

Towards ecological transformation: developing architectural education and research through L'Art Urbain initiatives

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ABSTRACT: The aim of this study was to examine the collaboration between the Faculty of Architecture at Gdańsk University of Technology (Gdańsk Tech), Poland and L'Art Urbain dans les Territoires, Paris, France, recognised for its involvement in transforming urban development over four decades. The focus is placed on the evolution of the association's annual competition, highlighting the growing emphasis on sustainability. Special attention is dedicated to the integration of themes relating to environmental and social sustainability into the curriculum of Master's level design courses. This study highlights the role of the competition in enhancing education in architecture and urban planning, as well as in developing research at Gdańsk Tech, especially in fields related to the social and environmental aspects of urban regeneration. Moreover, the research also considers the wider implications of this collaboration, in particular its effectiveness in linking theoretical education to real-world challenges and in equipping architects to deal with the complexities of sustainable urban development.

INTRODUCTION

As urban areas worldwide confront escalating environmental and social challenges, the imperative for sustainable urban development is increasingly evident [1-3]. Magnified by the dual pressures of climate change and rapid urbanisation, these challenges underscore the urgency for integrated, sustainable solutions [4][5]. Grounded in the principles outlined by the Brundtland Commission's 1987 report *Our Common Future*, sustainable development advocates for a harmonious balance between economic growth, environmental protection and social equity - a triad essential for the well-being of current and future generations. Realising these principles in urban contexts is a complex challenge, requiring innovative strategies that evolve with people's understanding of sustainability [5][6].

The most up-to-date interpretation of the idea of sustainable development was described in 2015 through 17 goals called the Sustainable Development Goals (SDGs). Tasks for the construction sector are encompassed within the scope of several different goals, primarily in goal 11 (Sustainable Cities and Communities), but also indirectly in others, such as 1 (No poverty), 3 (Good health), 7 (Renewable energy), 9 (Innovation and infrastructure), 12 (Responsible consumption), 13 (Climate action), 15 (Life on land).

Another important programme is the European Green Deal (EGD) enacted in 2019 by the EU. Its most crucial points include: climate protection, clean affordable energy, pollution emission reduction, energy and resource-efficient buildings, industry transformation towards a circular economy, sustainable and smart mobility, strengthening ecosystems, and transforming the food system (from farm to fork). These objectives are to be implemented in the spirit of social justice. The EGD goals were further developed in 2020 in the New European Bauhaus (NEB) initiative. It concerns the built environment and is based on three key values: beauty, sustainability and community.

To achieve sustainable urban environments, it is important to integrate the SDGs into educating future architects and urban planners [7-9]. Therefore, it can be seen, that the education system faces the dual challenge of imparting a comprehensive understanding of these goals, while also equipping students with practical skills for their application [10].

In this article, the authors discuss methods of implementing the principles and goals of sustainable development into the curriculum in the Faculty of Architecture of Gdańsk University of Technology (Gdańsk Tech), Poland. They are described on the example of collaboration with the French association L'Art Urbain dans les Territoires, Paris, France, regarding a competition for students and educators from higher education institutions worldwide. The aim of the article is to demonstrate the role of the competition as a supportive tool for incorporating the sustainability ideas into academic education and the scientific development of staff. For this purpose, an analysis of the development of co-operation with L'Art Urbain dans les Territoires and its educational significance within Master's design courses was conducted.

The conclusions focus on the universal elements of this particular initiative, crucial for educational objectives, which can be applied in creating other, similar methods.

METHODOLOGICAL FRAMEWORK

The analysis conducted in the article consists of three parts. The first part concerns the identification of principles of the international competition organised by L'Art Urbain dans les Territoires, which can be considered conducive to following the idea of sustainability when thinking about the urban and architectural context.

The second part examines the development of competition themes since 2000 in terms of their alignment with the SDGs and the propositions of the EGD and the NEB.

