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CONTRIBUTO TEORICO

Educating future architects in Italy and Türkiye. Are architecture curricula keeping up with the times?

Formare i futuri architetti in Italia e Turchia. I programmi delle facoltà di architettura sono al passo con i tempi?

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ABSTRACT ITALIANO
L'architettura si sta trasformando grazie alle nuove tecnologie, rispondendo al contempo a crisi globali quali il cambiamento climatico, l'esaurimento delle risorse naturali e la trasformazione sociale. La formazione in architettura richiede quindi una prospettiva multidimensionale che abbracci i contesti sociali, culturali, politici, tecnologici ed ecologici. In questo contesto, i programmi di studio che soddisfano questi requisiti possono migliorare le competenze pratiche e professionali degli studenti, garantendo che i laureati siano competitivi a livello nazionale e internazionale e diventino individui socialmente consapevoli. Questo studio adotta un'analisi comparativa qualitativa basata sulla revisione dei programmi di studio universitari di architettura pubblicati ufficialmente da università italiane e turche selezionate (ultimo controllo effettuato a dicembre 2025), cercando di formulare possibili raccomandazioni per la formazione professionale.

ENGLISH ABSTRACT
Architecture is transforming through new technologies while responding to global crises such as climate change, depletion of natural resources, and social transformation. Architecture education therefore requires a multidimensional perspective encompassing social, cultural, political, technological, and ecological contexts. In this context, curricula that meet these requirements can enhance students' practical skills and professional competence, ensuring that graduates are competitive at the national and international levels and become socially conscious individuals. This study adopts a qualitative comparative analysis based on the review of officially published undergraduate architecture curricula from selected Italian and Turkish universities (last check dated by December 2025), seeking to draw possible recommendations for professional training.

Introduction

Architecture today seems to be at a crucial point in its evolution, called upon to respond to the unprecedented challenges posed by contemporary societal changes that are reshaping not only our environment but also the architectural profession itself. Some of these challenges stem from urgent global crises such as climate change, resource depletion, and the imperative to transition towards sustainable practices, while others from the still ongoing digital revolution (e.g., the use of artificial intelligence, the growing use of BIM technology, or the new frontiers of 3D-printing).

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Others arise from the attention that architectural practice is finally giving to the diverse needs of individuals, which has led to the formation of new and different design approaches that it is essential to be aware of (e.g., inclusive design, human-centred design, design for well-being). All these challenges inevitably have far-reaching implications for architectural education, demanding a rethinking of its traditional frameworks to address emerging wagers in a fast-paced world, as already set out by the International Union of Architects (UIA Architectural Education Commission, n.d.).

However, many curricula still appear to prioritise traditional notions of form and aesthetics over more topical design paradigms that place people health, needs and experiences at the centre of the design process (e.g., sustainable architecture, Universal design, or Computer-aided design), which are increasingly gaining ground in today's architectural practice and which other architecture schools abroad have been incorporating into their programmes for years. Much remains to be done to align architectural education with the pressing needs of the 21st century, and there is a need for a more comprehensive and adaptive educational framework.

Therefore, this article aims to explore the intersection between contemporary challenges and architectural education, focusing on the urgent need for professionalisation processes in Architecture faculty. To address this aim, it adopts a comparative perspective focusing on the Italian and Turkish contexts, two educational systems characterized by strong architectural traditions and distinct institutional and pedagogical frameworks. Through this comparison, the study examines how architecture curricula in both contexts prepare future architects to respond to the demands of a rapidly changing professional landscape.

Within the existing literature, comparative studies of architecture faculty curricula across countries appear to remain relatively limited. Previous research often focused either on highly systematic and descriptive mappings of curricular structures (Bhattacharjee & Bose, 2015; Saghafi & Sanders, 2020), which provided valuable overviews but had limited generalizability or did not explicitly address emerging disciplinary challenges or propose future-oriented educational directions. Moreover, to the best of our knowledge, no previous studies have compared undergraduate architecture curricula in Italy and Türkiye. In this context, the present study seeks to contribute by positioning curricular differences within ongoing international discussions on sustainability, technological integration, and evolving design approaches, and then outlining shared tensions and a potential common agenda for architectural education.

