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THE AVANT-GARDE ARCHITECTURE VS REALITY OF EDUCATIONAL FACILITIES – SELECTED CASE STUDIES

AWANGARDA KONTRA RZECZYWISTOŚĆ NA PRZYKŁADZIE ARCHITEKTURY BUDYNKÓW OŚWIATOWYCH – WYBRANE PRZYPADKI

Abstract

The trend that can be described as the avant-garde in architecture can also be observed in educational buildings. It is visible not only in their form but also in shaping functional and spatial systems that allow for atypical classes. The above comments most often apply to new buildings, while the vast majority of educational facilities are existing buildings, the reconstruction and expansion of which is often the only way to improve their contemporary functionality. The article presents examples of contemporary school and kindergarten buildings that can be considered avant-garde. The cases of reconstruction and extension of existing facilities, which do not have such advantages but play an equally important role as educational institutions, were also discussed. The research involved an analysis of selected cases in the form of a description, with particular emphasis on selected features. On the basis of the comparison, the advantages and disadvantages as well as common elements were shown. The conclusions describe the challenges and goals that should be met by the contemporary architecture of educational buildings.

Keywords: schools' architecture, educational buildings, design for education

Streszczenie

Nurt, który można określić jako awangardę w architekturze, zauważalny jest także w budynkach oświaty. Jest to widoczne nie tylko w ich formie, ale także w kształtowaniu układów funkcjonalno-przestrzennych, które pozwalają na nietypowe prowadzenie zajęć. Powyższe spostrzeżenia dotyczą najczęściej budynków nowych, podczas gdy większość obiektów oświaty to budynki istniejące, których przebudowa i rozbudowa jest często jedyną drogą poprawy ich współczesnej funkcjonalności. W artykule przedstawiono przykłady współczesnych budynków szkół i przedszkoli, które można uznać za awangardowe. Omówiono także przypadki przebudowy i rozbudowy obiektów istniejących, które takich walorów nie posiadają, ale pełnią równie ważną rolę jako placówki oświaty. W badaniach przeprowadzono analizę wybranych przypadków w formie opisu ze szczególnym uwzględnieniem wybranych cech. Na podstawie porównania wykazano wady i zalety oraz elementy wspólne. We wnioskach opisano wyzwania i cele, jakim powinna odpowiadać współczesna architektura budynków oświatowych.

Słowa kluczowe: architektura szkół, budynki dla edukacji, budynki edukacyjne, projekty dla edukacji

1. INTRODUCTION

School is a place of special importance for a child, who spends a significant part of his active life here. It is a place of intense mental, physical and social development. However, education at all levels of education changes over time. It is no longer possible to classically define the teaching space. It becomes multidimensional, both spatially and programmatically. The changing formula of classes poses new requirements to the learning space, so there is a need to renovate old school buildings and adapt them to the constantly growing needs and curriculum requirements.

In recent years, architecture related to education (nurseries, kindergartens, school and kindergarten complexes, primary and secondary schools) has re-entered the circle of eagerly implemented facilities. The architecture of educational facilities may have avant-garde values, however, it should be noted that the utilitarian function, due to limited financial possibilities, often prevails, and the aesthetic aspects fall to the background. Many facilities related to education have been extended or modernized in recent years and most of them perform their function very well after expansion. Few of them, however, can be included in the avant-garde or even aesthetically different architectural trend.

School buildings have been deliberately related to or indirectly served other purposes than just providing space for (mass) schooling throughout history; purposes that might be more or less educational themselves¹. Grzegorz Piątek states that the basic module of the school building has not changed over the last century: the classroom (school room, office, workshop), where the teacher passes knowledge to students². The author outlined a short history of the conditions in which school buildings were built in the 20th century in Poland and outlined the most important challenges for the architecture of school buildings, including anticipating the possibility of reversible adaptation of schools to other functions in the projects.

Similar conclusions are presented by Cezary and Magdalena Szpytma. "The present educational paradigm, fundamentally unchanged since the 19th century, does not meet 21st-century educational needs. This paradigm shift must be accompanied by a strong educational architecture that fosters the skills needed for 21st century success, including creativity and cultural awareness"³. Jakub Szczęsny, in his considerations on the avant-garde in architecture, states that one of the greatest challenges for our profession in the future will be finding a new role. To be able to create visions, avant-garde or not, we will have to combine responsibility and social awareness with real activism, without forgetting the desire to do beautiful things⁴. A task set in this way becomes extremely difficult in existing situations, conditioned by numerous spatial, cultural and financial limitations. Józef Kuźma sums up his reflections on school architecture: the new school should combine local, regional, Polish and European goals and values. In the world, especially in Europe, the construction of large, multi-segment, and multi-storey "plants" is now being abandoned

¹ M. Helfenberger, *The Educationalization of School Architecture in Switzerland Between 1840 and 1950*, "Historia y Memoria de la Educación", 2021, 14, pp. 547–585.

