

## Examples of students' sustainable design through association activities in the Faculty of Architecture at Cracow University of Technology

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**ABSTRACT:** The offer of extra-curricular activities provides students at the Faculty of Architecture in the Cracow University of Technology with the opportunity to develop interests and skills in architectural and urban design. The Institute of Urban Design offers students the possibility of participating in activities proposed by the Students' Association of Sustainable Design, operating under the supervision of Patrycja Haupt and the author. For five years, students and their supervisors have organised scientific conferences, often of an international character. This has led to the publication of a book. Moreover, students have the opportunity to take part in scientific and study projects commissioned by the city. Joint activities are a source of satisfaction for both students and their tutors. They provide an opportunity to expand the knowledge and experience of students to better prepare them for their future as architectural professionals. Presented in this article are the results of selected activities of students within the framework of the Students' Association of Sustainable Design.

### INTRODUCTION

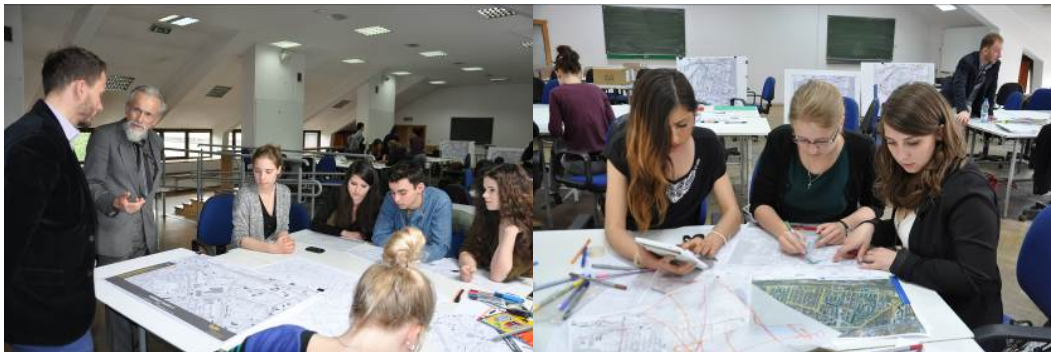
The Students' Association of Sustainable Design (SKNPZ) is located in the Faculty of Architecture at Cracow University of Technology, Kraków, Poland. It functions under the Chair of Housing Development within the Institute of Urban Design. The core activities of the Association include the organisation of workshops and participation in projects implemented by the foundations working for development and social assistance. Students take part in projects that can be considered preliminary studies of alternative architectural objects, proposals or detailed plans referencing selected fragments of urban units.

The SKNPZ does not fall within the scope of obligatory student activities. Its aim is to bring together people willing to address issues beyond the core curriculum of the Faculty. Its numerous activities relate to the issues of sustainable design, the city and, in particular, smaller structures within the city. The SKNPZ has 40 members, including students of the first- and second-degree studies. The SKNPZ provides an opportunity to pursue the passions and interests of its participants [1]. The members also frequently engage in non-academic activities and charity work. Collaboration between the students is particularly important for the undergraduate students, since it gives an opportunity to develop skills alongside older colleagues who have basic knowledge and experience in the field of conceptual design or research.

Students working in the Association undertake research on issues related to the assessment of the quality of the housing environment. This was manifested by their participation in a scientific project implemented at the request of the City of Kraków as part of the Pilot Block Rehabilitation Programme. Moreover, the SKNPZ organises the annual and cyclical International Scientific Conference Arch-Eco (Picture 1) [2], as well as accompanying events such as exhibitions (Picture 2) and workshops, e.g. the *International Student Interdisciplinary Architectural Workshop* (Picture 3) [3].



Picture 1: Arch-Eco 2015 (Photographed by students). Picture 2: Exhibition of students' works (Photography: J. Kobylarczyk).



Pictures 3 and 4: Students' workshops 2014 (Photography: P. Haupt).

