonesia has a long-standing history of over half a century. The Dutch government initially introduced it through technical engineering schools in Bandung. Throughout its development, design education in Indonesia has evolved into two distinct paradigms that remain relevant today. These paradigms are (1) design as a part of technical engineering typically incorporated within civil and architecture engineering programs, and (2) design as an extension of arts which has gained recognition from the government, leading to its formal placement under the Arts and Design term (Sachari, 2001; Istanto, 2002). These two paradigms continue to shape the landscape of design education in Indonesia, offering students different pathways to pursue their design studies. The technical engineering paradigm emphasizes integrating design principles within engineering disciplines, while the arts-based paradigm provides a platform for exploring design as a creative and expressive practice. A proposition is put forth for establishing a curriculum framework that enhances the rationality of design education while establishing interconnections with various other disciplines within the realm of engineering.

During the mid-1990s, there was a notable surge in the popularity of arts and aesthetic education worldwide. The global education system underwent a significant shift towards fostering creative thinking, embracing cultural diversity, and promoting interdisciplinary approaches. Contemporary art and design education is no longer a novel concept. Our modern design professions were born of the Industrial Revolution (Mc Coy in Bennet, 2006). We find ourselves in the era of the "red ocean," wherein educational institutions must establish a distinct identity and capitalize on unique selling points. This strategic approach equips graduates with the necessary competitive edge amidst the vast pool of individuals graduating from similar programs. The university's competitive advantage over other knowledge-producing institutions lies in its students. The regular influx and graduation of students ensure a constant flow of new ideas, setting it apart from research and development (R&D) units in firms and government laboratories, which tend to stagnate and lack the continuous "flow-through of human capital" inherent in the university environment (Etkowitz, 2008).

Taiwan's government believes that developing students with a strong foundation in "artistic cultivation and aesthetic literacy" is a crucial element of Taiwan's 12-year Basic Education system to enhance the country's competitiveness in aesthetics. From 2014 to 2018, the Ministry of Education (MOE) implemented the "First Phase Five-year Plan for Aesthetic Education" with three primary objectives. These objectives included strengthening learners' exposure to aesthetic courses and experiences, creating a campus environment that fosters aesthetics, and enhancing the aesthetic capabilities of educators.

To achieve these goals, the MOE has been actively promoting the practice and research of aesthetic education. It has implemented plans to incorporate aesthetics courses at each level of education and has embarked on initiatives to transform the campus aesthetic environment. Furthermore, the ministry has established a collaborative system involving cities, counties, and central government departments. This system aims to attract private resources and foster partnerships between industry, government officials, and academia. The ultimate goal is to deepen and expand the impact of aesthetic education in a comprehensive and meaningful manner.

Through these efforts, Taiwan is dedicated to nurturing a society that values and appreciates aesthetics, ensuring that aesthetics education permeates all levels of education. By integrating aesthetic principles into the curriculum and fostering collaborations across various sectors, Taiwan aims to cultivate individuals with a heightened aesthetic sensibility, contributing to the country's ongoing pursuit of artistic and cultural excellence. While most four-year art and design programs strive to go beyond teaching mere entry-level skills, there is often a focus on preparing students for their initial employment, which is commonly perceived as practical education. However, there is room for questioning whether this job-oriented training can be accurately labeled as education or if it genuinely aligns with the notion of practicality.

Undergraduate students are urged to showcase their creativity, often through playful experimentation. However, aspiring designers may need more skills, knowledge, experience, and confidence to navigate the inherent uncertainties associated with these conceptual lenses effectively. Thus, developing an effective curriculum design that creates secure environments where students can engage in iterative processes of

struggle, failure, and success is essential. This approach is crucial for facilitating their progress and achievement throughout their academic journey. Meyer and Land acknowledge the importance of creating a secure environment within the curriculum to allow students to confront intense uncertainty. They refer to these crucial components as the 'jewels in the curriculum,' facilitating transformative moments in the student's learning journey (Osmond in Tovey, 2015). However, a case for curriculum modification should be founded upon evaluating priorities.

The art and design curriculum in higher education institutions in Indonesia is designed to provide students with a comprehensive and multidisciplinary education in visual arts and design. The curriculum encompasses various subjects and practical experiences to develop students' artistic skills, critical thinking abilities, and industry-relevant knowledge. The curriculum typically includes a combination of theoretical and practical courses. The theoretical component covers art history, aesthetics, design theory, and cultural studies. These subjects give students a deep understanding of artistic movements, cultural contexts, and theoretical frameworks that inform their creative practice.

