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Original Research Article

Approaches to the Formation of Schools and Their Organizational Models Based on the Fundamental Transformation Document*

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Abstract

Problem statement: Many countries, including Iran, have developed educational transformation documents that significantly influence educational values and the nature of schools by introducing new content models. In countries such as Finland, Sweden, and Australia, schools are not confined to education but also serve an important social role, offering various resources and services to the surrounding community. However, in Iran, schools have not yet fully embraced this broader function. Research in this area remains limited, and there is no clear or comprehensive classification system for different school types. This research is trying to answer these questions; First question: How do the content models of the Fundamental Transformation Document influence the classification of schools, and what types of schools does it recommend?/ Second question: What are the prevalent geometric organizational models in schools, and what organizational models can the Fundamental Transformation Document recommend?

Research objective: This study aims to classify schools based on their focus on learning, services, activities, and auxiliary functions, and to determine the appropriate geometric organizational models for school types identified in the research.

Research method: This research is applied in terms of objectives and analytical-argumentative in terms of its methods. Data collection was conducted through library and documentary research. To ensure validity and reliability, an expert questionnaire was used. Initially, content models were extracted from educational documents and analyzed based on their focus on education, services, and auxiliary functions, leading to a classification of schools. Geometric organizational models were then set based on frequently occurring patterns of Grutter.

Conclusion: The study places schools into the following categories: park schools, nature-sport-health schools, scientific-research schools, social and cultural schools, and entrepreneurial schools. Social schools represent the broadest category. Eight common organizational patterns were identified. For social schools, a semi-dispersed and semi-free to semi-cohesive and semi-dense pattern is recommended and for other schools, a semi-dispersed and semi-free to scattered and free pattern is recommended.

Keywords: *School, Ecosystem social, Geometry, Design, Architecture.*

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Introduction

In the 21st century, with the rapid changes in society, the inefficiency of education in preparing future citizens has become more prominent. This inefficiency has led to transformations in education, resulting in the development of the concept of lifelong learning on one hand, and the introduction of new skills for life on the other, which are known as 21st-century skills. These skills are aimed at cultivating citizens who are flexible and adaptable to an uncertain future (Deppeler & Aikenz, 2020, 1). In lifelong learning, individuals, much like computers connected to central servers, constantly update themselves and acquire the necessary skills and knowledge (Nair, 2022). As a result, schools have become centers of eternal learning for citizens, from which students never truly graduate. These are the transformations the world is still in the early stages of. Therefore, many countries, including Iran, have adopted a fundamental education transformation document. However, the transformation in schools is not limited to the educational environment alone; it has turned schools from an education-focused system into a multi-faceted institution encompassing educational, cultural, social, and service roles that serve not only students but also the surrounding community, thus creating a social ecosystem (Zirnezam-e rahbourdi..., 2017, 11).

According to many scholars, the key point in designing new neighborhood models is the renewed emphasis on creating small local communities through design (Azizi, 2003; Aeinifar, 2007; Grant, 2006). This is the concept behind the idea of social schools. The transformation document and its subsets have introduced two sets of components: those related to education and learning, and those linked to the social ecosystem. In the non-educational components, the school is a central and crucial social hub, encompassing various dimensions in education, training, services, and needs. Addressing these needs can help establish or strengthen the social ecosystem and compensate for infrastructure shortages. However, every neighborhood has its specific weaknesses. In one area, risky behaviors or diseases may be more prevalent, while in another, cultural deficiencies might be more pronounced. Therefore, a single type of school cannot address the weaknesses and needs of all neighborhoods. This creates the necessity for different types of schools.

In the components related to education, students may have different interests or needs, which can also increase the diversity of schools. The main issue, therefore, is what types of schools are needed to respond to the different educational interests and neighborhood needs. Each of the components related to education and the social ecosystem in the transformation document can organize a specific type of school. However, another important issue arises here: the geometric organization of schools. This is the core issue. Categorizing schools gives each school a unique identity that results from integrating the functions of the social ecosystem into it, with a focus on learning methods. Thus, given the new dual nature of schools, there is a need for geometric models to optimize the organization of each type of school. This is a fundamental stage of school design and precedes the formation of physical school models. The organizational model defines the overall structure of the school. Therefore, at the outset, a distinction must be made between physical models, such as the "wall-less" model and other similar models, with organizational models. The primary goal of this research is to determine optimal models for the geometric organization of schools following the transformation document. However, to ensure its comprehensiveness, it is necessary to extract the different types of schools expected by the transformation document through the analysis of its various components, which is the preliminary phase of this research. Thus, the two concepts of school categorization and geometric organization are intricately and inseparably linked.

Research Question 1: How do the content models of the Transformation Document influence the categorization of schools, and what types of schools does it recommend?

Hypothesis: The content models of schools in the Transformation Document are divided into two categories: general components and components related to learning. The general components mainly encompass the services that schools can offer or the needs they can address in society, which contribute

to the formation of a social ecosystem. The learning-related components in the Transformation Document also influence the school's educational approach. Focusing on certain components and approaches can lead to the categorization of schools based on both the social ecosystem and the focus on learning. In this case, schools can be divided into six categories: Social School, Cultural School, Economic and Entrepreneurship School, School-Park, Research-Scientific School, and Nature-Sports-Health School. All schools are a function of Social Schools, with the Social School being the overarching categorization. Schools organize some of their services in line with their educational focus and the needs they address to support the social ecosystem. As a result, in this new perspective, schools can adopt a combined structure, meaning that in addition to educational environments, social, cultural, service-oriented, health, employment, technology, science, and research aspects can increase the utility of schools and help create a social ecosystem within the neighborhood.

Research Question 2: What are the common geometric organizational models in schools, and which organizational models based on the content models of the Transformation Document can be recommended for schools considering the categorization?

Hypothesis: The recurring organizational models of schools can be explored through Grutter (2004)'s eight aesthetic models. The recurring patterns of Grutter's categorization in contemporary schools, while rooted in the stylistic and aesthetic principles of their time, can provide a framework for organizing the multifaceted nature of schools. Based on this, the hypothesis for determining organizational models can be examined from two aspects. In the first aspect, the added functions of the social ecosystem create heterogeneity in the school's usage, which requires the expansion of the school's geometric fields to accommodate these added functions, resulting in a geometric heterogeneity corresponding to the heterogeneity functions. In the second aspect, in the categorization of schools based on the focus on learning, each learning approach has a unique usage coefficient derived from the percentage of its application. Therefore, some learning methods require more geometric spaces, resulting in a broader, more open, and less dense geometry, while others require a more cohesive and compact geometry. Thus, if the learning focus aligns with the inherent potential of the geometry, they reinforce each other, and if they do not, they weaken each other. Accordingly, semi-dispersed and semi-concentrated geometry seems more suitable for research-scientific schools, economy-technology-entrepreneurship schools, nature-based and park-based schools, and cultural schools. For social schools, a more concentrated and compact geometry, up to a nearly dispersed geometry, seems more appropriate.

