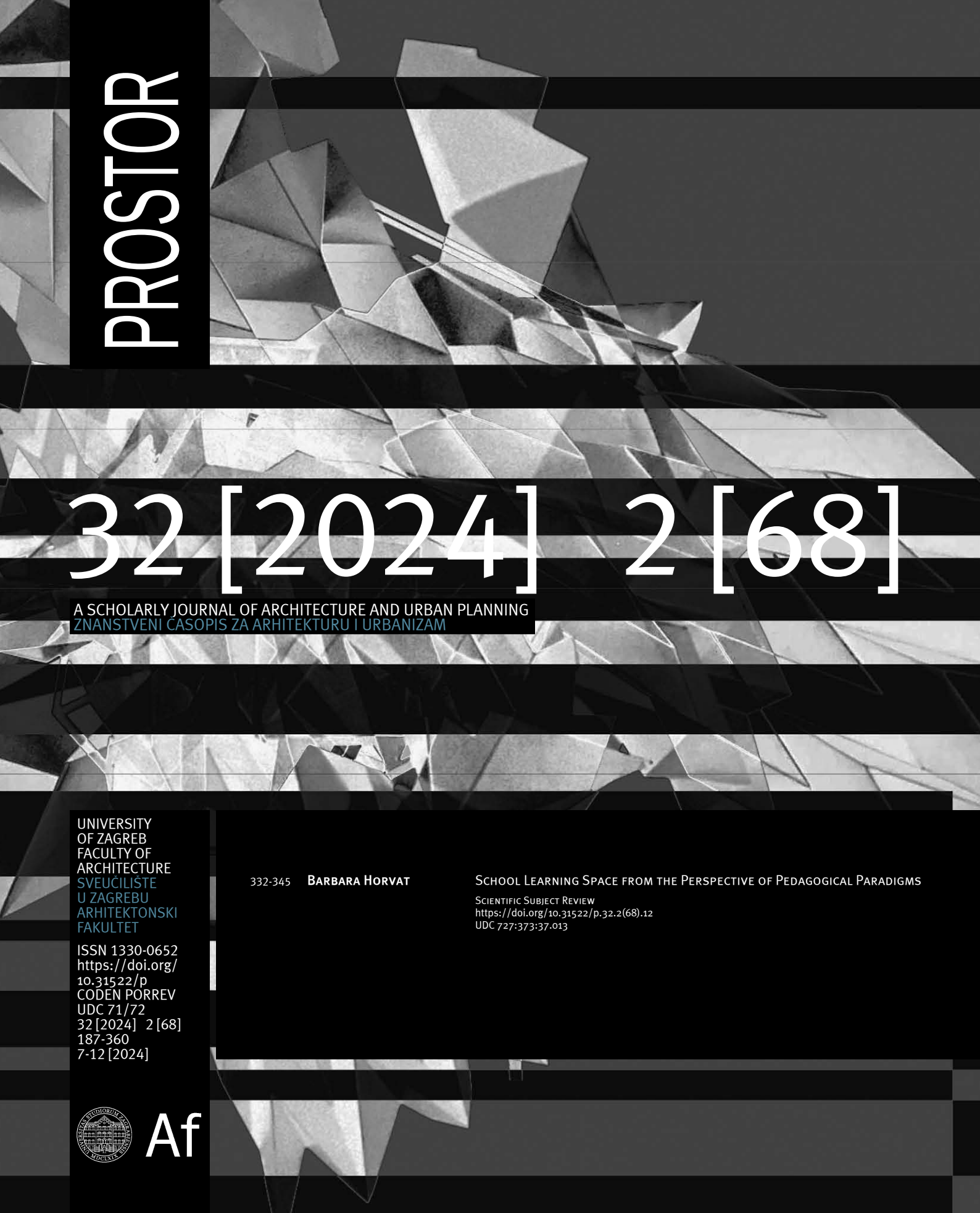

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Fig. 1 A view of the learning space in Bielefeld Laboratory school, which is an example of open learning landscape architectural design

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School Learning Space from the Perspective of Pedagogical Paradigms

ARCHITECTURAL CONCEPTS
LEARNING SPACE
PEDAGOGICAL PARADIGMS
PEDAGOGY
SCHOOL

The article examines the interior of school learning space in the German-speaking and southern part of the Nordic region from the 19th century to the present day. Through the review of sources, analysis of primary sources, and images, school learning space has been explored in relation to established pedagogical paradigms, Herbartian and Reform Paradigms, in terms of how they perceive teaching and learning process. In the 19th century, in line with a standardized teaching process, school learning space was relatively simply organised, with an orderly structure and rows of desks. With the emergence of Reform educators at the turn of the 19th to the 20th century, with a focus on teaching that catered to the needs and interests of students, school learning space acquired multiple roles and became the basis for the current understanding of school learning space. In Dewey's concept of ideal school, a conceptual origin of modern architectural designs of school learning space can be recognised. Based on the analysis of these designs from the perspective of current trends, particularly communication pedagogy, it can be concluded that a constructive school learning space requires an open area that does not isolate students. Open questions for further research into school space have been indicated.

INTRODUCTION

School space has always posed one of the most important questions and challenges for every society, as it represents the place where young people adopt culture, values, norms, and, in general, their future destiny. Each society has approached the issue of school learning space in its own way, depending on the historical period, and has shaped its own system of school organization, which has changed and reformed over time. Nevertheless, some European countries preserve their own traditions to a greater extent (e.g. England) since they derive from different values and a different concept of school space (e.g. Skubic Ermenc, 2018: 76).

