

Original Research Article

Cultural Changes Affected by Modernity on the Architectural Content of Iranian and Japanese School*Parisa Khayam Nekoui¹, Bahram Shahedi^{2**}, Kazem Yazdi³

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Abstract

Problem statement: Education and educational spaces have been one of the basic pillars of the formation, development, and transfer of cultural components in every period. The school as a space has undergone fundamental changes during different periods and under the influence of various factors. However, with this progress and technology, cultural values and concepts rooted in architecture are faint in contemporaneous Iranian architecture.

Research objectives: This research examines the modernity in the architecture of Iranian and Japanese schools; it examines the architectural developments and related cultural content in Iran and Japan during different periods. The reason for choosing these two countries was their rich background in traditional architecture.

Research method: the research is qualitative and comparative (a lens comparative study). It used the library research method to collect data by referring to previous books and studies in different periods. Finally, it described and analyzed the concepts and principles of space created in the architecture of these schools.

Conclusion: The reviews show discontinuity in the cultural sequence at the beginning of modernity in the countries, which has caused the deprivation of native culture among newly arrived cultures. Japan, after a period, has re-examined various factors and tried to use the native culture in the new era proportionately to the culture of the society; this path has led to the formation of its living culture. However, this process in Iran has not taken the right path and has caused a failure to transfer the rich culture to the new era. Finally, it is necessary to examine the chief characteristics of each period and transfer cultural characteristics in a new form to maintain the cultural sequence.

Keywords: *Iran, Japan, Physical structure, Modernity, Cultural concepts.*

Introduction

In the 19th century, progress in industry, science,

and technology and the growth of urbanization in the West caused fundamental changes in social organization and culture worldwide. Education has

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played a fundamental role in this transformation. The school was the only educational base that was built on a large scale and grew with general and specialized activities (Connell, 1980,4). Besides this progress and technology, the story of Iranian architecture today is the story of the dimming of cultural and civilizational values reserved in a deep-rooted and dynamic architecture. An architecture that is exposed to serious risks and ruptures and a sudden distance from self-control, identification, and originality in the age of modernization of the human civilization and the period of unimaginable expansion of communication and unbridled globalization of areas of thought and civilization. Meanwhile, the study of cultures that, despite the rises and falls of their history and civilization, have a sign of stability on their faces can be very instructive. A successful example of preserving local and traditional culture and their adaption to technological developments and transformations of social and historical manifestations is perhaps Japan (Shayan & Ghaderipour, 2002, 16). Although Japan compared to Iran has differences in terms of geographical dimension, religion, and traditions, but some cultural similarities, such as the close connection with some mystical concepts, made us determined to choose Japan as a model in this study. Therefore, relying on the achievements of the written literature of contemporary Iranian architecture in different periods, comparing them with the achievements of Japan, and using the experiences of this country for the needs of the Iranian society, this research seeks to find a way out of the cultural crisis in contemporary Iranian architecture. Since it is necessary to select the countries under study carefully and for logical reasons to review comprehensively contemporary architecture, the criterion for choosing these countries as a study case has been their major similarity in issues affecting architecture. Because both countries, while enjoying ancient history, have been under the influence of religion to varying degrees. The reason for choosing this interval in the research was the impact of

foreign forces on these countries. Some studies done on Iranian and Japanese schools have studied their structure. This research tries to find an answer to its question about the effects of modern architecture on the general structure of schools. The questions of this research: what has been the impact of modern architecture on the overall structure of Iranian and Japanese schools? How a culture should find a new translation to preserve the cultural continuity in each era according to its technical progress? This research analyzes the transformations resulting from modernity in the architecture of Iranian and Japanese schools to examine the cultural content related to it in Iran and Japan during different periods.

Nowadays, education is one of the main and most important subjects of precious experiences for the education and training of Iran's future generation. We usually believe that education in schools should be in harmony with global developments (Tabaian, 2021, 128). The changes in human life have affected social bases, including education so educational environments will also transform. One of the important educational spaces is schools that have experienced transformation during different periods (Alaghmand, Salehi & Mozaffar, 2017, 6). Therefore, the study of these developments and their causes is of great importance. A review of the research about schools shows that the researchers have paid less attention to the changes in the architecture and the schools in other countries, as well as their adaptation to our country, Iran. Thus, it is necessary to investigate these changes and their causes in terms of the quality of these spaces.

Research Background

We refer in the following to some research on the subject. Some studies have focused on the development and historical process of schools. Sami'i Azar (1997) in the History of School Developments in Iran examined the history of schools in Iran and analyzed the physical changes of schools in four parts before Islam, the Islamic period, the Safavid period, and the contemporary

era (the emergence of new schools), through the Cultural developments and educational system. Saeedi Kia (2018) also investigated in his research the evolution of Iranian schools from long ago until now. Sultanzadeh (1985) also reviewed the history of Iran's schools. Other ones have presented some studies on the architecture of Iranian schools that have examined a specific topic and approach such as special periods, typology, etc. Some (Hooshyari, Pournaderi & Fereshteh Nejad, 2013) have studied the typology of mosque schools in Iran during the Qajar period; they have considered the quality of the relationship between the educational and prayer environment. In their research, Mahdavejad, Ghasempour Abadi & Mohammadlouye Shabeastari (2013) investigated the mosques-schools of the Qajar period. Regarding the impact of the educational system on schools, Alaghmand et al. (2017) evaluated the conformity between the content of the educational system and the body of Iranian schools in different periods. Khodabakhshi, Foroutan & Samiei (2014) investigated in their research the evolution of the architectural space of schools based on the prevalent educational system. Another research (Divandari, Barakati & Dashti-Joshaghan, 2018) compared the evolution of the spatial structure of Qajar and Pahlavi schools based on educational values and expressed the effects of changing the educational system in schools of different eras. Another group of researchers has examined and compared the decorations of schools in certain historical periods (Bamanian, Momeni & Soltanzade, 2012). Some of them have evaluated the position of the school and the city, like Motedayen and Ahangari (2017) who investigated the sociability of schools in the three Timurid, Safavid, and Qajar periods. Some researchers have investigated Japanese school architecture for example, Manan Raisi (2019) in research regarding the privileged position of Japan in terms of quality and the mutual influence of the body and the content of education. Jowdat (1996) also researched Japanese architecture. He has examined the new and old architecture

