

Chapter # 21

STRENGTHENING THE UNIVERSITY-COMPANY PARTNERSHIP A Collaborative Design Project

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ABSTRACT

On a global scale, universities today are increasingly expected to enrich their curriculum with real-world learning experiences to increase student engagement and cultivate students' critical social competencies. The topic of collaboration between universities and companies has been extensively debated, and there is a widespread acceptance of the notion that companies can genuinely contribute to teaching content by sharing cutting-edge knowledge, expertise, and resources. In this chapter, the authors examine the discrepancy between universities and companies in the design field to identify viable strategies to enhance collaboration between these sectors. The authors provide a design project conducted in partnership with a prominent global company as a case study to illustrate the effectiveness of such initiatives in closing the gap between universities and companies. The authors aspire to furnish fellow researchers in cognate fields with a valuable reference point, informed by the experiences gained from this project, to explore further and enhance design practice, achieving more substantial and consequential outcomes.

Keywords: university-company collaboration, design practice, design education.

1. INTRODUCTION

The global higher education landscape has recently navigated the challenges posed by the pandemic, prompting a return to pre-pandemic norms. However, this transition is not without substantial challenges, as the academic realm undergoes a paradigm shift driven by the imperative for business reinvention, heightened workplace requirements, and evolving student aspirations (Euromonitor International, 2022). In recent years, a discernible emphasis has emerged on fostering stronger linkages between university and company, particularly within the dynamic design sector, necessitating effective collaboration to prepare a competent workforce capable of sustaining internal company capabilities (Burnside & Witkin, 2008). Oliver, Montgomery, and Barda posited that the innovative university-company partnership is based on “interactions between university and industry scientists working on translating academic science with commercial potential towards market applications” (2019, p. 759). Deloitte's research (2017) also emphasises that business acumen will be deemed an invaluable proficiency alongside creativity and innovation for designers, identified as a critical success factor for dynamic performance across industries. McKinsey & Company (2018) further asserts that companies with optimal financial returns embrace a design-centric vision, highlighting the urgency of enhancing the interconnectedness of design and business in contemporary education.

Traditionally, the university prioritises theoretical knowledge dissemination, while the company focuses on profit-driven product development. When these two realms converge in a synergistic collaboration, each will discover shared interests to establish a sustainable mutually beneficial outcome. Regrettably, this exemplary partnership is not commonplace. A disparity consistently exists between university instruction and industry practice. The university serves as an external network for the enterprise, playing a crucial role in facilitating the industry's progress and development. The substantial shift in design industries has rendered good academic-industrial collaboration increasingly essential. As the world evolves, the design sector and academic institutions must adapt their strategies. Developing an appropriate workforce for the industry necessitates ongoing and productive communication between academia and the professional sector. Instead of staying in an insular world, universities must transform and reinvent themselves to adapt to the sector's new realities and rectify the theoretical knowledge into up-to-date practical industrial issues to equip graduates with adequate skills and competencies. Research undertaken by Bocconi University in 2016 indicates that talent mismatch may contribute to substantial losses in Italian GDP and elevated unemployment rates. Due to the divergent motivations of universities and companies, challenges in interpreting and valuing shared objectives are unavoidable (Siegel, Waldman, Atwater, & Link, 2003). Achieving a shared contextual comprehension among diverse stakeholders has emerged as a primary problem in bridging the university-company divide (Wallin, Isaksson, Larsson, & Elfströms, 2014).

In this chapter, the authors introduce a design project, illustrating effective solutions to fortify the university-company ties. The authors provide insights into the interplay between academic research and design practice through unique perspectives, offering strategies to integrate these domains for innovation and knowledge advancement. The authors anticipate that the experiences shared in the case study will serve as a valuable reference for fellow researchers, encouraging a comprehensive exploration of design practices and yielding more impactful outcomes.

