# The path to sustainability: architectural education for the future

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ABSTRACT: In this article, the author provides brief presentations of two types of course organised at the Faculty of Architecture in Wrocław, Poland. The first, the more extensive, creates the so-called *path* of sustainable architecture, including four interrelated eco-responsible projects that promote new technologies and the use of building environmental impact assessments. During the course, students carry out research on sustainability, analysing a district, a set of buildings and a single building with technical parameters. The purpose of the project is to solve a real problem that is of vital importance to the city or local community. The second course deals with landscape architecture and public spaces. In co-operation with a homeless art centre, students gain an opportunity to familiarise themselves with the problems of this group of people. Meetings at the cultural centre, MiserArt in Wrocław, are changing students' perception of urban space and facilitating empathy-based design. In presenting the assumptions and learning outcomes, the author has analysed the problems posed by the implementation of sustainability in Poland.

## INTRODUCTION

In 2017, twenty five years had passed since the first Earth Summit in Rio and almost half a century from the report *Problems of the Human Environment*, announced in May 1969 by U Thant - the then Secretary General of the UN. It could have been expected that the data contained in the report would induce mankind to change not only the nature of production, but also the promotion of international co-operation, which would shift towards the elimination of poverty and support for less-developed countries.

This type of conviction about the fundamental human right to live in adequate dignified conditions was proclaimed in the *Declaration of the UN Conference on the Human Environment* (Stockholm 1972). It includes the provisions about the role of education in environmental matters (Principle 19) and a general recommendation: *Planning must be applied to human settlements and urbanisation with a view to avoiding adverse effects on the environment and obtaining maximum social, economic and environmental benefits for all* (Principle 15). The *social, economic and environmental* pillars of sustainability were highlighted in all the milestones of an *ecological age* (Table 1).

Table 1: The milestones of sustainability paradigm.

| UN conferences and declarations for sustainable development | International programmes and agendas for sustainable development | International declarations on human settlements |
|---|---|---|
| Stockholm 1972, Rio de Janeiro 1992, Johannesburg 2002, Rio de Janeiro (+20) 2012;<br>UN Millennium Declaration. | United Nations Environment Programme (1972), Agenda 21 (1992),<br>UN Millennium Project (2002), 2030 Agenda (2015). | Habitat I (1976), Habitat II (1996) and Habitat III (2016);<br>New Charter of Athens 1998, 2003. |

During this period, various international groups repeatedly attempted to refer to human knowledge, self-preservation instincts and ethics. Some of these references were directly addressed to architects, urban planners and those responsible for spatial management because humanity has to face new challenges as a result of the increase in population. At the end of 2016, it was estimated that more than 4.1 billion people lived in cities, which represented 55 per cent of the world population. This was half a billion more than the entire world population at the time the U Thant report was published. A lot of attention had been devoted to the future of human settlements, starting with the Habitat I Conference, during which the Vancouver Declaration on Human Settlements (1976) was adopted. The declaration created the basis for the United Nations Human Settlements Programme (UN-Habitat), while the evaluation of its effectiveness was carried out at twenty-year intervals by participants of subsequent conferences: Habitat II and Habitat III. Sam Harris' thesis posits the possibility of building a *moral landscape* based on scientific values [1]. If so, then a threat to life on our planet, where the means and associated knowledge to protect against this threat are agreed at

the highest possible level, should bring ecological and social imperatives into this moral landscape. They can be found in all the documents listed in Table 1.

Declarations have an influential character that can oppose reality, which they criticise while offering remedial solutions. Practical activities are based on fixed habits and beliefs sustained by specific group interests. Large exhibitions and prestigious awards for over 150 years have been promoting the same formulae for capturing mass imagination. This grew out of the industrial revolution and serves the same purposes as do economic growth drivers. An analysis of the current *List of architecture prizes* shows that only three of the 25 world awards are presented for achievements in the sustainable development category. There are another three for an eco-social approach. Out of 15 thematic awards, only three are associated with integral ecology, while among the 12 awards granted to students only the International VELUX Award has clearly defined assessment criteria. Winning projects described as *timeless*, *innovative* or *like no other* are promoted without any verification in terms of cost-effectiveness, post-occupancy evaluation (POE) or positive impacts on the environment.

