

# The Role of Disaster Management in Architectural Education in Turkey

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## Abstract

This article examines and discusses disaster management in architectural education in Turkey. Given Turkey's geographical location and its susceptibility to disasters, it is crucial for architectural education to address this topic and equip future architects with relevant knowledge and skills. Through a comprehensive literature review, we explore the role of disaster management in Turkish architectural education. We find a limited focus on disaster management by analyzing curricula in accredited architectural programs. Enhancing education and awareness in this area will empower architects to enhance public safety, sustainability, and resilience. Hence, all architectural programs in Turkey should prioritize disaster management, allocate more space for it in their curricula, and impart the necessary knowledge and skills to students to tackle disasters effectively. Collaboration among research institutions, public agencies, and architectural departments is vital to create a multidisciplinary approach to disaster management education. Additionally, interactive teaching methods should be employed to instruct future architects in current approaches, case studies, and innovative techniques related to disaster management. Architectural education must evolve to address the complexities of disaster management and prepare future architects effectively. This research identifies challenges and opportunities for improving architectural education concerning disaster management in Turkey, providing recommendations for future research and policy initiatives. The comprehensive perspective presented here sheds light on the significance of disaster management education in Turkish architectural programs, offering valuable guidance for the country's disaster management education and ensuring a resilient built environment for the future.

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## Introduction

In the contemporary era, significant intervals witness substantial disasters, leading to the displacement of millions of individuals. Mainly, the increasing frequency of these calamities (Özdoğan & Güney, 2016) deems disasters an urgent concern within modern society (Krishnan & Liao, 2019; Wagemann & Ramage, 2013). Given the adverse repercussions of disasters, their

management becomes a grave source of apprehension, and Turkey stands among the countries grappling with this issue. It is postulated that approximately 41% of over 50 distinct types of global disasters occur within Turkey (Ayyıldız Potur & Metin, 2021). Piles of the earth are predominating among the perils within the nation, with 92% of its territory situated atop active fault lines (Ural, 2001). Between 1900 and 2015, earthquakes of magnitude equal to or exceeding 5.0 resulted in the demise of over 100,000 individuals and inflicted severe damage upon around 600,000 structures (Mahmoud et al., 2019). While Turkey has undertaken various measures to mitigate the impact of disasters on the built environment, the persistence of building collapses and other catastrophes underscores the limited efficacy of these measures.

The frequency and intensity of disasters have resulted in widespread damage and destruction to buildings and infrastructure, leading to significant economic and human losses. This situation underscores the importance of resilient and secure building design and construction. Consequently, the decisions about the country's construction sector must be guided by disaster mitigation techniques and executed by individuals possessing technical expertise and a sense of social responsibility, such as qualified professionals like architects (Özmen, 2013). Given Turkey's susceptibility to natural disasters, it presents an apt case study to explore how disaster management is integrated into architectural education.

Disaster management constitutes a vital skill set for architects and other university graduates. Architects and their counterparts typically acquire the foundational components of their knowledge and skills during their university education (Mahmoud et al., 2019), and educational frameworks are nationally overseen by universities (Porrás Álvarez et al., 2016). Given that the design and construction of buildings significantly influence their resilience against natural disasters, architecture plays a paramount role in disaster management (Erdoğan et al., 2021). Consequently, integrating disaster management into architectural curricula holds pivotal significance in preparing future architects to address the challenges posed by disasters and, notably, to engage in building construction within the context of Turkey.

Architectural education constitutes a significant process that thoroughly nurtures young architects. It readies architectural students for the profession while instilling ecological awareness and social

responsibilities (Gökuç, 2021). In Turkey, architectural education dates back to the 15th century, with its Westernized form emerging by the early 19th century (Özdoğan & Güney, 2016). Although each university designs its curriculum, architectural undergraduate curricula generally encompass (mandatory and elective) courses in six categories: (1) general, (2) building sciences and technology, (3) design knowledge, history, theory, culture, and art, (4) environment, urban, and professional studies, (5) management, and (6) economics (Mahmoud et al., 2019). Furthermore, the primary influencer of program direction in Turkish architectural departments lies within the architectural design courses under the overarching title of 'design' (Ayyıldız Potur & Metin, 2021). However, knowledge concerning disaster management is not typically embedded within the architectural curriculum (Krishnan & Liao, 2019; Mahmoud et al., 2019). The absence of emphasis on disaster management in architectural education could cause concern, as it implies that future architects may lack the essential knowledge and skills to construct secure and resilient buildings.