In Europe, for instance, regarding the design and organization of schools, a seemingly obvious difference can be observed between the countries located in the north and those situated in the south of the continent. Based on literature (for instance: Hubeli et al., 2019) and several school visits, it can be concluded that the former exhibit relatively more diverse spatial arrangements, characterized by various learning and teaching spaces, including areas for relaxation, exploration, and study. At the same time, it can be recognized that in northern countries, "traditional" elements like hallways, dining areas, and libraries seem to be disappearing as these spaces, similar to the areas for learning and teaching, are understood as multifunctional areas within the school (Figs. 1, 7-10) (Chiles, 2015; Hubeli et al., 2019). The above-described changes to the school space interior are justified by arguments that schools designed, renovated, or newly built are thus more suitable for contemporary needs. In today's world, where children and teenagers spend their entire days at school, the focus is on respecting individual human rights, interests, needs, and values. The emphasis is on freedom of thought and beliefs, as well as the necessity to adapt to the continuous changes in our rapidly developing, technologically advancing society (Hubeli et al., 2019: 10-281).

In this text[1], we shall start from the assumption that the concept of the school learning space depends on the established pedagogical paradigms. Pedagogical paradigms shall be understood as pedagogical thought, or more precisely, how a certain pedagogical thought defines the structure of the educational process, the relationship between educational factors and to which of them – teacher, contents, environment and student – "it ascribes a key role in educational impact" (Medveš, 2015: 14). We shall refer to Medveš's (2015) classification of pedagogical paradigms, as this is the author's essential preoccupation. For the period from the 19th century onwards, he distinguishes four basic paradigms: Herbartian, Cultural or Spiritual, Social-Critical and Reform Pedagogical Paradigm.[2]

To date, relatively few texts have been published in the field of architecture on the issue of the interior of school learning spaces. Among them, studies dealing with the past or history, current times (e.g., Bobovec, Matković, and Rako, 2020), and the hidden curriculum stand out (e.g., Roth-Čerina and Cavallo, 2020). Conversely, in the pedagogical field, we notice a relatively large number of publications on the topic. However, besides examining it from a historical perspective, authors primarily focus on the desires and viewpoints of teachers and students regarding the school space. In the last two decades,

1 The text represents one of the results obtained within the framework of the Target Research Program "CRP 2021" titled *Guidelines for the Quality Design of Contemporary School Architecture to Support Comprehensive Sustainable Living and Work in Schools*. The project was conducted by the Faculty of Architecture at the University of Ljubljana, with co-implementers from the Faculty of Education at the University of Primorska and the Faculty of Sports at the University of Ljubljana.

2 Since the terms "Direction" and "Pedagogy" are also used, as in the Pedagogy of Herbartianism and the Pedagogy of Reform, the term Pedagogy (Herbartian Pedagogy, Reform Pedagogy) will be used to enable easier reading, even though it is narrower in meaning. Where this is not possible and a broader term for pedagogical thinking is needed, the term paradigm will be used.

there has also been a focus on the topic of the so-called inclusive learning spaces in both schools and kindergartens (e.g., Zenke, 2016, 2018).

However, there are relatively few contributions in the educational field that address the interior of the school learning space on the basis of pedagogical paradigms. In the article titled *Concept of Learning Space According to Pedagogical Paradigms in Terms of Analysis of Photographs*, published in 2018, the author (Horvat, 2018) establishes the link between a particular pedagogical paradigm and the conception of school learning space through existing photographs. An in-depth theoretical discussion of each paradigm is not included in the text, as the underlying purpose is to show the relevance of photographs for pedagogical research. This is followed by a paper published in 2019 (Horvat) entitled *Learning Space According to Pedagogical Paradigms*, in which the concept of school learning space is more thoroughly discussed, however, only from the perspective of Herbartian Paradigm.[3] Specifically, from the perspective of the Reform Pedagogy, the paper *The Learning Space of Volksschule Graz Mariagrün from the Pedagogical Perspective* was published in 2022 (Horvat), which presents a case study of one of the Austrian public schools operating according to the Jena-plan Reform concept.

This paper builds on the existing findings and examines school learning space from the perspective of the Herbartian Paradigm and the Reform Paradigm, with the emphasis on the latter paradigm.

The former one was chosen since it was supposedly universal, and dominant, in much of Europe in the 19th and early 20th centuries, while the latter represented a significant change in Pedagogy, and a starting point for the fundamental pedagogical thought that is still prevalent in much of Europe today, alongside Socio-Critical Pedagogy.[4]

Drawing on the Pedagogy of Herbartianism, the conceptual origins of some contemporary architectural concepts of the school learning space shall be sought, the so-called classroom plus, the cluster and the open learning landscape, as well as the connection between them and the understanding of the learning process in terms of how it is supposedly established through these spaces.

The aim is to establish a conceptual basis of some contemporary architectural concepts of the interior of the school learning space, the classroom plus, the cluster and the open learning landscape, which remain to be more thoroughly researched. We have also not yet seen in any source or literature how the highlighted contemporary architectural concepts of school learning space – the classroom plus, the cluster and the open learning landscape – could be understood and assessed from the perspective of one of the most current pedagogical theories, Communication Pedagogy, which is gaining recognition as a pedagogical field in its own right.

This article attempts to answer the following fundamental questions:

– Which pedagogical ideas are originally referenced by some of the most current architectural concepts of the interior, more "openly" designed learning spaces in schools – the classroom plus, the cluster and the open learning landscape?
– What has been the development of school learning spaces from the perspective of pedagogy or pedagogical paradigms in the German-speaking and partly southern regions of the Nordic area (especially in Austria, Germany, and partly in Denmark)[5] since the 19th century, i.e., since the period when the first reforms towards greater openness in education in general emerged?
– How is school interior learning space defined through the pedagogical paradigms of Herbartianism, Reform Pedagogy in terms of understanding the learning process?

The interior of the school learning space, which in this paper is limited to the space primarily dedicated to learning and teaching in the classroom or department has been studied. From an architectural point of view, the classroom has been focused on, while from a pedagogical point of view, the emphasis has been placed on the learning process, or how teaching and learning are established in the so defined space, according to Herbartian and Reform Pedagogical Paradigms.