Methodological approach

The study adopts a qualitative descriptive comparative approach (Creswell, 2024) based on the analysis of officially published undergraduate architecture curriculum documents from Italian and Turkish universities, drawing on the most recent architecture study programmes (2024-2025). Curricula were examined at a macro and interpretive level following three main analytical trajectories reflecting emerging challenges in architectural education practice and international disciplinary discussions, as outlined by the International Union of Architects (UIA Architectural Education Commission, n.d.): (1) sustainability, (2) integration of digital technologies, and (3) new design approaches (e.g.,

human-centred design, universal design, design for wellbeing). These trajectories functioned as analytical lenses rather than evaluative criteria, enabling a structured qualitative comparison of educational priorities across the two national contexts by focusing on curricular structures and course content.

The Italian context

The Italian Faculties of Architecture are progressively adapting their curricula to the intertwined challenges and opportunities of the twenty-first century to form a renewed understanding of professional practice, redefining the traditional boundaries of the architect's profession.

A first trajectory revolves around the widespread recognition of sustainability as a structural principle rather than add-on to traditional design education. This tendency reflects concerns already raised in international debates on architectural education, where sustainability is frequently integrated at a theoretical level without fully reshaping core design studios (UIA Architectural Education Commission, 2002). This shift in Italian schools seems to be found in the tension between tradition and innovation in education. On the one hand, many curricula remain anchored to the traditional teaching of 'Technologies of Architecture', which often tend to focus on traditional materials such as wood and brickwork, leaving students ill-prepared to engage with materials and methods that actually find application in the practical work of architects. On the other hand, a renewed interest in timber may offer a promising development when viewed through an ecological lens, emerging as a highly sustainable material for a more responsible design. Encouragingly, some forward-thinking Italian universities, such as Polytechnic University of Turin and Polytechnic University of Milan, have introduced courses on sustainability into their architecture programmes, acknowledging the importance of equipping students with tools to effectively address environmental and societal challenges. In the master's degree in "Architecture for Sustainability" at Polytechnic University of Turin, for instance, issues such as climate change, and energy transition are addressed not only through advanced technical courses but also through a theoretical framework that foreground the social, cultural, and ecological consequences of design decisions (Politecnico di Torino, n.d.). This approach is also mirrored in initiatives at the University of Genoa and at the Polytechnic University of Milan, the latter of which offers the well-established program "Sustainable Architecture and Landscape Design" (Politecnico di Milano, n.d.). At Milan, sustainability becomes an opportunity to explore innovative construction systems, cutting-edge materials, landscape-scale thinking, and the integration of buildings within wider ecological networks. Even more extensive is the perspective adopted by the Libera Università di Bolzano in its Master in 'Eco-Social Design', where environmental concerns merge with participatory practices, community well-being, and socio-cultural transformation (Libera Università di Bolzano, n.d.). Consequently, it seems that Italian architecture schools increasingly interpret sustainability not as a discrete technical problem, but as the fundamental paradigm through which future architects must understand and transform their world.

Alongside this cultural shift, first steps are being taken towards the integration of digital and computational technologies into architectural training. The digitisation of design and construction processes has made knowledge of BIM, parametric modelling, Artificial Intelligence, and immersive environments essential. The Iuav University of Venice is one of the few to respond to this demand through its post-graduate programme dedicated to BIM ("From zero to BIM Specialist with Revit Architecture"), which trains students in the management of complex digital workflows and the collaborative logic of contemporary construction practices (Università Iuav di Venezia, n.d.). Meanwhile, with technology increasingly treated as a framework that enables innovative and more informed ways of designing, other universities are beginning to propose courses on current technologies but in correlation with other fields. The Polytechnic University of Milan, for example, extends the technological discourse into the field of cultural heritage, proposing a course on digital and eXtended Reality tools for the communication and preservation of intangible cultural heritage (Poli.Design, n.d.). Sapienza University of Rome, instead, has established a master's degree in "Green BIM and Architectural Engineering", explicitly linking the potentials of digital modelling with environmental performance, regulatory innovation and sustainable construction methods (Sapienza Università di Roma, 2025).