The wave of criticism provoked by the 15th Venice Architecture Biennale (2016) confirms the designers' reluctance to confront *the cry of the earth and the cry of the poor* mentioned by Pope Francis in his concept of an integral ecology presented in chapter four of the environmental encyclical, *Laudato Si* [2]. Although *Reporting from the Front* announced by Alejandro Aravena did not trigger an influx of revolutionary ideas from the national curators and a layer of aesthetics softened the questions about the architect's role towards people struggling with the problems of poverty, homelessness or even extermination, the front line has moved into a sphere of polemics about the concept of the Biennale itself [3].

Some of the debaters followed Schumacher and defended the position that the discussion on architecture should not go beyond the discipline itself and its *specific contribution to society*, understood in terms of … *the most advanced, central, high-density, high-productivity, high-quality value arenas of world civilization, where the path-breaking creativity and superior sophistication is indeed called for* [4]. These allegations are easier to understand in the context of the exhibition, where the presentations focused mainly around the absence of architecture in situations where it potentially should have appeared. Schumacher's question: *Where is architecture?* in a paradoxical way, perfectly reflects the significance of the Biennale, drawing attention to the fact that on the most important fronts for mankind, none of the examples of *path-breaking creativity* could be found, except *emergency provisions for self-built huts*. This lack of presence prompts a reflection on the re-definition of goals and the mission of architecture, in response to the *Human Settlements for All* of the New Urban Agenda adopted at Habitat III.

## AESTHETIC ESCAPISM AND TECHNOCRATIC LEGALISM

Education in the field of architecture is shaped, on the one hand, by science, which inspires great political declarations, and on the other by the labour market. The latter is driven by the expectations of investors and clients with various levels of environmental knowledge or social empathy, which nonetheless determine teaching standards and attitudes of graduates. These dual influences seem to have a clear effect on architectural education, where two basic tendencies can be identified; namely, aesthetic escapism and technocratic legalism. The first one refers to the late-modernistic concept of architecture as a kind of meta art. The more the possibilities of new technologies grow, the more students and lecturers seem to be fascinated by *the intelligent, correct and magnificent play of forms in light* [5]. This tendency is perceived by the millennial generation as a passport to enter the world of a commodified *starchitecture* [6].

Aravena's front lines are also invisible from the level of teaching standards in the field of sustainable architecture, which seem to be dominated by technocratic legalism. The ideal became the *passive* building, covered with a green roof, adapted to rainwater harvesting and designed with respect to the renowned building certification schemes. On the one hand, students' way of thinking is shaped by legal regulations, which constantly improve certain parameters; for example, in terms of energy performance of the building, on the other - existing patterns, such as objects with the highest LEED (leadership in energy and environmental design); BREEAM (building research establishment environmental assessment method); HQE (haute qualité environnementale or HQE (high quality environmental standard)); or the DGNB (Deutsche Gesellschaft für Nachhaltiges Bauen eV - German Sustainable Building Council) certificates.

It is difficult to overestimate the role of certificates. They introduce measurable assessment criteria, at the same time promoting integrated solutions, enhancing creativity, and stimulating new directions in research and related technologies. Perfection, however, has its price not only in terms of the market. The dependence of humans on the infrastructure becomes the price of comfort and temptation to regulate the crucial parameters responsible for the quality of a built environment. In the name of human good, the high-tech world is becoming more and more sterile, one-sided and oriented towards *upgrading* technology.