The third part concerns the participation of groups from Gdańsk Tech in the competition. As an important part of the research, elements of the competition that facilitate their incorporation into semester courses were identified. Numerical data describing the participation of teams from Gdańsk in the finals and awarded projects since the beginning of the co-operation were also compiled, and the scope of research activities concerning the sustainability issues, in which the course leaders were directly involved, was demonstrated. Moreover, two exemplary competition proposals from 2022 were presented, indicating solutions directly related to specific SDGs and the postulates of the EGD and the NEB. The results of these analyses are discussed in the following sections.

THE IDEA OF SUSTAINABILITY IN THE ASSUMPTIONS OF ART URBAIN DANS LES TERRITOIRES

L'Art Urbain dans les Territoires is an association that has been active in France for 40 years. It connects various communities responsible for the quality of urbanised areas. The association collaborates with national and local authorities, professionals in design and investment, and representatives of higher education institutions, including students. One of the significant initiatives is an annual competition, which was initially addressed to students of French universities. It became international in 2003. The challenge is to develop a conceptual design for the revitalisation of a public space selected by the participants, considering the issues imposed by the organisers. Representatives from diverse areas of architecture and urban planning, including academic teachers involved in the competition, contribute to both formulating the annual competition theme and evaluating the submitted projects.

The competition concludes with a meeting in Paris that combines the celebration of the winning projects with presentations and discussions of their underlying concepts. This approach facilitates the integration of diverse groups, differing in many aspects - the roles they play (practitioners, government and business representatives, researchers, teachers and students), age and experience (providing a range of perspectives and insights), nationality and cultural background (fostering cross-cultural exchange and understanding). It is worth to emphasise that the sites selected for competition entries are located in different parts of the world. Therefore, they are subject to different economic, climatic and social conditions. This diversity enriches the competition and encourages innovative and adaptable solutions [11][12]. The final works are archived on a Web site, creating a valuable and publicly accessible resource, which serves as a knowledge base and a source of inspiration for future generations of architects and urban planners.

The competition's constant and unchanging assumption is the design approach defined by three values: architectural quality, quality of social life and respect for the environment [12][13]. The association's guidelines emphasise the importance of integrating buildings into their surroundings and enhancing public spaces. This reinforces the idea that the quality of architectural solutions is a fundamental factor in shaping the quality of urban spaces [11][12]. The category of architectural quality can be indirectly attributed to goal 11 (Sustainable cities and communities) of the SDGs, but it is most fully defined by one of the three values postulated by the NEB - beauty, as an aesthetic value that builds the identity of place and culture.

The category of social quality of life is understood in the competition as the strengthening of the revitalised area in terms of the accessibility of public spaces and a diverse functional programme that responds to the needs of local communities, supporting the integration of different groups. This category of value can be directly attributed to SDGs 3, 10 and 11. They are less emphasised in the detailed assumptions of the EGD, but they resonate in the basic assumption of an equal approach. In the NEB programme, the quality of social life is included in the third postulate - community.

Respect for the environment is understood in the competition as building the environmental quality of urbanised spaces and creating harmonious relationships between anthropogenic and natural elements. It is expressed in solutions of biodiverse blue-green infrastructure, but also in an ecological approach to building design. This category is directly and indirectly linked to the SDGs that are focused on the environment (e.g. 7, 12, 13, 15), with most of the EGD assumptions and the NEB postulate on sustainability.

Another permanent feature of the competition, also important from the point of view of the issue of balancing, is the interdisciplinary approach [10]. Teams participating in the competition must consist of one or two teachers and one or two students, and they should represent at least two different disciplines related to spatial design. In addition, there are permanent rules for project presentation, which makes it easier to compare works, including archival ones.

DEVELOPMENT OF THE COMPETITION THEME IN TERMS OF COMPLIANCE WITH THE SDGS, EGD AND NEB

Table 1 shows the list of competition themes over the years from 2000, highlighting the evolution of topics since before the competition became an international event in 2003. Based on the analysis of the theme descriptions included in the competition regulations, appropriate sustainable development goals and postulates of the European Green Deal and the New European Bauhaus were assigned to them.

Table 1: An overview of the themes of Art Urbain's initiatives and the assigned SDGs, and EGD and NEB postulates.

