10. *Designing Designers*

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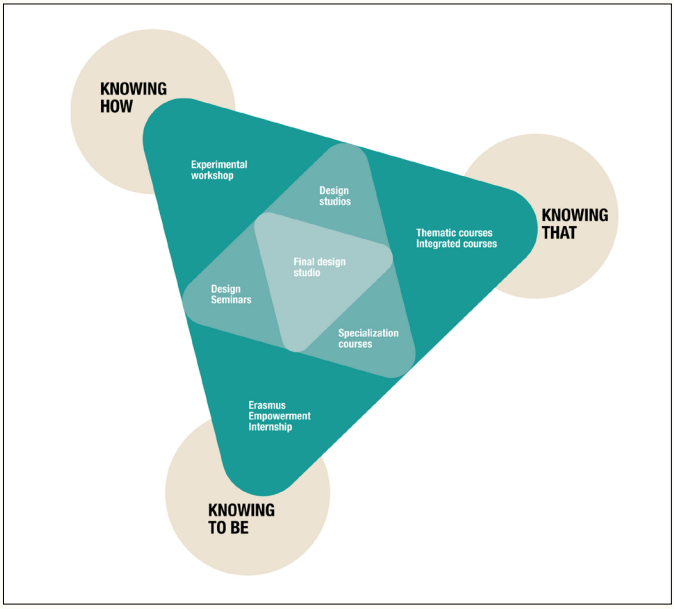
10.1 The School of Design: pillars and perspectives of an educational system

The School of Design in Politecnico is part of a wider and integrated Polimi Design System, comprising also the Department of Design and the POLI.design consortium. The system, which is the largest institution in Italy and Europe in terms of students' number and faculty, centres its educational model on a vision that intertwines theory and practice (Collina, 2017).

Over twenty years ago, the goal was to prepare designers with theoretical-scientific and technical-professional training, equipping them with knowledge and skills related to designing, producing, and valorising material and virtual industrial products (Seassaro, 2001).Today, the educational approach integrates different and complementary disciplinary contexts for the transfer of cultural and professional skills (Collina, 2017) to train designers in *knowing-that* (theoretical and conceptual content), *knowing-how* (technical and applied aspects), and *knowing-to-be* (soft skills and relational abilities).

Around these three pillars of knowledge, the School has been training since 3 decades designers capable of addressing both the complex aspects of professional and productive worlds and the critical issues of technological innovation, sustainability, and social inequality. This educational system can be analysed through five approaches highlighting these elements.

Figure 1.
Diagram of the relationship between the three knowledge and teaching elements.



10.1.1 Opening to the city and the world

The Design System has always conceived teaching as open to the city and the international context. Over the years, this attitude has been exemplified through actions that have generated and controlled knowledge flows to and from the outside. Among the activities in the city, there are the Open Lectures ↘, a series of lectures on relevant topics that took place starting from the 2002/2003 academic year (for the following three academic years). The lectures were held in unusual cultural production venues of design (such as showrooms, commercial spaces, theatres, and former industrial sites) and were open to the public. The willingness to open up to the world can be seen in establishing the Master's Degree in Product Service System Design in 2005. This program, taught in English and aimed at both Italian and international students, intended to respond to global design demands while creating an international exchange space and providing a multidisciplinary and multicultural design path within the School of Design. Finally, there is the Design Explorer program, launched in the 2019/2020 academic year. This program, through a schedule of events chosen and promoted by the School, allows students to explore the discipline and dimension of design by experiencing places, meetings, and activities

Milano Design Open Lectures 2002. Open design lectures for the city, promoted by the Degree Laboratories of the Faculty of Design.
Event→

Master's Degree Course in Product Service System Design.
Event→

outside the university campus, enabling them to build their educational path based on their curiosities, passions, and the development of creative skills (Manciaracina, 2023). All the above initiatives allowed the School's students to enhance relational skills, understand distant cultural contexts, deepen passions related to disciplines adjacent to design, engage with the international professional world, and experience educational settings outside the campus.