² G. Piątek, *Szkoła na miarę naszych czasów* [in:] *Szkoła dobrze zaprojektowana*, Załącznik nr 1 do zarządzenia nr 645/2021 Prezydenta m.st. Warszawy z 4 maja 2021.

³ C. Szpytma, M. Szpytma, *School architecture for primary education in a post-socialist country: a case study of Poland*, "Compare: A Journal of Comparative and International Education", 2022, 2022, 52:4, pp. 519–542.

⁴ J. Szczęsny, *Kłopot z awangardą*, "Autoportret", 2017, 4(59), pp. 105–109.

in favor of smaller schools (for approximately 400–600 students), but clearly integrated with the local environment⁵.

In view of many studies, the concept of educational buildings is very broad. The subject of school architecture is the subject of much research, and the state of knowledge in this field is significant. Janusz Włodarczyk⁶ describes the principles according to which school buildings should be designed. Balcer-Zgraja⁷ refers to technical solutions and social requirements. Winnicka-Jasłowska and Skowronek compare the new spatial solutions of the completed buildings to numerous existing schools described in the literature as schools for the millennium⁸. They pay special attention to the following criteria: innovative functional solutions, highlighting the entrance area, location and form of the space for cabinets, land development and external devices, pro-ecological solutions and accessibility for the disabled.

Based on the challenges related to the design and construction of modern school and kindergarten buildings, an analysis of selected cases was carried out in the form of a description, with particular emphasis on selected features of facilities built in the country and abroad. On the basis of the comparison, the advantages and disadvantages as well as common elements were shown. The conclusions and recommendations are presented in the further part of the article.

2. STUDY OF SELECTED CASES

The best world examples of contemporary schools, such as Evelyn Grace Academy in London, Zaha Hadid office project, PEGS school in Melbourne, Australia, designed by McBride Charles Ryan or a multifunctional building containing, among others, a school – the Klarendal in Arnhem in the Netherlands, designed by De Zwarte Hond are undoubtedly avant-garde facilities compared to other educational facilities in this category. However, among the Polish projects, there are also a few that stand out – a school in Podkowa Leśna by Grupo5, a primary school in Chotomów, designed by 90 Architekci S.C. Piotr Czarnecki, or in Warsaw by Medusa Group.

2.1. MFA KLARENDAL, ARNHM, NETHERLANDS

The multipurpose facility MfA Klarendal is located in Arnhem, the Netherlands, on former military sites that were previously inaccessible. Local representatives, teachers and the community participated in the design process carried out by De Zwarte Hond. The school building closes the inner space of the square next to the revitalized two other existing buildings with a total area of approximately 5,000 sqm (Ill. 1). The whole thing was called a multifunctional complex because it houses a school, a gym, a wellness center, a shop, and

⁵ J. Kuźma, *Rola architektury we współczesnej i przyszłej szkole*, “Państwo i społeczeństwo”, 2012 (XII), nr 1, pp. 182–191.

⁶ J. Włodarczyk, *Architektura szkoły*, Arkady, Warszawa 1992.

⁷ M. Balcer-Zgraja, *Architektura budynku szkolnego lat najnowszych w aspekcie wpływów współczesnej techniki i wymagań społecznych*, Wydawnictwo Politechniki Śląskiej, Gliwice 2008.

⁸ W. Skowronek, D. Winnicka-Jasłowska, *Modern Architecture of School Buildings in Poland. Selected Design Issues on The Example of Two School Buildings Built in the 21st Century*, 2021, IOP Conf. Ser.: Mater. Sci. Eng. 1203 022030.

a community center. The inner space is available to everyone, not only students. This is an example of combining new buildings with the old one that already exists in the vicinity, of a historical nature. The large common space of the newly designed school building on the main staircase is connected to the hall. Thanks to this, the communication space has an individual and intimate character, and does not remain impersonal.



Ill. 1. Klarendal MfA school, Arnhem, Netherlands, Source: Daria Scagliola&Stijn Brakkee <https://www.archilovers.com/projects/141209/mfa-klarendal.html> (access: 26.06.2022).