Observations by lecturers indicate that students have been caught up in this trap of imagination. They use new techniques, technology and materials as a kind of branding strategy, sometimes without adequate knowledge about the rational scope of their applications. Widespread practice, used not only by students, is the glazing of the façades irrespective of their insulation; the use of blinds or balconies on the north walls and similar solutions of a more

ornamental than utilitarian character [7]. Artificial forms and pavements also dominate the land use. Children from the very beginning are protected from contact with nature and forced to use safe, standard-equipped playgrounds. It is significant that the precisely designed housing estates, isolated from the outside environment are becoming a sign of prestige and even narrowly understood sustainability.

The desire to create a new icon of architecture, as well as the pursuit of technical excellence could be explained in terms of *society's specific contribution*. Therefore, there is no reason to question their correctness because, as history proves, searching for the architectural formula *for all* is usually misleading. Since the so-called *startecture* does not take into account the needs of the overwhelming number of people living in extremely difficult housing conditions, perhaps support should be given to low cost, inclusive architecture, as socially justified and potentially no less innovative. It is worth recalling the pioneering period of modernism and those green suburbs or neighbourhood units from the interwar period that have stood the test of time and still enjoy the residents' acceptance. Such a holistic approach opens up a wide field for science and universities, where green campus initiatives are more and more common, changing the way young people think and act.

## GREEN CAMPUS MOVEMENT

The first declarations regarding education focused on sustainable development were adopted in 1990 in the USA as the Campus Ecology Program and in Europe as Talloires Declaration - the latter by the Association of University Leaders for a Sustainable Future: ULSF (500 members). Three years later, the *Kyoto Declaration for Sustainable Development* of 1993, adopted by the International Association of Universities (IAUs), which had operated under UNESCO auspices since 1950, became the response to the Earth Summit in Rio de Janeiro. The preamble indicated the need to involve the academic community in teaching, undertaking research work and social activities for sustainability, promoting the basics of environmental ethics, sharing knowledge in this field, and - importantly - targeting universities in the implementation of best *green* practices. In the same year, the Association of European Universities (AEU) proclaimed its own agreement: COPERNICUS – the University Charter for Sustainable Development (Geneva 1993).

Publications about the green campus movement appeared in the USA at the end of the 1990s, shortly after the first Campus Earth Summit, which was held at Yale University in 1994 [8]. The two works of *environmental gurus* have greatly contributed to the development of this concept; namely, *The Campus and Environmental Responsibility*, published by David Eagan and David W. Orr (1992), as well as *Ecodemia: Campus Environmental Stewardship at the Turn of the 21st Century* by Julian Keniry (1995).

In the second decade of the 21st Century, the number of programme declarations and inter-university coalitions associating hundreds of universities around the idea of sustainability indicates that this movement has gone far beyond the stage of avant-garde exploration, growing into the mainstream. It is more difficult to assess the real scale of the implementation of the green campus idea. For example, university authorities may sign agreements for the one term of office, and then, not resume co-operation. The stability is, therefore, guaranteed by specially created inter-faculty *green* offices, as well as the sustainability plans or strategies adopted for the long-term perspective. The spirit of co-operation is also maintained by external structures, such as the above-mentioned IAU, bringing together 366 members in 2017. Among them are:

- 180 universities from Europe (including the University of Lodz as the only representative from Poland);
- 27 universities from Africa;
- 63 universities from Asia;
- 70 universities and colleges from North America, Colombia, Ecuador and Peru;
- 7 universities and colleges from South America (except Colombia, Ecuador and Peru);
- 19 universities and colleges from Australia.

The associations formed at the national or continental levels, especially in heavily populated areas, such as China and India should be added to this list. During this research, the author managed to identify 15 international organisations with *sustainability* in the name, but there are also such as the IAU, which identify their green goals through internal programmes or strategies. These structures deal with the organisation of conferences, run newsletters, libraries, fund awards and inspire the implementation of rating systems. This does not facilitate the assessment of how far the students of architecture are engaged in this movement, but the green campus formula is defined as *…holistic aiming to make environmental awareness and action an intrinsic part of the life and ethos of educational facilities. This should include students, academic staff, non-teaching staff as well as media, local business, contractors and visitors. Green-campus endeavours to extend learning beyond the classroom/lecture theatre to develop responsible attitudes and commitment* [9].