## SELECTED ACTIVITIES OF THE STUDENTS' ASSOCIATION OF SUSTAINABLE DESIGN

### Intercollegiate Workshops in Szczawnica, Poland

One of the Association's activities include a workshop requiring both analytical and research work by the students. Among other activities, in 2012 the Students' Association co-organised and participated in the Intercollegiate Students' Workshop in Szczawnica (Szczawnica is a spa town located in the Małopolskie Voivodeship, in the Nowy Targ District). The workshops were organised by students representing the AGH University of Science and Technology, Kraków, Poland, supervised by Prof. DSc PhD eng. Jan Dobrowolski, and students from Cracow University of Technology, supervised by Assoc. Prof. DSc PhD arch. Justyna Kobylarczyk and PhD arch. Patricia Haupt.

The aim of the workshops was to evaluate the quality of residential areas in Szczawnica. The task for students was to prepare an inventory of selected areas of the spa resort, including its centre. Students of the Faculty of Architecture working in the Association prepared an urban analysis and interviewed the inhabitants, which allowed them to evaluate selected residential areas and public spaces. At the same locations, students of the Faculty of Environmental Engineering at AGH University have conducted air pollution studies. The research allowed an assessment of the quality of the housing environments and an identification of the main problems and strengths. The urban analysis supported by the photographic documentation and inventory measurements allowed an evaluation of the density and type of buildings, quantity and quality of the greenery, the technical condition of the facilities, and the need to renovate and modernise them.

The environmental study was conducted in the form of direct interviews with the residents. The interviews explored the importance of the aesthetic qualities of the environment; assessment of the amount of greenery, the urban composition, development of common spaces, proximity of the integral spaces and opportunities for participating in the shaping of the common spaces and the security. The inhabitants assigned to each element a ranking from zero to 10 [4].

Sociological studies have shown that a high amount of green areas in a city is by far the most appreciated factor. A high pointscore was also given to the aesthetic qualities of the environment and security of the social spaces. These were followed by the urban composition, the development of the common spaces and the proximity of the integral spaces. Participation of the inhabitants in the creation of common spaces was perceived as least important (Figure 1).

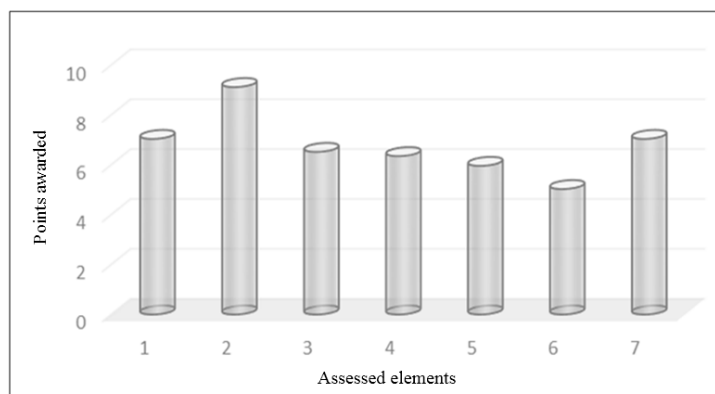


Figure 1: Results of the interview on the assessment of individual elements of the residential areas assessed by the residents (Source: J. Kobylarczyk).

The elements under assessment were: 1) aesthetics of the environment; 2) the amount of the greenery; 3) urban composition; 4) management of the common spaces; 5) proximity of the integral spaces; 6) possibility of participation in the shaping of the common spaces; and 7) security.

Field research has shown clearly that the public spaces are maintained in good condition and that much of it has been modernised, viz. Dietla Square and the banks of the Dunajec (Pictures 5 and 6, respectively). These pictures capture the social dimension, with the picturesque promenade and attractive greenery. It should be emphasised that the development of the centre of Szczawnica is compact and on a friendly scale (one- and two-storey objects). Also, the technical condition of the facilities generally is good. Attractively designed public spaces, such as squares and small greenways of communication and recreation importance, deserve a high rating.