Research Method

This research is applied in nature and employs an analytical-argumentative method. Data collection was conducted through library and documentary sources. In the first step of identifying and analyzing the components, the content models from the Transformation Document and other national documents were extracted. In the second step, these models were analyzed and reviewed in terms of learning focus, components related to the social ecosystem, and other general components, which resulted in the categorization of schools. Organizational models were then formulated for these categories.

In the first hypothesis, the learning and educational components, along with non-educational components, collectively determined the categorization of schools In the second hypothesis, since education has a more central role in schools, geometric organization first prioritizes learning focus, followed by the social ecosystem. To ensure the validity and reliability of the research and to enhance the accuracy in examining certain components, expert questionnaires were utilized to assess the results. Thus, 30 questionnaires were distributed to teachers, representing the educational and learning components. These questionnaires identified the various learning approaches applicable under the Transformation Document and determined the learning approaches appropriate for each type of school, with each learning approach assigned a specific coefficient based on the school type.

Additionally, 10 questionnaires were distributed to architects (Researchers of educational environments) to examine the components related to geometry. These questionnaires assessed the compatibility of geometric models with the general and educational components of the document. For this purpose, Groter's Aesthetic geometric models, which are frequently used in school organization, were employed as the baseline models. To determine the appropriate organizational models for each school type, the potential of each geometric model in aligning with the learning approach and the social ecosystem components of the Transformation Document was analyzed. The general components are common to all school types, so the suitable model for these components is also shared. However, for learning approaches, the usage coefficient of each learning approach was first determined according to the school type. This coefficient was then applied to the inherent potential of each geometric model in either harmonizing or conflicting with the learning approach, allowing the models to be scored and localized based on the school type.

Research Background

To date, there have been few studies on the structure and organization of schools. Perkins (2001) categorized various common geometric layouts of schools, though this categorization primarily focused on circulation systems. Nazarpoor et al. (2021) examined the organizational patterns of traditional to modern schools in Iran, focusing on access systems and the causes and geometric factors shaping them. In terms of school classification, Soleimani et al. (2019) proposed a model for the development of nature schools, although their planning did not include organizational structure. Chavoshi et al. (2020), as well as HosseinPour & Zeinabadi (2019), explored research-based schools in accordance with the Fundamental Reform Document of Education, but they did not propose a model for the architectural organization of such schools. Ghofrani et al. (2022) designed a model for entrepreneurial schools, though their study was not influenced by the components of the reform document. Mardomi & Ebrahimi (2015) focused on play-based learning environments rooted in the relationship between children and toys, yet their research was not based on the elements of the Fundamental Reform Document and did not result in an organizational model.

The social role and integrated nature of schools can be traced back to the era of mosques and mosque-school construction. In the early Islamic period, mosques were central to social and religious activities, serving as places of individual and collective worship, educational centers, hubs for the dissemination of Islamic teachings, and political strongholds under the authority of the ruling power (Sami Azar, 1997, 71). Baradaran Haghir & Nairipour (2020) highlighted the importance of society, family, media, and institutions, viewing social schools not within a physical context but as a collection of non-physical environments. As a result, the role of physical space in their research remains unclear and weak.

In Finland, Sweden, and especially Australia, changes have taken place regarding the social ecosystem of schools, turning them into spaces that offer services to the surrounding community. Cleveland et al. (2018), in their publication from the University of Melbourne, referred to a key feature of modern Australian schools: designing environments to host the maximum number of users.

A review of previous research reveals a lack of comprehensiveness, planning, and alignment with the components of the Fundamental Transformation Document, both in terms of school classification and organization. The majority of studies have not been conducted within the framework of the reform document's components, even though school classification must be based on educational visions and the reform document's elements. Another significant weakness is the disconnect between the educational focus and the services required for building a social ecosystem, as many school classifications either prioritize educational focus and approaches or social ecosystems. Each type of school needs to have an organizational structure that aligns with the components that guide its planning and should be comprehensive.

The goal of this study is to classify schools and develop a model for organizing them according to the Fundamental Reform Document of Education.

Theoretical Framework

• Approaches, Needs, and Fundamental Components of Schools in the Transformation Document

The Transformation Document is structured around six subsystems. These documents encompass the dimensions of education and training, approaches, and components of the social ecosystem, collectively referred to as the content model. The resulting organizational structure created from these elements is termed the organizational model.

Educational Heterogeneity: This refers to the emphasis on educational approaches that define the central focus of a school's education. Heterogeneity encompasses core approaches, while its opposite, educational homogeneity, pertains to non-core approaches.

Geometric Heterogeneity: This involves a tendency toward variation or avoidance of similarity, influenced by factors such as heterogeneous educational content, dissimilar approaches, ancillary uses, or diverse needs, resulting in the creation of various geometric fields.

Transformability: Historically, education has undergone reforms that did not address societal changes and needs, ultimately leading to the Fundamental Transformation of Education (Sanad-e tahavol-e ..., 2011, 8). Continuous changes in educational documents reflect evolving conditions and uncertainties. This is seen as the primary driver for the fundamental transformation in education, influencing the organizational model since schools must be flexible to cope with an unpredictable future.

Teacher-Centered Approach: The teacher plays a central role in activating students in the learning process and enriching the educational environment (Barname-ye darsi-ye ..., 2012, 9), serving as a guide and leader in the teaching-learning process. This component can influence the geometric model and the diversity of teaching methods, as a teacher-centered approach requires controlled, confined, and closed environments.

Student-Centered Approach: The learner is at the center of all learning activities, emphasizing exploration, practical learning, and the use of active, creative methods, and involving students in knowledge creation (ibid., 36-40). This approach aims at personalizing learning and can impact teaching methods, school categorization, and organizational models.

Diversification and Flexibility: The curriculum should be flexible and responsive to individual and gender differences, addressing diverse needs and talents (ibid., 10 & 11). Flexibility is a global approach used in innovative educational environments. Diversification can enhance educational services and opportunities according to community needs, student interests, and talent development through scientific, cultural, artistic, health, and sports services (Zirnezam-e barname-ye ..., 2020, 28), and focusing on creating learning opportunities for students (ibid.). This component can influence the geometric model and school categorization.