As natural disasters increase globally, disaster management education for future architects in Turkey is paramount. Disaster management should be integrated into architectural education, public awareness should be heightened, and collaboration with research institutions should be fostered. Equipping future architects with the necessary knowledge and skills to address disasters is of utmost significance. This research explores disaster management education and curriculum integration in accredited architectural programs in Turkey. To achieve this, it examines the current state of architectural education in Turkey and discusses challenges and opportunities for improvement.

## **Method**

This article provides a comprehensive assessment focusing on the role and significance of disaster management in architectural education in Turkey. Within this framework, a literature review explores the existing disaster management methods in architectural education in Turkey. The programs and curricula of accredited architectural departments are analyzed to examine the impact of the current system on the quality of architectural education in the country. Additionally, the challenges and opportunities related to disaster management in architectural education in Turkey are evaluated from a general perspective.

The Higher Education Quality Council (YÖKAK) was established within the scope of the Higher Education Council (YÖK) in 2015 to assess the quality levels of higher education institutions according to national and international standards, ensuring the quality of education, research, and administrative services. YÖKAK engages in efforts to enhance the quality of education and oversee accreditation processes (YÖKAK, 2023). Accreditation procedures are conducted through organizations authorized by YÖKAK, contributing to improving the quality of higher education in Turkey and establishing a competitive educational environment at the international level (Higher Education Quality Council YÖKAK 2019-2023 Strategic Plan, 2019). Architectural education accreditation is administered by the Association for Architectural Education Accreditation (MİAK) following the principles and criteria established by the Higher Education Quality Council (YÖKAK). MİAK engages in accreditation, external quality assessment, and informative initiatives to elevate the quality of architectural education programs (MİAK, n.d.). Accreditation durations provided by MİAK come in four distinct types, signifying a specified level of educational excellence achieved by accredited architectural departments. This research examined architectural programs accredited by MİAK and international accreditation bodies, and their associations with disaster management was analyzed from various perspectives. The findings and implications derived from this study were summarized, leading to a discourse on the status and significance of disaster management in architectural education in Turkey. Moreover, future-oriented research and policy recommendations were put forth, envisaging a valuable contribution to forthcoming endeavors in this field.

