Assessing the State of Preservation After Adaptive Reuse: Three Historic Madrasas in Istanbul-A Case Study

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Abstract **– Heritage buildings serve as witnesses to our past and the keeper of our shared values. While adaptive reuse stands as a sustainable method for effectively preserving and converting them into an active resource for the future, it must be supported by a thorough and multidisciplinary research in order to make informed judgments and implement appropriate solutions. The paper assesses the adaptive reuse of three historic madrasas in Istanbul and examines its impact on their preservation status. The selected madrasas are Mihrimah Sultan (1548), Şemsi Ahmed Paşa (1580), and Kılıç Ali Paşa madrasas (1588). The selected case studies are presented using data from literature, archival research, and field observations, and their adaptive reuse is evaluated using criteria established in the literature. According to the findings, adaptive reuse had a detrimental impact on the cultural significance of these valuable buildings.**

Keywords **– Istanbul, madrasa, adaptive reuse, building preservation, authenticity.**

1. Introduction

Heritage buildings provide evidence of previous civilizations and play a vital role in transmitting cultural identity through generations. Since many historic buildings have lost their original functions; it is necessary to propose new uses to ensure their preservation.

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This process, which is called adaptive reuse, is the act of modifying and adapting old buildings for new purposes while preserving their cultural significance [1]. In other words, successful adaptive reuse should maintain the heritage values of a building while adopting a modern look that does not undermine its originality [2]. This is critical to genuinely pass on the authentic heritage to future generations. Adaptive reuse, under this sense, is essentially a form of heritage conservation [3]. It not only retains the heritage building but also preserves the effort, skill, and dedication of the original builders [1], [4], revives the social and historical values embedded in the building that have been diminished by the functional obsolescence [5], and generates the financial resources required for the building's restoration and maintenance [4].

1.1. Adaptive Reuse and the Conservation of Architectural Heritage

Until the 1950s, the benefits of adaptive reuse were almost entirely considered in terms of architectural preservation [3], [6]. However, a rising body of literature underlines the important role of adaptive reuse in developing and sustaining the environmental, social, and economic values in urban settlements [7]. In terms of environmental advantages, adaptive reuse requires less energy and waste, protects buildings from the destruction caused by uncontrolled urban development, reduces construction and maintenance time, and decreases consumption of material and natural resources [1], [5], [8]. As for economic benefits, the reuse of heritage buildings expands, integrates, and manages economic resources, creating new possibilities for the surrounding people and improving local economic structures [8], [9]. On the social side, studies show that adaptive reuse enhances communal tolerance and social cohesion, as well as a sense of belonging [5], [7]. Due to their accessibility and utility, heritage buildings are cherished both locally and worldwide by visitors and tourists [4].

Because random and incorrect acts can cause lasting damage to heritage buildings, adaptive reuse is a challenging process that requires a multidisciplinary approach and thorough investigation. Numerous researches have contributed to identifying the obstacles that impact the quality of heritage buildings' adaptive reuse and building multidisciplinary models to guide and assess the process [10], [11], [12]. Pintossi *et al.* [13] identified the absence of participatory processes, a lack or fragmentation of strategical guidance, a limitation of capacity, a lack of financial resources, a loss of knowledge and traditional skills, and a lack of integration among sources of information as major challenges for conservation professionals. Wilkinson *et al.* [11] validated, in particular, the difficulties in complying with laws, regulations, and design specifications. Mısırlısoy and Günçe [14] highlighted a lack of appropriate strategies for the sustainable management of heritage buildings. They stressed that, while the primary goal of adaptive reuse is to protect heritage buildings, the process's economic viability is also critical to their future, since these structures must provide financial returns that pay future maintenance and restoration. According to these challenges and requirements, the ability of adaptive reuse projects is to preserve the building's cultural values; to add a contemporary layer that provides value for the future; and to provide the building with a new function that is technically feasible and economically viable are the determining factors of their success or failure [15], [16].

1.2. Criteria for Adaptive Reuse of Heritage Buildings

The guiding principle for adaptive reuse in the context of architectural heritage preservation is retaining, respecting, enhancing, revealing, and supporting the cultural significance of a heritage building [17], [18], [19]. Compliance with this principle is crucial and necessitates the consideration and understanding of all tangible and intangible values, with no undue focus on one value at the expense of others [17]. The UNESCO Operational Guidelines for the Implementation of the World Heritage Convention identified eight aspects that contribute to the authenticity of a heritage place; form and design, materials and substance, use and function, traditions, techniques, and management system, location and setting, language and other forms of intangible heritage, spirit and feeling, and other internal and external factors [20]. It also stated that "*knowledge and understanding of these sources of information, in relation to original and subsequent characteristics of cultural heritage, and their meaning as accumulated over time, are the requisite bases for assessing all aspects of authenticity*" [20].