10.1.2 Multi-disciplinarity of the programs

In the current context, the training of designers must pay great attention to appropriately responding to new design challenges and somehow anticipating them. For this reason, polytechnic cooperation between neighbouring fields of knowledge is fundamental ↘, responding to hybrid professional profiles (Penati, 2003) capable of mixing various skills and knowledge derived from different disciplines, fields, sources, and places. The designer is thus conceived as a «knowledge integrator or knowledge broker» (Texeira & Bertola, 2003), i.e., a professional figure «capable of collecting, organising, combining, and redirecting forms of knowledge scattered in local or global networks that influence the tactical and strategic behaviours of productive organisations» (Texeira & Bertola, 2003). Thanks to this multidisciplinary approach, the designer, in this context, may be a fundamental agent in the knowledge fabric, fuelling the design and innovation process. Accordingly, the designer actively generates and builds a knowledge that is essential for innovation (Cautela, 2020).

Rivista Politecnico n.4. Document→

10.1.3 Experiential learning

The constructivist theory, emerged in the 1970s, recognises the individual student's role in a broader context. The constructivist theory of learning focuses on the student's role from four perspectives (Harasim, 2012): encouraging students to participate and act, inviting the more experienced student to help the less experienced peer, stimulating students to participate and cooperate throughout the learning process, and teaching through doing. The educational project of the Design System, founded on doing and experience, centres on experimentation as a method for solving design problems. Training grounds for these practices are the design laboratories where students can

concretely implement design practices. Complementing these are the experimental laboratories (called Design Labs) that primarily fall within the know-how domain, as they provide instrumental support for students' design activities. They provide equipment and skills to support research, design, and prototyping activities in various design fields (Seassaro, 2006) ↘. They are involved in teaching within the design laboratories and are always accessible to students ↘.

Attività didattica al laboratorio Moda.
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Attività nei locali del Laboratorio di Allestimenti, Facoltà del Design.
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10.1.4 Group work as a training ground

Group project work is one of the most appropriate contexts for students to develop global and relational skills in design education (Mattioli & Ferraris, 2024). Social and emotional skills are essential in multicultural exchange environments such as learning and workspaces (OECD, 2019), and relational skills significantly influence design education. Group work has always been a fundamental component of the educational activities carried out in the design laboratories of various study programs. The individual student's role is recognised within a broader context where cooperative learning experiences promote the active construction of knowledge. The focus is thus on the connection between the individual's cognitive process and the dynamics of group work, which becomes a social place for design experimentation, almost like a training ground that prepares for the designer's profession. The student tests their relational and design skills in a design education context ↘ that proposes collaboration among peers in continuous reciprocal interaction among cognitive, behavioural, and environmental stimuli (Bandura, 1977b).

Attività in aula durante il Workshop con Enzo Mari_001.
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10.1.5 Relationship with the professional world

The Polimi Design System is based in Milan, a city that offers a rich tradition of research and creativity within a productive and cultural fabric of public and private institutions, professionals ↘, and companies. The educational workshops of the School of Design are situated in this scenario of interconnection between education and profession ↘. These are intensive educational activities lasting one week. Students can tackle real challenges presented by the production and cultural worlds and test the skills they have developed up to that point in their educational journey. Indeed, the educational process in the design field involves immersing students in the design experience, engaging them in problematic contexts that mimic the dynamics of an actual client (Celi, 2004). This activity represents both a teaching opportunity for students and an innovation opportunity for the partner company/cultural entity: on the one hand, it enriches the project topics covered in the student's curriculum by integrating them with new approaches to project concept formulation; on the other hand, the research, teaching, and design methods are made available to the partner, who receives stimuli for design innovation and has the opportunity to integrate design into their organisational structure (Palmieri, 2004).

Attività in aula durante il Workshop con Vico Magistretti_001. Document→

Locandine dei Workshop Novembre 2008. Document→

10.2 Exploring the Polimi legacy

What are the legacies and memories that Polimi alumnae and alumni keep and sometimes cherish? Are the learning outcomes of the mentioned design approaches been achieved, and are there recognized signature elements of the Polimi's Design education?

These questions require also a reflection on how the university helps transition from study to work, specifically, how Polimi has been able to develop *self-efficacy* in students. According to Bandura (1977a), self-efficacy is the belief in one's ability to perform a task and achieve a goal. This belief shapes behavior because people may think optimistically or pessimistically and are therefore more likely to engage in activities they believe they can succeed at, either self-enhancing or self-debilitating accordingly.