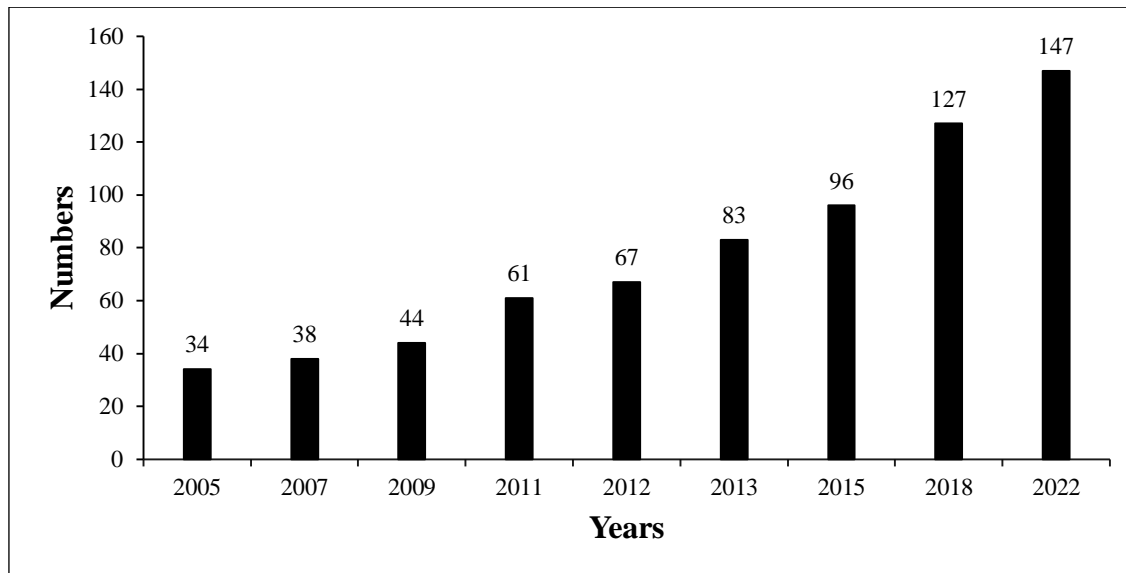
## **Results**

Architectural education is fundamental to enhancing architects' professional competencies and ethical values. In Turkey, architects are granted the authority for professional practice after completing a four-year academic education and becoming a member of a professional organization without being subjected to further professional examinations. In contrast, many other countries require architects to undergo additional processes beyond a five-year educational period to obtain professional practice rights (Erdoğan et al., 2021). The number of architectural departments in Turkey has been steadily increasing over the years: 34 in 2005, 38 in 2007, 44 in 2009, 61 in 2011, 67 in 2012 (Mahmoud et al., 2019), 83 in 2013, and reaching 96 in 2015. By 2018, architectural

education was provided across 127 departments in 102 universities (Ayyıldız Potur & Metin, 2021). According to the Higher Education Information Management System, as of 2022 (excluding the Turkish Republic of Northern Cyprus), 147 distinct architectural programs are offered in public and private universities under various faculties (Higher Education Information Management System, n.d.). Figure 1 illustrates the changes between 2005 and 2022.

**Figure 1**

*Changes in the Number of Architectural Departments in Turkey (2005-2022)*



The increasing trend in architectural education emphasizes the need to prepare future architects for complex challenges and effective contributions to the built environment. This requires comprehensive evaluation of how disaster management is integrated across diverse architectural programs. The diverse landscape of architectural programs necessitates a comprehensive evaluation to ascertain the extent to which disaster management is integrated into these curricula.

MİAK has accredited the architectural programs listed in Table 1. These programs are designed to provide high-quality education and offer students a solid academic foundation, aiming to equip future architects with the necessary skills and continuously update to meet industry requirements. As the number of universities offering education in architecture is steadily increasing, so is the

rapidly growing count of programs accredited by MIAK. The 14 architectural programs observed in Table 1 all strive to deliver students a high-quality education.

**Table 1**

*Accredited Architectural Undergraduate Programs*

University Name	Language	Type	Period
Mimar Sinan Fine Arts University	Turkish	6 years	March 27, 2029
Istanbul Kültür University	English	3 years	February 20, 2026
Istanbul Kültür University	Turkish	6 Years Conditional	February 20, 2029
Maltepe University	English	3 years	November 18, 2025
Maltepe University	Turkish	3 years	November 18, 2025
Izmir Institute of Technology	English	6 years	November 18, 2028
Yeditepe University	English	2 Years Supervised	October 3, 2024
Özyeğin University	English	6 Years	October 3, 2028
Özyeğin University	Turkish	6 Years Conditional	October 3, 2028
Yaşar University	English	3 Years	October 3, 2025
Gebze Technical University	Turkish	6 Years Conditional	October 3, 2028
Middle East Technical University	English	6 Years	October 3, 2028
Yıldız Technical University	Turkish	6 Years	June 28, 2023
Fatih Sultan Mehmet University	Turkish	6 Years Conditional	March 13, 2026

A pioneering institution in terms of international recognition for architectural programs is the U.S.-based National Architectural Accrediting Board (NAAB), which has established an international certification process for architecture programs. This international certification assures students that

they are receiving a respected education on a global scale, thereby enhancing graduates' employment prospects. This process aims to elevate the quality of architectural programs worldwide. It has resulted in 18 different architecture departments from various countries, including Istanbul Technical University and Yıldız Technical University Architecture Departments from Turkey, earning this credential (International Certification, n.d.). These accreditations significantly contribute to the international recognition of Turkish architectural education and its potential for global competitiveness. Accredited by MİAK and NAAB, specific architectural program curricula emphasize the topics of disasters and disaster management within their core learning outcomes. These subjects are deemed integral components of the knowledge and skills that students acquire during their studies. Notably, the program learning outcomes featured on the websites of these programs include specific references to "afet" or "afet yönetimi" in Turkish, as well as their English equivalents, "disaster" or "disaster management."

As illustrated in Table 2, a closer examination of distinct universities' architectural programs reveals variations in the incorporation of disaster management-oriented learning outcomes. Mimar Sinan Fine Arts University has no specified learning outcome statement regarding disaster management. Istanbul Kültür University's program learning outcomes encompass the impacts of geographical conditions and life safety on site selection and building design, encompassing natural and cultural aspects. Like Istanbul Kültür University, Maltepe University's curriculum emphasizes the ability to design and implement considering natural disasters. İzmir Yüksek Teknoloji Enstitüsü (Izmir Institute of Technology), Yeditepe University, Özyeğin University, Yaşar University, Gebze Technical University, Middle East Technical University, Yıldız Technical University, Fatih Sultan Mehmet Foundation University, and Istanbul Technical University do not explicitly mention disaster-related learning outcomes.