These remarks suggest that authenticity extends beyond the original features of a heritage building to include any adaptations made to the structure through time. As a result, successful adaptive reuse may be achieved when contemporary changes are perfectly integrated with the original characteristics, becoming part of the building's history through time and so contributing to its cultural significance [2].

As one of the interventions aiming at conserving heritage buildings, adaptive reuse follows the same criteria as the other levels of intervention. These criteria can be grouped under three main requirements:

A. Compatibility of use

The use should be compatible with the heritage building. This implies that it should involve minimal impact on its fabric, layout, and setting; respect its associations and meanings; and, when appropriate, provide for the continuance of activities that add to the building's cultural significance [17], [19]. To minimize the impact of the use, practitioners would consider restoring a heritage building for its original or very comparable function as the best alternative. Such a decision would necessitate small changes to the building while revitalizing its historical, social, and symbolic values, therefore earning community acceptance [2], [21]. If the original use cannot be maintained, an effort should be made to evaluate the compatibility of the new one by comparing the features of the heritage building, the requirements of the new use, and the demands of the new users. First, the new use's architectural space programming should relate to the spatial qualities of the heritage building [1], [2]. Furthermore, assessments would include performance characteristics such as spaciousness, beauty, tranquillity, comfortability, convenience, tidiness, and luxuriousness as well as psycho-social characteristics such as ergonomics, flexibility, privacy, territoriality, and security [22], [23]. The dynamic interaction between humans and their architectural heritage is ensured by combining the fulfilment of demands connected to people's activities with the ability to appreciate the historic buildings [1].

B. Compatibility of Changes

When maintaining the original fabric of the building, the features that really depict the architectural style, technology, workmanship, and tools at the time the building was constructed should be retained [1]. Any repairs should be carried out using materials and techniques that are similar to the originals, and the completion or replacement works should be distinct from the original parts while blending in harmoniously with the whole [24].

Because adaptive reuse may entail renovations, adjustments, and additions, these changes should have a minimal physical and aesthetic impact on the heritage building [2]. A cautious approach of "change as much as necessary but as little as possible" is always a good strategy to employ [17]. It is always recommended to determine if changes are actually required to fulfil the new functional requirements before taking the implementation decisions [1]. The structural alterations, in particular, should be assessed by expert consultants for safety indicators [2]. Furthermore, international charters prefer that any new work should be identified as contemporary rather than a poor replica of the building's original historic design [17], [18], [19]. According to Torres [25], it is necessary to allow contemporary interventions to express current values without fear of interfering with the past, and this can be used as an opportunity to enhance the architectural and cultural significance, as well as the physical character of the architectural heritage and its context. The incorporation of modern extensions into heritage buildings, using modern techniques and materials, should take into account its setting, mass, shape, and character.

C. Reversibility of Interventions

Reversible interventions are always desired since they provide the most alternatives for future development and issue resolution. As a result, any addition to the heritage building should be removable with minimal collateral damage to the original fabric [1], [2]. If a considerable change is suggested, designers should consider the potential for reversibility in the design of the adjustments so that the possibility of restoring the building to its previous condition is maintained open should the circumstances permit it at a later time [21]. Irreversible alterations can be considered only after all other options have been investigated [17], [19].

2. Materials and Method

Madrasa, which means the "place of study" in Arabic, is the Islamic college of jurisprudence. Mosques served as centres of learning in addition to their primary purpose as places of communal prayer during the early Islamic centuries. Because mosques could not provide accommodation for regular teachers and students, lodging establishments were established near to mosques as early as the 10th century. These lodges were a transitional stage in the evolution of the madrasa as a building type. The 11th century witnessed the establishment of the madrasa as an independent institution devoted exclusively to the teaching and housing of students, and supported by pious endowments (waqfs) [26].

Madrasas are often built around an open or roofed courtyard, which is surrounded by large classrooms for teaching and prayer, as well as small rooms for accommodation. They are equipped with water pools, toilets and occasionally kitchens and baths. Additionally, the founders' tombs might be located in nearby mausoleums [27].

