



CHALLENGES OF RESHAPING SCHOOL INTERIORS IN UKRAINE

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Abstract. *The article examines the issue of reconstruction of the interiors of Ukrainian schools, which are mostly built according to typical projects of the 20th century. The main inconsistencies of such buildings with modern requirements for the organization of the educational process are pointed out. The processes of updating the educational space of schools, which have been ongoing since 2016, and new challenges that appeared during the war are described. Challenges related to the renewal of school interiors are outlined, such as insufficient flexibility and variety of spatial organization, rigid structural schemes of buildings, non-inclusiveness, low energy efficiency, and security challenges.*

Keywords: *learning spaces, school architecture, school design, inclusivity, sustainability, interior safety.*

Introduction

The purpose of this paper is to identify the main challenges that arise during the reconstruction and adaptation of school buildings of 1930s – 1980s to modern requirements. One of the notable features of the 20th-century model designs is the closed design of the buildings. This complicates or even precludes the diversification of forms of organizing the learning. Another challenge is the non-inclusive design of school spaces. This issue pertains not only to physical inaccessibility, which has unfortunately become an increasingly significant challenge due to the war, but also fails to consider the needs of students and teachers with mental disorders, particularly PTSD. Another challenge is energy efficiency and overall sustainability, not only in response to global trends but also due to significant destruction of Ukraine's energy system by the aggressor. Lastly, but not least importantly, is the consideration of safety needs during military actions, given that Russian airstrikes reach across the entire territory of Ukraine.

Current state of school interiors in Ukraine

Mass construction of school buildings according to typical projects began in Ukraine in the 1930s. Initially, such buildings had only classrooms, united by a corridor structure. Since the 1950s, assembly and sports halls, laboratories, workshops have appeared in school buildings, since the 1960s - dining rooms, recess facilities; however, the structure of the buildings remains mainly corridor-like, only in the last projects of the 1990s do atrium spaces appear. Schools have from one floor in small settlements to 4 floors in large cities [1, 2, 3]. Some school buildings of the early years were reconstructed with extensions, in particular, dining rooms and sports halls were added to the old buildings. However, many schools remain in such buildings, which were built according to old projects, that is, with an incomplete set of premises.

Let's consider the main characteristics of the interior of existing schools in Ukraine.

The main educational premises of school buildings of the 1930s–1990s are of the same type. For example, a classroom, starting from the 1930s, has dimensions of approximately 5.7×8 ÷ 6.6×9 meters (area 45÷60 m²) designed to work with the whole class. Such a classroom area allows only front-row arrangement of student furniture and, accordingly, mainly frontal learning activities [4]. The areas of the premises of educational laboratories and workshops are larger, but considering the equipment, they provide only the minimum necessary opportunities for work; for



example, theoretical and experimental work in school science labs takes place in the same workplaces, which are not optimally suited for either.

The availability and parameters of other types of premises in Ukrainian schools such as dining rooms, sports halls, assembly halls, recess spaces etc. depends on the time of construction. In the buildings erected in the 1930s – 1950s, recess spaces were mainly arranged in the corridors; since the 1960s, recess halls have been provided. Narrow recess spaces in old schools cannot be used either for recreation during breaks or in the learning process, which is one of the modern trends in school organization, because they are also evacuation routes where no furniture is allowed for safety reasons.

As for the structures of the buildings, the schools of the 1930s – 1960s had a structural scheme with longitudinal bearing walls, where the inner wall separated the classrooms from the recess space; this made it impossible to change the planning of the building within the existing structure. In the 1970s – 1980s, a framework construction based on supporting columns was used, which gave more opportunities for both internal redevelopment and additions.

New approaches to designing schools in Ukraine

Worldwide, new approaches to the organization of learning spaces were formed during the 1990s – 2010s and continue to develop today. Based on the experience of humanistic pedagogy and modernist architecture of the 20th century, the concept of the “post-industrial school” was coined. This features a combination of flexibility and stability both in learning and in space; the variety of learning activities in groups of different numbers of students and, accordingly, the variety of school spaces both in terms of size and character (for example, open and closed); openness of the school as an institution to internal and external cooperation, and correspondingly openness of spatial organization: external and internal glazing, multi-level atrium spaces, the opportunity to work not only in isolated rooms, but also in public spaces [5]. It is obvious that school buildings of the 20th century do not meet these requirements, and not only in Ukraine.