Information and Communication Technology (ICT): The use of modern educational equipment and technologies (ibid., 5 & 20), virtual networks, online and offline services, electronic content, and connections with other educational environments (ibid., 29 & 13). Consequently, the environment will be equipped to use a wide range of communication and visual equipment, as seen in innovative schools. This component influences teaching methods, school categorization, and the organizational model.

Collaboration and Group Work: This aspect emphasizes group and collective methods and interactions between students, teachers, peers, and various learning environments (ibid., 30). This is a global approach. Innovative educational environments are designed for group work, which can affect teaching methods and organization due to the collective and group nature of these environments.

Vocational Skills Training: This aspect emphasizes entrepreneurship spirit, acquiring professional, skill-based, and artistic competencies that lead to productive

work (Sanad-e tahavol-e ..., 2011, 18 & 31; Zirnezam-e barname-ye ..., 2020, 10-22). This global approach is also seen in Finland, Sweden, and Australia, and can influence teaching methods, school categorization, and the geometric model.

Educational Approach: The primary goal of the school is to educate capable individuals to achieve a virtuous life (Zirnezam-e barname-ye ..., 2020, 5-11). Education results from being in the right context and gaining practical knowledge. The school's architecture should have a distinctive educational identity (Zirnezam-e tamin-e ..., 2016, 2). This can impact teaching methods and the geometric model.

Cultural-Educational Aspect: The school is a cultural and educational institution (Zirnezam-e rahbourdi ..., 2017, 11) and the educational content is based on cultural and educational values (Barname-ye darsi-ye ..., 2012, 12). The effects of this component are achieved by enriching the environment with cultural indicators. This approach is also focused on content production and strengthening students' fundamental competencies (Zirnezam-e barname-ye ..., 2020, 5). These components require organization aligned with the school's learning focus and the social ecosystem related to cultural components. This component affects school categorization and the organizational model.

Social Aspect: Acquiring social knowledge and ethics, communication skills (ibid.), and developing social skills and group activities (Barname-ye darsi-ye ..., 2012, 32-42). Innovative schools are designed for group work, participation, and communication skills. The school's central role in the development and progress of the neighborhood, especially in cultural and social dimensions (Zirnezam-e barname-ye ..., 2020, 22; Zirnezam-e rahbourdi ..., 2017, 35), and shared use of school space by the community (Zirnezam-e rahbourdi ..., 2017, 34) is emphasized. This component can affect school categorization and the organizational model.

Participation: One aspect involves the participation of parents, educators, and school officials in setting educational content and programs (Barname-ye darsi-ye ..., 2012, 10; Zirnezam-e barname-ye ..., 2020, 2), and maximizing family involvement in school activities (Zirnezam-e rahbourdi ..., 2017, 28), and strengthening family foundations and enhancing family skills in fulfilling educational roles (Zirnezam-e barname-ye ..., 2020, 15). Another aspect involves using school services (Zirnezam-e barname-ye ..., 2020, p. 23) and (Zirnezam-e tamin-e ..., 2016, 2) and the school's involvement in the community (Zirnezam-e rahbourdi ..., 2017, p. 17). Consequently, the school serves as a multifunctional hub that belongs to and is continuously connected with the community (Zirnezam-e rahbourdi ..., 2017, 34). The school's participation in crises and natural disasters as a community base (ibid., 35) is also highlighted. This component can influence school categorization and the organizational model.

Consultation Aspect: This aspect includes providing and developing counseling and educational services (ibid., 26). The establishment of a guidance and educational counseling system (ibid., 48). This can influence the categorization and organization of schools.

Supportive Aspect: This aspect includes active participation of the education sector in addressing the urgent and general needs of society, such as the spread of widespread diseases, earthquakes, eradicating illiteracy, enforcing laws and regulations, maintaining environmental cleanliness, serving the underprivileged, and more (ibid., 39). This element can impact the categorization of schools and the geometric organizational model.

Promoting a Healthy Lifestyle: Health and wellness, sports, physical education, and healthy recreation are interconnected subjects. Attention to physical, intellectual, social, psychological, and spiritual dimensions, healthy recreation, balanced nutrition, individual and social health skills, and games and sports are all important (Barname-ye darsi-ye ..., 2012, 29), which affect the categorization and geometric organization.

Diversification and Enrichment of the Environment (Zirnezam-e tamin-e ..., 2016, 2; Barname-ye darsi-ye ..., 2012, 13; Zirnezam-e barname-ye ..., 2020, 20): This aspect emphasizes responding to a wide range of expectations by providing educational services and

training opportunities tailored to society, students' needs and interests to foster their talents through scientific, cultural, artistic, health, and sports services (Sub-system of Curriculum, 2020, p. 28). This element influences the diversity of learning methods, the centrality of learning, and categorization.

School-based Approach: Community participation in the design, production, implementation, and evaluation of the curriculum (Barname-ye darsi-ye ..., 2012, 10) and the shift from centralized curriculum planning to school-based planning (ibid., 2). In this approach, schools become more localized, and the approaches and programs may constantly change, which can influence the organization.

Unity and Cohesion: Emphasis on protecting national unity and social and cultural cohesion (Sanad-e tahavol-e ..., 2011, 18; Barname-ye darsi-ye ..., 2012, 9). This is a social aspect and impacts the **organizational model and categorization of schools.**

Flexibility: Some elements of the Fundamental Reform Document, such as flexibility (Zirnezam-e barname-ye ..., 2020, 2), are broad concepts. Through geometric organization and some physical provisions, it is possible to create multiple and dynamic diagrams.

• Educational Strategies

Randall Fielding and Prakash Nair, prominent futurists, architects, and theorists of educational environments, have introduced all known learning methods globally within 20 components (Nair, 2022, 74). These methods can be categorized into five distinct approaches. Additionally, a display-based learning method can also be included in this categorization. Nair and Fielding's educational methods can be classified and compared with the educational methods outlined in the Fundamental Reform Document, as detailed in Table 1. In the categorization of schools, each of the five approaches proposed by Fielding and Nair may have a more central (main) aspect, which, if these central aspects are diverse and numerous, can lead to heterogeneity in the central educational and learning approaches of schools. Table 1 has been derived from administering an expert questionnaire to 30 teachers. Numerical values equal to or greater than 75% indicate a 100% alignment of approaches, while values less than 75% suggest either a related approach or the potential for combining approaches. According to the results in Table 1[1], all of Fielding and Nair's methods are utilized at least in one of the approaches of the Fundamental Reform Document.

Based on the Table 1 results, the learning dimensions most closely aligned with global models are practical, social, and naturalistic learning. Each type of school requires a specific percentage of approaches, and the implementation of each approach necessitates a unique organizational structure.