## Table 2

### *MİAK and NAAB Accredited Architectural Bachelor's Programs*

University Name	Program Learning Outcome Statement
Mimar Sinan Fine Arts University (Turkish)	Not Found

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Istanbul Kültür University (English-Turkish)	Geographic Conditions: Understanding the relationships between site selection, settlement, and building design, considering natural features such as ground conditions, topography, vegetation, natural disaster risk, as well as cultural, economic, and social characteristics.  Life Safety: Understanding the fundamental principles of safety and emergency systems at the scale of building and environment under conditions of natural disasters, fire, etc.
Maltepe University (English-Turkish)	Acquiring the ability to design and implement considering natural disasters.
Izmir Institute of Technology (English)	Not Found
Yeditepe University (English)	Profound knowledge and understanding in the relevant field regarding economic, environmental, and societal sustainability principles and standards, as well as multidimensional knowledge and comprehension in issues related to disasters.
Özyeğin University (English-Turkish)	Not Available  Not Available
Yaşar University (English)	Not Available
Gebze Technical University (Turkish)	Not Available
Middle East Technical University (English)	Not Available
Yıldız Technical University (Turkish)	Not Found

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Fatih Sultan Mehmet Foundation University Not Available

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Istanbul Technical University (Turkish) Not Available

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The presence of "disaster" or "disaster management" concepts and the English equivalent of "disaster" or "disaster management" expressions in the short contents of the courses included in the curriculum on the web pages of the departments are shown. Accordingly, while it is stated that Mimar Sinan Fine Arts University includes disaster studies within the scope of the "MFA300 Social Responsibility Practices" course, there is no information on other universities. The terms "afet" or "afet yönetimi" in Turkish and their English equivalents, 'disaster' or 'disaster management,' in the detailed course contents of department curricula have been examined. According to the provided information, except for one accredited architectural program, no occurrences of the terms 'disaster' or 'disaster management' or their English equivalents have been identified in the detailed course contents of the other architectural programs. However, at Istanbul Kültür University, the "MIM0110- Afet ve Konut Tasarımı (Disaster and Housing Design)" course includes content that investigates design criteria for post-disaster housing needs.

Examining curricula on the websites of architectural departments accredited by MIAK and NAAB reveals a distinct variability in the content of courses related to different types of disasters (earthquakes, floods, landslides, fires, etc.) among various universities. Based on this examination, it becomes evident that notable disparities in course content among these institutions concerning disaster-related education exist. Mimar Sinan Fine Arts University offers fundamental courses such as basic structural knowledge, statics and mechanics of materials, and structural analysis to impart essential structural engineering principles to students. Similarly, Istanbul Technical University delivers mandatory courses, including structural mechanics, structural analysis, and the design of load-bearing systems, thereby acquainting students with the fundamental aspects of structural engineering. Notably, the Izmir Institute of Technology provides a comprehensive perspective on structures' physical and behavioral aspects through courses in structural science and technology, thus enabling students to comprehend the multifaceted nature of structures.

The diversity within elective courses is also striking. For instance, Istanbul Kültür University emphasizes architectural practice by offering options like disaster and housing design and timber construction systems. On the other hand, Yıldız Technical University focuses more on design and construction materials in their elective courses. Meanwhile, Özyeğin University offers an in-depth education on the durability and safety of structures through elective courses such as geotechnical site investigations, structural risk management, and seismic isolation. Maltepe University and Middle East Technical University aim to provide students with profound insights through elective courses on architectural analysis and design. Conversely, Yaşar University and Gebze Technical University concentrate on earthquake-resistant design and structural safety. In conclusion, the analysis of curricula from MIAK and NAAB-accredited architectural programs, as showcased on university websites, underscores the distinct variations in course content concerning various types of disasters. These differences reflect universities' diverse educational approaches and priorities toward disaster-related education.