The analytical-descriptive and analytical-interpretive methods have been used. The former is characterised by learning about the characteristics of the phenomena under

3 This article does not provide a detailed analysis of the conditioning of the school learning space from the point of view of the Spiritual and Reform Paradigms. From the perspective of the latter, the correlation between the prevailing paradigm and school learning space is only illustratively indicated through Montessori and Waldorf Pedagogy.

4 Socio-Critical Pedagogy is fundamentally concerned with the question of how to make schools work justly, so that the social and material environment of students does not have a fatal impact on their future. An analysis of the internal school learning space from the perspective of this paradigm will not be conducted in this article, but it might be attempted in more detail in another paper.

5 The project group members chose primary school concepts from Austria, Germany and Denmark as target groups for studying architecture concepts of schools.

study and examining possible causes and connections between phenomena. Descriptive analysis focuses on generalisation and the search for important common features of similar and different phenomena (Mužić, 1999: 49-50). The analytical-interpretive method, on the other hand, attempts to develop theoretical concepts through processes of comparative analysis and theoretical synthesis (Strauss and Corbin, 1994). Drawing on available articles, both methods have been used to analyse primary sources, images and plans, using deductive and inductive modes of reasoning.

The text is theoretical in nature and divided into two parts. The article searches for and presents the reasons why certain characteristics of school learning space have become established in a certain pedagogical paradigm and explains how the conception of the interior of school learning space depends on the perception of education and the learning process (organisation, design, furnishing). The first part focuses on the period from the 19th century to the transition from the 19th to the 20th century, and the second part on the beginning of the 20th century onwards.

PEDAGOGY AND SCHOOL LEARNING SPACE FROM THE 19TH TO THE 20TH CENTURY

The question of when and on what conceptual foundations the changes towards more open school spatial designs first emerged is a complex one, as it concerns the difficulty of defining the origin of the so-called reform pedagogical ideas for which unambiguous answers still remain to be found.

According to the prevailing consensus in the field of Pedagogy, these ideas gained prominence at the turn of the 20th century and are associated with a group of the so-called reform educators. The most prominent among them include John Dewey (experimental teaching and experiential learning), Maria Montessori (scientific Pedagogy), Rudolf Steiner (education for the spiritual renewal of humanity, Waldorf education), William Kilpatrick (project-based method), and Peter Petersen (Jena plan, group teaching). All the above authors, despite their differences in approach, advocated for significant changes in the established Pedagogy and education approaches of their time; some of them as early as in the 19th century. All of them tried to achieve a radical shift in the approach to children and children's rights, a focus on greater authenticity in the teacher/educator-student relationship, increased directness in education in general, greater tolerance for a child's self-development, less content, programme and didactic formalization, and an emphasis on more spontaneity, if not outright improvisation, in the educational process (Medveš, 1992: 1-3). Their aspirations were so radical that they introduced an entirely new pedagogical direction, known as Reform Pedagogy.

However, Oelkers (w.d.) argues that the first progressive pedagogical ideas emerged in the mid-19th century in Prussia, a significant world power at the time and the birthplace of Pedagogy. From there, they supposedly spread "to other European countries, both to the west and to the east" (Skubic Ermenc, 2018: 9). As emphasized by Oelkers, it was during that period that a great deal of criticism was directed towards the Prussian education system, namely that classrooms were overcrowded (Figs. 2 and 3), unrealistic teaching methods were used, outdated teaching practices were utilised, and the authority of the teacher was maintained through corporal punishment. The author goes on to state that these ideas were so impactful that they resulted in the establishment of compulsory education in Germany in 1871 (ibid.).

Although a lack of consensus in identifying the origin of reform ideas persists, all advocates of the so-called "alternative" or reform ideas in education opposed the prevailing system of education, which can be best characterized as the Herbartian Pedagogy.

CONCEPTUALIZATION OF SCHOOL LEARNING SPACE AND EDUCATION IN HERBARTIAN PEDAGOGY

Herbartian Pedagogy, which was prevalent from the 19th century until the end of World War I, defined the values of duty ethics as relevant for education in schools, as well as provided four formal stages of teaching, the purpose of which was twofold (Herbart, 1835, 1874). On the one hand, the stages made the teaching process more organized (step-by-step work), by gradually guiding students through the topic of each lesson. On the other hand, the stages allowed the possibility of identification with the teacher. According to the established associative psychology of that time, it was believed that the ongoing mental processes in the teacher (e.g., analysis, synthesis) evoked the same processes in students. Through these processes, through presenting the subject matter, students' trust in the teacher was to be established as they followed the teacher's presentation of the lesson. Moreover, it was assumed that in this process, students emulated the teacher's personality and, in this way acquired knowledge (Medveš, 1989: 240-241; Medveš, 2000: 91-92).

Fig. 2 Physics lesson in an Austro-Hungarian secondary (Realschule) school in 1900. The picture presents a simulation of a lesson in a secondary school in Austro-Hungary, as presented at the Slovenian School Museum.

Fig. 3 Fourth grade of Globoko Primary School, 1914

By analysing classroom images of that time (Fig. 2), two separate areas can be observed in the classroom: teacher's area and, opposite it, an area for students. The gazes of the teacher and students met at an imaginary boundary, visually establishing an "axis" for the projection of thinking, emotions, and feelings from the teacher to the students. Another type of "boundary" between the teacher's space and the students' space was created by the difference in height – the teacher, typically standing, occupied a space on a pedestal, while the students sat at fixed desks (Fig. 2). The teacher's elevated position itself served to firmly establish their position of authority in the classroom.

