

## The Role of Architectural Education Models in Sustainable Transition of Cities

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**Abstract:** As one of the pillars for design professionals, design education in architecture and related fields contributes to the built environment's sustainable future. However, despite the dedication of educators, the evolving emphasis of design pedagogy is still not entirely accepted in the academic setting. Concerns regarding outmoded and static approaches in higher education have recently triggered some new insights causing the updating, upgrading and improvement of programs. Consequently, critical thinking and inquiry, creativity and innovation, research and investigation, collaboration and civic engagement, supported by technical competences, have become increasingly valued in the contemporary design pedagogy. In keeping with this pattern, the Sustainable City master's program at the University of Belgrade's Faculty of Architecture is organized around a project-oriented methodology. The process is finalized through a Civil Initiative Project Proposal data set established on the Teams platform, that addresses requests for proposals and several ongoing competitions. A Civil Initiative Project Proposal data set created on the Teams platform completes the process and offers the opportunity for active participation in solving the different issues facing local communities.

### 1 Introduction

After facing mounting concerns over the inflexibility of outdated pedagogical approaches in higher education, university curricula related to design courses began to be slowly adapted to current thinking about sustainability and resilience. Given their crucial role in shaping and developing the built environment of global settlements, architectural and urban design methodologies have also been adjusted to new levels of change and multiple challenges. The desired characteristics of critical thinking and inquiry, creativity and innovation, research and investigation, collaboration and civic engagement have been taken into account in many courses. However, the high level of diversity and a lack of common understanding have resulted in a heated debate among educators and academics regarding two major elements - the type of changes in the design pedagogy which would respond to the needs of the contemporary design profession and provide the best results, and their actual (and adequate) effects on the aspirations of contemporary society and its transformations.

*The MIT School of Architecture and Planning Report* was released as a result of these discussions (Beinart, 1981). This was not, however, an isolated effort; numerous other studies have since been conducted, greatly advancing the development of a new discourse on design pedagogy and serving as a catalyst and preface to a discussion on the state of architectural education and practice today. For instance, architectural educators are urged to increase their political, social, and cultural interactions with students in the 1991 book *Voices in Architectural Education: Cultural Politics and Pedagogy* (Dutton, et al., eds.). It presents a conceptualization of architectural pedagogy within a critical analysis of society at large and creates links between architectural education and society.

Teymur's 1992 paper, named *Architectural Education: Issues in Educational Policies and Practice* placed the architectural education debate in context and examines the function and implications of different theories in the teaching of design. Additionally, he is in favor of training students for global exchange and international practice. In the book *Architecture: Art or Profession*, the local context was considered. The first general history of architectural education was given in *Three Centuries of Architectural Education in Britain* (Crimson and Lubbock, 1994), which also covered the lessons learned from the past and the relationship between an architect's education and the built environment as a whole. Salama (1995) offered insight into the emerging trends in architectural education by emphasizing the importance of the design studio and considering a number of cutting-edge ideas in this innovative concept teaching model.

The importance of civil initiatives that incorporate best practices into teaching and learning is also emphasized by the more recent discourse on design pedagogy. The early theories of Boyer and Mitgang (1996), who argued for a more liberal, flexible, and integrated curriculum linked to real-world problems, as well as the edited volume of Pilling and Nicol (2000), which addressed the relationship between architectural education and modern professional challenges, have made significant contributions to this more pragmatic trend. A contemporary viewpoint on architectural and urban pedagogy is also provided by Salama (2009), and Harriss and Widder (2014) emphasize the value of successful, empirically supported live projects in architectural curricula.

### 2 A New European Bauhaus Agenda: Orientation at More Sustainable Urban Communities

The context of more sustainable urban communities was emphasized with the emergence of a *New Design Pedagogy* in the late 1990s. The conventional methods, design tools, techniques, models, and characteristics were also reexamined in this paper. New approaches, such as the case study model, community-based design

learning model, and participatory curriculum model, were consequently considered through the scope of the design teaching process. Furthermore, in architecture and design, critical inquiry and the *Process-Oriented Design Pedagogy* (which was implemented from the late 1990s to the mid-2010s) were associated with successful intelligence and creative thinking (Salama, 2016).

Lastly, in the 2020s, the issues facing urban areas gave rise to several new areas of focus: the New Design Pedagogy has promoted the concepts of live project studios, community-based design pedagogy, interchangeable design pedagogies. All of them are a recently promoted concept of the *New European Bauhaus Paper* (NEB, 2021).