The curriculum's practical aspect strongly emphasizes nurturing students' technical expertise and fostering creativity. It encompasses various art and design disciplines, including drawing, painting, sculpture, ceramics, printmaking, graphic design, and multimedia design. Through hands-on projects, studio-based work, and workshops, students refine their technical proficiency and have the opportunity to explore various mediums and techniques.

In 2002, the Ministry of Education initiated a pilot study on creative education in Taiwan. This research project aimed to gain comprehensive insights into Taiwan's historical and current endeavors in creative education. The study adopted a collaborative approach involving six research teams of graduate students and professors to accomplish this. Their collective efforts were directed toward gathering and analyzing available data to create a more comprehensive understanding of Taiwan's initiatives in the field of creative education.

The funding for the six action programs aimed at promoting creative education in Taiwan primarily comes from the Ministry of Education, with additional support from other governmental sectors and contributions from the private sector. These initial programs encompass various aspects: (a) nurturing trips for creative learners, (b) professional development for creative teachers, (c) comprehensive management for creative schools, (d) creative life in action, (e) online learning through a creative resource bank, and (f) ongoing consolidation of creativity cultivation. These six plans served as the foundation for programs between 2002 and 2006 and successfully passed through several evaluation stages conducted by the Ministry of Education (Wu, 2009).

The art and design curriculum also promotes collaborative and interdisciplinary approaches. Students are encouraged to collaborate with peers from different disciplines, work in teams, and engage in cross-disciplinary projects. This encourages innovation, adaptability, and problem-solving skills, enabling students to tackle complex real-world challenges they may encounter in their future careers. Furthermore, industry engagement is integral to the art and design curriculum. Many educational institutions establish partnerships with creative industries, design studios, galleries, and museums to provide students with practical experiences and exposure to professional practices. Internship programs, industry visits, and expert guest lectures are commonly incorporated into the curriculum, bridging the gap between academic learning and industry demands.

The primary obstacle in advancing design education in schools stems from the approach taken to its structure and content. Rather than starting with the foundational concepts, attitudes, knowledge, skills, and activities intrinsic to design, the emphasis has been on interpreting design from a limited perspective of specialized applications, distorting its authentic essence. Consequently, it becomes essential to establish clear stances on professional discourse and curriculum innovation. Innovators in the art and design curriculum concur that learning is an active process (Roberts in Thistlewood, 1990).

By incorporating practical experiences, collaboration, and industry engagement, the art and design curriculum equips students with technical skills and the necessary knowledge and abilities to thrive in the dynamic and competitive field of art and design. Overall, higher education institutions' art and design curriculum aims to nurture well-rounded, skilled artists and designers who can contribute to the creative

industry and society. The development of design education has been influenced by historical factors and the recognition of its diverse disciplinary foundations. By acknowledging these paradigms, art and design education continues to evolve, offering students a range of opportunities to engage with design principles and apply them in their respective fields.

UNIVERSITY AND CREATIVE INDUSTRY LINKAGES

In the current context, universities must keep pace with trends. What we teach students now may only sometimes remain relevant for four to five years. Universities should consider the industry as a strategic partner, however; this endeavor is not devoid of challenges:

The recent rise in university-industry partnerships has stimulated an important public policy debate regarding how these relationships affect fundamental research. However, the preliminary evidence appears to suggest that these partnerships have not had a deleterious effect on the quantity and quality of basic research; some legitimate concerns have been raised about these activities that require additional analysis. (Theotoky et al., 2002).

Faculty members must also stay informed about external developments and be receptive to new knowledge and emerging phenomena. Indeed, universities should not directly serve the industry, but those schools interested in advancing knowledge cannot expect inquiries from the industry other than those connected to its immediate benefit (Frascara in Bennett, 2006).

There are several reasons to encourage the industry to enhance university-industry cooperation. These reasons include Access to skilled manpower, including well-trained graduates and knowledgeable faculty members; access to primary and applied research outcomes that can lead to the development of new products and processes; solutions to specific problems or access to professional expertise not typically available within an individual company; access to university facilities that are not readily available within the company; assistance in providing continuing education and training opportunities; enhancing the company's prestige or image through collaboration with reputable universities; and demonstrating corporate social responsibility and fostering positive community relations (Atlan, 1990; Peters & Fusfeld, 1982).