From a knowledge perspective, school learning space was adapted to the prevailing epistemological paradigm of the time, which perceived reality as cognizable through the senses or facts; it stipulated that facts, transmitted through words, provided accurate descriptions of reality (David, 2018; Ule, 2004: 43-128). Based on this, the teacher was believed to "project" facts onto students through verbal, one-way communication. In a society grounded in values and logic of the so-called common, the teacher represented a fundamental source of knowledge and was regarded as a representative of truth. Through this principle, the ideal of universality was pursued, and standards of the so-called normality were established (Reckwitz, 2023). It was through standardisation and formalism that order, stability and efficiency of social practices were established in society (ibid.: 97)

Owing to this value and epistemological basis, communication in school during lessons was uniform for everyone. Consequently, the educational effect was understood to be stronger the more uniform, consistent, and identical it was (Medveš, 2018: 8). Physical space of a classroom, lacking partitions, curtains, spaces for withdrawal, or a possibility of parallel execution of at least brief other educational activities, such as relaxation, contributed to this. However, the arrangement of physical space allowed for constant supervision and immediate possibility of detecting and sanctioning mistakes.

It can be assumed that the way classrooms were furnished was linked to the above principles. Given that words were understood as the only means of transmitting knowledge and "teaching communicated only with words," which were essentially "representations" or "images" (Herbart, 1903: 148), teaching aids primarily consisted of visual materials, which were identical for all students and intended equally for all of them (Figs. 2 and 3).

After the adoption of the third state elementary school law in Austro-Hungary in 1869, schools were required to obtain prescribed teaching aids for each subject. For instance, maps of Austro-Hungary for History and Geography lessons (Fig. 2), hundred-square for Mathematics, and anatomical representations of the human body for Natural History (Fig. 3; Pavlič, 1978: 61-75). The law prescribed teaching aids for each subject, however, the results of a review show that most of the tools used were visual (posters, wall pictures), and no materials which students could hold in their hands were used. Since certain standards of "normality" in the development of learners were established based on age group, the tools utilised were identical for everyone in the class, without any adaptation.

Reckwitz (2023: 377) states that "standardised education" in a company of "equals" "coincided with the ideals of general education", and is critical of the current phenomenon in education, where universality, standards and norms have been "lost". He points

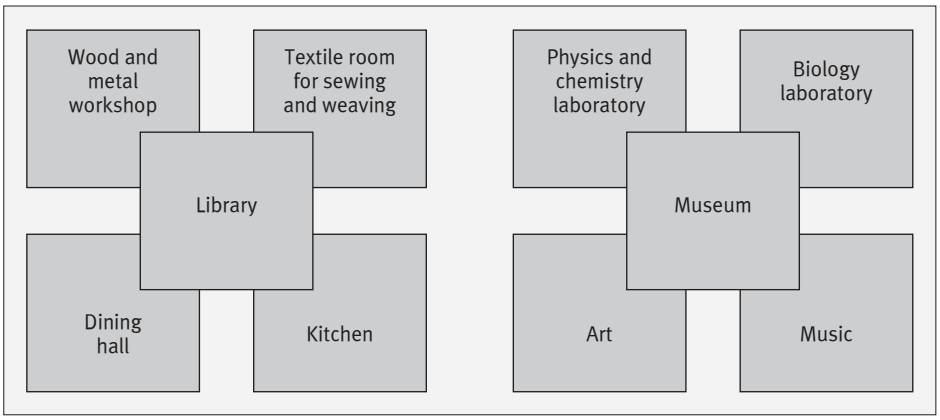


FIG. 4 LAYOUT OF DEWEY'S SCHOOL BY FLOOR AND ROOM: DIAGRAM OF THE GROUND FLOOR ROOMS (LEFT), UPPER FLOOR (RIGHT)

out that schools compete not only in the uniqueness of the school culture and the specificity of the educational programme offered, but also in offering unique programmes tailored to each individual student (ibid.: 382).

The end of World War I saw the decline of Herbartianism. Direct authority was not approved of in society anymore. There was a shift from the teacher as the key factor of education to the students and their needs regarding education and school learning space.

TRANSFORMATION OF SCHOOL LEARNING SPACE AND THE SHIFT IN THE UNDERSTANDING OF THE LEARNING PROCESS

The initially posed question where the first architectural designs of schools and classrooms, which were more child or student-friendly and at the same time more "open" in their design, originated remains unanswered.[6] Even though the issue remains unresolved, two crucial developments can be singled out as having played a significant role in the development of school learning space interior in the period at the turn of the 19th century to the 20th and after the decline of Herbartian Pedagogy.

Firstly, school learning space, previously a fundamentally unifunctional space dedicated to teaching or cultivating the young, began to be replaced by a multifunctional and hence more complex school learning space or multiple spaces (Kricke, 2020). Secondly, differently designed or conceptualised school learning space with multiple functionalities resulted in different furnishings. This in turn was a consequence of a new understanding of learning and teaching in line with the principles of Reform Pedagogy.

Regarding the first point, the shift from a fundamentally unifunctional school learning space to a space with multiple functions implies a reversal in understanding the complexity of the significance of school learning space, whose role became considerably broader at the time. This can be observed through Montessori's (1914) definition of school as a child's "second home".[7] It had various sub-spaces assumed to be "more child-friendly," such as day room, club room, and workshop[8] (Montessori, 1914: 9-10). Similarly, in Petersen's (1927) definition, the school was intended to be a friendly home for students. For this reason, it should have, besides the workshop, also appropriately designed multiple spaces, including a multifunctional classroom for various learning needs or situations, such as group work, circles, courses, and breaks (Petersen, 1927: 18-19). All this demanded not only a larger school learning space but also a more open understanding of school as such, where the emphasis is not on sitting and learning anymore.

