

# Teaching the creation of spatial form of contemporary cities

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**ABSTRACT:** In this article, the author presents the results of research work concerning the creation of the spatial form of contemporary cities in architectural education (teaching programmes and students' design solutions) in the Faculty of Architecture at Warsaw University of Technology (FA-WUT), the Chair of Urban Design and Rural Landscape. Spatial form was taught during engineering studies and during Master's degree studies, in the course, Specialisation AiU1 Architecture and Urban Planning. In researching these issues, particular emphasis was placed on the teaching of the creation of space, which could be observed in the entire educational process and curriculum that address the issue of sustainable development in the acquiring of skills that are important for the modern professional architect.

## INTRODUCTION

The necessity to apply the most recent ideas of the development of contemporary cities, especially the idea of sustainable development, has been partly realised by achieving high aesthetic qualities of the urban environment. At present, in accordance with the idea of sustainability, the striving to achieve spatial order of the built environment should result from the appropriate creation of its spatial form. One of the most important instruments for maintaining and shaping the spatial order of cities is urban design, spatial planning and urban composition (the tools for controlling space).

Urban form and land use patterns within a city are critical determinants of its environmental quality. Today, city form is determined by the interaction of countless decisions by individuals, households and businesses on the one hand, and a variety of government interventions designed to influence or control those decisions on the other. There are no *decision-makers* deciding on the shapes of cities. Urban design is necessary to organise and co-ordinate the different participants, for the resulting urban spaces to be properly designed. The task of urban design, working together with urban policy, is to create real spaces that are assets to society and, in effect, give society its design [1].

A special role in the creation of the spatial form of cities, especially in shaping multifunctional urban complexes with public spaces, is urban composition. It is based on the protection of the cultural image of the city with the application of the principle of historical continuation. The urban composition is the main criterion for evaluation of spatial form of any city; it is a factor and measure that determines the quality of space [2].

Unfortunately, often the need to remember the *compositional factor* in spatial development of cities is neglected by people deciding the shape of urban space and it is lost to short-term economic interests. This is caused, among other things, by little awareness that spatial order increases the value of everything, as does well-composed space [3]. Future architects must understand the nature of many problems of sustainable development, and architectural education is an effective means of achieving the spatial order of contemporary cities.

All guiding postulates and ideas in teaching in the Faculty of Architecture at Warsaw University of Technology (FA-WUT), especially in the Chair of Urban Design and Rural Landscape, are in agreement with the above principles, which are found in many planning documents, as well (e.g. Agenda 21, The Habitat Agenda, Declaration from Istanbul: Ecopolises - Settlements for Sustainable Development 1996, The New Charter of Athens 2003). Following these global trends, the aim is to try to find and apply in teaching a new sustainable model for the development of human settlements. Many of the students' design solutions concern the city of Warsaw. This is the reason why it is necessary to present at the start the most important spatial problems of a city. At present Warsaw - as the capital of Poland and the predominant urban structure within its own region - is in a unique situation, because it is the centre of political life,

as well as a crucial scientific, cultural and commercial centre. Many new modern investments can be observed involving the revitalisation of many parts of the city, including public spaces, as well as changing patterns of leisure activity. Unfortunately, despite many positive phenomena, many negative changes also can be observed, which influence mostly the natural environment and cause deterioration of living conditions in the city; for example:

- rapid development of motorisation and increasing air pollution;
- increasing urban sprawl;
- lack of readability of the townscape and a lack of spatial order in many parts of the city (especially on the peripheries);
- disappearance of local identity and the unification of the landscape;
- process of decreasing and polluted green open spaces; and
- insufficient recreational development of the Vistula Valley and other open spaces [4].

In the face of these changes shaping the efficient spatial city structure, explorations and design solutions related to the identity of urban areas, as well as preservation and creation of the spatial order of contemporary Warsaw should be of great importance.