This research found that universities have clear reasons for seeking cooperation with the industry. To establish a strong foundation for this growth, the creative industry must actively engage with the world of academia and education. Firstly, the industry provides a new source of funding for the university. Secondly, industrial funding often involves less bureaucratic red tape than government funding. Thirdly, collaborating on industrially sponsored research exposes students to real-world research problems, enriching their learning experience. Fourthly, such research opportunities enable university researchers to undertake intellectually stimulating projects. Lastly, when universities and industries collaborate in joint efforts, certain government funds become available for applied research.

Art and design educators are crucial in imparting foundational principles of form and communication to students. However, given the ever-changing landscape, they also recognize the importance of equipping art and design students with adaptability skills. As part of their responsibility, educators must analyze emerging trends and proactively prepare themselves and their students for the future. The discernment emerges that the foremost aspiration of art and design education should encompass the cultivation of students' intellectual acumen. Furthermore, it should furnish them with essential theoretical instruments that elucidate latent preconceptions and underlying presumptions intrinsic to design practice.

Universities have implemented various ways in which this interaction can occur, including faculty members providing consultancy services for companies, collaborating on mutually beneficial research and development projects funded by the industry, and participating in contracts or subcontracts for industry-funded projects. Additionally, personnel exchange between academia and the industry, setting up spin-off companies to develop products or services based on academy-owned Intellectual Property Rights (IPR), and licensing academy-owned patents to the industry are also essential modes of operation that facilitate fruitful collaboration between the creative sector and education institutions, leading to innovative breakthroughs and economic prosperity.

Indonesia launches university-industry collaboration through what it calls *Merdeka Belajar Kampus Merdeka*. In 2020, the Minister of Education and Culture issued a policy for the Independent Learning Campus which is expected to be able to integrate the industrial and academic. The form of learning activities following regulation of the Minister of Education and Culture No.3 of 2020 Article 15 paragraph 1 can be carried out within the study program and outside the study program, including Internships or work practices in the industrial world aim to provide sufficient experience for students, provide hands-on experience in the workplace. Students will acquire soft and hard skills; meanwhile, the industry will later acquire talents who can be recruited immediately.

The program includes entrepreneurial activities aimed at providing opportunities for students to develop their businesses and deal with the problem of intellectual unemployment among undergraduates. It is also possible for students to do research and study to elevate the caliber of student inquiries by fostering research competence through collaboration with research institutions and elevating the laboratory ecosystem and standards. Students also have the opportunity to undergo independent project studies. This activity aims to realize innovative student ideas, organize R&D-based education, and improve the achievements of nationally and internationally taught students.

The result shows that cross-discipline collaborations appear more likely to happen in any university and industry collaboration model. When universities and industries engage in partnerships or collaborative initiatives, these endeavors are more likely to involve participants from diverse disciplines or fields of expertise working together to achieve shared goals. This suggests that the collaborative environment inherent in university-industry partnerships tends to foster interactions and knowledge exchange among individuals with different areas of specialization, promoting cross-disciplinary collaboration.

In certain universities, the synergy between academic institutions and industry partners has led to tangible advantages, particularly evident in small and medium-sized enterprises (SMEs) operating within the creative industry and the educational journey of art and design students. These collaborations have yielded specific and substantial benefits. For SMEs within the creative sector, such partnerships have opened doors to critical resources, including access to cutting-edge design expertise, tailored solutions, and exposure to broader markets. Consequently, these enterprises have witnessed improvements in product innovation, market expansion, and overall competitiveness. Simultaneously, art and design students have reaped educational rewards, including hands-on experiences, industry mentorship, and internship opportunities. These immersive experiences have enriched their academic journey and equipped them with practical skills and industry insights, fostering their professional development and readiness for future careers within the creative field.

INSIGHT FROM TAIWAN

The creative economy is an integral part of Taiwan's economic stage. It has entered a period of healthy development. In the era of the knowledge economy, there is a growing interconnectedness between culture and industry, highlighting their close relationship. Driven by relevant policies, Taiwan's cultivation of culture and creative talents has distinctive characteristics in industry-university cooperation (Chao et al., 2013). Since 1992, in terms of policy, industry-university collaboration has been mainly to cultivate talents. Clear policies, guidelines, and measures have been made ever since.