of Japan and has mentioned the space and place in Japanese precious architecture and prominent architects such as Tange who are very skilled in space creation. Amirkhani, Ranjbar & Pourjafar (2008) in their research discussed the customs and traditions of Japan in creating architectural space. He concludes that because of the existence of non-physical concepts of contemporary architecture, ancient Japanese architecture has crystallized the physical concepts of architecture in their works with more flexibility. In a review of past research regarding the comparative study of the architecture of Iran and Japan, Nematipour, Dehghan & Poshti (2017) conducted a comparative study on the cultural roots of art and architecture in the architecture of houses in Iran and Japan. Esmaili, Dezhdar & Zebarjedian (2019) also researched the comparative study of contemporary architectural developments in three countries, including Iran and Japan. However, according to the studies that have analyzed the works of contemporary architecture in Japan, there is no comprehensive research on the cultural-ritual traditions of Japan through modernism. Among the conducted studies, we need research that examines the impact of modern thinking on the physical structure of schools during the important era of global transformation (modernity), research on the cultural discontinuity resulting from modernity in the body of Iranian schools, considering the impact of modernity on other countries. Thus, the current research has investigated and analyzed the process of changes in the body of Iranian and Japanese schools from the pre-modern era to the after.

Research Method

The current study was qualitative and comparative research, using a lens of comparative study based on Keri Walk's point of view. After determining the reference framework, we analyzed theoretical information based on past research. We gathered data based on theoretical information by referring to library studies of various sources, such as resources available in libraries, articles published in magazines,

valid sources, and so on. We examine the course of evolution in three periods: before the emergence of modernism, during the emergence of modernism, and after to evaluate the course of cultural developments affected by modernity. In a more detailed look at the method of lens comparison, the researchers have faced a comparison in which the impact of modernity on Japanese architecture is a lens to critically evaluate the impact of modernity on Iranian architecture as the focal point. Therefore, first, we presented the reference framework of the research, in which the desired concepts in the research are grouped as tables using the available reliable sources. We first compared and determined the desired indicators and compared the samples, and after the analysis of the selected items, we presented the common and different aspects in the findings section. Therefore, we examined the concepts and roots of culture, art, and architecture in Iran and Japan, as well as the context and reasons for the comparison of the two components examined in the research. The reasons that allowed the researcher to choose these items for comparison are based on the reference framework. Then comes the description of the impact of modernity on the architecture of these two countries, the evolution of schools and their structural trends in different periods, and finally, the comparison and review according to the selected case examples belonging to each period and the desired indicators for comparison. It is noteworthy that the researchers compared the investigated cases with a point-by-point structure and noted the differences.

Therefore, indicators and features in the architecture of schools in Japan have been a tool to help researchers discover and investigate indicators and features in the architecture of Iranian schools after modernity. Fig. 1 presents the research process.

Iranian and Japanese culture, art, and architecture

The national culture shows human priorities in achieving material and spiritual goals. Culture differentiates societies from each other and creates a sense of identity and solidarity among the people of a society. Culture differentiates societies from each other and creates a sense of identity (Nematipour, Dehghan & Poshti, 2017, 2). Contemporary Iranian architecture has been formed in a context that has been continuously under the influence of the currents of modernity, industrialization, and globalization. Achieving architecture with a thematic identity in such a situation is very important (Esmaeili et al., 2019, 13). If we categorized and examined the studies conducted on Iranian and Japanese architecture and culture, we can extract from them the characteristics that include the artistic and architectural roots in Iran and Japan. The studies imply the fact that there are common principles in the architecture of the countries under study, each of which has played an essential role to varying degrees in the formation of content, space, and body (ibid., 2019, 15). Table 1 categorized and presented these common principles.

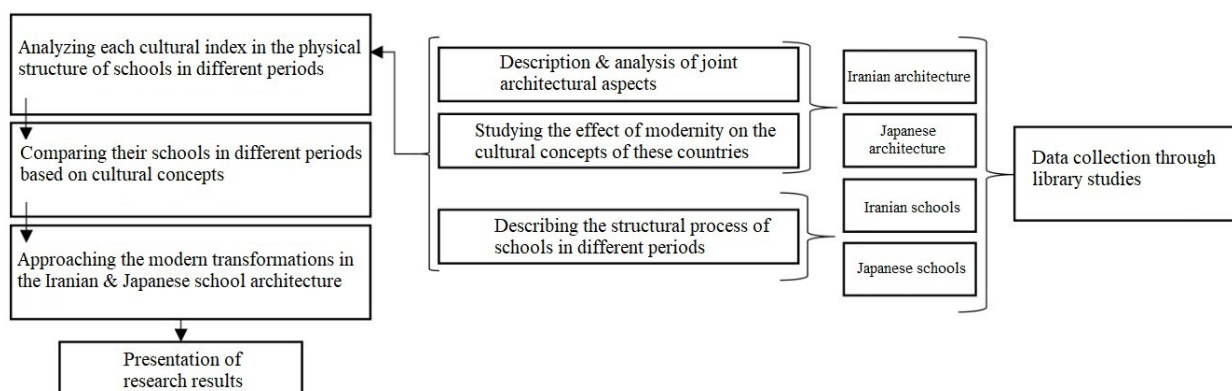


Fig. 1. Research process in this article. Source: Authors.

Table 1. Common cultural, artistic, and architectural principles in Iran and Japan. Source: Esmaili et al., 2019.