The third key dimension is the growing diffusion of human-centred and socially engaged design approaches. These methodologies, ranging from participatory and co-design processes to universal design and inclusive design, from experiential design to design for well-being, reflect a deeper reassessment of the relationship between physical space and final users' needs and experiences. One of the most interesting professionalisation approaches is the one traced by Iuav University of Venice. Here, the "Neuroscience Applied to Architectural Design" (NAAD) programme represents a particularly advanced expression of the ongoing design shift, as it grounds architectural design in neuroscientific research and explores how sensory, cognitive, and emotional processes shape human interactions with space (Università Iuav di Venezia, n.d.). Similar concerns are present in the "Design for All" course at the Polytechnic of Milan, developed in partnership with Proludic SRL, which focuses on accessibility and inclusivity as fundamental criteria of contemporary design (Proludic, n.d.).

Finally, it is interesting to see how in other cases an emerging tendency is to bring to light the underlying interdisciplinary nature of architecture, linking architectural education to other topics or fields. The "EDENSPACES" master's programme at the Libera University of Bolzano, for example, connects architecture, pedagogy, and ecology in the creation of learning environments that engage users and communities in transformative ways (Libera Università di Bolzano, n.d.). On the other hand, the course degree in "Eco-inclusive design" at University of Chieti-Pescara further synthesises environmental and social dimensions, framing inclusivity as an ecological imperative as well as a cultural one (Università degli Studi "G. D'Annunzio" Chieti-Pescara, n.d.).

The Turkish context

Architectural education in Türkiye has evolved from a five-year to a four-year program, with admission based on math-science scores from the national university entrance exam. As of 2025, 62 state universities offer undergraduate architecture programs, 11 of which are accredited by the Association for Accreditation of Architectural Education (MiAK) to enhance educational quality (HEC, 2025; MiAK, 2022). For this reason, this study involved carrying out readings through the curricula of schools accredited by MiAK. These schools are as follows: METU (Middle East Technical), YTU (Yıldız Technical), MSGSU (Mimar Sinan Fine Arts), IYTE (Izmir Technology), DEU (Dokuz Eylül), ETU (Eskişehir Technical), GTU (Gebze Technical), AGU (Abdullah Gül), KTU (Karadeniz Technical), BAU (Balıkesir), TU (Trakya). Architectural education in Türkiye has recently transformed, retaining its traditional design studio focus while incorporating emerging themes such as digitalization, sustainability, and social context. Although studios remain central, curricula now increasingly include digital tools (BIM, parametric design, 3D fabrication, VR/AR), as well as sustainability, energy efficiency, ecological architecture, and circular design.

As a first key dimension, sustainability issues have gained central importance in architectural education in Türkiye in recent years. After the 2023 earthquake, topics such as building safety, earthquake engineering principles and post-disaster sheltering have been added or intensified in many universities. Disaster-oriented design studios, field studies, and projects based on disaster scenarios are becoming more common (Akdag & Beyhan, 2024). At IYTE, courses such as “Building Technology and Science”, “Introduction to Energy and Heat Transfer”, and “Earthquake Resistant Design” address both ecological and disaster-related themes, while studios reinforce sustainable and safe design. Similarly, Balıkesir University’s “Natural Threats: Vulnerability and Disasters” course integrates sustainability and disaster management. In the broader context of sustainability, topics such as energy-efficient buildings, ecological materials, carbon footprint reduction, and circular economy principles are covered in theoretical courses and studios (Sahin & Komurlu, 2025), raising awareness of sustainable design, resource management, and environmental impact (Sungur & Muezzinoglu, 2021). Despite this progress, sustainability courses remain limited and are mostly offered as electives (Kobas, 2011). Social sustainability also receives relatively little attention. Moreover, sustainability topics are often introduced in the later years of study, restricting early engagement; integrating these themes earlier and reinforcing them through practical courses and studios has been recommended. At METU, courses such as “Environmental and Building Systems” and “Environmental Control Technologies” in the third and fourth years illustrate how sustainability is embedded in technical courses and studio work. Similarly, YTU places sustainability and ecology courses predominantly in the upper years, complemented by electives such as “Sustainable Futures: Alternative Practices on Nature, Culture and Space” and “Housing and Cultural Continuity”. These elective courses support in-depth exploration of ecological approaches, and sustainable space design, emphasizing the relationship between cultural heritage, and ecological design.