## **Discussion, Conclusion and Recommendations**

### ***Discussion***

In recent years, the increase in natural disasters worldwide and the growing impact of human-induced disasters have emphasized the importance of disaster management in architectural education. Contrary to expectations, the number of architecture schools offering courses related to disaster management could be much higher (Wagemann & Ramage, 2013). In schools where courses related to disaster management exist, it can be noted that these courses have emerged due to initiatives by students and academics (Mahmoud et al., 2019). Özdoğan and Güney (2016) state in their study that the presence of courses on disasters in architectural education, as seen in examples from the United States, Japan, and Italy, has a significantly enhancing effect on disaster preparedness and mitigation. For instance, in Japan, the subject of disasters in architectural education is not superficial; rather, it encompasses a wide range of topics such as earthquake, tsunami, hurricane, and flood-resistant design (Ayyıldız Potur & Metin, 2021). A similar approach being promoted in architecture education in Turkey would be a crucial step toward producing more prepared and conscious architects in the face of disasters.

There has been a significant increase in the number of architecture departments in Turkey since 2005. Many universities, especially in major cities, offer architecture programs, providing students with more options and perspectives. However, this rapid growth in architecture departments also brings along specific challenges. The number of architecture departments, 34 in 2005, reached 127 in 102 universities by 2018. The situation can raise concerns about finding qualified faculty and providing quality education (Ayyıldız Potur & Metin, 2021). Therefore, it is crucial for students to make careful evaluations when choosing universities and departments and to consider compliance with accreditation standards. Two of the 15 architecture programs in Turkey are NAAB-certified and accredited. The issue indicates that education is provided according to quality standards and enhances students' post-graduation competencies. Accreditation is essential for continuous quality assessment and improvement in architectural education. However, how disasters and disaster management are addressed in these programs cannot be solely understood from data. Therefore, other data have also been used for more comprehensive analyses.

Some architectural bachelor's degree programs accredited by MIAK and NAAB focus on disasters and disaster management. These programs aim to equip students with the skills to understand the impacts of disasters, implement safety measures, and consider disaster risks in building designs. They emphasize topics such as natural disaster risks, life safety, and the effects of disasters on design processes. However, there are variations in the extent to which different programs emphasize the topics of disasters and disaster management. While some programs explicitly incorporate these topics, others may not place as much emphasis on them. These differences could stem from the diversity in learning outcomes and curricula among programs or may be shaped by local needs.

The accreditation process helps programs meet quality standards and encourages continuous assessment and improvement. Therefore, it could be important for accreditation bodies to introduce more specific criteria and emphasis on the topics of disasters and disaster management to encourage their broader inclusion in architectural education. Such standardization could raise architectural students' awareness and preparedness regarding disasters. It is evident that among the accredited architectural bachelor's degree programs, courses related to disaster studies are only present at Mimar Sinan Fine Arts University. Other universities do not offer courses in this area. This

situation illustrates the distinct priorities of these programs. The fact that Mimar Sinan Fine Arts University emphasizes explicitly providing students with knowledge and skills in disaster-related subjects indicates a particular commitment to this goal. Therefore, it is essential for architectural programs to broaden their education and emphasis on disaster-related topics. By doing so, architects can become better prepared for disasters and contribute to enhancing the resilience of communities in the face of such events.

On the other hand, it is observed that many of the accredited architectural programs lack courses or course content related to disasters. This situation may lead to specific criticisms considering the significance and impact of disasters. Architecture is directly associated with the design and construction of buildings, and minimizing the effects of disasters is a crucial responsibility for architects. Therefore, architectural students need to acquire knowledge and skills in disaster management. Furthermore, including the "Disaster and Housing Design" course in the curriculum of Istanbul Kültür University is a positive step. However, in the curricula of other accredited programs, the absence of courses or content related to disasters is noticeable. This indicates that adequate emphasis is not placed on disaster management. Mitigating the adverse effects of disasters and ensuring public safety are significant responsibilities of architects.

In this context, architectural programs must focus more on disaster management and provide students with the necessary knowledge and skills. Programs should emphasize disaster management more prominently and incorporate relevant courses into their curricula to achieve this. Additionally, organizing workshops or seminars on disaster management with the participation of guest instructors who are experts in the field could be beneficial. Collaborative efforts can raise awareness and preparedness among future architects regarding disaster management.