Changes to the organization of school interiors in Ukraine began as part of the school reform “New Ukrainian School” (NUS, 2016). One of the directions of the reform is “a modern educational environment that will provide the necessary conditions, means and technologies for learning...” [6]. To ensure this, some regulatory documents were amended, in particular, an updated version of the State Building Norms (DBN) “Educational Institutions” [7] and Sanitary Regulations for Schools [8]. To practically ensure this direction, the “New Educational Space” program was implemented in 2016-2019 [9]. Within the framework of this program, partial reconstruction of about 300 buildings of educational institutions throughout Ukraine was carried out. However, such reconstruction, as a rule, involved only thermal sanitation, some improvement of inclusivity (for example, the installation of ramps at the entrance or tactile navigation) and a change in the exteriors and interiors – and the latter occurred without proper reasoning and led to the appearance a large number of decorative, extremely colorful, even visually trashy solutions. With the change of government in 2019, the program was suspended, and during the COVID-19 pandemic (2020-2021), there was no systematic effort to renew the learning space of schools.

With the start of a full-scale war from February 2022, the priority is to restore educational institutions damaged during hostilities and ensure the safety of students and teachers in those schools that work under constant enemy fire. The principle of Build Back Better is declared, which means opportunities for creating school spaces on modern foundations [10]. There are numerous public and private initiatives, including with international participation, aimed at the development of project proposals and their practical implementation both in the process of rebuilding destroyed schools and reconstruction of existing ones. An example is the SavEd Foundation introducing multifunctional learning spaces in damaged schools, which allow learning to begin even before the entire building is completely restored. Such spaces, although they are small local interventions, are based on modern approaches of flexibility and diversity of spatial organization [11]. In 2023,



the project of the Big City Lab was implemented regarding the cooperation of European and Ukrainian architects in the development of model projects for the restoration and reconstruction of schools; the result was five conceptual projects for the reconstruction of several types of school buildings from different periods of construction. These projects provide for the creation of more flexible, diverse, open school spaces, improve the inclusiveness of buildings according to modern approaches [12]. However, it can be assumed that in the ongoing hostilities, too open spaces with a large area of glazing cannot provide students and teachers with sufficient safety, both physical and psychological. A separate direction is the reconstruction or construction of school civil defense shelters. In 2023, the DBN “Protective Structures for Civil Defense” was updated [13], which detailed the requirements for civil defense shelters for various types of public buildings, including schools. Considering the new requirements, civil defense shelters in basements are being updated in Ukrainian schools, and where there are no such premises, they are being built as separate underground structures [14]; in the areas close to the combat zone, several underground schools have even been built, where the educational process can take place continuously without interruption during an air raid alert [15].

Challenges regarding the creation of modern school interiors in Ukraine

Thus, among the challenges related to updating the interiors of Ukrainian schools, the following can be named. The primarily is morally outdated school buildings that do not have a sufficient number and nomenclature of rooms in accordance with modern requirements, and those that exist do not meet these requirements in terms of basic parameters, such as area and lighting. Many of these buildings are made with bearing walls, which make it difficult or even impossible to reconstruct the interior. The second challenge of these aging buildings is lack of inclusiveness. Firstly, such buildings are physically inaccessible to users with limited mobility due to the substantial number of stairs, narrow corridors, inappropriate parameters of sanitary facilities etc. Secondly, it can be argued that for students and teachers with mental disorders, including PTSD, which is unfortunately increasingly common because of the war, both the old monotonous and closed spaces and the overly open and bright modern solutions are hardly acceptable; this issue requires a separate study. The destruction of the Ukrainian energy system due to Russian missile strikes has exacerbated the already pressing issue of the energy efficiency of school buildings. Today, this issue is solved by external insulation of walls and replacement of glazing with more energy-efficient one. However, one should also consider how the energy efficiency of the building is affected, for example, by the large atrium spaces or large areas of glazing. The constant war danger requires not only the arrangement of civil defense shelters, but also the proper organization of evacuation routes in the building. Existing narrow corridors and stairs do not provide the possibility of quick evacuation, especially for users with limited mobility; proposals for furnishing of the recess spaces further worsen evacuation conditions. All these challenges require careful and comprehensive consideration during the development of modernization projects of typical school buildings.

Conclusions

The buildings of secondary schools in Ukraine are mainly built according to model projects of the 1930s – 1990s. These buildings do not meet modern requirements regarding the organization of the educational process, inclusiveness, energy efficiency, and safety. The organization of a modern interior in the buildings of typical schools is often impossible due to the peculiarities of the building design: in this case, significant reconstruction or additions are required. Arranging an inclusive space based on universal design is often also not possible: it is necessary to apply approaches of reasonable adaptation, which cannot make the interior completely comfortable for all categories of users. As a rule, the perception of space by students and teachers with mental disorders is not considered. Requirements to improve the energy efficiency of buildings often



conflict with pedagogical requirements for the organization of flexible open spaces; there is also a possible conflict with security requirements in the conditions of war hostilities. If technical solutions for providing schools with civil defense shelters have already been developed, then the issue of evacuation from classrooms to shelters also requires changes in the interior of the school building. All these challenges act simultaneously, are often mutually contradictory and must be comprehensively considered when modernizing school buildings.

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