Principle	Explanation
Ritual thoughts	Architecture is a process that directly depends on religious thoughts and religion. As studies show, religion and ritual thoughts have always played a role as the most important factor in the body and content of architectural works.
Naturalism	Naturalism has long influenced physically and contently architecture not only in Iran but also in other countries. Nature is specifically important in architecture as a determinant of climatic conditions and the first and most important source of building materials.
Geometry	Data has been ingested to organize the shapes and bodies of the space as well as to regulate the movement of structural forces in the building. Geometry is a tool for creating space and body and manifesting concepts.
Simplicity	A unity that removes everything meaningless. Simple means being pure and not trivial. Simplicity in the body of architecture can be a tool to convey concepts more easily.
Hierarchy	It establishes a systematic relationship between the system components that make up a whole. Hierarchy is a principle governing the universe. The role of hierarchy in architecture is observable both conceptually under the influence of ritual and cultural thoughts and physically under the influence of climate on architecture.
Climate	Along with other environmental factors, the weather is the most important factor in the development and continuity of architecture. The mutual relationships between building and environmental conditions are examinable from different aspects.
Flexibility	It refers to the building's reaction to changes, which is a stability factor in architecture, and has always attracted attention in traditional architecture.
Space	A historical study of the architecture of different nations in different periods shows that the factor of fundamental changes in architecture was the transformation of spatial organization methods.
Decorations	As an important factor in the splendor and beauty of the building, it has always been important throughout the history of architecture and has progressed in every era with the facilities of that time.
Materials	There has always been a historical link between building materials and architecture. Native materials have been the fundamental elements of identity in architecture, which have always been of use in architecture under the technology of the time.
Cost reduction	Cost reduction has been a fundamental principle in traditional architecture and has been achievable through organic materials and climate-compatible architecture.

According to the studies on the artistic and architectural principles of the two countries of Iran and Japan, the researchers have reached a general framework about the artistic and architectural roots of these two countries. [Table 2](#) included these characteristics regarding previous studies in the framework of seven general titles.

Modernity in Japanese Architecture

Modern Japan was raised by opening its doors more and more towards the West and from the mutual and continuous influence of East and West. At the end of the 19th century, the government of Emperor Meiji (1912-1868) ended almost two centuries of isolation from the empire. Thus, the Japanese had conditions to study the cultural and political structures of Europe and North America. Engineers and scientists, including construction experts and architects, entered the country to speed up its economic and technical development. By receiving government decrees,

they established public buildings and modernized the education of architects. Simultaneously, Japanese architects traveled abroad to work and study in leading offices in Paris, Berlin, and Vienna. Between 1910 and 1920, a young generation of architects created the Japanese architectural style and finally ended the period of historicist construction ([Nikfetrat & Eshghi Sanati, 2021, 36](#)). Therefore, since the 1920s, modernist architects were seeking models that provide better practical solutions. They left behind the three major forms of traditional Western architecture, the commemorative or sacred aspect, domination over nature, and the role of decorations as additional practice. Traditional Japanese architecture praised three things: its human scale, harmony with nature, especially light and water, as seen in Japanese gardens, and minimalism or the lack of additional decorations ([Hoghoughinia & Torabi, 2021, 73](#)).

However, around 1930, Japan turned its back to the

Table 2. Examining the cultural, artistic, and architectural origins in Iran and Japan. Source: Authors.

Iran	Japan	Reference
<ul style="list-style-type: none"> • Unity in multiplicity, complexity in hidden combined capabilities, and return to centrality. <ul style="list-style-type: none"> • Symmetricality. • Calculated repetition of columns and spaces in the hierarchy. • Well-known system of adjusting the dimensions and proportions in the building: the traditional measurement of “module” <ul style="list-style-type: none"> • Simplicity and purity in geometry and receiving meanings with the movement of the human body and eyes • Emphasis on the skyline by using more horizontal than vertical lines in the building’s facade as a sign of balanced architecture • Paying attention to human proportions 	<ul style="list-style-type: none"> • Spatial order and spaces with different degrees and hierarchies for reaching the central symbol of divinity. <ul style="list-style-type: none"> • Creation of asymmetry and organic growth of architecture in nature and the fluid penetration of nature in the interior space • Well-known system of adjusting the dimensions and proportions in the building: the traditional measurement of “Shako” and “Ken”. • Geometric Simplicity and purity: buildings are square, rectangular, and sometimes hexagonal and octagonal. <ul style="list-style-type: none"> • Emphasis on the skyline by using more horizontal than vertical lines in the building’s facade as a sign of balanced architecture • Paying attention to human proportions 	<ul style="list-style-type: none"> - Diba, 1999, 100 - Shayan & Ghaderipour, 2002, 17. -(Shayan & Ghaderipour, 2002, 17)
The principle of geometry and simplicity: the importance of geometry and spatial regularity in different dimensions		
<ul style="list-style-type: none"> • Presence of nature comprehensively and in a hierarchical process in semi-open and semi-closed spaces • Placement of plants, water, air, soil, and light according to a specific order • Water as a symbol of cleanliness and purity and as a fountain, inside the pond and the font • Respect for nature, harmony with nature, and optimal use of native materials for construction 	<ul style="list-style-type: none"> • Architecture, a mass in the middle of the solitude of nature as a part of it, creating a view from all directions towards the manifestations of nature <ul style="list-style-type: none"> • Placement of plants, water, air, soil, and light according to a specific order • Water as a symbol of cleanliness and purity and as passing through the descent and into the font • Respect for nature, harmony with nature, and optimal use of native materials for construction 	<ul style="list-style-type: none"> - Diba, 1999, 100 - Shayan & Ghaderipour, 2002, 71 -(Shayan & Ghaderipour, 2002, 71)
The principle of naturalism, materials, and cost reduction: the presence of various elements of nature in the space		
<ul style="list-style-type: none"> • Creating a space for solitude and thinking • Yard as the main essence of space and surrounding matter 	<ul style="list-style-type: none"> • Creating a space for solitude and thinking • Simplicity and belief in the principle of stillness and peace 	<ul style="list-style-type: none"> - Mirmiran, 1995, 71 - Etezadi, 2000, 58
The principle of Ritual thoughts and space: Belief in silence and solitude in space		
<ul style="list-style-type: none"> • A system of order and sequence in placing spaces and functions and the occurrence of activities, views, and movements • Importance of privacy and creating spaces with different moods and functions 	<ul style="list-style-type: none"> • A system of order and sequence in placing spaces and functions and the occurrence of activities, views, and movements • Importance of privacy and creating spaces with different moods and functions 	<ul style="list-style-type: none"> -Shayan & Ghaderipour, 2002, 24
The principle of hierarchy and ritual thoughts: the existence of hierarchy because of the importance of the spatial function		
<ul style="list-style-type: none"> • Presence of the intermediate space of the porch • Existence of light and shade and their control in creating transparency <ul style="list-style-type: none"> • Windows and grilles • Presence of mesh shelters for the transparency of the body facade 	<ul style="list-style-type: none"> • Fences and gates, an emphasis on the fluidity of the place and the interaction between outside and inside • Japanese wooden light structures with sliding surfaces 	<ul style="list-style-type: none"> -(Shayan & Ghaderipour, 2002, 24)
The principle of geometry and space: the presence of spatial transparency and continuity according to the importance of spatial performance		
<ul style="list-style-type: none"> • Versatility and concept of multifunctional space • Yard as adjusting all the required changes in different scales 	<ul style="list-style-type: none"> • Versatility and concept of multifunctional space • Lack of limits for space and using sliding doors 	<ul style="list-style-type: none"> -(Shayan & Ghaderipour, 2002, 24)
The principle of flexibility: flexibility and multi-functional space		
<ul style="list-style-type: none"> • Calligraphy, Islamic abstract art, inspired by ambiguities and metaphors • Use of forms and symbols in evoking architectural space 	<ul style="list-style-type: none"> • Use of forms and symbols in evoking architectural space 	<ul style="list-style-type: none"> -(Shayan & Ghaderipour, 2002, 24)
The principle of ritual thoughts and decorations: the existence of ambiguity and association in cultural and archetypical forms		