The complexity of school learning space is evident from Dewey's concept of ideal school (Fig. 4), as described in his work *School and Society* (1932). The author placed workshops[9] for practical learning in two "corners" of the lower floor of the school building, whereas in the centre of the floor he positioned a library as a "collection of intellectual resources" (Fig. 4). Dewey claimed that resources offered a basis for practical work of the youth, giving their work broader meaning and value (ibid., 72-76). In a similar way, he defined the learning spaces of the upper school floor (Fig. 4): he placed laboratories for special subjects and rooms for various arts in individual "corners" of the building, connecting them in the centre with a museum as a collection of materials. He explained the role and the arrangement of space by saying that the collected materials at a concrete level conceptualised and gave meaning to the entire learning process: from idea to product. They should be exchanged continuously based on subjects and topics (ibid., 76-80).

As recognized, the boundaries of the internal school learning space or classroom have expanded beyond just the architectural dimen-

6 It is quite challenging to identify common or general characteristics of school learning spaces and classrooms from the end of the 19th century, no matter whether they originate from the principles of the Reform Pedagogy or advanced ideas of the 19th century Prusia.

7 Montessori calls school the "house of children" (for instance Montessori, 1914: 9-10).

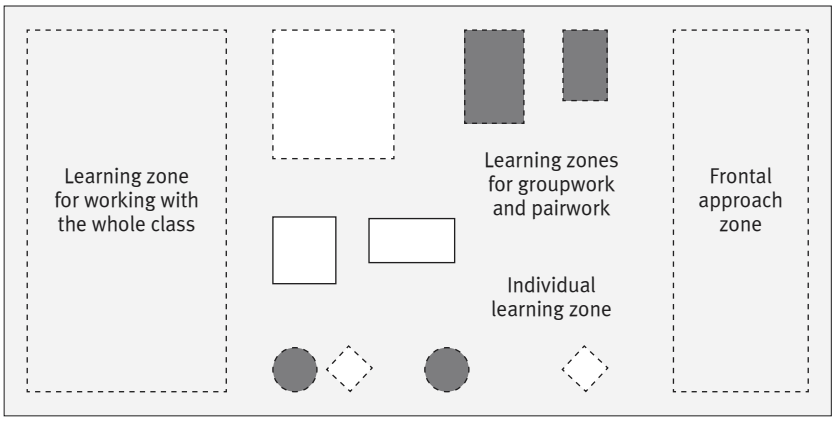
8 In addition to these rooms, Montessori proposed the following rooms: gym, bathroom, kitchen and dining room (Montessori, 1914: 9-10).

9 Dewey emphasised the importance of wood and metal workshop and sewing and weaving workshop (Dewey, 1932: 72).

sions, but also conceptually. The school should not only be the "second home" for students, but also, their first, according to Dewey's ideal school "cultural sanctuary" and "scientific preparatory ground".

Secondly, concerning the development of the interior of school learning spaces, with the decline of Herbartian Pedagogy and the transition from the 19th to the 20th century, it became apparent that a changed, more complex understanding of the school learning space also presupposed a changed understanding of how school spaces should be furnished. This coincided with the tendencies towards an altered perception of the educational process.

Whereas in the Pedagogy of Herbartianism, teachers were mainly committed to verbal transmission of knowledge to students, and their words were considered to be the main means of teaching, their role, at the turn of the 19th to the 20th century became at least partially 'superseded' by other, so-called external sources. Students were now supposed to access knowledge as independently as possible using those external sources. This process would be facilitated by learning materials available in the learning space, for instance books in the library, as seen in the concept of Dewey's ideal school. According to Montessori's theory (Montessori, 1914, 2008: 11), it was the didactic material that was supposed to replace the direct mediating role of the teacher[10], while students, were supposed to choose materials according to their own discretion, desire and need, and learn at their own pace and in their own way. According to Dewey's and Peterson's theory, peers too represented external sources of knowledge. Both authors claim that students should be able to learn with others, in different ways, for instance through group work or in a circle where students and a teacher conduct the so-called topic discussions. It should be mentioned that neither of the last two approaches, contrary to Montessori's theory, excludes the frontal approach which is directly led by the teacher (Dewey, 1997: 139-163; Montessori, 1914, 2008; Peterson, 127: 17-41)



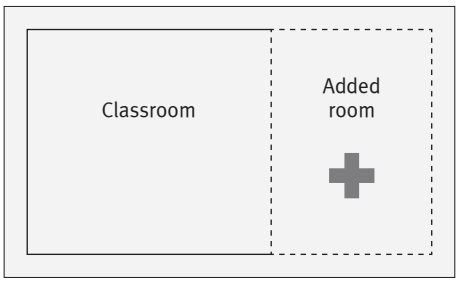


Fig. 5 (left) Classroom plus layout

Fig. 6 (up) Layout of open learning landscape

In contrast to the Pedagogy of Herbartianism, the authors of all three discussed theories emphasised that internal sources of learning should be considered to foster an effective learning process, such as the students' desires, interests, as well as the right to make choices and decisions in the learning process (Dewey, 1997: 152-163; Montessori, 2008: 11, 20; Petersen, 1927: 17-41). This is one of the main focal points of Reform Pedagogy.

To conclude, the turn of the 19th to the 20th century saw a shift from the unifunctional and relatively simple school learning space towards a more complex learning space with different functionalities, based on the aspirations of reformist educators.