2. A COLLABORATIVE DESIGN PROJECT WITH MIDEA

2.1. Beyond the Formal Curriculum

In the book *The Curriculum*, the educationist Bobbitt (1918) suggested that education should be concerned with both directed and undirected curricula for completing and perfecting the individual's abilities. Like his idea, Goodson (1995) also suggested that the curriculum should not be too narrowly focused not to restrict learners. Leask (2015) declared it would be helpful to consider the curriculum's "formal, informal, and hidden elements" (p. 8) when shaping lived experiences for all students. "Passion in Action" is an initiative the Politecnico di Milano offers, integrating directed and undirected training experiences to enhance students' abilities, attitudes, and appreciation.

Passion in Action is a catalogue of instructional activities that anybody may participate in. These activities are designed to help students build skills that can be used across many areas, such as communication and teamwork. The goal is to inspire and assist students in broadening their personal, cultural, and professional experiences. The training and educational activities are intended to be interactive, pragmatic, and captivating, enabling students to get fresh insights and establish significant associations with peers in their respective domains. The following activities are included:

- The short courses on transversal tools and processes: provide students with a thorough comprehension of diverse tools and techniques crucial in today's dynamic and continuously changing business landscape. The courses are structured to be concise and concentrated, enabling students to rapidly gain fresh skills and information within a short duration.
- Designing exercises in interdisciplinary domains: enhance students' capacity to engage in creative and critical thinking when faced with intricate situations. The multidisciplinary events promote cooperation among students from many areas and backgrounds. This educational setting might greatly benefit students looking for fresh insights on a specific topic or issue.
- Collaborative initiatives with enterprises: allow students to use their skills and knowledge in a practical, real-life context. The projects are conducted in partnership with businesses, enabling students to get hands-on experience and cultivate professional connections. Collaborative projects in a group setting may help develop cooperation and collaboration abilities, crucial competencies in the 21st century.
- Hackathons and contests: motivate students to use their expertise and understanding to address practical issues in the real world. These activities provide a stimulating setting where students may test the limits of their abilities. Competitions and hackathons give students a distinct chance to connect with their classmates and experts and get acknowledgement for their accomplishments.

2.2. Midea Design Workshop

The Midea design workshop is one of the great educational activities offered in the Passion in Action catalogue. It presents a unique opportunity for students to hone their skills and develop an understanding of the design discipline. This design practice demands that students integrate their interdisciplinary knowledge of design principles with their creativity to craft solutions dedicated to the Midea products. This trial challenges students' ability to collaboratively develop aesthetically compelling and practically effective designs applicable across various design contexts.

Midea, situated within the home appliance sector of the Midea Group, an eminent global high-technology enterprise holding the 245th position in the 2022 Global Fortune 500 ranking, encompasses a diverse portfolio of over ten brands. Aligned with the overarching ethos of "Humanising Technology" shared across all Midea Group businesses, Midea's operational philosophy prioritises consumer-centricity and proactive problem-solving. The company is committed to exceeding current expectations while anticipating and addressing evolving consumer needs through continuous exploration and innovation. Under the Midea Home Appliances brand, the company presents an extensive array of products within the home appliance industry, specialising in air treatment (encompassing both commercial and residential air conditioning solutions), refrigeration, laundry, large kitchen and cooking appliances, small kitchen appliances, water appliances, floor care, and lighting. This comprehensive product range underscores Midea's dedication to offering multifaceted solutions to the dynamic requirements of consumers, thereby positioning itself as a significant player in the global market (Figure 1).

Figure 1.

Left: Midea logo. Right: A Midea water dispenser product for the Chinese market.