According to historical records, more than 500 madrasas were built in Istanbul between the conquest and the end of the 19th century. The fact that there were 185 madrasas in 1914 and just 80 madrasas survive now indicates the magnitude of the historic and architectural loss [28]. Many of these structures were damaged by successive fires and earthquakes. In addition, many planned repairs were halted by the onset of WWI, the effectuation of the new educational system, and the closure of the traditional madrasas in 1924. The expenditures of maintenance work could not be met because many endowed properties that supplied income to maintain the madrasas were in territories lost during the late Ottoman period. Furthermore, the dilapidated buildings were either removed to make way for new schools or were demolished due to the city's multiple urban plans during the twentieth century [28]. Although historical information is available, architectural information including design, building techniques, and materials is rather limited and confined to the madrasas that have survived to the present day. This emphasizes the historical significance of the extant madrasas, as well as the imperative of preserving their authenticity as unique examples of Classical Ottoman architecture.

This study was carried out in Istanbul between 2020 and 2021. We investigated the tension between contemporary adaptive reuse and the preservation of authentic features in nine adaptively reused madrasas by focusing on the implemented interventions and their compatibility with architectural conservation principles [29]. Three case examples were chosen for presentation in this article. Our selection was based on some common features to facilitate comparison, such as architectural type (open courtyard madrasas), historic value (classical Ottoman madrasas designed by chief architect Sinan), and current location within the urban fabric (madrasas located in a vibrant and threatening urban setting).

The study was carried out in three stages. First, the relevant literature on the concept of adaptive reuse, as well as its aims and principles in the field of heritage preservation, were analyzed to generate the assessment criteria. Second, the case studies were thoroughly examined to determine the modifications brought about by adaptive reuse. Third, a cross-case comparison of the case studies was made to evaluate the influence of adaptive reuse on the preservation status of the buildings.

In order to facilitate the comparison among the three cases, the interventions were divided into five main categories: (1) plan organization, (2) facade order, (3) urban setting, (4) interventions to the historical building, and (5) new additions and fittings.

3. Case Studies

The following subsections present: data about the history of the three selected madrasas, their architectural characteristics, previous interventions and adapting modifications. The data was collected through literature analysis, archival research, and field inspections. Unless otherwise noted, all photographs and illustrations were taken and prepared by the authors.

3.1. Mihrimah Sultan Madrasa in Üsküdar

Location: The Mihrimah Sultan complex is located on Istanbul's Asian side, overlooking Üsküdar Pier (Figure 1). The complex's linear composition was compelled by the narrow site between the coastline and the steep slope behind it. The mosque and madrasa are elevated on a stone terrace, facing Üsküdar square, and are separated from the primary school to the south by a narrow street. Although many of the complex's structures have perished as a result of urban change in the area, the main edifice housing the mosque, dependencies in its courtyard, and the madrasa retains an integrated ensemble, albeit endangered by heavy traffic and urban renewal in the surrounding environment (Figure 2). Üsküdar Square is today one of the key hubs in Asian Istanbul, linking the ferry port, bus stations, railway station, and vehicle coast road, as well as hundreds of commercial and social facilities.

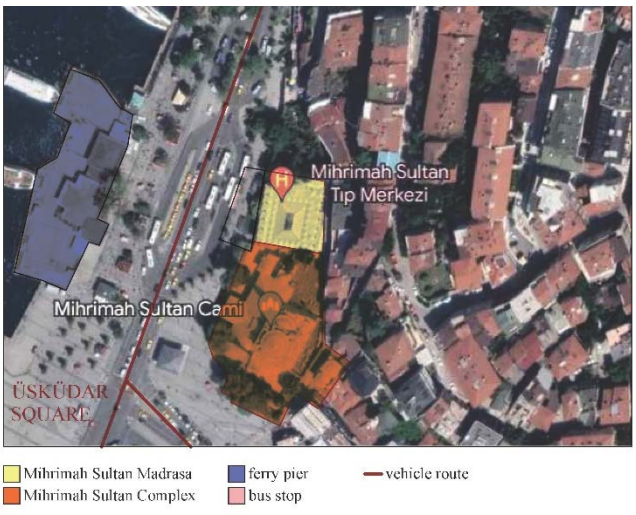

Figure 1. The urban setting of Mihrimah Sultan Madrasa

History: The complex was founded by Mihrimah Sultan, daughter of Sultan Süleyman the Magnificent, in 1548. Originally, it comprised a mosque, a madrasa, a primary school, a guesthouse, a caravanserai, a hospice, public fountains and a small cemetery. Among these structures, the mosque, madrasa, and hospice are credited to the chief architect Sinan. Several other dependencies were built by other patrons over the years, while others, such as the hospice, guesthouse, and caravanserai, disappeared [30]. The complex's distinctive heritage significance stems from the fact that it was the first complex designed by Sinan in Üsküdar, and so played an essential role in the area's urban development. Its prominent location overlooking the pier made it a well-known landmark that has been featured in old paintings and photographs. The mosque in particular is noteworthy for being one of Sinan's early mosques, where he experimented with structure by flanking the main dome with three half-domes on three sides.