Year	The theme of the year	SDG ¹	EGD ²	NEB ³
2023	Ecological transition, new uses: territories in all their diversity offer solutions	11, 13, 15	6	1,2, 3
2022	Ecological transition and improving the quality of life in cities, towns and villages	11, 13	6	1, 2, 3
2021	Urban regeneration on the periphery of towns, cities and villages	10, 11	8	1, 3
2020	Cities, towns and villages. Mobility for all	10, 11	8	1, 3
2019	Revitalising the centres of small and medium-sized cities	10, 11		1, 3
2018	For a network of public spaces accessible to all	10, 11	8	1, 3
2017	Enhancing public spaces, common good of the citizens	10, 11		1, 3
2016	The case for felicitous public space enhanced by light and the arts	11		1
2015	Public space at the core of urban renewal	11		1
2014	Towards reorganisation of suburban neighbourhoods through mobility	9, 10, 11	6	1, 2, 3
2013	Ecological neighbourhoods linked to a nature network	11, 15	1, 6	1, 2, 3
2012	Facing urban sprawl, what kind of living environment will we have in the future?	11, 13, 15	6	1, 2, 3
2011	Valorisation of the forgotten empty spaces	11		1
2010	The city centre and its surroundings accessible to all	10, 11	8	1, 3
2009	Composing with nature, territories between municipalities and small towns	11, 15, 13	6	1, 2
2008	Reconsidering allotment sites as urban complexes on a human scale	11		1, 3
2007	The public square, a place for social life	11		1, 3
2006	Watercourses in our neighbourhoods (rivers and brooks, canals and lakes)	6, 11, 13	6	1, 2, 3
2005	City dwellers, cars and parking	11, 13		
2004	Exterior advertisements	11		1
2003	On the bridges and under the bridges	9, 11		1, 3
2002	Around the school	4, 11		1, 3
2001	The city and people with reduced mobility	10, 11		1, 3
2000	Vegetable gardens for the cities of the 21st Century	3, 11	6, 7	1, 2, 3

¹ SDG: 3 Good health and wellbeing, 4 Quality education, 6 Clean water and sanitation, 9 Industry, innovation and infrastructure, 10 Reduced inequality, 11 Sustainable cities and communities, 13 Climate action, 15 Life on land;

² EGD: 1 Climatic neutrality, 2 Clean, affordable, safe energy, 3 Circular economy, 4 Energy and resource-efficient building and renovating, 5 Zero-emission, 6 Preserving, restoring ecosystems, 7 From farm to fork, 8 Sustainable, smart mobility;

³ NEB: 1 Beautiful, 2 Sustainable, 3 Together.

It can be observed that initially, the competition themes placed a much greater emphasis on combining architectural and urban quality with social problems [11-13]. Over time, this approach began to merge with an environmental focus, mainly concerning greenery and water in the human environment [11][12]. A holistic view of natural elements as a network that permeates public spaces was proposed in 2013. This theme emphasised the importance of the natural environment for the climate and society.

The competition's themes have been directed towards mobility several times. Initially, the focus was on the issue of excess cars. In subsequent years, mobility was linked to the functioning of suburban areas, the accessibility of public spaces and social inequalities. For the past two years, the themes have been directly related to the postulate of ecological transformation. In 2022, the topic concerned the significance of the natural environment for the quality of public spaces in urbanised areas [14]. The latest theme refers to diversifying the functionality of urban and suburban sites. This theme is connected with the consequences of the Covid-19 pandemic, inflation, the economic crisis and the problem of increasingly limited housing availability. This is the first theme that is so distinctly focused on the economic aspect of sustainability.

An analysis of the competition themes over the past 23 years shows that they have evolved in line with the development of the definition of the idea of sustainability. There is a high convergence with the SDGs and the NEB principles. To a slightly lesser extent, it occurs in the context of the EGD assumptions. However, this is understandable, as they are more focused on technical infrastructure and construction than on urban planning [15].

PARTICIPATION OF GDAŃSK UNIVERSITY OF TECHNOLOGY IN THE ART URBAIN COMPETITION

Teams from the Faculty of Architecture at Gdańsk Tech participated in the competition for the first time in 2006. The initiator of this collaboration was J. Gujski, an architect and lecturer, who was actively co-operating with

the architectural community in France. First, the competition theme was introduced as a project task for the Landscape Design course for the entire group of final year students, and then for the Architectural and Urban Design course in the second semester of Master's studies for a group of 30 students (i.e. 20-25% of the entire year group). This type of integration of the semester project with the competition theme is realised year by year until today.