• School Classification and Typology in the Document

To classify schools, the components of the fundamental transformation document can be categorized and organized. These components can be divided into several categories based on their impact on school classification, as follows:

Social School: The concept of a "social school" emphasizes components focused on social aspects. These include community engagement and participation (Barname-ye darsi-ye ..., 2012, 10; ; Zirnezam-e barname-ye ..., 2020, 2), child and maternal health and educational services, socio-cultural programs, counseling, and services for at-risk individuals. These components can contribute to creating an effective social ecosystem. In times of crisis, such as floods and earthquakes, additional social services are provided (Zirnezam-e rahbourdi ..., 2017, 26, 34, 35, 39 & 48), which may involve mobilizing the community and providing necessary training or converting the school into a shelter for the injured or affected.

Another set of components focuses on learning methods, emphasizing social education through group and collective activities and student-centered approaches (Barname-ye darsi-ye ..., 2012, 9, 32, 40 & 42; Zirnezam-e barname-ye ..., 2020, 5, 22 & 30; Zirnezam-e rahbourdi ..., 2017, 11). This suggests that the transformation document seeks to solidify and enhance interactions among students, which was previously discouraged as a disruption in classrooms.

Table 1. Correspondence between Nair's Learning Approaches and the Fundamental Reform Document (2011). Source: Authors.

Approach	Learning Methods of Fielding and Nair	Approaches and Learning Methods of National Educational Documents						Utilization of each Nair method in document approaches
		Information and Communication Technology	Group learning	Teacher-centered learning	Student-centered learning	Discovery-based learning	Practical learning	
Social	Group participation	65%	65%	25%	25%	65%	82%	54%
	Peer teaching	65%	100%	15%	65%	65%	65%	62.5%
	roundtable discussion	15%	100%	15%	65%	82%	82%	59%
	Team teaching and learning	65%	100%	15%	65%	100%	82%	71%
	Social-emotional learning	15%	50%	15%	82%	50%	50%	43%
Aligning Nair's method column with the document approach		45%	83%	19%	60%	72.5%	72.5%	57.9%
Technology	Distance learning	82%	15%	100%	15%	50%	65%	54%
	Learning through software	100%	32%	65%	15%	32%	82%	54%
Aligning Nair's method column with the document approach		91%	23%	82%	15%	41%	73%	54%
Nature	Nature-based learning	32%	82%	50%	50%	82%	100%	66%
Theoretical	Interdisciplinary studies	65%	50%	50%	50%	82%	65%	60%
	Internet-based research	100%	15%	0	15%	65%	65%	43%
	One-on-one learning with a teacher	50%	15%	100%	65%	32%	50%	52%
	Student presentations	65%	50%	15%	82%	82%	65%	59%
	Teacher presentations	82%	32%	100%	15%	32%	50%	51%
	Independent study	65%	0	32%	65%	65%	50%	46%
	Storytelling	50%	65%	65%	82%	50%	65%	62%
Aligning Nair's method column with the document approach		68%	32.5%	51%	53%	58%	58%	53%
Practical	Design-based learning	82%	82%	82%	65%	82%	65%	76%
	Project-based learning	82%	82%	50%	65%	65%	82%	71%
	Art-based learning	50%	50%	50%	65%	50%	65%	55%
	Performance-based learning	50%	65%	82%	65%	50%	82%	65%
	Play-based learning	32%	82%	50%	65%	82%	82%	65%
	Demonstration-oriented learning	32%	65%	50%	65%	65%	82%	59%
Aligning Nair's method column with the document approach		55%	71%	60%	65%	66%	76%	65%

Cultural school: The concept of a "cultural school" highlights other components of the transformation document that emphasize cultural aspects (Zirnezam-e rahbourdi ..., 2017, 11; Barname-ye darsi-ye ..., 2012, 12; Zirnezam-e barname-ye ..., 2020, 5 & 22). Culture is a human product and creation, making this component more advanced than the social component. These components may focus on Iranian-Islamic culture. Cultural programs such as theater and performance, community cultural development, and planning can be

one dimension of this component. This is somewhat similar to the nature of a cultural center, except that here, the production and impact of culture and media become important, and the school creates cultural products and added value. Some of these components also relate to students and their cultural knowledge and upbringing. Today, a large part of cultural work is related to media. Some facilities can be shared, such as a school printing press for internal publications that can be made available to the community. Literature, poetry, storytelling, playwriting and theater, virtual content production and familiarity with the internet, festivals, exhibitions, and galleries can be part of the program.

Health-Focused and Play-Based Schools: Some components focus on promoting a healthy lifestyle (Barname-ye darsi-ye ..., 2012, 29). These components concentrate on nutrition, exercise, health, and recreational activities. Health and wellness are promoted through the provision of healthcare services and facilities, such as a health room where a physician and mental health counselor can be stationed. Enhancing the school's nutrition base, such as a cafeteria providing healthy food and beverages under the supervision of a nutritionist, also contributes to well-being. Another component mentioned in the document is physical education and sports. Nair (2022) suggests that sports should be selected in a way that enhances the child's personality and spirit, creating a determined and healthy individual. Recreational activities, while they can be independent, can also have an educational aspect, utilizing closed, open, and semi-open spaces in a targeted manner. In this way, recreation and learning can be integrated, leading to game-based learning that involves touch, experience, experimentation, and hands-on activities, making childhood and learning through play important (Mardomi & Ebrahimi, 2015). Play-based learning is also recognized as the pinnacle of active learning. Considering the approach of recreation and entertainment, active learning (Barname-ye darsi-ye ..., 2012, 40), and the promotion of healthy living according to the reform document, play-based and nature-centered learning can be applied as the peak of active approaches in elementary schools.

Employment-Focused Schools: Some components of the reform document focus on employment, production, entrepreneurship, and skill development (Sanad-e tahavol-e ..., 2011, 18-31; Zirnezam-e barname-ye ..., 2020, 10), which aim at skill acquisition or value creation so that students become familiar with earning income from a young age. This component can serve as a platform for turning ideas into reality and a place where people can visit to implement their ideas. It can encompass a complete cycle of production, marketing, and sales.

Research-Oriented Schools: Some components of the reform document refer to participation in the production of knowledge, research, and exploration-focused approaches (Zirnezam-e barname-ye ..., 2020, 12 & 40). These can be considered part of active learning approaches centered on research. This component may focus on observation and comparison, experimentation, analysis, and conclusions.