When it comes to future careers, self-efficacy becomes central in career theories based on Social Cognitive Learning Theory (Lent, 2013), which posits that people learn new behaviors by observing and imitating others, influenced by their personal factors and environment. Thus, individuals learn about careers and make career decisions through interactions with others: those with high self-efficacy often become active agents in designing their careers by seeking learning experiences (Taverna, 2023).

So, the more a university exposes students to professionals, companies, organizations, and alumni, the more effective it is in providing a context to their study and in forming their professional expectations for the future, while strengthening relationships with industries.

To explore and understand how Polimi's Design education flowed into the professional lives of its alumnae and alumni, 25 interviews with former Polimi students were conducted in 2023 as part of the initial creation of the *Design Philology* archive ↘. The interviewees graduated from different Design programs and had been enrolled since the program's beginning in 1993. Clearly, these interviews are subject to biases. In fact, students were primarily invited by the faculty to participate; their closeness to the School can therefore be associated with a degree of affection for Polimi and positive feelings about their past education. Nonetheless, there are several recurring points in their responses that are worth discussing.

Echoes from alumni. Narratives →

A semi-structured format guided the interviews, with the aim of providing a plot for self-shot videos. Interviewees were invited to speak about their desires and fears during their student years and the beginning of their professional lives, their work experiences, what they learned (or did not learn) during their studies, and what they consider important for designers to learn. In a few minutes of self-narration, they touched upon their personal experiences and legacies of study

Riccardo Agosto, Laureato in Product Service System Design, 2020.
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Ana Ospina, Laureata in Product Service System Design, 2017.
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Giulia Salem, Laureata in Design & Engineering, 2015.
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Sara Biancaccio, Double Degree Politong in Product Service System Design, 2015.
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Anna Vezzali, Laureata in Integrated Product Design, 2022.
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Giovanni Colombara, Laureato in Interior & Spatial Design, 2015.
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Alice Casiraghi, Double Degree Politong in Product Service System Design, 2015.
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and work. Nine clusters of insights gather recurring themes from narrations. By comparing these themes with the five approaches described in Polimi's Design education, connections and causal effects can be discussed.

10.2.1 International vision

The international vision is one of the themes that design alumni refer to the experience in Polimi. This is discussed through different points, such as being exposed to people coming from all over the world with different mentalities, backgrounds and ambitions; learning the perspectives of other cultures; and interacting in English language, as very instrumental for practicing a skill today fundamental [from interviews: Agosto ↘, Ospina ↘, Salem ↘, Biancaccio ↘].

Accordingly, alumni recommend collaborating as much as possible with the international colleagues, «because they really can make your vision, your world a lot bigger. And this would be extremely useful for the future» (Agosto, 2023). Another recommendation is traveling to nurture curiosity. These comments match well with the idea of opening to the city and the world, which is mentioned above as one of the signature approaches of the Polimi Design education.

10.2.2 Political vision and values

Former students often mention Polimi's values legacy in terms of political vision of design and designer. This corresponds to the development of personal and professional values, the cultivation of a complexity and systemic approach, the encouragement to think big, the aim to achieve excellence, and the commitment to social and environmental sustainability. [from interviews: Vezzali A. ↘, Colombara ↘, Casiraghi ↘, Salem, Agosto]. Besides the personal experiences, these points have common traits:

- the political role of design to change people's vision and behaviors, as well as public vision and values. Through a careful design of artifacts, services and spaces, designer can introduce new perspectives on everyday issues, help frame new

meanings and decide accordingly, which has a deep political meaning;

- the reflection on values that design encourages, prompting consideration of the consistency between personal and professional values to achieve personal fulfillment;
- the attitude to look at and consider the bigger system and context in which things occur, that shape them and proved a reason for;
- the prompt at thinking big and achieving excellence in projects and in the own work for the sake of doing good and fully develop the own talent. This attitude seems to stay in the delicate balance between challenges and skills (Csíkszentmihályi, 1990) where the flow of optimal experience happens: abilities are stimulated, but not frustrated, and people achieve high efficacy. This is seen as «the beauty of our job» (Casiraghi). This is also a way to push boundaries of disciplines, professions and personal ones, thanks to curiosity, often pointed out as a driver for the own work and creativity;
- the focus and priority on environmental and social principles. It partially trickle down from the previous points: the designer's responsibility toward these issues is gradually growing and spreading and is seen more as an opportunity than a challenge.