Such classes are conducted in the form of a design studio. According to its principles, a group of students receives a design task to be completed under the supervision of a teacher. This work system is focused on practice and has many analogies to the functioning of real design studios. The competition formula fits very well into the required work system of the Architectural and Urban Design courses. The project scope adequately links urban and architectural issues to the course requirements [16]. The problem-based approach meets the objectives of Master's studies focused on integrating design with science [17]. The entire group faces a single design problem, but it can be implemented on cases involving different areas. Students most often propose sites they have become familiar with and have identified a need for transformation. This gives the opportunity to work on current problems, including sites prepared for revitalisation in local government initiatives [13][18][19].

It can be estimated that over the years, around 600 students have participated in the course, developing approximately 300 projects. On average, 70% of the projects reached a level sufficient to be submitted to the competition. The group leading the course over the years has consisted of about ten teachers. The most significant contribution comes from the staff of the Department of Urban Design and Regional Planning, the Department of Environmental Design and the Department of Urban Architecture and Waterscapes. Figure 1 presents data related to the participation of teams from Gdańsk since 2006. It shows the number of all projects qualified for the finals in each year and the number of final projects submitted from Gdańsk. In that time, teams from Gdańsk have won a total of 21 prizes and awards. Analysis of the data shows that the participation of teams from Gdańsk Tech can be considered significant in terms of both finalist and awarded projects. What is important, the awards received by Gdańsk teams were a strong motivation for students in the following years.

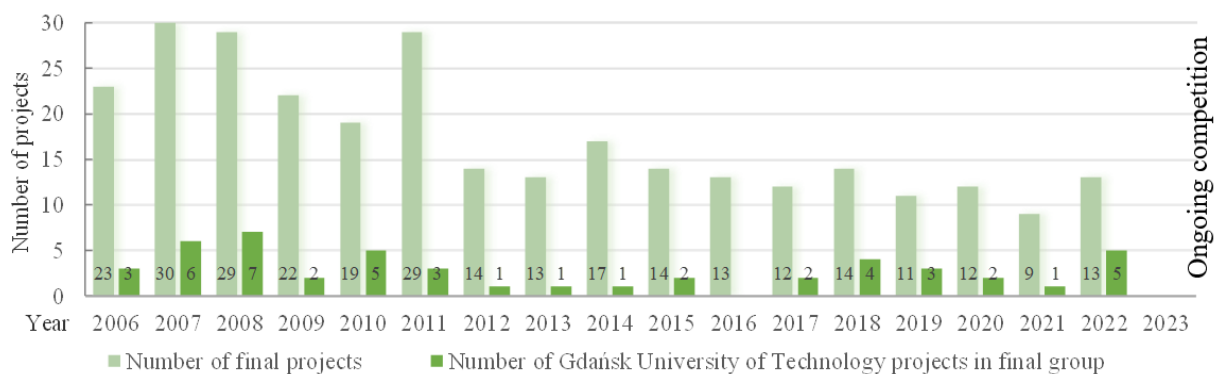


Figure 1: Total number of final projects and number of Polish projects in final groups over the years.

It should be pointed out that the course in which the competition projects are developed has brought together teachers who are involved in research directly related to sustainable development. Since 2018, they have participated in the following research and didactic projects: TELOS (Towards European Landscape Economy for a Sustainable Urban Development - Erasmus+), EmCliC (Embodying Climate Change, Transdisciplinary Research on Urban Overheating - Iceland, Liechtenstein and Norway Grants), B4F_PTPL (Balcony for the Future, an Architectural Assessment of Home Balconies for the New Post-pandemic Era in Lisbon and Warsaw - FCT Portugal Grant), and SOS Climate Waterfront (European Union's Horizon 2020). The exchange of scientific and didactic design experiences related to the competition proved to be valuable and stimulating for both teachers and students.