When examining the curricula of accredited architectural programs on their respective university websites, a notable presence of courses related to various types of disasters (such as earthquakes, floods, landslides, fires, etc.) can be observed. For instance, courses like "Seismic Resistant Building Design" at Mimar Sinan Fine Arts University and "Disaster and Housing Design" at Istanbul Kültür University stand out. These courses aim to cultivate sensitivity towards disasters and equip students with the skills to design resilient structures in the face of such events. However,

a closer look at the data reveals the absence of disaster-related courses in the curricula of some universities. This underscores a potential inadequacy in addressing disaster management in architectural education. Architects play a crucial role in ensuring the resilience of buildings during their design and construction, making it imperative for architectural programs to strengthen their focus on disaster education and equip students with the necessary knowledge and skills.

The current state of affairs suggests that disaster management might need to be adequately emphasized. Accredited architectural programs should allocate more weight to disaster management courses to foster a conscious approach toward mitigating the impacts of disasters and ensuring societal safety. In addition to these courses, focusing on interactive learning methods such as workshops, seminars, or conferences could enhance the overall educational experience. Such comprehensive efforts will produce well-prepared architects to address the challenges posed by disasters and prioritize community resilience.

The presence and distribution of disaster-related courses in architectural education reveal a disparity among universities, with some excelling in this aspect while others need to put in more effort. Architectural programs should enhance their focus on disaster management topics, provide students with more opportunities, and embrace interactive learning methods. By doing so, architecture graduates will possess the necessary knowledge and skills to enhance community safety and minimize disaster risks. This approach will empower architecture professionals to respond effectively to the broader needs of society and contribute to a sustainable future. As the field evolves to incorporate a more comprehensive understanding of disaster management, it has the potential to play a significant role in shaping a safer and more resilient built environment.

### ***Conclusion***

Disaster management stands as a vital factor influencing the entire spectrum of building and infrastructure processes, encompassing design, construction, and maintenance. The potential repercussions of both natural and human-induced disasters, including fires, earthquakes, and floods, emphasize the imperative of integrating disaster management into architectural education. Equipping students with the requisite knowledge and skills to effectively address and navigate such challenges is paramount. Architects and planners play an indispensable role in minimizing the

impact of disasters on communities by constructing resilient structures and infrastructure. Their responsibility extends beyond aesthetics and functionality, encompassing safeguarding public safety and well-being within the built environment.

Seismic activity, floods, and other adversities punctuate Turkey's history. This context underscores the need for architectural education to encompass comprehensive instruction in disaster-resistant design, secure building construction, emergency management during crises, and post-disaster reconstruction. Moreover, the curriculum should extend its scope to encompass strategies addressing natural and human-induced disasters. The research findings underscore a compelling demand for robust integration of disaster management education across Turkey's architectural programs. A disparity in awareness and knowledge levels regarding disaster management within different programs is evident, calling for a more consistent and comprehensive approach.

Given Turkey's susceptibility to disasters, thoroughly integrating disaster management into architectural education is imperative. Although certain universities offer specific disaster-related courses, the subject should permeate the core curriculum, not only as an elective. This is critical to ensure that architects are adequately prepared to design and erect disaster-resilient structures. A holistic approach could be achieved by embedding disaster management principles and techniques into core courses like design studios and building technology.

### ***Recommendations***

To strengthen disaster management education in Turkish architectural programs, it is advisable to adopt several strategic measures. Firstly, accreditation bodies such as MİAK should consider introducing specific criteria and emphasis on disaster management within their evaluation process. This initiative could motivate institutions to prioritize disaster-related content within their curricula, fostering a more resilient architectural education. Secondly, architectural programs should proactively enhance the prominence of disaster management by incorporating dedicated courses into their core curriculum. Interactive learning methods, such as workshops, seminars, and practical exercises, should be integrated to provide students with tangible insights into disaster management concepts and applications. Thirdly, a collaboration between architecture departments, research institutions, and industry experts should be encouraged. This partnership could facilitate

incorporating real-world case studies, guest lectures, and hands-on experiences into the educational process, enhancing students' practical understanding of disaster management. Fourthly, a periodic review and curricula update is pivotal to ensure that architectural education remains aligned with evolving societal needs. Disaster management should be treated as integral, reflecting the profession's responsibility to design structures that ensure public safety. Lastly, fostering a culture of preparedness and resilience within architectural education requires sustained commitment from educators and students. Institutions should encourage students to engage in community-focused projects, simulations, and experiential exercises that practically demonstrate the application of disaster management principles. By adopting these recommendations, Turkish architectural education can effectively elevate its focus on disaster management. The resultant graduates will be better equipped to address disaster challenges, contribute to community resilience, and shape a safer built environment for the future.

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