10.2.3 Transdisciplinarity

Tightly connected to the previous, another legacy of Polimi's education is the acknowledge of the wicked nature of problems and the complexity of all systems where products and services exist, which requires an integrated and multistakeholder approach to knowledge.

Today, more properly, we call this approach *transdisciplinarity*. It seeks to work at the intersections between and across science, society, and technology, balancing subjective and objective perspectives. This approach extends beyond current disciplinary expertise to engage all stakeholders in collaborative design (Bernstein, 2015; Nicolescu, 2014).

Fioravanti ↘ defines design as «a discipline that seemed to encompass almost everything in the world». Indeed, alumnae and alumni often mention their professional role as knowledge

Odo Fioravanti, alumno di Disegno Industriale.
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integrators working transversally across different vertical domains, or as directors of complex processes [from interviews: Vezzali A., Casati ↘, Casiraghi]. They refer to this skill as a life-skill to navigate the everyday complexity. This resonates very well with the educational approach to multi-disciplinarity previously mentioned.

Paolo Casati, Laureato in Disegno Industriale, 2001.
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10.2.4 Learning to learn

Being immersed in extended and complex project contexts, and trained to teamwork and collaborative design, alumni often speak about continuous learning and learning to learn as skills they have developed [from interviews: Agosto, Franchi ↘, Elli ↘, Sengupta ↘]. Learning is seen as a key capability when you face complexity and diversity, because you need to learn on the go. It is also key «to find your way» (Agosto, 2023).

Francesco Franchi, Laureato in Design della Comunicazione, 2007.
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Learning to learn is thus explained as understanding a context and what has already been done, thereby making the best possible decisions accordingly. It also involves learning from users, stakeholders, younger minds, companies, and artisans.

Federico Elli, Laureato in Design & Engineering, 2012.
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For some, the value of learning is combined with that of teaching. Teaching can occur in institutional contexts, such as universities, but also in professional settings, especially in the most recent developments of design, like service design, where teaching is becoming part of the professional role (Deserti *et al*., 2018). This tendency can be attributed to a condition where «everybody designs» (Manzini, 2015), and design skills are spread across society and organizations.

Sarthak Sengupta, Laureato in Product Service System Design, 2008.
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10.2.5 Research and creativity

Curiosity and creativity are reported as fundamental skills for the work of a designer, yet not as given conditions, as talents, but purposefully nurtured instead. Accordingly, interviewees [from interviews: Bassan ↘, Benedetti ↘, Manzi ↘, Redigolo ↘, Fioravanti] speak about:

Giulia Bassan, Laureata in Yacht Design, 2021.
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- getting energized and willing to make things happen, thanks to the «magic of design» (Fioravanti, 2023);
- researching to feed creativity through either a scientific or free

method, so to bring about wellbeing for all, including the designers themselves, thanks to the enriched visions that everybody gains;

- understanding scientific research as a basis for the work, so learning to collaborate with experts of other fields and disciplines;
- combining science and technology with humanities and intuition through creativity, tapping into other bodies of knowledge.

Former students often agree on the importance of putting effort into keeping curiosity alive, along with the willingness to challenge oneself as they did during their university years.

10.2.6 Method

A point very often raised by alumni is the *Politecnico method*: it seems to be a unique approach to designing and thinking (a *forma mentis*). It seems to be a multigenerational trademark of Polimi's education that includes the method of study and the design method.

Someone describes it as «an approach to the project, a method of working, that remains unique and shared, namely the ability to work in a network and to orchestrate complex processes» (Casati, 2023).

Another perspective [from interviews: Faoro ↘, Franchi, Cionfoli ↘, Romano ↘, Grotto ↘] emphasizes an approach firmly based on preliminary research that leads to insights, which in turn lead to a project and ultimately to potential production. This problem-solving sequence guarantees robustness and meaning for design choices. This same approach transitions seamlessly from academic study to professional practice, offering several benefits. For instance, it allows designers to explain and justify their choices to clients while also becoming Socratic in conveying the importance of the method itself (Biancaccio). Others (Cionfoli, Giuliani ↘) emphasize the ability to do making, that is, the pragmatism to turn visions into facts and the know-how to do things – «thus putting together, building, creating prototypes, which gave us a truly different perspec-