Green campus becomes a mini-model of a community guided by the idea of sustainability and engaged in the same spirit for the benefit of the university, the city, the region and the world. In the way in which buildings and sites function, as well as in the organisation of everyday life, green campus resembles the living laboratory, where the most advanced eco-friendly solutions are tested.

Universities taking part in this movement are guided by multi-annual action plans, combined with a measurable and unambiguous auditing system. For example, the American Sustainability Tracking, Assessment and Rating System™

(STARS), which is used by the universities affiliated to the Association for the Advancement of Sustainability in Higher Education (AASHE), facilitates the monitoring of progress in five key areas:

- Academics (AC), including curriculum (number of *green* academic courses, undergraduate and graduate programmes, living labs, etc) and research (number of surveys and scholarships related to sustainability, support for *green* research, etc).
- Engagement (EN), concerning campus engagement (*green* orientation of students and employee, outreach materials, publications, campaigns, etc) and public engagement (*green* partnerships and co-operation, participation in public policies, community services, etc).
- Operations (OP) including air and climate (e.g. greenhouse gas emissions), buildings (e.g. design, maintenance or construction), energy, food and dining, grounds (landscaping, biodiversity), purchasing, transportation (e.g. commute modal splits, campus fleet, etc), waste and water management.
- Planning and administration (PA) including co-ordination and planning, diversity and affordability, investment and finance, wellbeing and work.
- Innovation and leadership (IN) concerning exemplary practices [10].

Due to the detailed, unambiguous rating criteria, STARS itself is of great educational importance. However, it should be noted that there are other proven assessment systems, which are popular in Europe and Asia. They refer to similar aspects of university life, but differ in the ways of estimation. In this context, the green campus as a holistic concept of shaping students' attitudes and their learning outcomes seems the most desirable way to educate young architects. Universities associated in this movement, including Stanford University, Boston Architectural College, Norwegian University of Science and Technology (NTNU, Trondheim, Norway) and many others, increasingly offer MSc programmes in sustainable architecture or environmental design. Their graduates seek employment in environmentally conscious companies, which facilitates the development of the idea of sustainability [11].

Additional incentives are created by professional associations expecting knowledge and pro-ecological orientation from their members. For example, 2017 Code of Ethics and Professional Conduct accepted by the American Institute of Architects (AIA) contains obligations to the environment. One of them emphasises that …*members should use sustainable practices within their firms and professional organizations, and they should encourage their clients to do the same* (Canon VI, E.S. 6.3). Similar, but not so far-reaching statements were included in the Code of Professional Ethics for Architects, 2005, published by the Chamber of Architects of the Republic of Poland. They create a clear message for the universities and should inspire the academic staff to modify the way they conduct courses and select topics.

## CASE STUDY 1: PATH OF SUSTAINABLE ARCHITECTURE IN WROCŁAW (POLAND)

Against this general background, it may seem that everyone knows what is meant by the concept of sustainable architecture and that education in this field is almost conformist in nature. However, this is not the case. Guy and Moore write about *The Paradoxes of Sustainable Architecture* [12]. They point to the frequent identification of sustainability with economical energy management and/or other technical aspects of the impact of buildings on the environment. Relationships with social issues are usually dealt with separately. Such a situation occurs in most Polish architectural departments, where the above-mentioned technocratic legalism dominates, which means that problems are perceived in the light of compliance with applicable regulations.