West again and was a completely closed country until World War II. The third reopening of Japan’s ports occurred in 1945 after the defeat in World War. Japan revised the imperial system-based constitution, and it became a democratic institution. Japan again accepted

various aspects of Western culture and was primarily under the influence of the United States. Although the Japanese initially adopted foreign social, cultural, and political systems exactly as they were, whether Chinese or Western, over time they changed these

systems to incorporate their Japanese traditions into them. In the 1930s, the Japanese recognized the possibility of a successful mediation between the two; they finally announced it as the goal of their architecture (NikFetrat & Eshghi Sanati, 2021, 7). Thus, World War II broke off the development of independent modern Japanese architecture. After 1945, under the influence of the United States, as the victorious power in the war, it took some time for Japanese architects to connect with the process that had already begun. This happened mostly thanks to Kunio Maekawa and Jonzo Sakura (both of whom had worked with Le Corbusier). They managed this discipline and combine traditional spatial concepts with modern architectural approaches (ibid, 2021, 36). Table 3 presents the course of developments caused by modernism in Japan.

Modernity in Iranian Architecture

The peak of Western developments and industrial revolutions is the beginning of the 19th century, the 13th century of Hijri, which coincides with the “Qajar” rule in Iran. We can divide the characteristics of Iran of that era into three basic “economic”, “social” and “political” parts. It is noteworthy that the formation of the centralized government of “Qajar” in 1786 is equal to a new period in world history, a period that began with the French Revolution of 1789 (Haghir & Kamelnia, 2021, 57). At the beginning of the 19th century, there were no new schools in Iran, and by the end of the 19th century, there were only twenty new schools plus one high school (ibid.).

Since the beginning of the 19th century, when Iranians got a relation with other societies, such as India, Caucasus, the Ottoman Empire, and Europe, they gradually realized that many of the changes and developments in the societies have not happened anymore in Iranian society (ibid.). Therefore, Iran underwent many political and social changes from the middle of the 19th century and after a successive internal and global transformation. The most profound and stable aspect of these developments has concerned cultural developments. It first affected the opinions of a certain layer and then the understanding of all people. A result of this procedure has been to move away from traditional examples and increased orientation towards the symbols and signs of Western culture, including adopting the new education structure (Sami' i Azar, 1997, 243).

Qajar architecture developed the principles, themes, and foundations of Iranian architecture and created courageous innovations in space. However, it could not create a new architecture. Therefore, Iranian art and culture did not move towards the realm of modern thought, rather, it made an involuntary movement in a historical path; it did not know that there was no divine sage in its new conversion place, and this was the beginning of an unhappy story (Bani Masoud, 2018, 75). Because of the great transformation in the new international structure and the new social system, Pahlavi I created new scientific-educational activities such as primary school, high school, art school, university, etc. along with the old activities such as old-style school and religious Islamic school. The

Table 3. Developments caused by modernism in Japan. Source: Esmaili et al., 2017, 4.

Period	Architects	Transformations
• Pre-modern • Reception of Western architecture	Reception of Wright and Gropius	• Establishment of the first architectural school in 1875 • Invitation of European architects for teaching at this school
Modern architecture 1960	Western architects	After the defeat in the World War, the need for reconstruction because of accepting the principles of modern production and consumption in the 1960s
	Japanese architects	Formation of the first traditionalist movements with the support of the government and the people
Post-modern architecture	Return of educated Japanese architects Presence of international architecture stars in Japan	Kishukuro Kawa founded the metabolism Activity in all fields of architecture

mentioned times, simultaneously with the development of industry in Europe and other countries, created a type of architecture called industrial architecture (Falamaki, 1992, 474). The related architecture was factories created and developed during the industrial revolution. The construction of these factories during the first Pahlavi period created a special architecture in the old context of the cities that we should consider as the beginning of Iran's industrial architecture (Kiani, 2004, 142). An effect of industrialization on the educational structure was a need for industrial-educational centers and the new educational centers called Industrial Academy for teaching industrial jobs in them (Kar Ahmadi, Kiani & Ghasemi Sichani, 2019, 8). Table 4 presents the course of developments caused by the Iranian modernism.

Japanese Schools

Before the Meiji Era, there were public schools in Japan (1868-1912), of course, apart from the private schools called Hanko. These feudal schools, which were run by clans, trained samurais (warriors), and Terakoya schools, which belonged to temples were dedicated to training farmers and merchants. In these schools, a teacher taught children of different ages, and the principal subjects of education were math, reading, and writing. Terakoya schools were one-room houses, but Hanko schools had a better organization to plan. There was a main hall and several small classrooms in these schools. The Shizutani Gakko School (built-in 1675)

shown in Fig 2 is one of the best examples of such a school (Murasawa, 1980, 156-97).