SUSTAINABILITY-ORIENTED SOLUTIONS IN COMPETITION PROJECTS

Competition entries are a valuable source of knowledge about the educational outcomes of the Art Urbain contest in terms of implementing sustainability ideas into design tasks [13][17][20]. A good example is provided by two selected projects from Gdańsk, which were qualified for the final group in 2022. All members of these teams (students and teachers) were additionally involved in a seminar and an optional project carried out as part of the international educational project TELOS. Thanks to this, students could use analytical research and various forecasts of development for the chosen area - Altbach Island in the Stuttgart region, Germany, in their design work for the course and as a foundation for developing a revitalisation project of a small part of this area within the Art Urbain competition.

The first project (Figure 2), entitled: *Industrial adaptation - From factory to society*, concerns an area occupied by a declining, non-intrusive industry. It proposes the adaptation of existing buildings into cultural, sports and recreational facilities. The programme is complemented by new residential buildings combined with small-scale urban farming. The previously inaccessible riverbank has been incorporated into the system of public spaces linked by bicycle paths.

This project was awarded a distinction in the social quality category. In the second project (Figure 3) titled: *Industrial symbiosis - Use already used*, a transformation of a highly industrialised zone along the river into a multifunctional district and its connection with a residential area at the other end of the island were proposed. The presented solutions lead to the natural reinforcement of the post-industrial area and its integration into the system of public spaces.

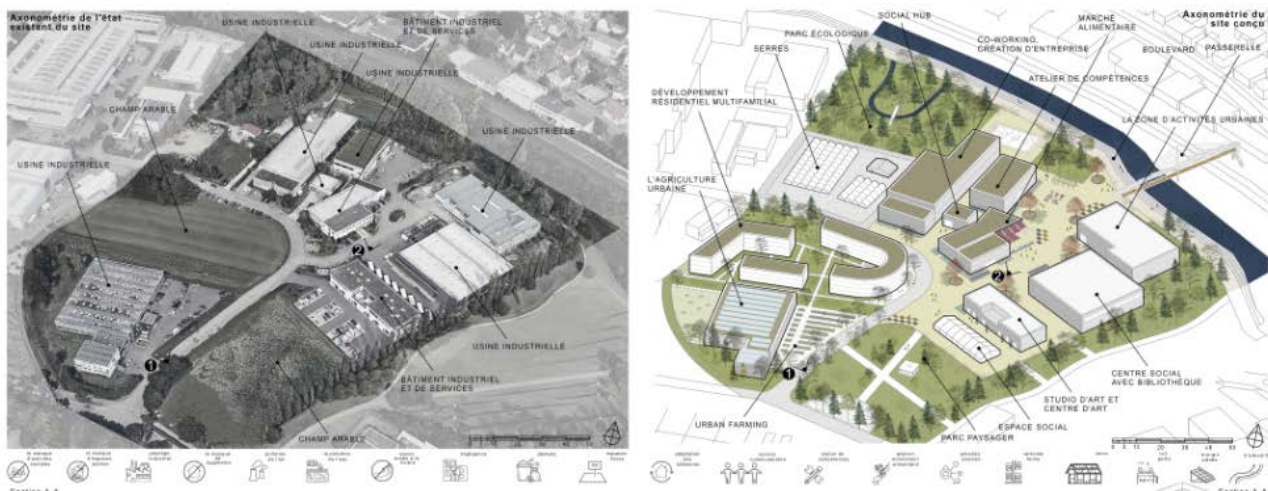


Figure 2: Project that received the Quality of Social Life mention in the 2022 edition, titled: *Industrial adaptation - From factory to society*. Study area overview - on the left side, with transformation strategy outline - on the right side (authors: group: J. Wojtun and M. Woronecka, led by architects D. Wojtowicz-Jankowska and K. Zielonko-Jung; source: database of the Faculty of Architecture at Gdańsk Tech).