Figure 2. A general view of the madrasa from Üsküdar Pier, 2021

The madrasa's first teacher was appointed soon after it was built in 1548 [31]. According to the archival documents, the building stopped functioning in the beginning of the 20th century, and years of neglect accelerated its degradation [32]. It was restored and utilized as a post office, a children's dispensary and finally as a health facility under the responsibility of Üsküdar Municipality [32]. During the conversion of the structure to these consecutive purposes, the main entrance from the mosque's courtyard was cancelled, a cell-sized entry hall was formed next to the classroom, and a stairway was built to enable access to the new entrance from the square. A new block was built on the classroom's other side, balancing the volume of the new entry hall (Figure 3). Following inspections to assess the building's conservation state in 1988, the decision was taken to comprehensively repair the structure [32]. The madrasa was inaugurated as a medical polyclinic facility in 2000.

Architecture: The madrasa is a free-standing edifice with an entrance from the mosque's front portico. It has outer dimensions of 28×28.8m and a surface area of approximately 800m2. The impressive entrance portal adheres to the classical Ottoman style with its muqarnas hood and two small wall niches on either side of the arched entryway. A classroom faces the entrance, and 16 student rooms are organized symmetrically in a U-shape.

Figure 3. A general view of the madrasa in the 1960s, the Archives of Istanbul Metropolitan Municipality
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A portico precedes all the rooms and runs along the four sides of the rectangular courtyard, its domed ceiling supported by ogee arches resting on marble columns with lozenge capitals (Figure 4).

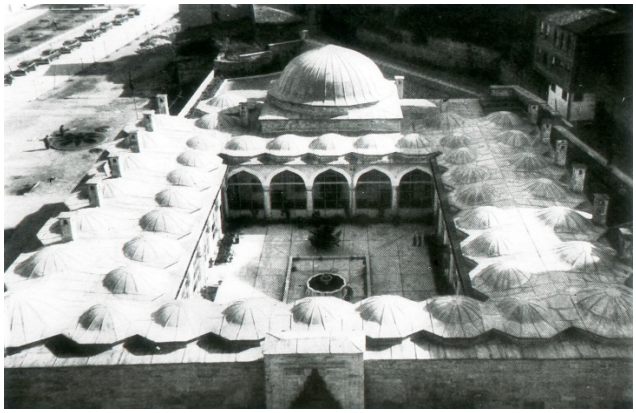

Figure 4. A general view of the madrasa in the 1950s Ali Saim Ülgen Collection, Salt Research.
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Two vaulted passageways on either side of the classroom lead to the backyard, where the toilets were originally located. The square classroom is topped by a dome supported by eight arches with squinches serving as transition elements. There are nine windows on the walls of the classroom, as well as a fireplace and several wall niches.

The student rooms are likewise square in plan, with domes sitting on pendentives covering them. Every room has a fireplace and wall niches. In addition to the windows that view the courtyard, the rooms on the western side, are lighted by windows that overlook the square. The masonry walls are made of dressed limestone, while the domes are made of brick and covered with lead. In addition, marble and limestone were utilized for the jambs, lintels and sills of the openings. Puddingstone is used joggled with marble to form the entrance arch.

Adaptive Reuse: In addition to technical and storage services, the current program of the building includes 14 clinics, an x-ray department, an emergency department, and administrative rooms (Figure 5).

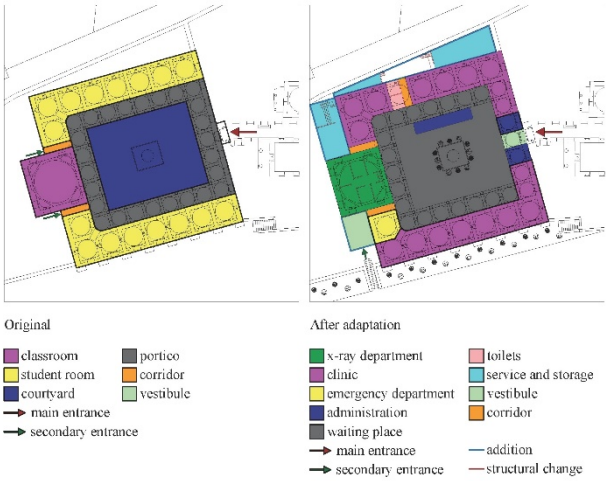

Figure 5. The functional program of the building

Such a heavy program necessitated wide-scope interventions in the building. The courtyard was closed off with a metal and glass roof and used to house the main information desk and waiting areas as part of the structural alterations. The character of open and semi-open areas was lost by shutting the courtyard, resulting in a confined block disconnected from nature (Figure 6).