The advanced public school system with classes for different ages started in 1872 during the Meiji period (1868-1912). This system introduced compulsory education for children and placed children in different groups according to their age and abilities. Public schools got quickly established all over Japan (Yanagisawa, 2015, 41). In 1890, the central government proposed a strategy for the construction of elementary schools so that the schools become standardized. For example, the number of students in each class, the size of the classes, and the style and space of the lecture halls or ceremonies were set in this strategy. A few years later, a model of the school plan was approved in 1895, as Fig. 3 shows it. This model designed classrooms with 80 students in a space of 65 square meters, along the corridor so that enough natural light enters the classrooms with proper ventilation. Most public schools in this period benefited from this model and had common characteristics. The characteristics of these schools, such as classes placed along a hall or corridor, are still observable in many contemporary Japanese schools, and the school design strategies are still are also those of the Meiji era. One exception in the Meiji era schools is the separation of boys' and girls' classrooms (Ueno, Tanabe. & Yanagisawa, 1995, 136-141).

Few changes occurred in the design and planning of

Table 4. Developments caused by modernism in Iran. Source: Esmaili et al., 2017, 3.

Period		Architects	Transformations
Pre-modern (reception of Western architecture)	From 1921 to 1941	Non-Iranian architects	Establishing the first school of architecture in Iran in 1941. In this period, the architectural design for government buildings occurred by order of the first Pahlavi and often by non-Iranian architects, which was associated with a superficial interpretation of Iran's past architecture.
Modern	From 1941 to 1961	Return of educated Iranian architects	Implementation of the principles and foundations of modern architecture and orientation to the past architecture
Postmodern	From 1961 to 1978	Iranian architects	End of the modern era and the formation of the post-modern trend, attempting to create a deeper link with the past
	From 1978 to 1991	-----	From the Islamic revolution until the end of the imposed war, thirteen-year stagnation and lack of attention to architecture, a period of reconstruction and ignoring identity-oriented architecture.
	From 1991 until now	Iranian architects are mostly educated in the country	Formation of four major currents in Iranian architecture, the absence of non-Iranian architects in the country.



Fig. 2. Shizutai Gaku School. Source: <http://shizutani.jp>.

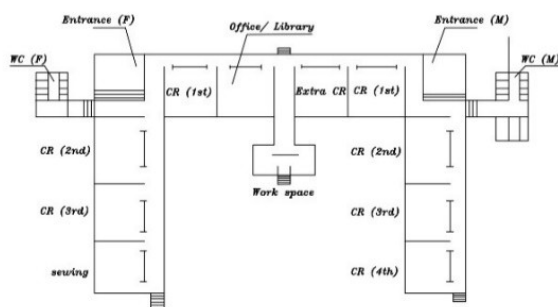


Fig. 3. School plan in 1985. Source: Walden, 2015, 42.

schools at the beginning of the 20th century. Recent issues such as science, art, library, and life skills training were also added in this period. The rooms and spaces were designed in harmony with these themes. After the Kanto earthquake in 1923, which destroyed many schools, the central government designed a new model of schools with reinforced concrete. Tokyo government rebuilt 117 schools using reinforced concrete structures. The Jiyu Gakuen school in Tokyo is one that had an excellent design before World War II. Frank Lloyd Wright designed and built the first building in 1921, as shown in the Fig 4. The secondary building was completed in 1934; Shin Endo designed it, who was a follower of Frank Lloyd Wright in Japan. Both buildings were single stories with a large area. Unfortunately, this unique school had no impact on other school designers in Japan (Naghdebishi & Rahmati, 2017, 40). Finally, open-plan schools with common spaces have

become popular since 1984. There are different open-plan schools in Japan. One type has a wide corridor. The width of its corridor is twice the usual width in normal schools. This space is useful for learning. One type of graded space has a common space that is openly connected to classes on different bases. The other has multi-class sharing with a large common space shared by over two educational levels. One unique example of these schools in the 1980s is Honochō elementary school (Fig. 5). It has both a multi-grade common space and a central courtyard that is usable for all grades as a common space (Naghdebishi & Rahmati, 2017, 40). However, some planners and architects of the time criticized open-plan schools, because many of these schools lack a sense of human scale and were special for private spaces. In contrast to open-plan schools and even traditional schools, they designed unique schools with independent buildings for classes and additional multi-purpose spaces that had pavilions and small roofs in this common space. They attempted to create smaller and more diverse spaces for individuals and groups. These ideas did not become mainstream in Japan, but they did influence some open-plan schools. Kashahara Elementary School (1982) is the best example of such a school (Fig. 6). This school had a design in the style of a traditional and rural Japanese school with classrooms that have tiled roofs. Each independent classroom has an entrance for easy access to the outside space. These schools



Fig. 4. Gakuen School. Source: <https://jiyu.jp>.

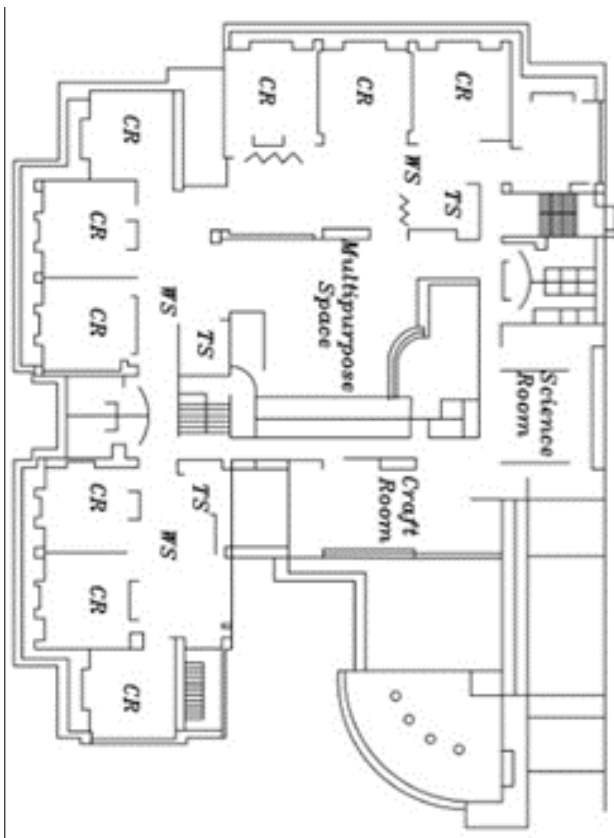


Fig. 5. Honko School, Kanagawa. Source: Naghdbishi & Rahmati, 2017



Fig. 6. Kasahara School. Source: www.fureai-cloud.jp/kasasho.