2.2. PEGS, MELBOURNE, AUSTRALIA

The new facilities intended for a pre-existing educational institution for boys certainly stand out among school extensions. From the street it is a shiny black building. However, this blackness is not a coincidence, but the contour typical for local buildings – the contour of a single-family house with a sloping roof (Ill. 2). The building opens to the north and south, but the street-side façade is completely open to avoid distracting students. In addition, the internal space is illuminated by skylights, and the shape of the roof itself is quite unusual and allows you to freely interpret its shape. However, this school is surprising not only thanks to the façade on the side of the entrance⁹, but also thanks to the façade on the side of the internal courtyard made of corrugated white and red metal, thanks to which an interesting and safe internal space for students was created, which is closed with other buildings also owned by the school. The colors of the interiors and the form of the interiors are also interesting, which, as the research shows, directly influences the perception of the school by students.

⁹ Ch.R. McBride, *PEGS Junior Boys School*, 2011, <https://www.archdaily.com/161388/pegs-junior-boys-school-mcbride-charles-ryan> (access: 3.07.2022).



Ill. 2. The front elevation of the school in the new part of PEGS in Melbourn, Source: McBride Charles Ryan; source: <https://archirama.muratorplus.pl/artukul/galeria/co-ma-eric-bana-do-nowej-szkoly-dla-chlopcow-w-melbourne-od-mcbride-charles-ryan,1193/499/3620/> (access: 2.07.2022).

2.3. AKADEMEIA HIGH SCHOOL, WARSAW

Akademie High School in Warsaw was implemented in 2017. It is a 3-storey U-shaped building located in the western part of Wilanów. The building, designed by Medusa Group, represents numerous pro-ecological solutions: geogrid and greenery in some of the paved areas from the entrance side, greenery to the side of the inner courtyard. The inner courtyard with stairs and seats and pots (Ill. 3), which allow for outdoor activities, as well as access to the roof, also covered with vegetation, deserves attention¹⁰. Akademie obtained the LEED Platinum certificate, so it is not only a building serving the needs of education, but also a building educating through architecture in terms of ecology and solutions. There are no classrooms and benches as we know from typical solutions – in their place there are workshops for less numerous groups.

¹⁰ K. Mycielski, G. Stiasny, *Szkola bez ławek w Wilanowie*, "Architektura-Murator". 2018, 1(280), pp. 30–35.



Ill. 3. Courtyard with stairs and seating for students, Akademia High School Warsaw, source: Juliusz, Jędrzej Sokołowski <https://www.medusagroup.pl/pl/projekty/uzytecznosci-publicznej/akademia-highschool-w-warszawie/> (access: 26.06.2022).

2.4. PRIMARY SCHOOL IN CHOTOMÓW

Primary school in Chotomów, designed by 90 Architekci S.C. Piotr Czarnecki is an example of an educational facility built as a result of intensive urbanization of this until recently little-known village near Warsaw. Educational-cultural center in Chotomów, for which an architectural competition was organized in 2009, is a complex consisting of a primary school, middle school, community center and library planned on a triangular plot at the intersection of Partyzantów Street leading from Jabłonna with the local Kisielewskiego Street. The primary school is the first, and so far the only completed part of the construction of the Educational, Cultural, and Sports Center, 4,000 sqm, total area 12,700 sqm. The form of the building (simple form and a sloping roof) is to correspond to children's ideas about the shape of the house, and it is also to refer in scale and form to the surrounding single-family housing (Ill. 4). At present, however, it is difficult to assess the whole, as the spatial form of the building will be obvious only after the completion of further stages of the investment, when the remaining modules will create an internal courtyard.



Ill. 4. Primary School in Chotomów, Partyzantów Street, side view. Source: Marcin Czechowicz, https://architektura.muratorplus.pl/realizacje/szkola-podstawowa-w-chotomowie_5338.html (access: 2.07.2022).

Undoubtedly, the ecological aspect of this project is also avant-garde. “The school is completely heated in winter and cooled in summer with renewable energy”¹¹. The interiors with their colors in the tone of the earth play an important role in the building. Among them, the spiral staircase plays a special role, i.e. the one that does not function as an escape route. This cage, together with the soul, gives a sense of coziness, emphasizes the role of the hall as a common space, integrating children during breaks, and gives interesting perspectives, different from the typical views of the staircase, corridor, classroom door.