Figure 6. A general view of the courtyard after its closure, 2021

The madrasa's main entrance was reactivated, but the secondary entrance, constructed during the 1950s alterations, was retained together with its vestibule and allocated for emergency units. The space between the student rooms on the northeast and the curtain wall of the terrace was built up and set aside for storage and technical rooms (Figure 7). This part is accessible by a hallway cut in one of the student rooms. The remainder of the space was set aside for toilets. The X-ray department had reserved the classroom. A new floor was installed to divide the lofty area into two levels, and several walls separate each level into various booths. Partitions were installed in the portico bays to serve as administration rooms, clinics, or just waiting booths. All of the original building materials and architectural details, with the exception of the portico columns, have been replaced or disguised by new materials, cladding, and fittings (Figure 8).

Figure 7. A close-up view of the enclosure in the northeast showing the incompatible interventions to the madrasa's wall, 2021

Figure 8. A general view of one of the students' rooms, 2021

In contrast to the excessively renovated interior, the building's external characteristics have been largely preserved. However, the external surfaces show a lack of maintenance and low-quality repairs made using inappropriate materials.

It was also observed that the new fittings were installed in such a way that they harmed the historical building both visually and physically (Figure 9).

Figure 9. The external wall of the classroom showing the incompatible fittings and poor maintenance of the historic fabric, 2021

3.2. Şemsi Ahmed Paşa Madrasa in Üsküdar

Location: The madrasa is part of the founder's complex in Üsküdar district on the Asian side of Istanbul. The complex is built on a roughly rectangular plot that is aligned east-west with the Bosporus shoreline. It was built to the east of the founder's shore palace and was surrounded by exquisite gardens that extended all the way up to the hills behind it [30]. However, major urban changes that began in the late 19th century have radically transformed the complex's original urban setting. The complex forms today the western boundary of Üsküdar square. The heavily used vehicle coastal route, opened in the 1980s, separates it from the urban fabric to the south. By the late nineteenth century, the patron's palace on the western side was in ruins, and its site is now occupied by commercial constructions [33]. The environment was further damaged in 2017 when the coastline of Üsküdar square expanded over piling at the complex's north-eastern corner, violating its most distinguishing feature as a seashore complex (Figure 10).

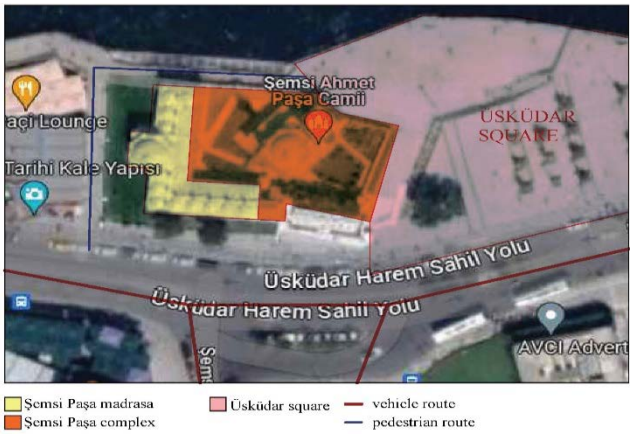

Figure 10. The urban setting of Şemsi Ahmed Paşa Madrasa

History: The complex was established by Şemsi Ahmed Paşa in 1580 who was a vizier and one of Sultan Murad III's favourite royal associates. It is the smallest complex designed by the chief architect Sinan and is considered one of his remarkable works as an "example of his skill in organically blending architecture with the natural landscape" [30]. The complex includes a mosque, the founder's mausoleum, and a madrasa that served as a hadith college. According to the inscription above the mosque's portal, it was completed in 1580-1581, while the first madrasa's teacher was appointed in 1572-1573 [33]. The complex was quite dilapidated by the early 20th century. The madrasa itself was out of function and its rooms were inhabited by refugees [33]. The General Directorate of Religious Endowments undertook extensive repair work in the early 1940s, which was overseen by architect Süreyya Yücel [34] (Figure 11). Despite efforts to restore the buildings in accordance with their historical characteristics, the works carried out were distant from modern restoration principles. The painted decorations and inscriptions of the mosque, for example, were significantly altered, and cement was extensively used in the madrasa [30]. In 1953, the madrasa was converted into a library, with the portico closed with glass walls and the classroom used as a reading hall [34]. Within the scope of the recent repair works in the complex, which took place in the 2010s, the madrasa was renovated with the continuation of its function as a public library.