## METHODOLOGY

The main objective of research work presented in this article is the analysis of teaching programmes and contemporary design solutions in the creation of spatial forms of contemporary cities, as exemplified by students' design projects in the Faculty of Architecture at Warsaw University of Technology (FA-WUT), especially in the Chair of Urban Design and Rural Landscape. The research was carried out taking into account existing knowledge and by applying methods appropriate for the morphological research of urban space. The research methods applied were:

- 1) Analysis and criticism of sources (documents, literature, design projects).
- 2) Observation.
- 3) Comparison.

## CHAIR OF URBAN DESIGN AND RURAL LANDSCAPE: AIMS AND PRINCIPLES OF EDUCATION

The multidirectional teaching and scientific activity of the Chair of Urban Design and Rural Landscape in the FA-WUT complies with the principles found in many planning documents (referred to above). The activity covers a wide range of courses; a large number of students - including those with a doctorate; scientific research in the field of spatial development of contemporary cities and rural areas; active participation of the Chair staff in domestic and foreign meetings and scientific conferences; as well as their other professional activities. This allows the application and introduction of both verified and current content, and methods of teaching at the FA-WUT. Their source is both the traditions of urban planning of the 20th Century, and the present contemporary creative tendencies, ideas and results of scientific researches introduced to the educational process.

The holder of the Chair of Urban Design and Rural Landscape is Professor Sławomir Gzell, who is a continuator of the Polish school of town planners - theoreticians, visionaries and practitioners - whose representatives in Warsaw were Tadeusz Tołwiński, Jan Olaf Chmielewski and Kazimierz Wejchert. The Professor's achievements in designing the space of metropolitan centres; the revalorisation of small towns and innovative solutions in the field of urban composition of residential districts, as well as numerous scientific publications, informs the modernisation of the teaching and education of young professionals.

A main aim of education at the Chair is teaching the creation of space by applying the timeless principles of urban composition through lectures, seminars and design projects. In the process of the creation of space, there is a reference to the most important features of a real place, as well as inspiration by design ideas that best suit the student.

The searches related to shaping the individual identity of urban complexes are considered particularly important as necessary actions in the face of urban sprawl, the disappearance of features related to a region and unification of the townscape. It is necessary to distinguish several main issues that are discussed with students: the phenomenon of suburbanisation (one of the answers to urban sprawl is shaping the polycentric settlement network); broadly understood reconstruction/revitalisation of the internal space of cities (central and indirect zones); the need for reservations and rules for using reserved areas for infrastructure investments outside and inside cities; and the issue of social participation of residents in planning and design.

It is wise to remember that spatial order is a reference not only to aesthetic problems, but also to unique economic, social and political dimensions. Educating students on the creation of space would not be possible without presenting the newest ideas of the development of contemporary cities. These are contained in lectures on Contemporary Urban Planning (engineering studies); lectures and seminars on Problems of Contemporary Urban Planning (Master's degree); lectures on Elements of Urban Composition (engineering studies); and numerous individual presentations in the form of lectures within the courses of urban design and town planning.

In addition to the main issues, selected specific issues are presented:

- 1) Legal regulations and other tools of shaping townscape and rural landscape, as well as methods of applying them in design projects.
- 2) Issues related to space friendliness (including accessibility).
- 3) Issues related to urban detail (including the use of modern materials and technologies).
- 4) Issues related to architecture and town planning relationships at all project scales.
- 5) Principles for shaping public spaces, mainly in European cities. The ideas and design solutions presented at lectures concern cities around the world, while the subject of student design works are European areas, mainly in Polish cities and municipalities [5][6].

A special research area is Warsaw and its surroundings, providing the best possibility for conducting detailed analyses and survey of the existing condition in one of the most dynamically developing cities in Central Europe. In addition to topics from Warsaw, students also undertake design works in other medium and small cities [5][6].

With regard to teaching methods related to students' elaboration of design works at the Chair of Urban Design and Rural Landscape the following methods are applied:

- 1) Observation used for research and assessment of the existing state of a real place from an interdisciplinary perspective.
- 2) Analysis and criticism of planning documents concerning the studied area, and used for analysis of design ideas and realisations of a similar functional and spatial scope, as well as for inference.
- 3) Presentation of design ideas in a professional urban planner language (that enables reviews of student works and public discussions), as well as presentations at exhibitions at the end of semesters, with a public discussion summarising the work of students and the work of scientific and didactic units.
- 4) Teaching by independent study adopting the newest information technologies.
- 5) Design work, enabling both the making of independent decisions and the acquiring of co-operation skills in inventory and design teams, while paying attention to the completion of the task by a specific date and stages (inventory, concept, preliminary sketches, elaboration of the final design solution) [5][6].