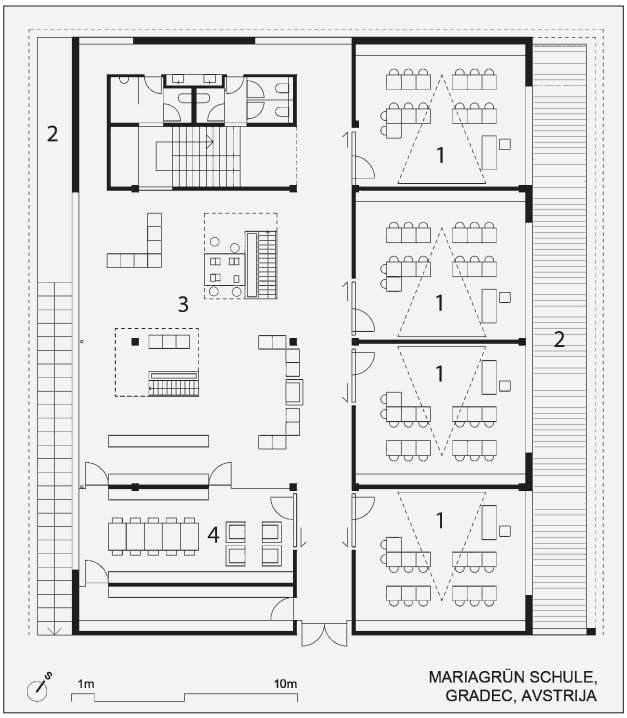
Contemporary Architectural Concepts of Student-friendly Learning Space

After World War II, reformist pedagogical movements failed to penetrate most state school systems in Central Europe. However, certain principles, including architectural ones, had a relatively strong impact on official Pedagogy (Medveš, 1989) and contemporary school architecture. It is challenging to specify which reformist direction developed each solution.

According to one of the basic classifications of school learning space models[11], the so-called classroom plus (Fig. 5), represents an

10 The didactic material included a key to provide feedback on students' work (Medveš, 1992: 9).

11 This article uses classification that is well-established and most frequently used in the German-speaking environment. It was chosen because architectural concepts of schools in Austria and Germany were studied within the Target Research Program "CRP 2021". Contrary to the classification used, authors like Bobovec, Matekovic and Rako (2020) base their work on a different typology of spaces. These authors distinguish, for example, between single-track and double-track designs, molecule, pavilion, container, central design, village or city, fortress, etc (ibid., 34-35).



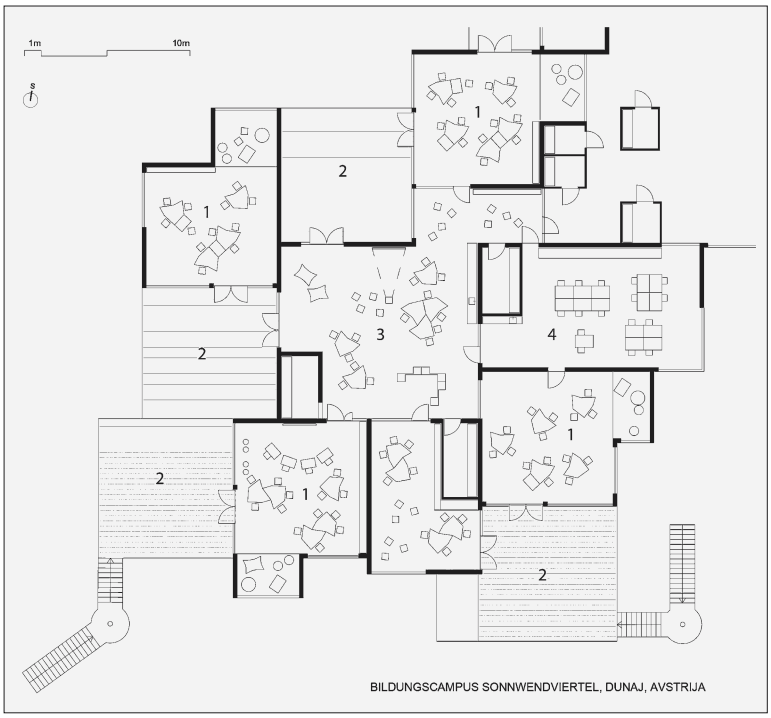


FIG. 7 CLUSTER SCHOOL DESIGN IN VOLKSSCHULE MARIAGRÜN, GRAZ. DESIGN: CHRISTOPH KALB AND PHILIPP BERKTOLD. ONE OF THE FLOORS: 1 – CLASSROOM, 2 – TERRACE/BALCONY AS OUTDOOR CLASSROOM, 3 – OPEN LEARNING SPACE OR CENTRE, 4 – STAFF ROOM. FOR MORE INFO: HORVAT, 2022.

FIG. 8 CLUSTER SCHOOL DESIGN IN BILDUNGSCAMPUS SONNWENDVIERTEL, VIENNA. DESIGN: Š PPAG ARCHITECTS. A PART OF PRIMARY LEVEL FLOOR: 1 – CLASSROOM, 2 – TERRACE/ BALCONY AS OUTDOOR CLASSROOM, 3 – OPEN LEARNING SPACE OR CENTRE, 4 – STAFF ROOM.

elementary contemporary architectural concept, where an extra multifunctional space is added to the classroom to be used for the purpose of carrying out parallel learning activities without losing visual contact (Fig. 5) (Hubeli et al., 2019: 100-101).

Although the development of conceptual architectural designs of interior school learning space moved towards multifunctionality, it is interesting that the fundamentals of classroom plus can be found in the 1903 bulletin 'The New Building for Education and the Laboratory Schools at the University of Chicago', in which Dewey envisioned ideal school classrooms with a separate learning space for conducting group work. As he wrote: "Connecting with each grade-room, there is a smaller room, half the size of the grade-room, to be used for purposes of group-work." (Bulletin of Information of the School of Education of the University of Chicago, 1903, cited in Wirth and Bewig, 1968: 85).

The question how this architectural concept has evolved into more complex ones, i.e., the cluster and the open learning landscape (Fig. 6), remains open from an architectural point of view. However, it should be noted that the cluster concept represents "a group of spaces in which several learning spaces and classrooms, together with associated areas of differentiation, recreation and regeneration, are grouped together in a clearly identifiable unit" of a classroom, linked by a kind of group centre (Hubeli et al., 2019: 102-103). Given that Dewey's concept of the ideal school building is also defined by multiple spaces with different functions, it can be assumed that the beginnings of the contemporary architectural concept of cluster were already implied in Dewey's ideal school building concept (Fig. 4).