3. STUDY OF AUTHOR'S PROJECT CASES

Contemporary, completed expansion projects known and described in Poland include, among others, extension of Primary School No. 147 with Integration Departments in Wesoła, Plac Wojska Polskiego 28, xystudio¹² project, and extension of the municipal school complex in Kazimierz Dolny, designed by Tomasz Studniarka and Małgorzata Pilinkiewicz. The above can be considered exceptional¹³. The authors present their own design experiences, which constitute important illustrations of the issues discussed in the article. The case of primary school No. 13 in Gliwice has a long history spanning over 100 years. At that time, in the school located in the Żerniki district, other buildings were being built: schools, teachers' apartments, the second school building, one of the buildings was converted into a kindergarten, a gym was added (in a style not matching the whole), and recently (2017), the main school building was expanded, adding a body that complies with conservation requirements¹⁴. In 2022, the reconstruction of the kindergarten building begins. The history of the place and local conditions had a significant impact on the form of the last two projects, which will ultimately change the character of the place.

3.1. PRIMARY SCHOOL NO. 13, GLIWICE

The project to expand the primary school No. 13 was designed in 2017 and completed in 2018 (Ill. 5). The project to expand the primary school was created in 2020. The appearance of the building was determined by the provisions of the local MPZP and the necessity to make arrangements with the municipal monument conservator. The functional layout and aesthetics have been adapted to existing facilities. The new body proposed an entrance hall, which was missing in the existing buildings. The shape of the staircase and the entrance is distinguished by a clinker cladding. The bands around the windows are analogous to the neighboring building protected under the MDCP building entry.

¹¹ P. Czarnecki, *Szkoła podstawowa w Chotomowie*, 2015, https://architektura.muratorplus.pl/realizacje/szkola-podstawowa-w-chotomowie_5338.html (access: 3.07.2022).

¹² *Szkoła Podstawowa nr 174 w Warszawie*, https://architektura.muratorplus.pl/realizacje/szkola-podstawowa-nr-174-w-warszawie_11156.html (access: 31.01.2022).

¹³ *Zespół szkół w Kazimierzu Dolnym*, https://architektura.muratorplus.pl/realizacje/zespol-szkol-w-kazimierzu-dolnym_9749.html (access: 3.07.2022).

¹⁴ T. Bradecki, B. Uherek-Bradecka, *Wybrane zagadnienia w projektowaniu budynków szkolnych i przedszkolnych – problematyka przebudowy i rozbudowy obiektów istniejących na przykładzie zespołu SP13 w Gliwicach*, “Builder”, 2022; 299 (6), pp. 22–25, DOI: 10.5604/01.3001.0015.84210.



Ill. 5. Primary school No. 13 in Gliwice, extension. Authors' source.

3.2. KINDERGARDEN AT PRIMARY SCHOOL NO. 13, GLIWICE

The project of a kindergarten at primary school No. 13 was created in 2020 and involves the demolition of the existing building housing kindergarten departments and the construction of a new, eight-section building. The construction of a new building is necessary due to the poor technical condition and maladjustment of the existing building in terms of functionality, fire protection, hygiene and sanitation. The proposed architecture is certainly not one of the avant-garde solutions. However, it is adapted to turning: a multi-hipped roof covered with plain tiles, the colors or the facade with clinker cladding elements were dictated by arrangements with the municipal conservator of monuments. As in the case of the extension of the school, the element breaking the compact body of the building is a rectangular staircase raised above whose roof, the façade is entirely made of clinker bricks (Ill. 6).

The design of the kindergarten takes into account the differentiation of the height of the terrain. In place of the lowering of the terrain, it was proposed to go to the green area and to form the slope in such a way that it will be attractive for users during the summer – partial roofing allows you to go out and get some air without exposure to rain. Part of the dining room in the kindergarten is to be multifunctional: apart from serving meals, there will be performances and special events. The body of the dining room was sloping and exposed, and a utility terrace was proposed on its flat roof. It seems that such a solution will allow for more frequent and easier use of fresh air by two kindergarten groups that have access to the terrace. The kindergarten dining room, similarly to the present one, is to be available for younger primary school students, due to the fact that there are no other options for the location of the kitchen and the dining room outside the complex.



III. 6. Design for kindergarten next to primary school No. 13 in Gliwice (2021), visualization from the side of the recreation area for children. Authors' source.

3. CONCLUSIONS

The presented list of 'typical examples' alongside their 'outstanding counterparts' illustrates the challenges which are not always met. The more that local design constraints often require a specific appearance and expression of newly designed objects. On the basis of the presented examples, common features of distinguishing projects can be identified:

- Individual and surprising form.
- Individual and contemporary approach to interiors, including common spaces. In most cases, corridors, staircases, lobbies are an element that stands out due to the proportions of space, design and the possibility of arranging them for other functions than just communication.
- Caring for external common spaces, which can also be used for teaching, recreation, and leisure.
- Balanced, unobtrusive contemporary architecture, respecting the environment and creatively drawing from it.
- The use of energy-saving solutions and technologies, including those obtained from renewable sources, as an important visible infrastructure and educational element. This aspect is no longer unique and is becoming more and more common, occurring in many new buildings. Exhibiting pro-ecological solutions that affect the physiognomy of the building can be considered an element of broadly understood education.