Figure 11. A general view of the madrasa during restoration in the 1940s
Ali Saim Ülgen Collection, Salt Research.
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Architecture: The small size of the complex's plot and the location's constraints hindered the axial layout of buildings that is typical of Classical Ottoman complexes. The complex has two entrances: one along the seawall that leads into the main courtyard shared by the mosque and the madrasa, and another to the east along the cemetery wall.

The square, single-domed mosque abuts the coast at an angle, with the appending mausoleum projecting towards the waterfront. The L-shaped madrasa runs along the western and southern sides, with a sea wall on the northern side pierced with grill-windows. A small cemetery occupies the eastern side, behind the mosque (Figure 12).

Figure 12. A general view of the complex in the 1940s
Ali Saim Ülgen Collection, Salt Research.
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The madrasa consists of twelve student rooms and a large classroom. All the rooms are fronted by a portico with a shed roof and ogee arches resting on marble columns with lozenge capitals (Figure 13). The student rooms have a square plan and are covered by domes supported by pendentives. Every room features two windows, a fireplace, and one or two wall niches. The classroom is located in the midst of the western wing extending beyond the madrasa wall. It is topped with a dome carried on an octagonal drum, the windows of which alternate with four exedras. The classroom's walls have 13 windows, as well as a mihrab and two wall niches on the western wall. Finally, the restrooms are located in a vaulted cell attached to the southern wing's end.

Figure 13. A general view of the madrasa's courtyard and portico, 2021

The walls of the madrasa are built in an alternating pattern with one row of dressed stones and three rows of bricks, while the portico and seaside rooms are made with ashlar masonry to match the mosque and mausoleum on the waterfront facade. In addition, limestone was utilized for the jambs, lintels and sills of the openings. The portico features two pairs of green and pink porphyry columns aligned with the classroom's entrance. The entrance is surmounted by a depressed arch made of joggled puddingstone and limestone. The domes are constructed of brick and covered with lead.

Adaptive Reuse: The madrasa's portico was encased by glass walls and supplied with an entrance right across the classroom as part of the adaptive reuse (Figure 14). The madrasa has been spatially separated from its courtyard and used entirely as a closed facility as a result of this alteration. The classroom serves as the primary reading hall, with additional reading areas located along the portico on both sides of the entry (Figure 15). Seven student rooms have been used for book shelves. Some walls were eliminated between adjacent rooms to allow for easier access (Figure 16). The remaining rooms are used for administration, storage, and a kitchenette. The restrooms have retained their original use and are accessed outdoors via the open courtyard.

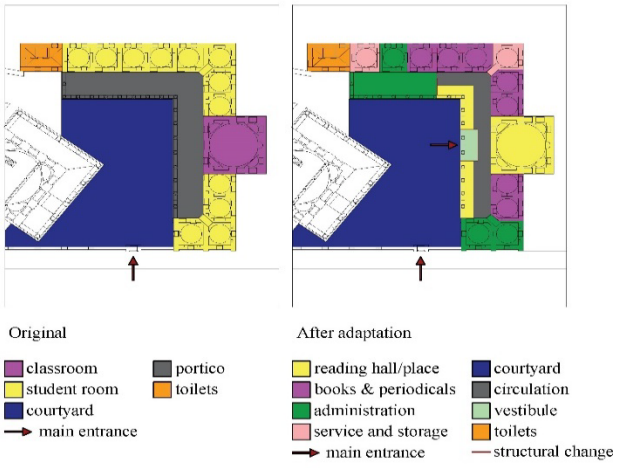

Figure 14. The functional program of the building

Figure 15. A general view of the portico, 2021

Figure 16. A general view of the students' rooms, 2021

Although materials close to the originals were used in the historic building's restoration, the execution and finishing techniques demonstrate poor workmanship. On the other hand, many original elements, such as wooden doors, wooden windows, and stained glass windows, have been replaced with poor imitations (Figure 17). The external characteristics of the building are better conserved and devoid of incompatible contemporary fittings as compared to Mihrimah Sultan Madrasa. Unfortunately, this does not apply to interior.