By organizing content patterns, it appears that some patterns in the reform document create new and integrated structural functions, which can also be seen in innovative schools. Focusing on certain content patterns may lead to the creation of specific types of schools aimed at establishing or strengthening a social ecosystem. The history of this type of social ecosystem can be traced back to the interactions of early Muslims and the Middle Ages with social uses, such as Islamic mosque schools, which had courtyards and chambers for community interaction. In the early Islamic centuries, mosques were centers of activity and social relations, encompassing a diverse range of activities such as individual and collective worship, educational venues, and centers for disseminating Islamic teachings, and intellectual and spiritual enlightenment. They also served as political bases under the control of the ruling power and centers for social and political activities. Decrees and governmental orders, declarations of war, public alerts, and collection of government and religious taxes were all conducted in the large city mosques (Sami Azar, 1997, 71). Sami Azar (ibid.) notes that in Isfahan during the Safavid era, schools were so intertwined with the community

that addressing and theorizing social problems and realities was pursued within these schools. Modern schools in the reform document can be seen as a scaled-down version of Safavid-era schools; these schools can be viewed as bases for nurturing, repairing, and enhancing citizenship and future citizen studies. They not only interact with future citizens but also maintain their connection with current citizens through spatial hierarchies and access.

Approaches that could be central to school design and operation include technology and entrepreneurship, science and research, sports and health, play and entertainment, and cultural and social approaches. Other general components can also influence the organization and uses of schools. Worship alone is a significant factor in the utilization of school services. Education in elementary schools might focus on worship, thus making worship environments and their programs child-oriented and educational, and not suitable for general use by adults. In secondary education, the educational aspect of worship diminishes, and spontaneous participation becomes more pronounced due to adolescents' tendency towards self-importance. Therefore, prayer rooms should be larger and more independent, with a separate entrance to accommodate neighborhood members. In cases of urgent community needs, such as earthquakes and wars, facilities for accommodating and housing affected individuals, cooking or distributing food, and providing health services should be available. Therefore, in the new perspective on schools, each physical area should create appropriate physical and structural value.

- **Geometric organization patterns**

Every school requires an optimal pattern of organization tailored to its specific type and functions. Since categorization is dual-faceted, geometric organization is influenced by two broad categories of components, which are related to social ecosystem and learning-focused aspects. In his book Aesthetics in Architecture, Grutter (2004) examines the relationship between the type and arrangement of elements, and the composition of buildings, spaces, or structures, with their function, hierarchy, and symbolic value within the group. Grutter introduces various organizational patterns in his book. Fig. 1 presents eight organizational patterns extracted from Grutter's work, selected based on frequently observed patterns in school organizations over the past 123 years. Thus, each school adheres to one of the organizational patterns shown in Fig. 1. Table 2 categorizes schools according to stylistic aesthetics, year of construction, and location.

In Fig. 1, in a complex system with a large number of components, creating a simpler whole is easier. This is because, in a less complex state, components are numerically identifiable and present themselves as an independent single. Additionally, incomplete components tend to be perceived as part of a whole more readily than complete components (Grutter, 2004, 448). The more uniform the components are, the sooner they will be perceived as a whole in the aggregate; conversely, the more complete an individual component is, the more disparate and heterogeneous the overall system will appear (ibid., 435 & 436). Shape "C" has a centralized but singular geometry, making it orderly and minimal in components. As the geometry approaches the shape "D," the order and independence decrease. Therefore, it can be said that pattern "G" represents something beyond itself, indicative of multiplicity. By default, shapes "G," "D," "F," and "H," due to their multi-core or multiplicity nature, have greater potential to create multiple geometric fields, integrate various uses, and generate multi-environmental settings with numerous diagrams. A geometric field refers to the aggregation of several lines and knots together, which can form a field or core. In each type of school where there is an emphasis on the learning approach, certain learning methods are frequently used. The nature of these methods can

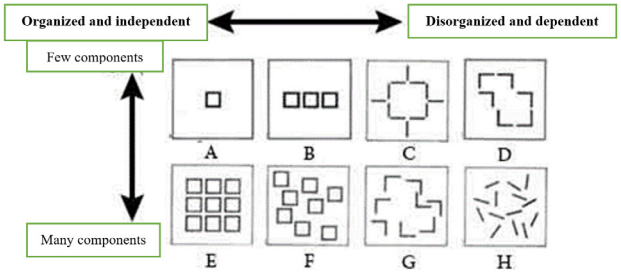
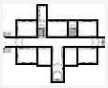
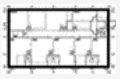
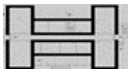
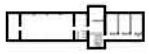
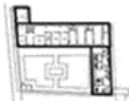


Fig. 1. Types of Geometric Organization Adaptable to Schools Based on Grutter's Organizational Patterns. Source: Authors based on Grutter, 2004.

Table 2. Identification of Frequently Repeated Geometric Patterns in Prominent Schools and Similar Educational Spaces Throughout the 20th and 21st Centuries. Source: Authors.

Pattern	Decade					
	1900-1920	1920-1940	1940-1960	1960-1980	1980-2000	2000-2023
A	 Furogh, Rasht/ Modern	-	 Crown Hall Chicago/ Modern	-	 Gran Bilbao Spain/ Modern	 Sydney preschool/ Modern  Vitra Sweden/ Modern
E	-	-	-	 Imam Sadegh Tehran/ Post-modern	 Gmainer Pakistan Post-modern	 Whittingham uk/Modern -
C	-	-	-	 Jundi Shapur / Post-modern  Richard C. Lee nyc. Modern	-	- -
B	 Ferdowsi Tabriz /Modern  Fine Arts Qom/ Modern	 Anushiravan Tehran/ Modern  Hakim Qom/ Modern	 Rashdieh Tabriz/ Modern	-	-	- -
F	 Bauhaus Weimar/ Modern	 Bauhaus Weimar/ Modern	-	 Fulad Shahr/ Modern	 Davison Canada/ Post Modern	- -
H	-	 Taliesin USA/ Modern	 Kostra Germany/ Modern	 National Art Cuba/ Post-modern	-	 Sanskrit India/ Modern -
G	-	-	 Darmstadt/ Modern	-	 Heig Holland/ Modern	- -
D	-	-	 Carpenter Cambridge/ Modern	 Tao/ Barcelona Modern	 Obi Japan/ Modern	 Kolaskolan -
	Modern			Late Modern and Post-modern		Post-modern

determine the need for geometric fields and, as a result, the organizational model. Table 3[1] shows the alignment between method and type of school.