Alessandro Benedetti, Laureato in Yacht Design, 2021.
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Alessandro Manzi, Laureato in Fashion Design, 2008.
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Marta Redigolo, Laureata in Interior & Spatial Design, 2018.
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Gabriele Faoro, Laureato in Design & Engineering, 2015.
Document→

Patrizio Cionfoli, Laureato in Disegno Industriale, 1999.
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Clara Romano, Laureata in Design for the Fashion System, 2017.
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Giulia Grotto, Laureata in Design della Moda, 2018.
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Simon Giuliani, Laureato in Disegno Industriale, 2005.
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tive compared to our European and international colleagues» (Cionfoli). Eventually, this *Politecnico method* appears as a feature that distinguishes the Polimi design graduates from the others and a signature trait of their education. It finds roots in the experiential learning described as one of the approaches adopted by the Design System.

10.2.7 Teamwork

Teamwork is recognized as another key learning outcome of the experience in Polimi, in a direct relation with the approach to group work as training ground mentioned before.

Elena Vezzali, Laureata in Interior & Spatial Design, 2018. Document→

Francesca Jakin, Laureata in Product Service System Design, 2007. Document→

Jessica Prunotto, Laureata in Fashion Design, 2010. Document→

It is a legacy with different impacts on the professional life [from interviews: Manzi, Vezzali A., Vezzali E. ↘, Jakin ↘, Elli, Prunotto ↘]:

- a source of meaningful exchange with colleagues and therefore of joy and wellbeing, so intending design as a community practice and communality;
- a continuous exercise of democracy, listening and respect, learning to value the contribution of the others and get nurtured in the own creativity;
- an experience of collective living, not only working, in which friendship and human closeness are connected to professional trust and relation.

All alumni that mention teamwork refer to this practice as something that shaped their idea of the organizational culture in the workplace (Rossi, 2021).

10.2.8 Pioneers and evangelists

For alumni graduated in the Polimi study programs that were initiating new disciplinary directions (for example the Master of Science in Product Service System Design in 2005), there is often the feeling and the excitement of being pioneers and evangelist of a new way of thinking [from interviews: Jakin, Ospina]. While feeling like «being part of history in the making» (Jakin) they also felt the responsibility of creating a design culture from scratch, either in companies or in their own organization. One of the first students of Polimi's Design programs (Fioravanti) recalls the world-renowned professionals teaching in the courses, who exposed students to a profession still in the process of being defined.