2.3. Design Workshop Objectives

The workshop focuses on enhancing the market presence of Midea's ICE-BANK enabled SODA water dispenser in Europe, encouraging adoption by addressing both functional and emotional aspects. The product under consideration represents the latest development by Midea, featuring a distinctive attribute known as ICE-BANK, facilitating an uninterrupted supply of chilled carbonised water. The primary functionality of the product lies in delivering purified water, chilled purified water, and chilled carbonised water. It is important to note that the platform is fixed and immutable. The company must enhance its market standing in Europe, incentivising consumers to adopt the SODA water dispenser. This strategic move aligns with the growing significance of SODA and purified water dispensers in mitigating the environmental impact associated with plastic bottle consumption, transportation, and storage.

Given the escalating popularity of water purification systems and evolving perspectives on SODA utilisation in various contexts (e.g., social gatherings, culinary activities, health-conscious practices), the workshop sets forth the following objectives:

- Collecting pertinent data and information concerning the European market to identify potential innovative scenarios.
- Propose design solutions that capture customer attention by enhancing visual engagement with the SODA function.
- Strengthening the overall user experience associated with the SODA water dispenser.
- Augmenting the visualisation and perception of the dispensing process, mainly focusing on the user interface (UI) aspects.

Specifically, the workshop aims to address the following thematic areas:

Visual Engagement:

- Strategies for effectively communicating and showcasing the SODA function in retail settings.
- Design expressions that convey the SODA function and emotionally engage potential customers.
- Techniques to evoke interest and prompt purchase decisions.

User Experience (UX) Physical Interaction:

- Improving the overall user experience during the SODA dispensing process.
- Enhancing interaction aspects during maintenance operations.

- Addressing considerations such as the type of vessels used, timing of usage, and diverse user needs.

UX Interface-UI:

- Exploring methods to engage users emotionally in the SODA process.
- Enhancing user interface design to improve the overall utilisation of the SODA dispenser.
- Encouraging users to perceive SODA as a compelling beverage choice through thoughtful interface design and interaction.

2.4. Design Team Structure

The design team comprises a diverse and multi-disciplinary group of professionals with varied design expertise. Senior professors with substantial knowledge in the relevant field oversee the scientific direction. Complementing their leadership, mentors, junior designers, and structured researchers contribute with their distinct perspectives and approaches to the project. The six operational groups consist of 19 master-level students of international origin, hailing from different countries and possessing diverse design backgrounds. These students were selectively chosen from the School of Design at Politecnico di Milano and POLI.design, the consortium founded by Politecnico di Milano. In addition to the academic constituents, corporate partners affiliated with Midea play a pivotal role by imparting invaluable contributions to the project. This contribution involves sharing technical specifications, offering suggestions, and infusing artistic and creative inputs. The collaboration extends beyond academic boundaries, fostering an international and interdisciplinary environment that facilitates the generation of innovative and cutting-edge ideas within the design team. This collaborative effort provides a unique learning opportunity for students and enables them to glean insights from experienced professionals in the field (Table 1).

Table 1.
Design workshop team structure.

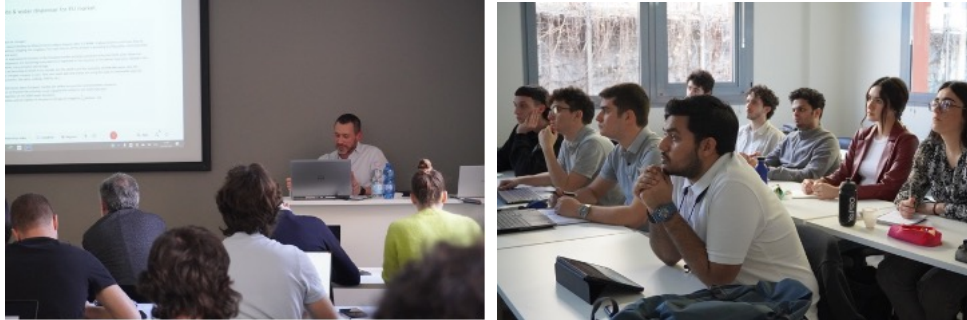
		Scientific Direction: Senior Professors from the Politecnico di Milano, School of Design, highly qualified in the relative field.
		Mentors: Junior Designers/Structured Researchers from the Politecnico di Milano, School of Design.
		Working Team: 19 international students selected from Politecnico di Milano, School of Design, and POLI.design.
		Corporate partners from Midea, bringing contributions of their technical specifications/indications/artistic/creative inputs.