It can be concluded that group participation, discussions around a table, team teaching and learning, nature-based methods, project-based learning, game-based learning, movement-based learning, and performance-based methods are more prevalent. However, in general, each type of school employs a specific percentage of learning methods according to its type, which impacts the organization of the schools. Now, based on the components of the Fundamental transformation document, we can assign a score to each of the Grueter models. In Tables 4 & 5, the components of the Transformation Document are divided into two categories: curricular and general. In Table 4, the potential of each spatial model is evaluated based on non-curricular components. The results of Tables 4 & 5[2] were obtained through a questionnaire with 10 educational environment researchers.

In the Table 4, the volumes that encompass multiple geometric fields are more suitable for content models (Components) that give the school a multifaceted nature. This is because, while these environments

Table 3. A Compatibility Assessment between Teaching Approaches and Teaching Methods Applicable to Each Type of School, Using a Scoring Scale of 4. Source: Authors.

Approach	Methods	Social school	Cultural schools	Schools of economics, technology, entrepreneurship	School park	Health schools	Science schools	Repetitive methods
Social Learning	Group participation	3.66	4	4	4	3.66	3	3.72
	Peer teaching	2.66	3	3	2.66	2	3.66	2.83
	Roundtable discussion	3	3.66	3.33	2.33	2.66	3.66	3.88
	Team teaching and	3.33	4	4	3.33	2.33	3.33	3.38
	Socio-emotional	4	2.66	3.33	3.66	2.33	2.66	3.1
	Total	88%	86%	88%	79%	64%	81%	
Technology-Enhanced Learning	Distance learning	2.33	2	3	2	2.66	3.33	2.55
	Computer-assisted	2.66	2.33	3.33	1.66	1.66	3.33	2.49
	Total	62%	54%	79%	45%	54%	83%	
Nature	Nature-based	3	3	3.66	3.66	4	2.66	3.33
	Total	75%	75%	91%	91%	100%	88%	
Theoretical Instruction	Interdisciplinary studies	2.66	2.66	3	2	2	2.66	2.49
	Internet-based research	3	3.33	3.33	1.66	3	3.66	2.99
	Storytelling	3	3	1.66	2.66	2.33	2	2.44
	Oone-on-one learning with a teacher	2.33	2.66	2	2	1.66	3.66	2.38
	Teacher-led instruction	1.66	2.66	1.66	1.66	2.33	3.66	2.27
	Independent study	1.66	1.66	1.66	2	3	3	2.16
	Student presentations	3	2.33	2.66	3	2	2.33	2.55
	Total	61%	65%	57%	53%	58%	74%	
Experiential Learning	Design-based	2	3.33	3.33	3	2	3.33	2.83
	Project-based	2.66	3.33	4	2.33	2.33	3.66	3.05
	Arts-based learning	2	2.66	3	3	2.66	3	2.72
	Performance-based learning	3.33	3.33	3	2.66	2.33	3.33	2.99
	Play-based learning	3	3.66	2.66	4	3	2.66	3.16
	Demonstration-oriented learning	3.66	4	2.33	4	2.66	2.66	3.21
	Total	69	84%	76%	79%	62%	77%	
	Total percentage	70%	76%	73%	70%	68%	79%	

enjoy relative independence, they also interact with other school spaces, allowing a variety of functions to be well integrated into the school. Focused patterns, such as patterns "A" and "C," which have a collective nature, are more suitable for the social aspect and have also received higher scores. Table 5 shows that, overall, for multifunctional and mixed-use spaces, geometries "E," "D," "F," "H," and "G" are the best geometric patterns for organizing components related to the values of the fundamental Transformation Document, due to their high potential inappropriately distributing the uses of social and cultural components through the creation of multiple geometric fields and their compatibility with other components. These geometric patterns must also align with educational components, including teaching methods and school typologies. Among the selected geometric patterns, compatible patterns can be identified for each teaching method.

In Table 5, the components are generally divided into two categories: those close to the cohesive pattern "A" and those close to the dispersed pattern "H." Therefore, if the weight of components with similar learning characteristics is higher, the final pattern will align accordingly. Notably, in irregular geometric patterns where the geometry formation is almost free and decentralized, like in geometries "G" and "H," it is somewhat possible to support focused environments, but the reverse is not true. More cohesive and centralized patterns are more successful in creating collective environments and social learning. Learning through technology, if all the technology equipment is centralized in one environment, may cause excessive interference with other functions or users, or due to the low dispersion rate of the equipment, it may not appropriately meet the needs. Excessive dispersion, as seen in geometry "H," reduces efficiency and makes equipment less accessible. In nature-based learning, low-density masses like geometries "G" and "H" establish better connections with their surrounding natural environments. For theoretical education, regular and relatively independent environments, like patterns "B," "C," and "A," are more optimal for individual

Table 4. Compatibility of Grutter's Common School Geometry Models Based on the General Values (General Components Content Models Or Non-Learning) of the Transformation Document. The Scoring Scale Ranges From -2 To +2. Source: Authors.

General Values of the Fundamental Transformation Document	Grueter's 8 Models							
	A	B	C	E	F	D	H	G
Transformability	-1.66	-0.66	0.33	-0.33	0.33	1.33	2	2
Diversification	-1.33	-1	0	0	1	1	2	1.66
Flexibility	-1	-0.33	-0.33	0	1	1.33	2	2
Cultural Aspect	-2	-2	-1.33	-0.66	1.33	2	1.66	2
Social Aspect	-2	-2	-0.66	-1	0	1	1.66	2
Participation	-1	-1	0	0.33	0.66	1.66	2	2
Consultation	0.33	0.33	0.66	0.66	0.66	0.66	2	1
Aid and Support	-0.33	0	1	0.66	1	1.66	1.66	2
Environmental Enrichment	-0.33	-0.33	0.33	0.66	0.66	1.33	2	2
School-Centeredness	-1.33	0.66	-0.66	0	0.66	0.66	1.66	2
Total	-10.65	-6.33	-0.66	0.32	7.3	11.63	17.64	18.66

Table 5. Compatibility of Grutter's Common School-Building Patterns Based on the Educational Approaches of the Transformation Document. The scoring scale ranges from -2 to +2. Source: Authors.