Picture 5: Public spaces in the centre of Szczawnica  
(Photography: Kamila Zasada).



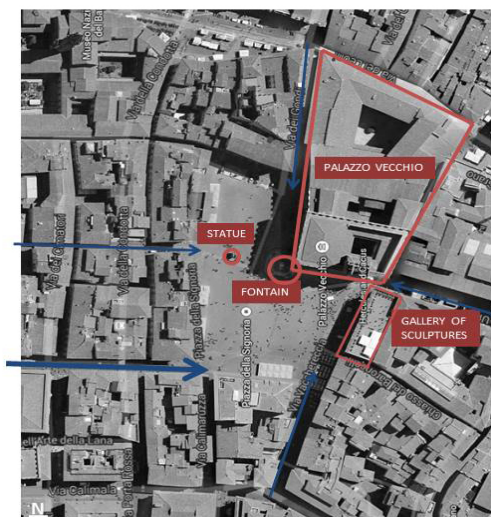
Picture 6: Riverbank of the Dunajec  
(Photography: Kamila Zasada).

On the basis of the studies conducted by the students, it can be assumed that with appropriate investment and promotion activities, Szczawnica is likely to develop positively, creating an image of an important tourist and health resort.

#### International Workshops in Florence, Italy

Students belonging to the Students' Association of Sustainable Design participated also in workshops that took place in Florence. The theme of the project involved three selected squares, viz. Piazza Santa Maria Novella, Piazza Della Republica and Piazza Della Signoria. The theme of the study was the necessity for the city to create spaces for performances, which is particularly important in a city such as Florence, which has many cultural events.

The workshops were attended by students of architectural departments at four universities, viz. Yerevan State University of Architecture and Construction (Armenia); St Petersburg University (Russia); University of Hasselt (Belgium) and Cracow University of Technology (Poland). Preparation of the urban planning analyses informed the design process in the selection of locations and scenes, taking into account the historic facilities located in a square. It was important to define a space for a stage that would be visible from different sides. An open view of such space was provided by the streets adjacent to the square (Picture 7). The location of one of the scene concepts was in Piazza Della Signoria (Picture 8).



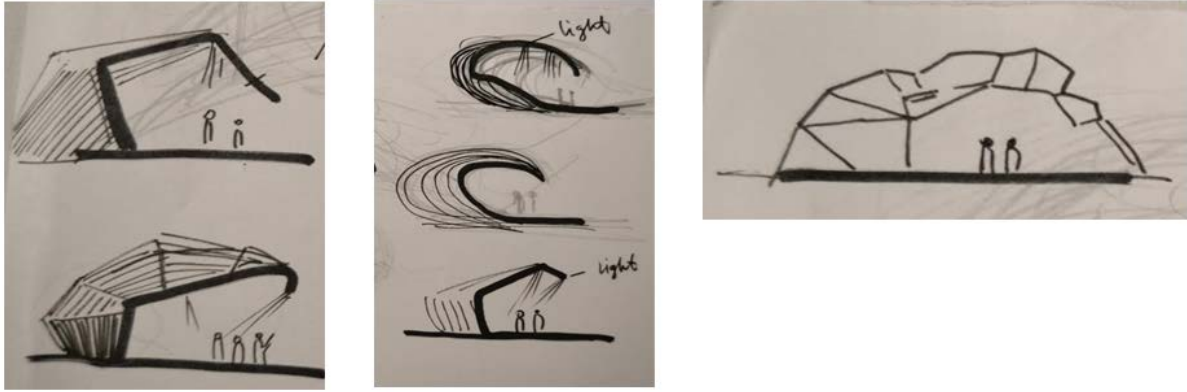
Picture 7: Piazza Della Signoria  
(Source: <https://www.google.pl/maps>).



Picture 8: Concept of the scene on Piazza Della Signoria.  
(Source: Students' work by Justyna Jakubas MSc arch.).