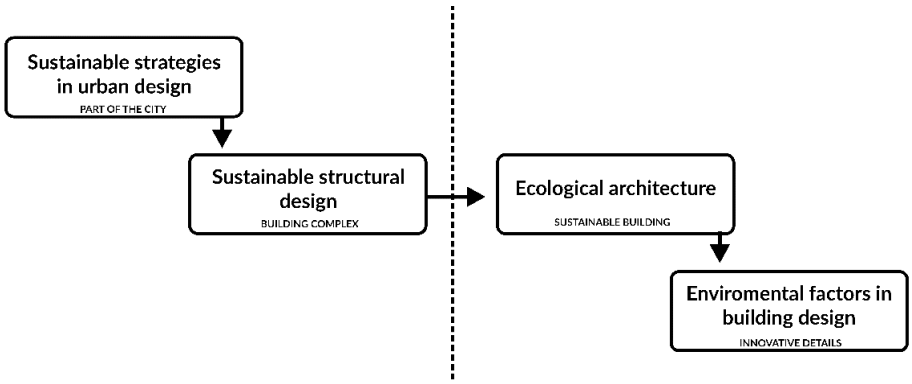


Figure 1: Diagram of the two-semester path of sustainable architecture at the Faculty of Architecture in Wrocław.

The exception to this rule is the so-called path of sustainable architecture at Master's course level at Wrocław University of Science and Technology (WUST), and other courses provided by the Division of Environmental Planning and Design. The path includes four integrated projects or rather one project topic solved on four levels of complexity. The students are to prepare critical analyses covering all dimensions of sustainable development; namely, the following aspects: environmental (4D: environmental impact in terms of the entire life cycle of a building), socio-cultural (5D: needs and aspirations of local communities, inclusive architecture) and economic (6D: affordable/low budget housing).

The first level of research concerns a fragment of the city, e.g. a housing estate or part of the waterfront, for which the entire group develops a green strategy. A reference for works on this scale is to be applicable for the title of the Green Capital of Europe, which - as in the STARS system - have strictly defined assessment criteria. Nevertheless, students are encouraged to self-interpret general slogans and, if needed, to make corrections. The proposed recommendations are systemic and serve to identify priority tasks that are solved in the next three phases of the project. They cover the scale of the building complex, the selected building and the main elements of its structure. Each stage lasts for half a semester and they are consecutive, which means that it takes two semesters for the whole path. At Polish universities this is quite an exceptional situation, because as a rule, students perform three projects at the same time, which determines their level of theoretical preparation and the complexity of the final work (see Figure 1).

Phase 3, the development of a sustainable building, coincides with the course titled Ecological Architecture, taken by all students in the year, where more advanced members of the AZ group (Polish abbreviation for Sustainable Architecture) can act as leaders. Carrying out the self-assessment of the project in terms of sustainability is one of the final elements of the report, which students submit at the end of the semester together with technical drawings prepared in the form of posters. The base set of grades is given during the first classes, as a basis for comparative analyses, but the authors have the right to extend the list, as long as they can justify this by citing some innovative solutions. The evaluation criteria are summed up separately for aspects 4D, 5D and 6D and then analysed collectively. In this approach the students can see to which aspects they should have paid more attention and where they apparently lack knowledge.

The leading topic for the whole group is chosen by tutors, who try to find one with some implementation potential. One of the very popular projects was the WUST green campus project. Based on interviews with residents of academic homes and their own experience, students proposed many practical solutions that could change the model of life of the entire university community. The conclusions from these studies became the inspiration for the WUST green campus initiative, which was proposed by the Department of Environmental Design and Planning in March 2018. Already in 2014, the AZ team presented their proposals for the 24 hours Politechnopolis at the Copernicus Alliance conference, which is a European network of universities and colleges committed to promoting sustainability.

The home university was not interested in implementing this idea at the time [13]. After many years, the situation has changed and the green campus initiative gained the support of the rector and the inter-faculty unit, which could perform the co-ordinating function of the green office. This would be the first success of grassroots activities conducted as part of the education for the future.