Educational Approaches of Fundamental Transformation Document / 5 Teaching Approaches	The Sum of Gardner's Eight Intelligences							
	A	B	H	F	C	E	D	G
Social Learning	1.66	1.33	0.33	-0.33	2	2	1.33	1.33
Technology-Enhanced Learning	-1	-0.66	0.66	1	0.33	0.33	1	1.33
Nature	-1	-1	1.66	1.33	0.33	-0.33	0.66	2
Theoretical Instruction	1.66	1.66	0	1	1.33	2	0.66	0.66
Experiential Learning	-1.33	-1.33	2	1	-0.33	0.33	1	2
Total	-0.01	0	2.66	3.33	3.66	4.33	4.99	5

study and teacher-centered approaches. In practical learning, irregular volumes with free-form geometry, due to creating varied environments and geometric fields, have greater potential in hands-on learning. Fig. 2 shows the overall compatibility of each pattern with Educational components and general components. Given that each type of school has a specific coefficient in utilizing various approaches, the differences in coefficients and the nature of the approaches can either increase or decrease the need for geometric fields. Therefore, the coefficient of each approach must also be applied to the score of the geometric patterns, which determines the potential of each pattern for different components, to identify the most suitable pattern for each type of school. The coefficient of focus for each type of school in the educational approach is specified in Table 3. In Tables 6, 7, 8, 9, 10 & 11, the focus of each learning axis is distinguished by its specific percentage. Part of the geometric organization is also influenced by the intrinsic potential of each pattern. The results may vary depending on whether the intrinsic potential of each pattern or the focus of the learning approaches is more prominent. The intrinsic compatibility potential of each pattern with the educational approach is also outlined in Table 5.

Fig. 2. Compatibility of Grutter's Common Geometric Patterns in Schools with Educational Approaches and the General Values of the Transformation Document. Source: Authors.

In social-type schools (Table 6), the educational heterogeneity is low to moderate, and the focus is on social learning, but other approaches are still significantly used. As a result, social and theoretical learning, which require similar geometry, are not strong enough to push the geometry towards fully focused patterns and instead are directed towards patterns "D" and "G".

In Cultural-Type schools (Table 7), educational heterogeneity is observed, particularly in practical, nature-based, and social learning. Thus, since practical and nature-based learning carries more weight compared to social learning, the geometric pattern is directed towards patterns "H" and "G." The intrinsic geometric compatibility potential of these two patterns aligns more closely with practical and nature-based learning.

Table 6. Compatibility of Organizational Patterns and Learning Approaches in Social-Type Schools. Source: Authors.

Concentration Coefficient of Approach in School Type	Fielding-Nair Learning Approaches for Social School	Grueter's 8 Geometric Models							
		A	B	C	D	E	F	G	H
88%	Social Learning	1.46	1.17	1.76	1.17	1.76	-0.29	1.17	0.29
61%	Theoretical Education	1.01	1.01	0.2	0.4	1.22	0.61	0.4	0
69%	Practical Learning	-0,91	-0.91	0.24	0.69	0.22	0.69	1.38	1.38
75%	Nature-Assisted Learning	-0.75	-0.75	0.81	0.49	-0.24	0.99	1.5	1.24
62%	Technology-Assisted Learning	-0.62	-0.62	0.22	0.62	0.2	0.62	0.82	0.4
Method Alignment with Model		0.19	0.12	3.23	3.37	3.16	2.62	5.27	3.31

Table 7. Compatibility of Organizational Patterns and Learning Approaches in Cultural-Type Schools. Source: Authors.

Focus Coefficient of Approach in School Type	Fielding-Nair Learning Approaches for Cultural School	Grutter's 8 Geometric Patterns							
		A	B	C	D	E	F	G	H
86%	Social Learning	1.42	1.14	1.72	1.14	1.72	-0.28	1.14	0.28
65%	Theoretical Instruction	1.07	1.07	0.86	0.42	1.30	0.21	0.42	0.00
84%	Practical Learning	-1.11	-1.11	-0.27	0.84	0.27	0.65	1.68	1.68
75%	Nature-Based Learning	-0.75	-0.75	0.24	0.49	-0.24	0.99	1.50	1.24
54%	Technology-Based Learning	-0.35	-0.35	0.17	0.54	0.17	0.54	0.71	0.35
Method-Pattern Alignment		0.28	0.00	2.72	3.43	3.22	2.11	5.45	3.55

In Economy, Technology, and Entrepreneurship-Type schools (Table 8), educational heterogeneity is significantly observed, particularly in practical, nature-based, technological, and social learning. Given that nature-based, practical, and technological approaches are stronger, the geometric pattern is directed towards geometry "H" and "G." The intrinsic potential of these two geometric patterns is also more aligned with practical, technological, and nature-based learning.

In Park-Based (Play-Based) schools (Table 9), educational heterogeneity is observed, particularly in social, practical, and nature-based learning. Given that nature-based and practical learning are more prominent than social learning and other approaches, the geometry leans towards patterns "G" and "H." The intrinsic potential of these two geometric patterns is also more aligned with practical and nature-based learning.

In Health-Based schools (Table 10), there is less educational heterogeneity, and nature-based learning is the dominant approach. The primary focus in these schools is on nature-based learning, along with practical and social learning. However, the intrinsic potential and alignment of geometry "G" and "H" with practical and nature-based learning, and the greater weight of these two approaches alongside the technological approach, are powerful enough to push the outcome towards geometries "H" and "G".

In in Research-Based schools (Table 11), complete educational heterogeneity is observed, meaning all approaches are used strongly. Thus, patterns "H" and "G" are better suited for these schools. Although theoretical and social approaches require more focused volumes, the strength of practical, nature-based, and technological approaches is sufficient to direct the geometry toward more open patterns.

The inherent potential of geometry and the centrality of learning are crucial in determining high-ranking geometric models for any school. When the intrinsic potential and focus of the approaches are aligned, they reinforce each other; when they are misaligned, they weaken each other. Therefore, it should not be thought that a powerful learning approach alone is effective, the final effect may created by a set of aligned approaches that have common characteristics in the environmental needs. To create a balanced geometry, the superior geometric patterns for each type of school can be combined. It is important to note that by "pattern," we mean the order and structure that arranges the components together.

Table 8. Compatibility of Organizational Patterns and Learning Approaches in Economy, Technology, and Entrepreneurship-Type Schools. Source: Authors.

Coefficient of Approach in School Type	Fielding-Nair Learning Approaches for Economy, Technology, and Entrepreneurship School	Grutter's 8 Geometric Patterns							
		A	B	C	D	E	F	G	H
88%	Social Learning	1.46	1.17	1.76	1.17	1.76	-0.29	1.17	0.29
57%	Theoretical Instruction	0.94	0.94	0.75	0.37	1.14	0.57	0.37	0.00
76%	Practical Learning	-1.01	-1.01	-0.25	0.76	0.25	0.76	1.52	1.52
91%	Nature-Based Learning	-0.91	-0.91	0.30	0.60	-0.30	1.21	1.82	1.51
79%	Technology-Based Learning	-0.79	-0.52	0.26	0.79	0.26	0.79	1.05	0.52
	Method-Pattern Alignment	-0.31	-0.33	2.82	3.69	3.11	3.04	5.93	3.84

Table 9. Compatibility of Organizational Patterns and Learning Approaches in Park-Based (Play-Based) Schools. Source: Authors.