Comparing Dewey's ideal school design with some contemporary architectural cluster concepts such as the Volksschule Mariagrün in Graz (Figs. 7 and 9), and the Bildungscampus Sonnwendviertel in Vienna (Figs. 8 and 10)[12], similarities can be found between them in terms of clearly defined classrooms. In the designs, individual classrooms are intended for the teaching of individual classes. However, if we compare the design of one of the floors of the school building of Volksschule Mariagrün (Fig. 7) with the design of a part of a floor on the primary level of Bildungscampus Sonnwendviertel (Fig. 8), it seems that based on the type of school learning spaces, the Graz school is more similar to Dewey's concept of the ideal school than the Vienna school. It can be understood that at Volksschule Mariagrün (Figs. 7 and 9)[13], the library tower and computer tower try to replace Dewey's library, while the science station is

12 These schools are presented because they were selected for a more detailed study in the previously mentioned Target Research Program "CRP 2021".

13 Inside the so-called learning island as open learning space.

Fig. 9 A view of open learning space with a reading tower at the front, which is accessed by a staircase, with a computer tower, covered with netting on the top, on the right and other temporary niches in Volksschule Mariagrün school in Graz

Fig. 10 A view of open learning space or centre of a part of floor at primary level in Bildungscampus Sonnwendviertel school in Vienna

used instead of the workshop and the specialised classrooms of the ideal school concept. However, judging from the available photographs and the layout (Figs. 8 and 10) learning spaces with specific roles are not apparent in the architectural concept of Bildungscampus Sonnwendviertel. At the first glance, the design of Bildungscampus Sonnwendviertel seems to be even more similar to Dewey's ideal school than the design of Volksschule Mariagrün. However, regarding the identification of roles of learning spaces, the Vienna school is not so similar to Dewey's ideal school design. From a structural point of view, the cluster design, as seen in Bildungscampus Sonnwendviertel, seems functionally undefined or 'open'. Unlike Volksschule Mariagrün, however, each of Bildungscampus Sonnwendviertel (Fig. 8) classrooms is fitted with an additional smaller room and therefore such a classroom functions as a classroom plus. However (judging by the plan and the pictures), it is not intended for group work, but for rest, relaxation, socialising or other activities.

This raises the question whether the main intention of the authors of an architectural design such as the Bildungscampus Sonnwendviertel was to create a cluster structure or a state-of-the-art design, the so-called open learning landscape as the "interior" learning spaces are functionally relatively less defined. As stated by Hubeli et al. (2019), the open learning space design assumes the creation of "multi-purpose open learning areas, enabling individualized learning and learning in small groups", with the understanding that the number of enclosed functional spaces is kept to a minimum, and various access areas and common spaces are directly integrated into it as so-called communication zones (Hubeli et al., 2019: 102-103; Fig. 6). The Bielefeld Laboratory School in Germany, built in the 1970s (Fig. 1) serves as an example of open learning landscape design. Interestingly, unlike schools in Germany and especially Denmark, which are also built according to the architectural concept of open learning landscapes, no schools built according to the latter concept were found in Austria.

In the second half of the 20th century the development of school learning spaces took place through various architectural concepts, such as classroom plus, cluster and open learning landscape design, depending on the educational system of each country. It is assumed that Dewey's concept of ideal school served as the basic conceptual framework.

Contemporary architectural concepts of the school learning space discussed here clearly show that the focus on the student seems to have become even more important in the 21st century, which is further confirmed by The Salamanca Statement (1994) that introduced the principle of inclusion as a new social norm in schools. The principle of inclusion dictates that school systems and programmes are formed in the way that considers the diversity of students and each individual's needs, which should also be reflected in the school learning space.

The Specifics of Contemporary Time and Space and Communication Pedagogy

Although this chapter remains within the framework of the Reform Pedagogy, we touch upon the analysis of the comparison of the presented contemporary architectural concepts of schools (classroom plus, cluster, and open learning landscape) from the perspec-

tive of the so-called Communication Pedagogy, according to which the student remains the central focus of education. This is one of the most current pedagogical theories or paradigms, which is currently not consistently implemented even in the German-speaking areas since it is still gaining recognition. Therefore, the purpose of this chapter is to outline possible directions of thought that Communication Pedagogy opens up for the field of architecture.

According to Communication Pedagogy, communication is understood as the fundamental means of teaching, through which goals can be pursued, with one of these being communication itself, within the classroom. We do not understand it if we define communication merely as the conversational method of teaching or dialogue as part of the teaching practice. It can be defined as an interactive, open interpersonal relationship between the teacher and students and among the students themselves, characterized by the recognition of the equality of all subjects involved in the teaching process (Medveš, 2018: 7-15). In educational practice, this is not self-evident, as teaching is permeated with the so-called guided schoolwork methods – explaining, storytelling, describing, addressing, reminding, warning, preventing, rewarding, and punishing – which do not correspond to the definition of communication we rely on here, based on Habermas (1995) and Luhmann (1991). According to the former author, communication is defined as a form of listening to the interlocutor's ideas and viewpoints, expressing arguments, contesting them, accepting or critically defining them, and seeking consensus, but without any authority's dominance. This means, for instance, the teacher is not supposed to impose their views or arguments on students'. The only rule that applies is the assertion or dominance of the better argument (Medveš, 2018).

A different version of communication, based on neuroscience, is represented by Luhmann's (1991) definition, which has been applied to Pedagogy through the author's so-called Systemic Theory. According to this view, there are two "closed", independent systems present in educational process. One is communication, represented by the learning process, which, in the pedagogical context, means a mutually evolving activity established on the responses of the student and the stimuli of the teaching content. The other independent system represents the student's consciousness, which acts as a "black box". Importantly, neither the communication of teaching nor the consciousness of the student (or teacher) can mechanically influence each other. Each individual's consciousness can only make sense of and structure external influences, such as specific teaching content, through its own ("cognitive") filters. Changes in the student's consciousness towards the set learning goal are expected to occur during educational process; it is assumed that this change in consciousness can only be achieved through communication (Medveš, 2020).