The principle applied during the programming of courses is the annual update of topics (topicality of the subject). Students work on areas that in recent years have undergone significant transformations or those that require rehabilitation and revalorisation.

Topics that have just been the subject of competitions are being developed. The fact that students deal with the current problems of cities is greatly important for their involvement in the project work. It should be added that very often students' elaborate topics, that local authorities are interested in, are reflected in the exhibitions of students' design works in their city or district (for example: co-operation with the Warsaw School of Economics and the Mokotów District Office; co-operation with the *Serenissima* Patriotic Foundation - a competition in engineering studies at the FA-WUT on the project of the monument of the Battle of Warsaw 1920; co-operation with the University of Warsaw; co-operation with the Ursynów District Office - elaboration of the area of Gandhi Street; co-operation with the city of Płock - elaboration of the area of Tumaska Street). Experience shows that such topics cause greater involvement of students in the design work [5][6].

To sum up, teaching the creation of space has two main elements:

- 1) Identification of the most important features of a real place being the subject of the project, and formulation of guidelines for the project based on these features.
- 2) Shaping the individual identity of the new spatial solution.

The process of teaching the creation of space plays an extremely important role in the educational process. It can be observed in all types of design work: in single public space projects; in residential complex projects and multifunctional complex projects (with a predominance of service functions); in projects set in the rural landscape; in local spatial development plans; in studies of conditions and directions of spatial development of the municipality; in design projects carried out as a part of international design workshops, as well as in engineering and Master's diploma projects [5][6].

The valuable method of public debate of students and lecturers established by the Chair is repeated several times during the semester. This allows students to compare results and concepts with colleagues. Reviews also serve to teach how to prepare a concise and convincing presentation of the design work for synthesis and cogency. This is one of the possibilities that practice offers, especially with the *design project* idea, as it is invaluable in the context of later professional presentations of diploma theses and, of course, during professional work. After each semester, organised exhibitions are held of design projects and public discussion with the students, thus allowing assessment of results. The Chair is not the only unit at the Faculty of Architecture related to education in contemporary town planning, but it occupies an important place, taking into account the courses, the number of students, elaborated scientific works and the wide professional activities of employees [6].

The subject of the research work presented in the article was concentrated on the design projects presented during the following courses:

- 1) Elements of Urban Composition;
- 2) Housing Urban Complex;
- 3) Specialisation AiU1 - Architecture and Urban Planning - City as the vehicle for development of civilization;
- 4) Engineering and Master's Diploma Projects. The main feature of the educational programme is to increase the scale of areas to be elaborated by students, as well as to increase the difficulty of the topics.

#### *COURSE: ELEMENTS OF URBAN COMPOSITION*

Theoretical bases in the field of urban composition given during the course, Elements of Urban Composition, are then applied in practice in the design project series developed during this course, and further in various design projects during the entire studies. The course was introduced at the FA-WUT by Professor Kazimierz Wejchert in the 1950s, and consists of lectures and design projects (presently the course is part of engineering studies and is obligatory for every student) [7].

The aim of the course is to provide a theoretical basis in the field of urban composition and urban design by means of lectures, and then to apply it in practice through design projects. The main objective of the project series is to investigate and solve problems such as: composition of simple and interconnected urban open spaces; the use of elements of natural-green forms; composition of urban floors; composition of a small housing complex and service units. One of the key issues of this course is for students to practise techniques of synthetic drawing and to acquire the capacity of quick presentation of their own design ideas. As a result of acquaintance with basic ideas in urban composition and introducing them into practice, students develop spatial imagination, a sense of observation, visual memory, orientation in space, and the feeling for the proper scale of urban open spaces and urban complexes. Lecture topics during the course include, among others: spatial structure of the city; urban interiors; the problem of daylight; artificial lighting and colour in urban design; as well as the problem of greenery in urban design [4][8].