Focus Coefficient of Approach in School Type	Fielding-Nair Learning Approaches for Park-Based School	Grutter's 8 Geometric Patterns							
		A	B	C	D	E	F	G	H
79%	Social Learning	1.31	1.05	1.58	1.05	1.58	-0.26	1.05	0.26
53%	Theoretical Instruction	0.87	0.87	0.70	0.34	1.06	0.52	0.34	0.00
79%	Practical Learning	-1.05	-1.05	-0.26	0.79	0.26	0.79	1.58	1.58
91%	Nature-Based Learning	-0.91	-0.91	0.30	0.60	-0.30	1.21	1.82	1.51
45%	Technology-Based Learning	-0.45	-0.29	0.14	0.45	0.14	0.45	0.59	0.29
	Method-Pattern Alignment	-0.23	-0.33	2.46	3.23	2.74	2.71	5.38	3.64

Table 10. Compatibility of Organizational Patterns and Learning Approaches in Health-Based Schools. Source: Authors.

Focus Coefficient of Approach in School Type	Fielding-Nair Learning Approaches for Health School	Grutter's 8 Geometric Patterns							
		A	B	C	D	E	F	G	H
64%	Social Learning	1.06	0.85	1.28	0.85	1.28	-0.21	0.85	0.21
58%	Theoretical Instruction	0.96	0.96	0.77	0.38	1.16	0.58	0.38	0.00
62%	Practical Learning	-0.82	-0.82	-0.20	0.62	0.20	0.62	1.24	1.24
100%	Nature-Based Learning	-1.00	-1.00	0.33	0.66	-0.33	1.33	2.00	1.66
54%	Technology-Based Learning	-0.54	-0.35	0.17	0.54	0.17	0.54	0.71	0.35
Method-Pattern Alignment		-0.34	-0.36	2.35	3.05	2.48	2.86	5.18	3.46

Table 11. Compatibility of Organizational Patterns and Learning Approaches in Research-Based Schools. Source: Authors.

Focus Coefficient of Approach in School Type	Fielding-Nair Learning Approaches for Science School	Grutter's 8 Geometric Patterns							
		A	B	C	D	E	F	G	H
81%	Social Learning	1.34	1.07	1.62	1.07	1.62	-0.26	1.07	0.26
74%	Theoretical Instruction	1.22	1.22	0.98	0.48	1.48	0.74	0.48	0.00
77%	Practical Learning	-1.02	-1.02	-0.25	0.77	0.25	0.77	1.54	1.54
88%	Nature-Based Learning	-0.88	-0.88	0.29	0.58	-0.29	1.17	1.76	1.46
83%	Technology-Based Learning	-0.83	-0.54	0.27	0.83	0.27	0.83	1.10	0.54
Method-Pattern Alignment		-0.17	-0.15	2.91	3.73	3.33	3.25	5.95	3.80

Table 12. Prioritization of Geometric Patterns for Each Type of School Based on School Type. Source: Authors.

Types of schools based on categorization	Gardner's eight multiple intelligences							
	H	G	F	E	D	C	B	A
								
Community School	3.31	5.27	2.62	3.16	3.37	3.23	0.12	0.19
Cultural School	3.55	5.45	2.11	3.22	3.43	2.72	0	0.28
Economics, Technology, and Entrepreneurship School	3.84	5.93	3.04	3.11	3.69	2.82	-0.33	-0.31
Play-based school	3.64	5.38	2.71	2.74	3.23	2.46	-0.33	-0.23
Health and wellness school	3.46	5.18	2.86	2.48	3.05	2.35	-0.36	-0.34
Research-oriented school	3.8	5.95	3.25	3.33	3.73	2.91	-0.15	-0.17

In Table 12, the final patterns corresponding to each type of school are introduced based on their compatibility with the learning focus and approach. In Table 4, the appropriate patterns for various general components that build or strengthen the social ecosystem are also presented. To determine the final organizational pattern, it must be taken into account that the primary priority of a school is to train future citizens while pursuing educational and learning goals. Therefore, when determining the organizational pattern, the priority is the compatibility of the organizational pattern with the focus of the educational approaches, then followed by its compatibility with the general components of the social ecosystem.

Conclusion

The research, which investigates the impact of the content patterns of the transformation document on school typologies and geometrical organization, suggests six types of schools: social, cultural, research-oriented, economy-technology-entrepreneurship, play-based, and sports-health. This typology is dualistic, with one focus on learning and the other on the social ecosystem. Therefore, schools are no longer solely focused on students and learning but also incorporate new, supplementary functions that can strengthen the social ecosystem. Social schools, as the primary and overarching category of this typology, focus on social environments, spaces, elements, and programs, aiming to foster interaction,

empathy, communication, understanding, and support. Consequently, all other types of schools are first and foremost social schools, and then, based on their specific type, they strengthen the social ecosystem, address needs, and provide services. In terms of learning focus, each type of school, depending on its specific learning focus, is stronger in certain learning methods and approaches, which can determine the school's educational nature. In response to the second question, which examines both the prevalent geometric organization patterns in schools and seeks to identify suitable geometric organization patterns, the research identifies eight main geometric organization patterns based on Grutter's patterns. By comparing these organization patterns with the components of learning focus and social ecosystem, compatible patterns for each type of school were identified. Each type of school, depending on its learning focus, has congruence or incongruence in learning approaches, which can lead to changes in geometric fields based on its nature and essence. If the learning focus is compatible with the inherent potential of geometry, they reinforce each other; otherwise, they weaken each other. The added and supplementary functions of schools also cause incongruence in use, which requires a multi-field geometry. In this case, for general components and those that strengthen the social ecosystem, a semi-distributed and semi-focused geometry such as patterns G, H, F, and D is more suitable. For the learning focus in social schools, a semi-distributed and semi-focused geometry such as patterns G and D is more optimal, while for other schools, a semi-distributed and semi-focused geometry to the scattered and free range in the range spectrum including G, D, and H is more suitable.

Endnotes

1. The results presented in Tables 1 and 3 were obtained through a questionnaire administered to 30 teachers specializing in learning and teaching. In fact, it was not possible to determine the dominant results and saturation level with fewer than 30 teachers. The researchers continuously improved the results as more questionnaires were received.

2.The results presented in Tables 4 and 5 were obtained through a questionnaire administered to 10 educational environment researchers. In fact, it was not possible to determine the dominant results and saturation level with fewer than 10 researchers. The researchers continuously improved the results as more questionnaires were received.

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