Other results are the effect of the co-operation between students and one of the neighbourhood councils in the city of Wrocław. When developing the green strategy for the neighbourhood, students encounter real problems of participatory urban planning and gain first experiences in the school of life. The Council receives a professionally prepared strategy that will facilitate its activities in the future and residents gain a number of suggestions on how they can improve the quality of the environment in their area. The first attempt to implement the strategy will be a design workshop devoted to the revitalisation of a sports park located within the district. In the course of analyses this was recognised as a priority task. The first part of the workshop is City Future Game in which residents take part. Co-operation with the Council and city authorities is a kind of guarantee that the results of the workshops will become the basis for further actions in this area. This awareness motivates students to become more involved, which they often declare during the classes.

## CASE STUDY 2: PATH OF MISERARCHITECTURE IN WROCŁAW

Co-operation with the MiserArt centre, which through art tries to reach the homeless community, offers students from the Wrocław Faculty of Architecture a different kind of experience. Simple artistic activities allow excluded people to turn a neglected courtyard into a specific art garden, where everyone can feel at home. They discover there the joy of baking bread together, the opportunity to share their problems or to get medical help. During a few meetings at the centre, they get acquainted with students and become strict jurors of their works dedicated to public spaces. They pay attention to the simple fundamental aspects of living outside the home, exposing society's decreasing willingness to think in inclusive terms. The same aesthetic escapism is found in student projects, inspired more by the form than by the desire to create a living-friendly space.

Figure 2: Discussion in the MiserArt centre Wrocław, with Adam Grehl, Vice-President of the city (in the middle) (Photograph by Agnieszka Wolska).

The MiserArchitecture formula is researched by students as part of the landscape architecture course, where they try to combine the urban furniture design of the parklet with landscaping that considers the needs of small animals inhabiting the city. Classes with homeless people help them understand the social and ecological mission of architecture and learn to use simple, cheap solutions to achieve lofty goals (see Figure 2).

The co-operation of the Department of Environmental Design and Planning with MiserArt started relatively recently, in 2016, but it has already brought results. These include the project for adapting the centre's building to the needs of homeless people, a diploma thesis on the infrastructure for homeless people and a doctoral dissertation (being written) on the features of inclusive architecture in Polish refugee centres. Although the classes at MiserArt attract a lot of interest from students, conducting more in-depth research in this field, and projects addressing, these matters require a lot of empathy and is much more difficult than the other standard problems. It is also difficult to implement results of the work, because local communities are becoming more and more hermetic. In this perspective, MiserArchitecture seems to be a challenge worth continuing within the co-operation network that needs to be created. The architecture of the poor might be high goals that become the driving force for new directions, as history has already shown us many times.

## SUMMARY AND CONCLUSIONS

The issue of education for the future seems too broad to be concluded and summarised in such a short text. It is obvious that the teaching of architecture is not limited to the transfer of practical skills, but must reflect real situations, including the commodification of science. The information society created its flagship university lists, renowned citation indexes and common education and training standards. They play an important role in the exchange of students, research co-operation and contacts with future employers or professional bodies. The green campus movement has become a new variation of this model, which has many positive features, including the creative measurable commitment to local communities, the region and the world. In this case, green education has a holistic dimension and covers all spheres of student life, viz. the offer of courses, research topics, modes of leisure and commuting to the university, as well as hundreds of everyday small choices, such as disconnecting electronic devices from the source of power, without leaving them in the standby mode.

Considerable attention is paid to student exchange combined with learning about other cultures and developing the ability to co-operate in interdisciplinary, international teams. Despite so many positive traits, the counteracting poverty and exclusion are still perceived selectively. This proves that we are still at the stage of searching, which reveals the presence of a deep internal conflict between the exclusive and inclusive vision of the city and the architecture of tomorrow. The only solution seems to be the creation of a sufficiently wide educational offer that would include initiatives similar to both the path of sustainability and MiserArchitecture.

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