It is difficult to clearly define whether the above conclusions can be considered as recommendations for creating truly avant-garde educational facilities. It is worth paying attention to the fact that avant-garde objects often stand out from the environment, break it or even

stand in opposition to it. For local communities, however, the environment with its genius loci is of great value and its behavior and respect are extremely important here. However, we can certainly consider the above guidelines as contemporary and in line with the demands of Józef Kuźma. However, it is also worth paying attention to another aspect raised by this author: “the maximum use of the existing spatial resources (objects requiring revalorization) with adapting them to the current needs”¹⁵, and this trend is part of the expansion of school No. 13 in Gliwice.

References:

- [1] Balcer-Zgraja M., *Architektura budynku szkolnego lat najnowszych w aspekcie wpływów współczesnej techniki i wymagań społecznych*, Wydawnictwo Politechniki Śląskiej, Gliwice 2008.
- [2] Bradecki T., Uherek-Bradecka B., *Wybrane zagadnienia w projektowaniu budynków szkolnych i przedszkolnych – problematyka przebudowy i rozbudowy obiektów istniejących na przykładzie zespołu SP13 w Gliwicach*, "Builder", 2022, 299 (6), pp. 22–25, DOI: 10.5604/01.3001.0015.84210.
- [3] Czarnecki P., *Szkoła podstawowa w Chotomowie*, 2015, https://architektura.muratorplus.pl/realizacje/szkola-podstawowa-w-chotomowie_5338.html (access: 3.07.2022).
- [4] Helfenberger M., *The Educationalization of School Architecture In Switzerland Between 1840 And 1950*, "Historia y Memoria de la Educación", 2021, 14, pp. 547–585, DOI: 10.5944/HME.14.2021.27308.
- [5] Kuźma J., *Rola architektury we współczesnej i przyszłej szkole*, "Państwo i społeczeństwo", 2012 (XII), nr 1, pp. 182–191.
- [6] McBride Ch.R., *PEGS Junior Boys School*, 2011, <https://www.archdaily.com/161388/pegs-junior-boys-school-mcbride-charles-ryan> (access: 3.07.2022).
- [7] Mycielski K., Stiasny G., *Szkoła bez ławek w Wilanowie*, "Architektura-Murator", 2018, 1(280), pp. 30–35.
- [8] Piątek G., *Szkoła na miarę naszych czasów* [in:] *Szkoła dobrze zaprojektowana*, Załącznik nr 1 do zarządzenia nr 645/2021 Prezydenta m.st. Warszawy z 4 maja 2021 r., <https://architektura.um.warszawa.pl/documents/12025039/22205420/Za%C5%82%C4%85cznik+nr+1+do+zarz%C4%85dzenia.pdf/1337a828-9989-3b00-0bf8-2d6fa6fcfa8e?t=1628762886796> (access: 6.07.2022).
- [9] Skowronek W., Winnicka-Jasłowska D., *Modern Architecture of School Buildings in Poland. Selected Design Issues on The Example of Two School Buildings Built in the 21st Century*, 2021, IOP Conference Series: Materials Science Engineering 1203 022030.
- [10] Szczęsny J., *Kłopot z awangardą*, "Autoportret", 2017, 4(59), pp. 105–109.
- [11] *Szkoła Podstawowa nr 174 w Warszawie*, https://architektura.muratorplus.pl/realizacje/szkola-podstawowa-nr-174-w-warszawie_11156.html (access: 31.01.2022).
- [12] Szpytma C., Szpytma M., *School architecture for primary education in a post-socialist country: a case study of Poland*, "Compare: A Journal of Comparative and International Education", 2022, 52:4, pp. 519–542, DOI: 10.1080/03057925.2020.1777843.
- [13] Włodarczyk J., *Architektura szkoły*, Arkady, Warszawa 1992.
- [14] *Zespół szkół w Kazimierzu Dolnym* https://architektura.muratorplus.pl/realizacje/zespol-szkol-w-kazimierzu-dolnym_9749.html (access: 3.07.2022).

¹⁵ J. Kuźma, *Rola architektury we współczesnej i przyszłej szkole*, "Państwo i społeczeństwo", 2012 (XII), nr 1, pp. 182–191.

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