Taiwan's cultural and creative design industries have their 4Cs: cultural, collective, cheerful, and creative. The convergence of "design-driven innovation" and "humanity in arts" represents the intrinsic value of these products (Lin et al., 2021). While Taiwan historically prioritized industrial production, there has been a notable shift in emphasis as design emerged as a critical national competency (Huang, 2020, as cited in Lin et al., 2021). Presently, design-related disciplines are thriving within Taiwan's higher education landscape. Various universities offer well-established design educational programs at the undergraduate, postgraduate, and even doctoral levels.

According to the Ministry of Education's objectives for 2022, the Taiwanese government aims to enhance Taiwan's science and technology workforce by offering advanced digital learning environments. Furthermore, there is a focus on optimizing the realistic training environments provided by technical and

vocational educational institutions and establishing regional bases for industry-specific human resources and technology training. Another objective is to enhance the quality of higher education and foster talent in key national and vital areas. Additionally, efforts are being made to strengthen the connections between industry and academic research and expand universities' research and development capabilities.

Taiwan attaches great importance to rich creativity in design through industry-university-enterprises integration in several design project competitions. Joining a design competition is almost mandatory for design students. These competitions can build trust and mutual relationships between universities and industries. To advance industry-university cooperation and the training of skilled personnel in critical sectors, efforts are being made to promote collaboration among industries, government, and universities (Pan, 2022). This collaborative approach enables industries and universities to work together more effectively, focusing on cultivating high-level scientific and technological talent in Taiwan's strategic areas. Through initiatives like "The Featured Areas Research Center Program," universities' research capabilities will be consistently reinforced, leading to the cultivation of world-class talent in key fields. This collaborative approach addresses societal challenges and enhances the international reputation of research conducted in Taiwan.

Taiwan perceives university-industry collaboration (UIC) as a chance to improve academic innovation. In recent years, Taiwan's cultural creativity has emerged as an economic force that competes with developed countries and regions (Huang & Chen, 2016). Additionally, most Taiwanese universities offer a UIC (University-Industry Collaboration) program supported by the National Science Council of Taiwan (Mei et al., 2013). In 2005, Taiwan stakeholders, as well as the Ministry of Economic Affairs (MOEA), the National Science Council (NSC), and the Ministry of Education (MOE), designed a comprehensive scheme that promotes university-industry collaboration. This initiative was developed in response to the growing trend of the Creative Economy and to align with the national education policy focusing on fostering strong links between universities and industries.

In response to the increasing global competition for talent, the Ministry of Education (MOE) has initiated various projects to elevate the overall excellence of higher education and promote the diversified growth of universities. To enhance research and development (R&D) capabilities, there is a strong emphasis on industry-academia collaboration in Taiwan. Universities are actively encouraged to collaborate with industries to drive innovation in R&D and facilitate business start-ups. The ultimate goal is establishing a culture of innovation and entrepreneurship within Taiwanese universities by effectively connecting their R&D expertise with industry resources. Through this collaboration, universities aim to maximize their R&D potential by offering courses on innovation and business start-ups and securing industry funding for newly established ventures.

CONCLUSION

Compared to Taiwan, Indonesia still has room for improvement in achieving successful industry-university cooperation. Enhancing the synergy between government, industry, and universities should be ongoing. Offering adequate financial support for research can strengthen partnerships between industry and universities, facilitating growth and fostering critical technological innovations.

Drawing lessons from Taiwan, stakeholders in Indonesia must raise awareness in the industry about the expertise and innovative contributions universities can offer. Simultaneously, universities must demonstrate to the industry that their students possess the necessary competencies. Building mutual trust can be achieved by maximizing government-designed programs like Kampus Merdeka and regularly monitoring their implementation. Additionally, the government should support the increase in industry-university competitions.

It is important to note that industry and educational collaboration can thrive in collaboration. As a policymaker, the government plays a pivotal role in regulating and facilitating industrial and university cooperation. The relationship between these three parties, commonly called the "triple helix," is crucial. Universities act as generators of knowledge-based societies, while the industry is the primary locus of production. The government provides contractual relations to ensure stable interactions and exchanges.

Various models of interaction between academia and industry have been developed, tailored to institutions' specific conditions, missions, values, expertise, and local cultural environments. Factors such as local and national industries' needs, requirements, and operational methods influence how academic expertise can be effectively utilized. However, a comprehensive evaluation of successful collaborative models between universities and industry, along with further research, is urgently needed to assess the level of learning outcomes achieved.

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