have unique design features for stimulating students, such as ceilings that have stars in the constellations, fences that have shapes like the abacus, and columns with engraved famous Japanese poems (Ueno et al., 1995, 154-159). Another unique example is Saljiugakni Primary and Middle School, built in 1993. The elementary school has independent classes, and each class has a building like a house (Naghdebishi & Rahmati, 2017, 41).

Nowadays, we can see unique schools in Japan. Notable examples are schools that have integrated the concept of open plans with small independent spaces. Utase Elementary School in 1996 fig 7 is a pattern of this type of school. This school has spaces with different shapes, such as an oval gymnasium, Zig Zag walls, and curved classrooms. Each class has a careful design to have a suitable scale for activities proportionate to each educational level. Small gazebos, wide stairs, attics, small yards, and other unique spaces have a design to stimulate children's mental and behavioral activities (Akamatsu, 1998, 53-59).

According to the indicators examined in Tables 1 & 2 about the common principles of culture, art, and architecture in Iran and Japan, Table 5 analyzes and presents the characteristics of the schools of each period with the cultural and architectural principles of Japanese schools to compare the characteristics of school architecture in different periods.

Iranian schools

The official history of schools in Iran began in 1068. When Khwaja-Nizam-ul-Molk, the great

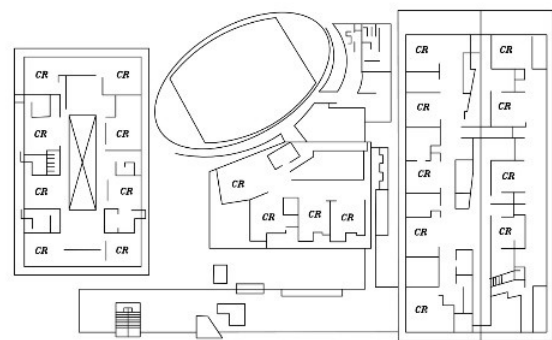
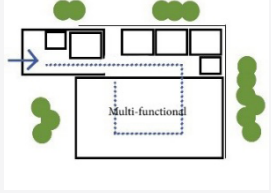
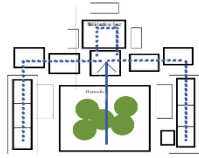
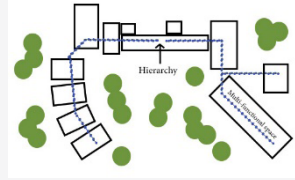
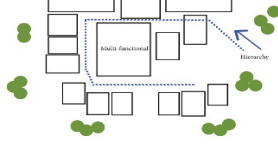



Fig. 7. Utase Elementary School, Shiba. Source: <https://c-and-a.co.jp/en/projects/utase-elementary-school>.

Table 5. Examining the architectural characteristics of Japanese schools in different periods. Source: Authors.

Year	Characteristics of schools	Case	Importance of geometry and spatial order	Presence of various elements of nature	Belief in silence and solitude	Hierarchy	Transparency and spatial continuity	Ambiguity and association of culture	Flexibility and multi-functionality
1670	<ul style="list-style-type: none"> - Oldest school in the world as a public school for ordinary people - Design based on native architecture - Having a hall and several small classes and a teacher for different ages 	Shizutai Gaku	*	*	-	*	*	*	*
									
1921	<ul style="list-style-type: none"> - A single-story building with a large area - Placement of classrooms along the corridors and light and ventilation in the classrooms - Coordinating the space with art, education, and science 	Jiyukagoen	*	*	-	-	-	-	*
									
1982	<ul style="list-style-type: none"> - Design based on Japanese traditional and rural architecture - Classes with independent entrances to the open space - Classrooms with tiled ceilings - Using symbols in design to stimulate students 	Kashahara	*	*	*	*	*	*	*
									
1984	<ul style="list-style-type: none"> - Open plan with common spaces and wide corridors for learning - A central courtyard connecting the common space with each base 	Hanko	*	*	*	*	*	*	*
									
1996	<ul style="list-style-type: none"> - Integration of open plans with common spaces and spaces with different shapes - Designing the class scale according to the type of activity of each level of education - Unique design to stimulate the student's mind - Combination of Japanese traditional and modern style 	Utahs	*	*	*	*	*	*	*
									

Seljuk vizier, established the great military school in Baghdad, the official schools began in the history of Iran (Hillenbrand, 2004, 216). We can mention the

school of Khargerd Khaf (485 A.H.) as an example of the schools of this period, which is the first and oldest large school with four porches (ibid.). The

four-veranda plan model, the provision of living space (rooms), and the simple and rectangular plan of these schools were the characteristics of these schools. The cells had sometimes one part, i.e. included the living space of the students and were of direct connection to the yard (Mohseni, 2018, 2). The Ilkhani period, in terms of the variety of educational centers, is one of the most fruitful periods in the history of Iran (Hatami, 2010, 8-9). One school of this period is the Imami School of Isfahan (741 AH). This school has four porches, whose south porch is connected to a dome (Fig. 8). Entering the school has the order of entrance, hall, and porch. The eastern and western porches of this school are connected to a space similar to three-part cells (small porch, cell, back room). The cells have two floors in this school (Hillenbrand, 2004, 286).