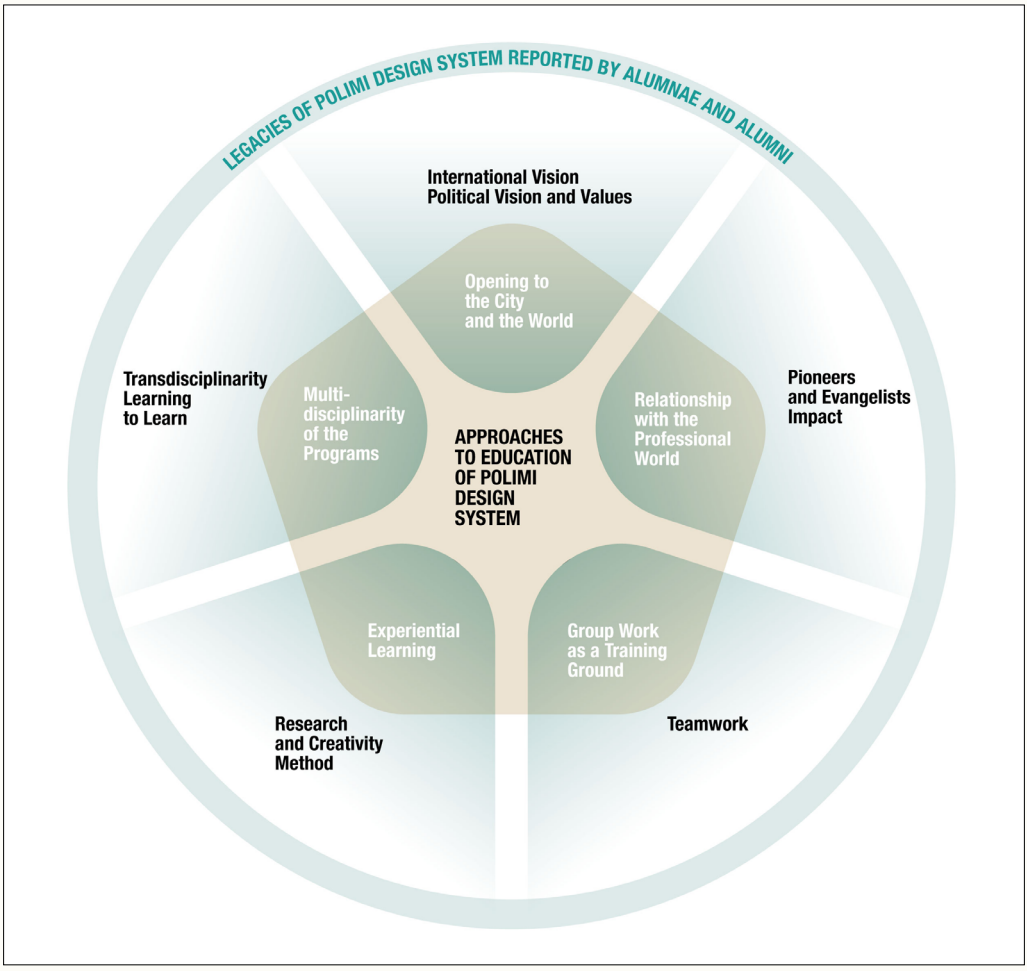

Figure 2.
Diagram of the relationship between Polimi Design System education and legacies.

These memories are part of the complex relationships with the professional world described as one of the education approaches of Polimi Design System.

10.2.9 Impact

Lastly, a critical point raised by alumni as an area for improvement is the importance of evaluating and demonstrating the impact of designers' work: specifically, how projects and ideas will affect businesses and society. How might hiring a designer increase numbers and transform an organization's business? «I imagine designers», says Ospina, «in the future being equipped to get the most out of data, being empowered

to fully measure the impact of their projects. Analyzing and understanding metrics should be part of their study».

A deeper knowledge of the designer impact is also seen as a pathway to more strategic roles in companies (Yang ↘), together with business and organizational knowledge, which are both pointed out as competences to strength in the university programs. A final mention of what needs to be taught with a big impact on the future jobs, are fundamentals of Artificial Intelligence and of the generative AI. Given the recent outbreak of AI, the incorporation of specific teachings in design programs is a present time move.

Marco Chenhao Yang, Laureato in Product Service System Design, 2021.
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10.3 Elements of a perpetual evolution

Topics emerging from interviews, within the limits of the study, are worth to be confronted against employment and career data. The Polimi Career Service, today, systematically collects data about graduate employment after one or five years of completing the studies. The latest data (Career Service, 2023) show a general satisfaction for the design studies in Polimi, around 86%. Same data say that the perception of coherence of the study and job is higher for international master graduates (91%), than for Italian ones (86%), and generally lower for the bachelor graduates (75%).

Core data are about employment rate: despite pandemic, there is a consolidated rate above 90% of employment one year after the graduation, with a better performance for the master graduates. After 5 years, the employment is in average 95%.

Data differ from across study programs, yet there are consistencies, such as: the main rate of employment in SMEs; the relative low percentage of self-employed around 21%; the main destination in Italy for Italians, while international graduates work equally in Italy or abroad; the equal employment rates for males and females, but the lower salary for females.

This positive picture seems to support the validity of the educational approach of the Polimi Design System, at least so far. In a perpetual evolution and in a context of big numbers, study programs are continuously transforming, and new ones are giving birth, building on

the same pillars of *knowing-that*, *knowing-how*, and *knowing-to-be*. Yet, the educational approach acknowledges the evolution of a discipline, design, that in the last 3 decades has evolved, expanded and changed a lot, in the direction of becoming more and more *trans*-disciplinary, that is systemic, creative, multi-perspective and not only about solutions to problems, but about the combination of factors that need to be considered.

This is ambition to tackle complexity is thus one the element of the mentioned Politecnico method, which unites students and alumni of the Design System. It always implies design to be an «interdisciplinary bridge» (Seassaro, 2001a) between different applied sciences.

Indeed, over 30 years since the launch of the first Bachelor's degree course in Industrial Design, the School of Design reaffirms its significance as a center for educating individuals (both as designers and as persons), for experimentation (bridging professional practice and research), and for fostering dialogue (with the city and the world).

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