Since teachers lack a tool through which they could reliably and directly influence the change in the student's consciousness towards the learning goal, it is crucial that they plan the teaching or communication as carefully as possible. Therefore, they build it gradually through stimuli directed at the students, their responses received in real-time, and move towards the purpose of teaching or the set objectives (Medveš, 2020).

The significance of the highlighted architectural concepts of the school learning space, classrooms plus, cluster, and open learning landscape, can be better understood through the conceptualizations of communication in the context of Communication Pedagogy. Indeed, if teachers are to monitor students' responses to a given stimulus or prompt, and if they are to contemplate how students make sense of and structure the information provided, if they are to seek reasons for given responses, it can be inferred that a relatively more organized school learning space is necessary for learning and communication. If a lesson is to be organised in the way that it builds on the responses or views and arguments of students, a transparent school space is required, since a closed classroom with rows of desks would make it more difficult to achieve the goals. Considering that each student's argument and response is supposed to be a stimulus to their peers, it seems that desks organised in rows would hinder communication or cause unequal position of students. Whether this may also cause unequal status of their views, responses, and arguments, will be left aside for now.

However, a question arises how to understand the architectural concept of an additional, i.e., "plus" room, in the context of a classroom plus. How is communication created when an individual or a group of students are occasionally moved into a separate room? With what responses, arguments, perspectives, and stimuli is communication in the plus room fostered (or limited), and with what responses, arguments, perspectives, and stimuli in a room separate from it? How is communication fostered (or limited) when the teacher removes the boundaries of the plus room? Similar questions apply regarding the associated areas of differentiation, recre-

ation, and regeneration in the architectural concept of a cluster.

From the perspective of Communication Pedagogy, spatial exclusion is non-inclusive, so the question remains open as to what is to be understood as constructive in the school learning space or classroom from the perspective of Communication Pedagogy.

Conclusion

This paper defines school learning space through pedagogical paradigms. Drawing on the Herbartian and Reform Paradigms, the analytical-descriptive and analytical-interpretive methods have been used to study the school learning space in the period from the 19th century to the present day, in the German-speaking and partly southern part of the Nordic area. The conception of the school learning space was examined based on how teaching or the learning process is perceived in each paradigm.

In the 19th century, when the Herbartian Paradigm was established, it was understood that learning was the result of the teacher's personality in the process of conducting lessons, which the teacher carried out for all students simultaneously, in the same way, using the same means. The school learning space or classroom was essentially intended for learning and was relatively simply arranged and transparent, with a structure of order created by desks arranged in rows.

At the turn of the 19th to the 20th century, the perspective on education changed. The focus shifted to students, who became the focal point of instruction, with an emphasis on considering their desires and needs and enabling choice in implementation. The school learning space gained multiple roles, aiming to become ostensibly "friendlier" to students ("second home"). In the presented conceptualization of the school learning space, a conceptual basis that is also implemented in contemporary school architecture can be recognised. Some of the architectural concepts that are prevalent today – such as classroom plus, cluster, and open learning landscape – supposedly draw on Dewey's concept of an ideal school.

This article only touches upon contemporary Communication Pedagogy. Communication is defined as a fundamental tool of instruction, aimed at achieving the goals and purposes of teaching, one of which is communication itself. According to Communication Pedagogy, the teacher should constantly reflect on and observe how students make sense of and structure their knowledge and, based on this, respond as constructively as possible in real-time. Through the analysis of the contemporary architectural concepts of the school learning space highlighted here, the open learning space of the school has been defined as more constructive, as it does not isolate students.

Despite all spatial solutions intended to make teachers' work more constructive, at least two issues remain unresolved. Firstly, whether communication, which is not spatially limited in the classroom, for instance by barriers or boundaries, poses a problem at all. According to Communication Pedagogy, any communication limited in space restricts responsiveness. However, it is assumed that the challenges teachers face in the classroom concern their reactions to the students' responses. Secondly, and related to this, can it be a spatial problem (related to the arrangement and design of the classroom) if communication cannot develop beyond the boundaries of the "home" classroom? From the perspective of Communication Pedagogy, communication limited to the "home" classroom is seen as "confined". However, teachers' problems usually do not stem from communication that opens up thinking beyond the intended topics, rather the opposite. Therefore, it may be more sensible to focus less on the perfection of highly specialised school learning space but rather seek solutions that do not limit (potential) thinking due to overly specific content.

It has become apparent that there is no escaping the questioning of what to pursue and what to move towards in the future. It is school that defines the culture of all of us. But the questions outlined here, and especially the final ones, can help us think more clearly about how to define school in the future.

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Illustration sources

Fig. 1	Photo: Dirk Damm
Figs. 2, 3	Slovenian School Museum, photo library
Fig. 4	Dewey, 1932: 72, 76
Fig. 5	Hubeli et al., 2019: 100
Fig. 6	Adapted from Hubeli et al., 2019: 102
Fig. 7	Cluster school drawing by Mojca Gregorski, Eva Hočevar, Tjaša Tahirović, Hana Videmšek and Mitja Zorc based on the cluster school design in Volksschule Mariagrün, Graz
Fig. 8	Cluster school drawing by Mojca Gregorski, Eva Hočevar, Tjaša Tahirović, Hana Videmšek and Mitja Zorc based on the cluster school design in Bildungscampus Sonnwendviertel, Vienna
Fig. 9	Photo: Mitja Zorc
Fig. 10	Photo: © Hertha Hurnaus; PPAG Architects, 2022 (For more info: PPAG Architects, 2022)

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