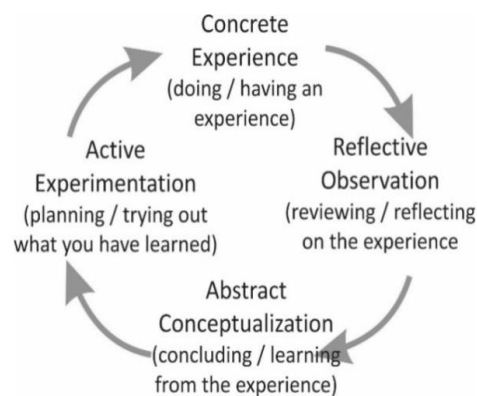
The challenges presented by new educational trends, resurgent learning philosophies, and emerging digital technology forced design educators and architecture schools to adapt their pedagogy. The evaluation of performative criteria, which are necessary to maximize the potential of design techniques, can be made easier using contemporary digital tools. These criteria include daylight, shading, noise, air and water qualities, biodiversity health, comfort, user appreciation, energy, water, waste, and related services (like shared mobility). Digital tools are not, however, applied comprehensively, systemically, or broadly enough to address every facet of the Green Agenda Objectives and the New European Bauhaus agenda (NEB, 2021).

### 3 Project Oriented Approach: The Case of The Course Sustainable City

A curriculum that encourages active student participation in the real issues facing local communities is created by the project-oriented approach used in the Sustainable City course at the Faculty of Architecture in Belgrade. Placed in the first year of master's studies, this course serves as a research polygon for curriculum design and further upgrading, and it is both required and optional depending on the master program chosen. Predictive learning and future design are frequently used in the *Sustainable City curriculum*, drawing inspiration from the theories of Chen and Hoffman (2017), who successfully used experimental and creative game-based curriculum design to the studies of urban surroundings, as well as Kelly's (2006, 2010) work, which concentrated on journaling and reflexive thinking in education.

The possible effects of changes on environmental values are investigated through these educational interventions. Students identify and describe a number of specific urban problems related to various aspects of sustainability through the examples they have chosen. The final assessment takes the shape of a Civil Initiative Project Proposal, which addresses issues from various current project calls and competitions. The data set created on the Teams platform, the *Civil Initiative Project Proposal*, represents the culmination of the study process. Its functions include offering the chance to actively participate in the current practice and addressing (and resolving) a range of urban community issues.

The course gives students the ability to identify and specify their ideal futures for the chosen urban environments, by putting this strategy into practice. The synergy of foresight techniques and the long-term socio-cultural potentials of urban communities forms the basis of these potential development options and opportunities. Thus, this route bridges the gap between environmental attitudes and ecological behaviors and culminates in a planned intervention in community (Stupar, Mihajlov & Simic, 2017). By introducing the students' participation, the curriculum directly supports their research divided into two main phases: reflexive and creative, which are introduced during 14 weeks of the course and practiced through four steps-phases. The process of education implemented during the course could be explained by Kolb's learning cycle (Kolb, 1984). (Figure 1):



**Figure 1.** Kolb's learning cycle in the context of reflexive thinking (1984), adapted in the context of the Sustainable City course

- The first one consists of thematic discussions on the rising issues of urban ecology, urban population, available and-or limited resources, energy, air, water and waste systems, transportation, vegetation, local surrounding, etc. (time horizon 2030). This phase aims at increasing a student` environmental consciousness.
- The second phase is related to reflexive thinking. Students write down their impressions, addressing numerous questions related to a) problems which might trigger their reaction/intellectual response; b) images/discussions which challenge their viewpoints/perspectives; c) methods for improving the sustainability of cities; d) their willingness to study the local environment in situ.
- The part related to the case study focuses on an urban transformation process. Through the examples selected by students, a number of specific urban problems related to different aspects of sustainability are identified and described as a practical contribution.
- The creative phase (exam) is the last step in the process. It includes the students` proposals and recommendations for improving the selected urban environment, tested through the development of a small pilot project. These projects could tackle different problems and propose solutions in various forms and modes - from public innovations, tactical urbanism, urban revitalization, adaptation to climate change, business-driven sustainable solutions, etc. Through this phase students verify their ability for preparing proposals for research grants, aiming at the desirable urban transformations via affordable solutions and a precise ecological purpose (e.g. tree planting, useful resource recycling, waste discount and reuse, urban green infrastructure preservation, defensive flood forests, experiencing vegetarianism, business startup programs etc.)