2.5. Design Workshop Process

The workshop began on the 24th of March 2023 and concluded on the 15th of May 2023, followed by three stages.

Initiation and briefing: The first stage of the design process involves comprehensive project initiation and briefing. The design team thoroughly examines the project's requirements, objectives, and contextual constraints at this step. A clear understanding of the company's expectations and the broader socio-cultural context is established. This stage necessitates effective communication between the scientific team, corporate partners (experts from Midea), and design students to ascertain project goals, constraints, and any specific considerations that may inform the subsequent design phases (Figure 2). Empowered with this foundational knowledge, participants have embarked upon the critical step of discerning and delineating the fundamental problem statements inherent to the project.

Figure 2.
Project initiation and briefing with Midea representatives.



Design development: After the briefing phase, the design process advances into the conceptualisation and design development stage, marked by synthesising ideas, exploring design possibilities, and formulating preliminary design concepts. In the second phase of the workshop, a studio-based collaborative approach is systematically employed to assess the quality, feasibility, and alignment of design concepts with the specified project objectives. This pedagogical strategy is rooted in an intersubjective exchange between students and their academic mentors, embodying a democratic and open collaborative ethos. It fosters the seamless transmission of knowledge while concurrently catalysing the emergence of innovative pathways toward expertise cultivation. Within the studio-based framework, students are actively encouraged to participate in experiential learning, applying theoretical knowledge to practical design challenges. This pedagogical environment facilitates an iterative process wherein the initial, ambiguous understanding of product requirements gradually transforms into refined and superior outcomes, aligning with the observations of Green and Bonollo (2003).

A critical stage of this phase entails the active involvement of Midea representatives, who are invited to participate in the mid-term presentations. Within this collaborative context, students have the distinctive opportunity to articulate and present their evolving design proposals, thereby opening themselves to constructive critique and invaluable feedback from industry professionals. Collaboration and feedback loops among team members and stakeholders throughout this stage are crucial in refining the design concept before the finalisation phase.

Final delivery: The design workshop's conclusive phase involves refining the proposal and developing comprehensive design specifications. Students are responsible for presenting their finalised design concepts to a discerning audience of company representatives (Figure 3). This ultimate stage represents a valuable opportunity for students to subject their work to the criticism of industry professionals and mentors. The feedback during this evaluative process prompts profound self-reflection among the students, facilitating a systematic dissection and evaluation of their designs' inherent strengths and weaknesses. Following an intensive discussion and assessment, Midea representatives selected a single proposal that most closely aligned with the stipulated objectives of the project. This chosen proposal is earmarked for further development, ultimately culminating in its finalisation.

*Figure 3.
The final presentations of the project.*



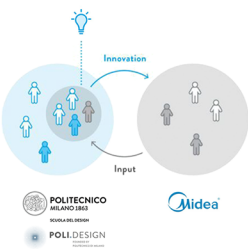
3. OBSERVATION AND CONCLUSION

The correction of the skills mismatch emphasises the need for a consistent alignment of university courses with the ever-changing requirements of the industrial sector. The key focus of this project is to provide a smooth and uninterrupted route that enables graduates to skillfully navigate their career paths and successfully transition into their chosen professions. Spang (2014) argues that it is necessary to establish a flexible delivery model in design education to meet the diverse needs of modern students, deviating from the current traditional approach. The case study presented in this chapter demonstrates the increasing spread of a culture that prioritises design across various academic institutions, professional bodies, companies, and practitioners. Furthermore, creating cooperative alliances inside educational paths is seen as a strategic method that can accelerate the achievement of students' desired goals. Several crucial characteristics are critical to the effectiveness of this framework (Table 2):