As a second key dimension, participatory, co-design, inclusive, and human-centred approaches are increasingly integrated into architectural education in Türkiye. Participatory design studios engage students directly with users, communities, and stakeholders (Şen et al., 2021). Universal design and accessibility courses ensure that designs address the needs of individuals with physical, cognitive, or social differences (Bakar & Şimşek, 2023). Human-centred design encourages user-focused solutions considering aesthetic, social, psychological, and ergonomic dimensions (Saraçgil, 2022). These developments indicate a shift toward contemporary architectural education emphasizing social responsibility, sustainability, and participation. At YTU, human-oriented and inclusive design is taught through courses such as "Barrier-Free Architecture" and "Social Environmental Impacts in Architectural Design". At MSGSU, elective courses such as Career Planning, Ecological Design, etc. work for the benefit of society. In addition, studios and "Architectural Design Studio" courses support a user and community-oriented approach.

The final key dimension, digital education, is often limited to the creation of representations (2D/3D drawings), while more advanced methods such as computational and parametric design, as well as BIM, are not sufficiently integrated into curricula. Although digital design courses are widely included in architecture undergraduate programs in Türkiye, their alignment with current technological developments remains debated (Göksel & Tavşan, 2025). BIM courses are mostly elective, and early integration of energy simulation can improve building performance. Augmented reality supports interdisciplinary collaboration, experiential learning, and enriched field-trip information (Gülel & Arabacıoğlu, 2019). The implementation of digital and fabrication courses depends on universities' technological infrastructure, such as FABLABs and specialized laboratories. Institutions like METU, with extensive facilities, can offer these courses and expand postgraduate specialization. At METU, digital design and computer applications are particularly emphasized in the 2nd and 3rd years, enabling students to work with both traditional and parametric tools. FABLAB and digital production facilities, especially in 3rd and 4th year studios, further support prototype development and computer-aided design skills. Elective courses at YTU, such as Generative Design in Architecture, Computational Design, Architectural Animation, and Building Information Modelling, equip students with competencies in computer-aided design, BIM, animation, and computational design. Technical universities including METU, KTU, IYTE, and GTU have FABLABs that support digital fabrication technologies such as 3D printing and robotic arms, although these facilities remain limited. Examination of the 11 architecture programs shows that all schools have incorporated developments in sustainability, participatory design, and digital transformation. While technical universities have expanded laboratory infrastructures reflecting a focus on digitalization, sustainability and participatory design topics are largely integrated into curricula through theoretical elective courses.

Emerging tensions in Italian and Turkish Architecture curricula

Both Italian and Turkish Architecture schools are undergoing a gradual shift in their pedagogical identity. Traditional priorities such as compositions, and aesthetic expression

are now being challenged current environmental, technological and social challenges. This tension between traditional, studio-centred and form-driven pedagogies and emerging environmental and social demands has been widely discussed, which calls for a fundamental transformation of design education models (Salama, 2015). Yet, as already mentioned above, there are still limited studies (especially related to Italy and Türkiye) that compare architectural school curricula across countries and examine to what extent they align with contemporary needs.

Italy shows visible progress in sustainability, with many leading schools investing in programs dedicated to ecological transition, energy efficiency, and socially responsible design. Yet, the progress still seems uneven. Many universities still treat sustainability as an optional add-on, and innovation-related topics such as technological innovation (e.g., courses on BIM, AI or XR) are not yet sufficiently covered in education, even though various Italian universities have FABLAB laboratories. Additionally, new design approaches (e.g., inclusive or participatory design) remain often confined to postgraduate levels.

As a result, most undergraduate students enter the profession without exposure to skills now common in practice, where digital workflows and user-centred approaches are rapidly expanding. Some multidisciplinary initiatives, such as those in Bolzano, signal promising experimentation, but they remain isolated. Italian architectural education therefore seems in transition: forward-looking in certain areas but slow and fragmented in others.

In Türkiye, design studios largely preserve a traditional, form-centred model. Sustainability, circular economy, and social responsibility typically appear as electives and seldom shape core studio work. This limited integration reflects a broader critique in sustainability education research, which argues that sustainability remains ineffective when treated as an additive topic rather than as a transformative framework reshaping educational structures (Sterling, 2010). This is particularly striking given the country's urgent environmental challenges, earthquakes, rapid urbanization, climate pressures, and resource scarcity. Ecological concepts are often taught theoretically and disconnected from real projects. Courses in materials and technology continue to emphasize conventional methods, with limited attention to carbon footprint, energy efficiency, or reuse. Digital tools such as BIM, parametric design, and AI are spreading, yet critical and ethical perspectives on their use remain underdeveloped. Similar gaps between technological adoption and critical pedagogical integration have been observed in previous studies on digitalisation in architecture curricula (Göksel & Tavşan, 2025). Innovative efforts exist at institutions like METU, ITU, YTU, and IYTE, but they have not yet led to a broader pedagogical shift.