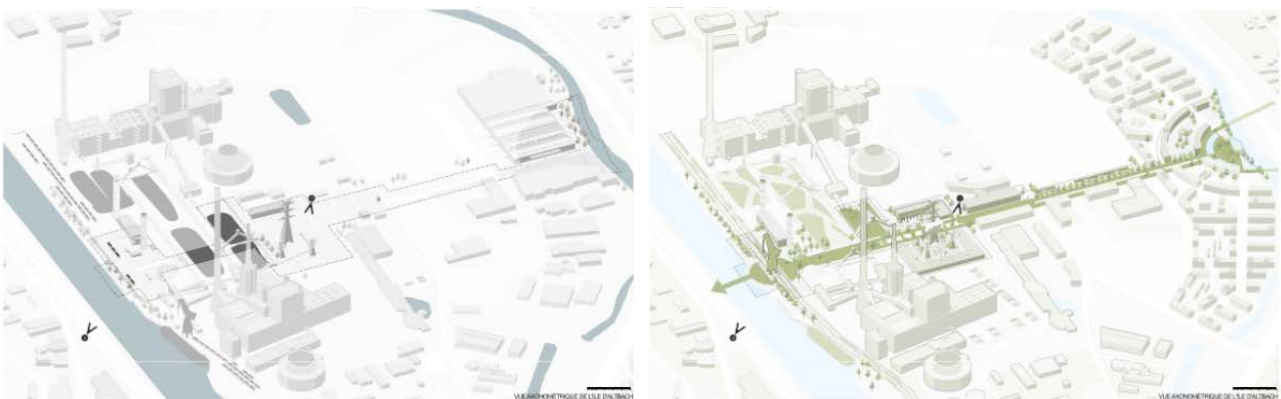


Figure 3: Project from the final group in the 2022 edition, entitled: *Symbiose industrielle - Utiliser déjà utilisées*. Study area overview - on the left side, with transformation strategy outline - on the right side (authors: group: N. Fronczek and S. Jackowski, led by architects K. Krośnicka and I. Burda; source: database of the Faculty of Architecture at Gdańsk Tech).

Both projects place a strong emphasis on biodiversity, adaptation of existing building resources for new purposes, energy-efficient solutions and equality in access to public and recreational spaces. Moreover, both projects align with Sustainable Development Goals: 7 (Clean affordable energy), 9 (Innovation and infrastructure), 11 (Sustainable cities and communities), 12 (Responsible consumption), and the European Green Deal (EGD) mandates regarding the circular economy, clean and affordable energy, energy and resource-efficient building and renovation, pollution reduction, and climate and ecosystem protection. They are also designed to reflect the three pillars of the New European Bauhaus, enhancing the aesthetic, environmental and social quality of the development sites.

CONCLUSIONS

The analysis presented here has shown a significant degree of integration of the competition formula with the curriculum of the Faculty of Architecture at Gdańsk Tech. The collaboration initiated 23 years ago continues to this day and has become a permanent element that strengthens the curriculum, allowing for the combination of educational initiatives with scientific ones. It generates a high level of involvement among teachers and students. The results can also be highly rated, both in terms of competition results and educational effects.

The competition, despite its many constant and unchanging rules, allows for following the evolution of the idea of sustainability and for continuous attempts to implement it into design using the examples of areas requiring intervention. Although L'Art Urbain dans les Territoires is relatively not a large association, the effects of its activities

in terms of influencing the curriculum of the Faculty of Architecture at Gdańsk Tech can be highly rated. They also contribute to strengthening the links between research and didactics.

The features that determine the quality of this impact are:

1. Consistency in treating the competition task as revitalisation aimed at improving quality in three categories: architectural quality, social quality and environmental protection.
2. Problem-based approach (updated every year) with free choice of project case.
3. Openness to co-operation among a wide range of specialists, interdisciplinarity.
4. Continuous updating of the approach, searching for current challenges.
5. Building a publicly accessible database (constant rules for the graphic form of the projects and their archiving).

Thanks to these features, the activities related to the Art Urbain competition can be defined as a kind of platform aimed at implementing the idea of sustainability into architecture and urban planning. It is a tool that connects theory, scientific research, education and practice. The fact that this initiative has been ongoing for many years, is constantly developing, and has so deeply integrated into the curriculum at Gdańsk Tech, suggests that the key features mentioned here are universal and can be the basis for other, equally effective initiatives, both at this and other universities

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