- The function of intermediate facilitators: The intermediate facilitators have a crucial role within the complex network of university-company cooperation. These intermediate characters act as intermediaries between the academic and industrial sectors, skillfully managing communication channels and promoting collaborative synergies to achieve mutually beneficial results. Intermediate facilitators are crucial in bridging the gap between academic and company stakeholders by translating their perspectives, goals, and priorities into a common language. They are essential in identifying shared interests and facilitating the exchange of knowledge and expertise between academia and industry.
- Corporate partner serving as a trainer: In an academic setting, the corporate partner takes on a position similar to that of a teacher, with the necessary skills and expertise to encourage active student engagement. The business partner plays a crucial role in fostering student engagement and co-creation as an essential participant in the educational process. Students develop a mutually beneficial grasp of the topic via organised meetings, immersion trips, and thoughtful presentation evaluations, strengthening the academic experience.
- Interactive experience conducted in a studio setting, including active participation from the participants. Prioritising the implementation of studio-based teaching approaches is of utmost importance, with a focus on actively engaging students and cultivating a collaborative atmosphere. Students are not passive receivers but rather active participants who actively influence their learning experience, contributing to

developing their cross-cultural and interdisciplinary views. This teaching method covers the whole range from understanding the project instructions vaguely to achieving an excellent result. It helps students to explore, solidify abstract ideas, and create new methods of acquiring information.

Table 2.
A collaborative partnership within educational pathways.

		Participatory teaching and learning: active student engagement and collaboration to shape new knowledge paths.
		Partner as a trainer: bring external requisite skills and knowledge to facilitate the internal active learning process.
		Intermediate Facilitators: identify common areas and promote the exchange of expertise between academia and industry.

Creating collaborative partnerships within educational pathways is a strategic approach to tackling the skills gap. This involves enhancing the academic journey with substantial experiential learning opportunities, allowing students to develop into adaptable professionals who are well-prepared for the workforce. This method highlights the critical relationship between academics and enterprise, resulting in a balanced and mutually beneficial environment that fosters a skilled workforce capable of navigating the diverse terrain of modern professional practice. This chapter presents a case study that serves as a reference and symbolises a practical approach to strengthening the relationship between academia and the business world. With distinctive viewpoints and profound understanding, the authors provide a knowledgeable account of the interaction between scholarly research and the practical application of design. Their academic insights aim to illuminate the ideal merger of these two domains, a merging that promotes innovation and drives the boundaries of knowledge.

When it comes to modern company operations, establishing an innovative culture is of utmost importance. This culture should encompass active participation in imaginative brainstorming and the solicitation of feedback from outside sources. This approach encourages the development of innovative viewpoints and makes it possible to generate meaning that is in tune with the zeitgeist that is now in effect. The design sector is witnessing rapid expansion, which coincides with the demands of discerning customers who are looking for higher attractions, experiences, and quality. Through talks with partners that are both experts and collaborative, this sector works toward the goal of presenting high-quality products and services that are within reach of the average person and are in line with the cultural vision of producing a new generation of professionals. The reinvention of businesses is already underway, and it will be accompanied by the shifting demands of the workplace and the developing expectations of students. In this regard, enhancing the synergy between design and business and bridging the gap between academia and industry has been deemed to be extremely important in the internationalized era that we are currently living in.

The authors wish to inspire colleagues and scholars in related fields by presenting their experiences and discoveries. Their shared goal is to significantly contribute to the continuous and determined effort to enhance the spirit of cooperation and the creative interchange of

ideas that characterise the interaction between academics and industry. The authors believe that the findings from their case study have the potential to stimulate a more productive and mutually beneficial integration between academic research and industrial design. The consequence of this transformational interaction is expected to provide meaningful results, which will have a favourable effect on several aspects of modern business and academic research.

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