Most accredited programs include sustainability-related courses only as electives, and design studios rarely integrate user experience, societal needs, or participatory processes. This finding aligns with studies advocating for participatory and human-centred approaches as essential yet insufficiently embedded components of contemporary architectural education (Şen et al., 2021; Saraçgil, 2022). Architectural education in Türkiye thus continues to follow a designer-centred model. Yet, contemporary architects must

engage with environmental and social issues as active contributors, not merely as creators of buildings.

Defining a common agenda

Italy and Türkiye currently stand at a similar crossroads: both are attempting to reconcile long-established pedagogical traditions with the pressing environmental, technological, and social demands redefining contemporary architectural practice. Yet, their trajectories diverge in meaningful ways. Italy shows a more visible, albeit uneven, movement toward curricular innovation, integrating environmental concerns, experimenting with multidisciplinary approaches, and cautiously embracing new technologies. Türkiye, by contrast, remains more firmly rooted in a classical design paradigm, where emerging themes such as sustainability, co-design, and digital fabrication are introduced only partially and inconsistently. As a result, the gap between architectural education and the complex global realities faced by today's practitioners is wider in the Turkish context, while Italy, despite its inconsistencies, is already negotiating a transition toward more contemporary forms of training.

Starting from these shared challenges and differentiated responses, a clearer picture emerges of what can be done to strengthen architecture school curricula and enhance the professionalization of professors, ultimately preparing future architects to operate confidently within the demands of our time. One first and fundamental step for universities to bring the ongoing challenges into the everyday structure of teaching, for example, would be to play an active role by organizing seminars, workshops, short-term events, and research-driven design activities that expose students to current practices and foster knowledge exchange. These initiatives would not only modernise learning environments but also help bridge the persistent gap between academic training and professional expectations.

Equally important is the continuous development of academic staff. As technologies such as BIM, artificial intelligence, extended reality, computational design, and digital fabrication reshape the design process, professors should acquire new skills to teach them effectively. In this case, professional development programs, both internal and internationally supported, can ensure that academics remain equipped with up-to-date knowledge. For example, training in AI-assisted design optimization, energy performance analysis, generative design workflows, and parametric modelling would allow instructors to guide students through performance-driven, data-informed approaches that define leading architectural practice today. Increasing financial support for research projects can further consolidate expertise by expanding the number of research assistants and specialist academics working in these areas.

In parallel, strengthening international collaborations through joint studios, exchange programs, shared research projects, and cross-border teaching partnerships, can enhance knowledge transfer and enrich both student and staff experience. Such collaborations help align curricula with global standards, especially when combined with the integration of internationally recognized frameworks such as LEED and BREEAM certifications, inclusive design guidelines, and digital competence benchmarks. The evolution of

architectural practice toward interdisciplinary collaboration requires that curricula cultivate transversal skills. Architects are indeed increasingly expected to operate not as isolated designers but as coordinators who interact with engineers, planners, environmental specialists, and digital fabrication experts, and embedding collaborative, interdisciplinary modes of working into coursework would prepare students for this reality. Finally, innovative learning modes, digital teaching formats, virtual laboratories, and structures to support lifelong learning, could enable continuous professional growth beyond graduation. Therefore, only by modernising curricula, investing in the professionalisation of academic staff, and encouraging environments where sustainability, new design practices, and technological innovation are integral to teaching, future architects would be trained to become capable of addressing the urgent environmental challenges, societal transformations, and digital revolutions shaping the profession today.

This study faces some limitations. As it relies on a qualitative and non-systematic analysis of formal curriculum documents and does not include empirical data such as interviews or learning outcome assessments, the findings should be interpreted as indicative rather than fully generalizable. Future research could build on these results by adopting systematic or mixed-methods approaches, including empirical investigations with faculty and students, to further validate and extend the comparative insights proposed in this study.

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