One of the students' projects included a stage that was based on a circle. The moulded walls formed the shape of a shell. In order to increase the visibility of the stage, it was situated on a slight elevation. The design was based on adjustable elevators regulated in the range of 1.3 to 1.8 metres, with pockets for the instruments and the monitor. The design also included stairs in front of the stage. Some of the concepts were presented in the form of sketches (Drawing 1), which allowed various possibilities for the shape of the solid [5].





Drawing 1: Concept sketches by the workshop attendee J. Jakubas, DSc arch. (Source: Students' drawings).

#### Functional-Spatial Diagnosis of two Cracow Suburbs: Olsza II and Ugorek

An equally important student project, this time with a scientific nature, was undertaken within the framework of the Pilot Block Rehabilitation Programme in the municipality of Cracow. As part of the project, the students together with the management team prepared a diagnosis of selected residential neighbourhoods located within the two Kraków suburbs of Olsza II and Ugorek. The result of the work included a scientific book, *Functional-Spatial Diagnosis of Cracow Settlements: Olsza II and Ugorek*, published by Cracow University of Technology in 2014.

The students prepared a second volume, in which they presented the results of macro analysis of the selected settlements, assessing their location, their security, the social structure and its prestige as a place of residence. The location of the settlements was particularly important as it was well connected to the other districts of the city through an efficient communication system. Students, tutors and an expert team were given the Rector's Award for this publication. The diagnostic work was accompanied by the International Student Workshop Arch-Eco, organised under the title, *The International Student Interdisciplinary Architectural Workshop: Ugorek and Olsza II*.

Participants included the PhD students and the Association students from the Department of Environmental Engineering at the AGH University of Science and Technology in Kraków. During the workshops, students presented concepts for arranging spaces in the settlements, mainly of a recreational and commercial nature. In addition, they proposed design solutions that applied biomass energy production and lighting of the shaded interiors using solar energy [6].

#### International Workshop in Wuhan, China

Another event was an international workshop in China organised in 2016 by the Architecture and Urban Planning School of Huazhong University of Science and Technology. Students of the Faculty of Architecture, Cracow University of Technology, including the members of the Association, worked with the Wuhan students on a concept to develop the neighbourhood spaces in the Old Community Quinshan District (Pictures 9, 10, 11 and 12). The social housing estate has had many problems in maintaining the usability of the space and the communication links. Collaboration between the students of both Universities has proved extremely valuable in broadening knowledge of urban planning. It was also useful in exchanging students' experiences on the project and the manner of reaching the final concept, through all the development stages. The work was presented at the University of Wuhan and in an exhibition at the Faculty of Architecture, Cracow University of Technology.



Picture 9: The problem connected with the lack of parking spaces (Photographed by the author).



Picture 10: The problem with maintaining cleanliness (Photographed by the author).



Pictures 11 and 12: Problems with the arrangement of public spaces (Photographed by the author).

## CONCLUSIONS

The programme implemented within the Students' Association of Sustainable Design is particularly valuable due to the interdisciplinary initiatives that were undertaken by its members. Encouraging students to collaborate with other universities creates the opportunity to gain experience in teamwork, and to skillfully use and combine the knowledge and practice of representatives from different disciplines and different universities.

Complementary research and analysis of the individual stages of a problem, gives an opportunity to broaden the perspective of the problem. It allows the formulation of objective conclusions from well-thought-out studies. It is particularly valuable to know the approach of students from different universities and different countries implementing their own, individual study programmes.

Further, it is an enriching experience to learn different ways of working on a project; different ways of looking at urban problems and perceptions of the cultural values associated with the identity of a place. Another noteworthy element is the teamwork realised during the workshop exercises. This prepares students to work in the profession, where collaborators work together on projects. Video conferences and video workshops are becoming increasingly popular, but are just one forum for students in which to present their achievements and the implications of their studies. Direct contact with others still remains extremely important.

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