The Timurid era is the golden era of Iranian schools. Especially in the east of Iran, there are beautiful examples of Timurid schools. Ghiyathieh Khargerd School (848 AH) is one school built in this period (Memariyan & Pirnia, 2003, 251). The school Khargerd includes an entrance. The southern facade of the entrance comprises three parts: the middle portal, the set of arches on the sides of the portal, including three arches on each side, and towers in each of the corners of the building. The portal leads to the vestibule (portal, vestibule, and porch). The vestibule leads to two domes. The cells of the school are two-part (they include a porch in front of the cell). On the second floor, the porch

of the cells comes together through the portico that is in front of the cell (Mohseni, 2018, 74). The schools became more mature and complete during the Safavid era (Pirnia & Memariyan, 2013, 351). The Chaharbagh School of Isfahan (1126 AH), built at the end of the Safavid period, has experienced certain physical changes (Fig. 9). In this school, the prayer space is so important that the south porch of the school leads to a gigantic dome; in the east, it has the Shabestani dome too. Two minarets are also built next to the south porch. We can see on the west porch the clock tower (ibid.).

The Qajar period is the beginning of decisive developments in the architecture of Iranian schools. Although this period built valuable schools and the architecture of the schools had a special evolution in some aspects, this period built Dar al-Nun School and Alborz School outside the structure of traditional schools and created an irreparable break in the architecture of Iranian schools (ibid.). One of the spatial transformations during the Qajar period was the phenomenon of terraces in schools. The Qajar period first created terraces in Sayed Isfahan School (1240 AH) and changed the composition of the cells from “porch, cell, and back room” to “terrace, cell, and back room”. Another innovation that we can see in the construction of this school is the separation of prayer training space on two separate floors. These terraces seem to have the role of a yard for students on the second floor. Other additional measures in this school are



Fig. 8. Isfahan Imami School. Source: <https://gardeshgari724.com/attractions>.

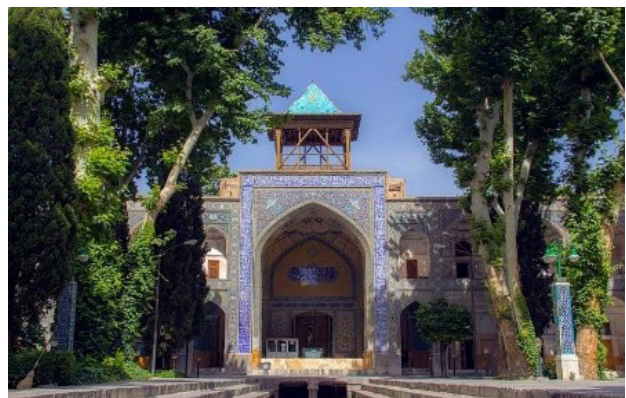


Fig.9. Chaharbagh School of Isfahan. Source: <https://safarzon.com/mag>.

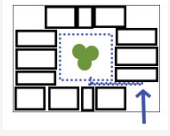
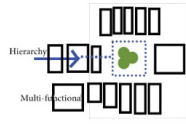
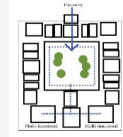

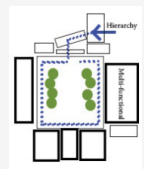
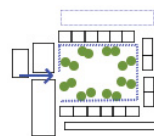
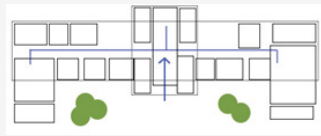
multiple entrances and its clock tower (Bamanian et al., 2012, 5).

During the time of Pahlavi I, the government was dominant over the entire country and implemented its plans well. One of its plans, which it carried out with haste and perseverance, was the establishment of new schools. Therefore, it destroyed or rebuilt many old schools and turned them into new schools. Many factors caused schools' architecture to take a different shape and form compared to traditional schools (Kar Ahmadi, Kiani & Ghasemi Sichani., 2019, 7). In fact, the building of schools with a traditional form was set aside at once and a new form of schools emerged using Western architecture. Therefore, this period presented a new description of the educational environment and its physical characteristics and the design of schools happened in a new way (Sami'i Azar, 1997, 150). The most important structural change that occurred in the history of Iran's schools is the replacement of the corridor with the central courtyard in Iran's modern schools. This transformation was the end of the traditional school form and the beginning of the design of schools in a new style. This transformation is the destruction of the meanings of the central courtyard and traditional hierarchy in the structure of school spaces (ibid., 1997, 109-110). We can say that the modern system of schools created a European imitation of the history of Dar al-Funun by removing the residential side (school cell) toward (school-corridor-class). At this period, the school is a foundation where the views of the relationship between teacher and student and the relationship between education and life, which existed in the previous schools, are no longer present in the new schools. The components of this school are classrooms, corridors, porches, and courtyards. The classrooms are diverse and increased, there is no longer a central courtyard, and the schools are built linearly with two side wings (Alaghmand

et al., 2017, 16). The facades of Dar al-Funun school have used signs and elements of Western architecture. Thus, the design and physical structure of the school is a combination of the Isfahani style and Western neoclassical style (Ghobadian, 2013, 70). The plan of the building is a one-story, quadrangular building; it has a total of 50 rooms with a width of 4 meters and an area of 16 square meters, and large balconies and many columns in front of them. On the north side, there was a wide area and several small and large rooms dedicated to the system and music (Bani Masoud, 2018, 118). In Alborz High School, as another example, the building plan is not similar to the plan of Iran's past schools. The plan is in the shape of an elongated rectangle, with two rectangular edges added at its two ends. The entrance part is in the middle of the building, which has a rectangular cubic volume out of the main body of the building. Its plan has a neoclassical design. Unlike the plan, all facades have a design Isfahani style. The entrance of the building is of beautiful formalities. The roof covering has a gable style and is installed on wooden trusses (Khodabakhshi et al., 2014, 69). As for the indicators examined in Tables 1 & 2 about the common principles of culture, art, and architecture in Iran and Japan, Table 6 has presented the characteristics of the schools of each period with the cultural and architectural principles of Iranian schools.