Figure 17. A general view of the classroom showing the replaced architectural features, 2021

3.3. Kılıç Ali Paşa Madrasa in Tophane

Location: The complex of Kılıç Ali Paşa is located in Tophane quarter on the European side of Istanbul. The location was significant since it was close to the Tophane Pier along the Bosporus and across from the Ottoman canon foundry on a hilltop behind it. However, little of the urban fabric that previously encircled the complex has survived. Because of building along the shoreline, the site is now positioned further inland.

When the avenue between Tophane and Beşiktaş was enlarged in the 1950s, the north wall of the mosque courtyard had to be moved back, and many endowed shops were demolished and replaced by high-rise commercial structures (Figure 18).

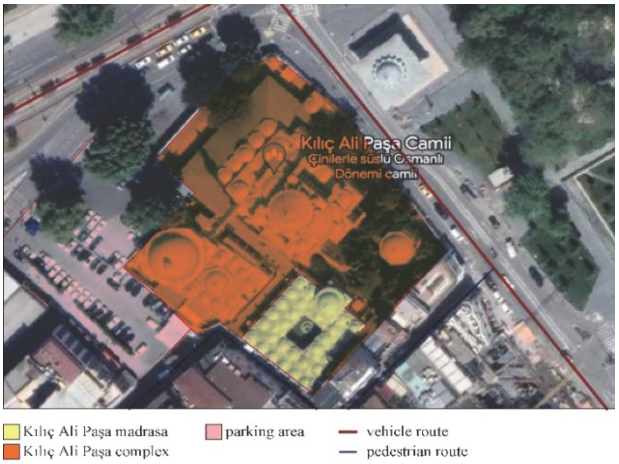

Figure 18. The urban setting of Kılıç Ali Paşa Madrasa

History: The complex was established by Kılıç Ali Paşa, the grand admiral of the Ottoman Navy, and completed in 1581 according to inscriptions. It comprises a mosque, a madrasa, a public bath, a public fountain and a cemetery that includes the founder's tomb. Architect Sinan's autobiographies mention the complex but not the madrasa. However, historians assume that the madrasa was designed by Sinan and completed after his death because its first teacher was appointed in 1588 [35]. The complex is particularly notable for the unconventional longitudinal plan of its mosque, which is considered a reinterpretation of the historical prototype of Hagia Sophia [30]. In the early twentieth century, the madrasa was dilapidated, and it was recommended that it be repaired and utilized for a new purpose as the neighbouring area became a business district [36]. As a result, the structure was repaired and operated as a dispensary in 1972 [36]. The restoration works included the use of new materials as well as the modification of certain original construction details [35]. To accommodate the new use, the portico was closed off with glass walls, some of the student rooms were united by demolishing the dividing walls, and wooden partitions were installed within the classroom [35]. The building was comprehensive restored in 2011, and it was reopened in 2017 as a cultural and community centre administered by a local association.

Architecture: The madrasa is a free-standing edifice in the complex's southern corner. The entrance is located in the north-western wing and is reached by several steps down. The classroom, seventeenth student rooms, and vestibule are positioned symmetrically along the four sides of a rectangular courtyard with an octagonal water pool in the centre (Figure 19).

The classroom is located in the midst of the north-eastern wing, projecting towards the complex's cemetery. It has a square plan and is topped by a dome supported by eight arches with squinches as transition elements. The classroom walls have seven lower and five upper windows, as well as a mihrab and three wall niches. The student rooms are also square in plan, with domes sitting on pendentives covering them. Each room has a fireplace and wall niches, as well as lower and upper windows. All of the spaces are preceded by a portico, which has a domed roof supported by ogee arches resting on marble columns with lozenge capitals. Some of the portico's bay had to be narrower in order to correspond to the axial and symmetrical design. Domical vaults rather than domes cover these bays. The walls of the madrasa are built in an alternating pattern with one row of dressed stones and three rows of brick, while the domes are made of brick and covered with lead. Marble and limestone were utilized for the jambs, lintels and sills of the openings.

Figure 19. A general view of the courtyard, 2021

Adaptive Reuse: The building's present program includes multiple ateliers for traditional crafts in addition to administration spaces (Figure 20). The classroom serves as a meeting room (Figure 21), and eight student rooms are set aside for the various ateliers, three for administration, three for storage, and three for services.