The design projects developed during the course contain themes in four main subject groups:

- 1) Reproduction of remembered urban space.
- 2) Composition of simple and interconnected urban open space with regard to urban detail.
- 3) Particular problems in urban composition (light, colour, green, urban detail).
- 4) Design of small projects in real situations (housing, urban open spaces).

All design projects are presented as sketch designs, with freehand drawing techniques (students produce sketches on A4 paper, drawings should be simplified and synthetic, taking into account correct proportions and reflecting the character, mood and spatial form of the selected topic). The design projects are evaluated and marked weekly by teaching staff and results are discussed at the start of the following class. At the end of the project series, students prepare a final project, which is a form of verification of the knowledge acquired during the course [4][8].

#### *COURSE: HOUSING URBAN COMPLEX*

In the design projects developed during the course called Housing Urban Complex (engineering studies), students must design a complex of dwelling houses of different kinds, with accompanied services in a chosen city in Poland (with particular emphasis on the existing greenery and the urban context of the immediate environment). Students should prepare: studies of existing conditions of the area with its surroundings (property on the land, transport system, existing buildings, existing green and natural systems, and so on), and studies of directions of development of the area using various types of residential building (single-family and multi-family housing with service facilities that are mainly built-into ground floors).

There are two main types of design project:

- 1) Revitalisation of degraded inner-city areas (the creation of new city structures on former industrial, railway, harbour areas, as well as on various regained areas).
- 2) Development of peripheral city areas (the creation of new city structures of legible composition and with distinct limits).

Locations mainly are in Warsaw and other neighbouring cities, in the external or urban zone [4][9].

The final version of the design project consists of an inventory of the area, with analyses and pre-design conclusions; and a project design drawing with spatial visualisation in any form. The developed projects should have the following features: a clear concept (manifested in a clear composition and spatial structure of the complex, in use of urban interiors, pedestrian paths, view axes and view openings, determination of clear boundaries of the complex, clear division into public, social and private spaces); shaping of identification elements, e.g. use of topography and natural

values of the area and introduction of new elements of greenery; division into legible quarters; innovation of housing development (including functional flexibility, low energy building, ecological buildings); shaping the urban floor (small architecture and urban detail); clear transport system (with particular emphasis on pedestrian traffic); correct technical solutions; and high information value. New housing complexes should improve the image of the existing city and contribute to the development of the city [4][9].

#### COURSE: *SPECIALISATION AIU1 - ARCHITECTURE AND URBAN PLANNING - CITY - VEHICLE FOR THE DEVELOPMENT OF CIVILISATION*

In 2015, at the FA-WUT, Master's studies were introduced with six specialisation programmes that include new courses, the aim being to teach the newest ideas, trends and problems in architecture and town planning, as well as to give students the possibility of directing their interests and their professional profile. One of these is Specialisation AiU1 - Architecture and Urban Planning - City as the vehicle for development of civilisation. It deals mainly with the internal areas of urban agglomerations, central points, landscape and architecture of a compact city. In addition to the mainstream issues, the specialisation also deals with the problems of development of peripheral areas and housing issues. The aim of the specialisation AiU1 - Architecture and Urban Planning is to educate students, in accordance with their interests, in the contemporary problems of city development, paying particular attention to transformation and development of internal urban areas, prevention of urban environment degradation and development of cities in the peripheral zone.

The focus on priority issues of the specialisation AiU1 - Architecture and Urban Planning results in two programme blocks:

- 1) H-City Block (H- as historical city) - concerning the phenomenon of revitalisation and development of internal urban areas;
- 2) E-City Block (E- as ecological, electronic city) - concerning issues related to the role of the natural environment in the development of contemporary urban areas and the inclusion of information systems in design and implementation of contemporary urban structures.

The Specialisation AiU1 programme was prepared by staff of the Chair of Urban Design and Rural Landscape. In addition, the staff offer subjects from the Master's programme: the Conservatory Multi-scale Project; Problems of Contemporary Town Planning (lecture and seminars); and the study of conditions and directions of spatial development of the municipality [6].