School is the students' second home and they should feel calm and safe in it. Its characteristics are unique for different ages. Therefore, the designer should meet while designing educational spaces, the general needs of the students of the same age (Tabaian, 2021, 128). As modernity dictates, global standards and modern norms should not lead to ignoring the influences and determinants of the cultures of different societies. Modernity itself dealt with modernism in every country based on its ancient culture and not as a final ideal by erasing the previous culture. We can say that modernity is everywhere consistent with

Table 6. Examining the architectural characteristics of Iranian schools in different periods. Source: Authors.

Year	Characteristics of schools	Case	Importance of geometry and spatial order	Presence of various elements of nature	Belief in silence and solitude	Hierarchy	Transparency and spatial continuity	Ambiguity and association of culture	Flexibility and multi-functionality
1092	<ul style="list-style-type: none"> - Collection building: school, bathroom, library, dormitory - Standardization in the physical model in architectural features - Pattern of four porches/porches with a simple and rectangular plan - Creating a living space (room) 	Khargerd Khaf	*	*	*	*	*	*	*
									
1340	<ul style="list-style-type: none"> - Four porches / connecting the south porch to the dome - Complying with the entrance hierarchy (head, hallway, small porch) - Hierarchy in the cells (small porch, cell, back room) 	Imami	*	*	*	*	*	*	*
									
1444	<ul style="list-style-type: none"> - Four porches / two-part and three-part cells - Compliance with geometry in the façade and hierarchy 	Ghayathieh Khargard	*	*	*	*	*	*	*
									
1714	<ul style="list-style-type: none"> - Four porches structure/building of an extroverted school - A green courtyard in the center and surrounding cells and porches - Functional elements such as cells, classrooms, libraries, mosques, etc - Hierarchy in placing spaces and in the bodies - Holding seminars on the porch and holding discussions on the small porches - Lecture circle and the possibility of discussion 	Madarshah (Chaharbagh)	*	*	*	*	*	*	*
									
1824	<ul style="list-style-type: none"> - Having multiple entrances - Creating moonlights/changing the order of cells to moonlight, cell, backroom - Separation of teaching and prayer space on two floors 	Seyyed mosque	*	*	*	*	*	*	*
									
1850	<ul style="list-style-type: none"> - End of traditional schools - The existence of uniform windows in the classrooms and the use of Western symbols in the facades - Uniform arrangement of tables in rows in classes - Removal of the residential section (school cell) - Creating a hierarchy (school-corridor-class) - A semi-traditional mode because of the presence of a yard 	Dar al-Fonun	*	*	-	*	-	-	-
									
1923	<ul style="list-style-type: none"> - Completely different from traditional schools and the removal of the porch and the central courtyard - Linear schools with two side wings / major components: class and corridor/creation of row classes 	Alborz	*	*	*	-	-	-	-
									

its past. It is a shell and an appearance of nature without identity (Haghir & Kamelnia, 2021, 172). By studying the evolution of architecture in Iran and comparing it with the evolution of architecture in Japan, and examining the effects and transformations caused by modernism in these two countries, we can examine the identity crisis in Japan and use its results to pave the way for Iranian architects. Our study aimed at identifying the influential reactions of the modern style in contemporary architecture and it showed that the reactions happened in almost the same way in the two countries. Fascination with modernism, defensiveness towards the expansion of modern style, postmodern trends, repetition of the past, the return of educated architects from the West, and the beginning of identity-seeking movements in two countries happened in a regular and meaningful way during the recent decades. However, the deficiency and failure of Iranian architects were unbalanced. Although the currents are in the same direction as the contemporary global architectural currents, the speed of synchronizing with the global currents has been slow. There has been a distance between theory and praxis in Iran. In Japan, this success in the practical and theoretical fields has been

harmonious, and this has given the identity of contemporary Japanese architecture a distinctive and unique shape (Esmaili et al., 2019). Finally, based on our investigations, Table 7 presents the roots and cultural patterns examined in the schools of the two countries of Iran and Japan in the pre-modern era and modern era.

Conclusion

According to the evidence from the schools of both countries at different times, this research shows an important point. The study of Iranian schools shows that the evolutionary course of the structural process in different periods unfortunately has suffered a break and failure in Iran. Since the cultural break and the removal of principles in the design of post-modern school spaces are against the general rules of modernity, then the architecture of contemporary educational spaces is not modern and only has a modern appearance, and their main nature is without identity and quality. Iran could not practically create new architecture according to its culture and tradition, and not only did it not take the right step towards modern thinking, but also distanced from its correct and cultural principles. In contrast, because of its rich native

Table 7. Examining the architectural characteristics of Iranian and Japanese schools in the pre-and postmodern era. Source: Authors.

Period	Importance of geometry and spatial order	Presence of various elements of nature	Belief in silence and solitude	Hierarchy	Transparency and spatial continuity	Ambiguity and association of culture	Flexibility and multi-functionality
Iran	Pre-modern	*	*	*	*	*	*
	Post-modern	*	*	-	*	-	-
Japan	Pre-modern	*	*	*	*	*	*
	Post-modern	*	*	*	*	*	*

and cultural background, Japanese architecture has examined modern ideas and has used them based on its culture and tradition. Maintaining relations with past architecture in modernity is one of the important pursued goals. The growth of Japanese school architecture in the post-modern era shows the Japanese architects' greater flexibility in the design process so that they have been able to crystallize some of the previous concepts of Japanese architecture in them.

As for the response to the questions of this research about the impact of modernity and modern architecture, we can see cultural discontinuity and instability at the beginning of modernity in countries. In the beginning, this causes alienation of native culture among imported cultures, cultural instability, and cultural pluralism. However, some countries like Japan after some time have re-examined various internal and external factors and tried to transfer native culture to the modern era innovatively and suitably. This process has created a living culture in a new era and caused positive development. Unfortunately, this process has not occurred properly in Iran and has caused failure in transferring rich culture to the new era. As for the research second question, we should examine the key characteristics of each period and transfer the cultural characteristics corresponding to a new period in a new form for maintaining the cultural sequence in each period. We hope that investigations and studies like ours will be the light of future designers to prevent the creation of such failures in future architecture and to change today's architecture in the wake of the native culture and under today's pace of progress.

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