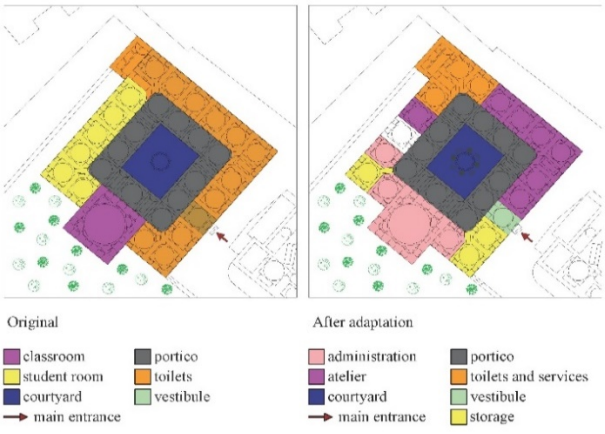

Figure 20. The functional program of the building

Figure 21. A general view of the classroom, 2021

The restrooms in the southeast corner of the building were refurbished and preserved their original function. The courtyard and porticoes were maintained open, unlike the Mihrimah Sultan and Şemsi Paşa madrasas. The courtyard, however, is no longer accessible because its paved surface has been covered with a lawn.

Figure 22. A general view of external walls showing the poor quality repairs, 2021

Today, the building's circulation is confined to the porticoes, which are occasionally utilized for exhibits and ceremonies. The new function of the building has not necessitated permanent structural changes, and the original features have been significantly preserved; however, the overall preservation condition of the building is critical due to poor quality repairs and restoration works (Figure 22), a lack of maintenance (Figure 23), and incompatible fittings (Figure 24).

Figure 23. The lack of maintenance inside the building, 2021

Figure 24. A general view of one student room showing the incompatible fittings, 2021

4. Discussion

The investigation of three examples of adaptively reused monumental madrasas in Istanbul revealed that the new uses were, in theory, consistent with the spatial quality and cultural significance of the buildings. However, the extensive functional programs, the excessive renovation, and the poor quality of preserving interventions to the original fabric have all dramatically impacted the authenticity and integrity of the buildings and failed to add a modern layer that enhances their values. When it comes to renovations and modern fittings, there is a complete lack of the notion of reversibility. A second observation was that certain consideration was placed on preserving the external features of the buildings, albeit with some negative interventions, while the inside was extensively transformed.

By doing so, the emphasis is solely on conceiving and appreciating the appearance of the historical building from the outside, without providing any interesting experience for the users where they can feel welcomed and relaxed while admiring the beauty of the building. This was especially noticeable in Mihrimah Sultan madrasa, where the contrast between the outer traditional appearance of the building and the renovated interior is striking, and in Şemsi Paşa madrasa, where, despite its unique location on the seashore failed to provide an enjoying reading space because it was completely enclosed inwards, separated from the surrounding and not benefiting from the courtyard's high potential. Another observation made in the three cases is the drastic changes in the urban environment of the madrasas, which produces problems that extend beyond the actual adaptive reuse. Opening highways, clearing structures for open spaces, and constructing incompatible structures all place extra strain on historic buildings and ensembles, shattering long-established meaningful, and symbolic landscapes. Finally, a lack of periodic maintenance was seen in all of the investigated cases. This implies the absence of management plans for these heritage buildings, which play an important role in looking after them, sustaining their quality and performance, and enhancing their values.

5. Conclusion

Adaptive reuse aims at utilizing a heritage building while honoring its cultural values and significance. Every alteration should take into account the building's formal and typological qualities, the original fabric, context, history, and changes, and should be justified by a value assessment. As a result, adaptive reuse becomes a tool for re-appreciating, presenting, and enhancing the cultural value of the building rather than compromising it to meet new purposes.

A major reason for the complexity of the adaptive reuse of heritage buildings is the multifaceted changes that have occurred in society, culture, and the economy over the past few decades, as well as the contemporary understanding of architectural heritage's importance and role. While the field of adaptive reuse has undergone much research in Turkey, there are still no clear guidelines for monitoring projects. The result is that many projects fail to succeed due to inadequacy to local needs or due to buildings' lack of compliance with the new functions inflicting irreparable damage to the valuable buildings. On the other hand, due to the lack of a clear system for assessing completed projects, each project is a fresh experience that is executed neglecting the strengths and shortcomings of prior ones.

Therefore, it is necessary that assessment models be developed and integrated into strategic and management plans. Such models are critical for informing legislation and policymaking as well as guiding future adaptation projects.

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