**4 The Results: Curriculum Experiences, Environmental Attitudes**

The outcomes of student surveys are submitted as a Civic Initiative Project Proposal, which can be applied to various funding sources such as local initiatives, organizations representing civil society, individuals, and other interested parties. (Figure 2).



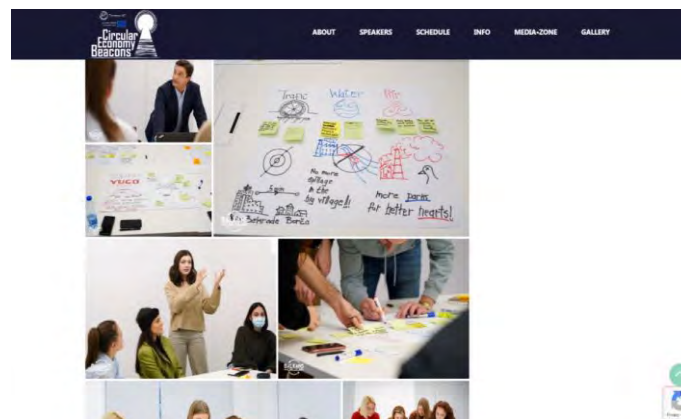
**Figure 2.** The proposal for improving the sustainability of the urban environment in Pancevo, tested by developing a small pilot project: students Emilija Drndarski and Sara Brkic (1<sup>st</sup> award at the CirEkon and EIT Food Competition for Engaging Citizens in Circular Economy)

## 5 Conclusions

The curriculum design raised four main questions for the participating lecturers to find the practical and long-lasting modifications in roles and attitudes through pedagogical stimulus:

- What attitudes do students want to see about the environment and sustainable futures?
- When they encounter an educational stimulus associated with a sustainable foresight, do their attitudes shift significantly?
- What are the scenarios and pictures of their ideal or expected surroundings?
- Do their own environmental awareness and future actions change because of the interventions from pilot projects?

After taking the course, students' environmental awareness and capacity to envision sustainable futures increased, according to the analysis of the curriculum and its findings. Additionally, the course design aimed to investigate students' attitudes in their preferred or expected environments using a qualitative approach, examining their growing awareness of their responsibilities and potential environmental effects. Workshop discussions and the introduction of reflexive thinking contributed to their improved overall attitude. (Figure 3.)



**Figure 3.** The workshop Balkans Go Circular: The database support to the Civil Initiative Project Proposals. Organized by EIT Climate KIC and CirEkon d.o.o. on 15 December 2022, at the Serbian Chamber of Commerce, the participants were students from the course Sustainable City (<https://circular-beacons.net/wrapping-up-the-year-with-balkans-go-circular-conference/>)

As a result, the engaged students summarized their perception about the course in four dimensions:

1. Curriculum experience, acting as a catalyst for research to be conducted outside of the classroom and allowing a closer look at the real urban and natural features of a city.
2. Connecting motivation with reflexive thinking to connect ecological, technological, cultural, and spiritual aspects of the environment and raise awareness of environmental issues.
3. The capacity to act responsibly in social situations, suggesting that change is possible in the ecological future that is anticipated. Enhancing the curriculum by encouraging student participation is a powerful and constructive force for a radical shift, bolstering the theory that future-focused educational interventions can improve the capacity for action.
4. Future urban society visions: students are continuously urged to critically examine their empirical beliefs, the nature of cities, and the prevailing paradigms while examining the relationships between the internal and external worlds.

In the scope of questions mentioned, the course will continue to evolve, and its database may attract greater public interest, creating new avenues for the exchange of ideas, knowledge, and instruction as well as for the investigation, testing, and validation of some novel projects within the University and in the local communities. (Fig. 4)



**Figure 4.** The awards ceremony at the CirEkon & EIT Food Competition "Engagement of students towards circular economy" on December 10th, 2021. Winners Emilija Dndarski and Sara Brkic, supervisor Associate Professor Dr Vladimir Mihajlov, project entitled New Page - Make a Change (<https://cirkularnaekonomija.org/proglaseni-pobednici-konkursa-za-angazovanje-gradana-ka-cirkularnoj-ekonomiji-ako-svi-uradimo-pomalo-promenicemo-mnogo/>)

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