#### DIPLOMA PROJECTS

In diploma projects developed during engineering and Master's studies, the shaping and creating of spatial form of contemporary cities, according to the principles of sustainable development, are highly important. This is expressed in undertaking difficult design project topics, in which both elements of the built and natural environment are significant elements of building the spatial form of the city (paying special attention to shaping public spaces). One example is the diploma project developed during Master's studies: *Shaping public spaces of the Vistula Valley in Warsaw* (author: Tomasz Jakubowski; supervisor: Katarzyna Pluta, in the academic year 2017/2018). The topic of the diploma was the problem of shaping the landscape of the Vistula Valley in Warsaw and the associated problem of linking riverside areas with the existing city (see Figure 1 and Figure 2).



Figure 1: The diploma project, *Shaping public spaces of the Vistula Valley in Warsaw* - a fragment of the plan, Warsaw, 2018. Author: Tomasz Jakubowski; Supervisor: Dr hab. inż. arch. Katarzyna Pluta, Prof. PW. Source: Archival materials of the Chair of Urban Design and Rural Landscape, FA-WUT.



Figure 2: The diploma project, *Shaping public spaces of the Vistula Valley in Warsaw* - spatial visualisation of the concept, Warsaw, 2018. Author: Tomasz Jakubowski; Supervisor: Dr hab. inż. arch. Katarzyna Pluta, Prof. PW. Source: Archival materials of The Chair of Urban Design and Rural Landscape, FA-WUT.

The history of Warsaw is permanently connected to the Vistula River. From the beginning of the city's existence, the river was the most important factor in its development. The city, facing the river, grew and shaped a unique form of buildings on the Escarpment area. Landscape values of the city encouraged the building of more residences, churches and monastery foundations, which, with the gardens falling down to the Vistula River extended along the Escarpment, creating a picturesque panorama of Warsaw.

The ongoing return of the city to the river is associated with numerous investments and design projects that attract residents to the Vistula River. The growing demand for high quality public space determines the emergence of new concepts and discussions about the future of Warsaw. New sections of boulevards are being created; their cultural programme is being expanded and numerous initiatives appear, favouring recreation on the Vistula River. However, despite these activities, the crossing towards the Vistula River is connected with a crossing through one of the largest transport arteries in the city: the Wisłostrada route [6].

The diploma tasks deal with the problem of regaining public space by limiting the negative impact of the Wisłostrada route on the area of the Vistula Valley. The creation of a new, multi-functional public space would be a response to the growing demand for publicly available urban space. The extension of the existing Wisłostrada tunnel and the related recovery of a new space of high cultural and landscape value could be an impulse for conscious shaping of the central section of the Vistula Valley in Warsaw, and could enable the display of the unique landscape features of Warsaw and the restoration of its unique identity associated with the Vistula. The proposed solutions consistently implement the principle of opening up the city to the river, while simultaneously exposing the most valuable urban complexes and buildings, as well as including a unique landscape of the Vistula river valley in a system of public spaces [6]. Particular values of the diploma are the method of analysis and proposed solutions taking into account the specificity of the area in urban, architectural, cultural and social aspects, as well as the application of the principles of urban composition during the shaping of the public space of the Vistula Valley.

## CONCLUSIONS

The research on issues concerning the didactic processes in the Chair of Urban Design and Rural Landscape have shown that one of the main aims of education is the teaching of the creation of space of contemporary cities by applying the timeless principles of urban composition. This occurs throughout the entire educational process, including lectures, seminars and all types of design project. In the process of the creation of space, there is visible both a reference to the most important features of the place, as well as the inspiration of new design ideas.

Searches related to shaping the individual identity of urban complexes are considered particularly important in the face of the processes of urban sprawl, disappearance of features related to a region, and unification of the townscape. It is also a response to the modern needs of residents. This means first of all: shaping the spatial structure of the city; revitalising and shaping the fragments of cities, public spaces and social spaces, as well as the broadly understood composition of the townscape at various scales. Warsaw, especially, is a city that is rapidly developing, and so requires good, attractive and interesting innovative ideas and modern visions for urban concepts of many areas that require rebuilding.

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