Bridging Architecture and Public Health: A Croatian Case Study on Non-Formal Education in Southeastern Europe

Tomoya Wakayama [1]

[1] *Tampere University, Faculty of Built Environment, Finland. Email: Tomoya.wakayama@tuni.fi*

KEYWORDS
Architecture Education, Non-Formal Pedagogy, Public Health, Southeastern Europe, Higher Education Institutions

ABSTRACT
Over the past decade, architecture education in Southeastern Europe has increasingly intersected with public health imperatives, reflecting the region's efforts to create healthier, more resilient built environments. Scholars have debated the merits of formal versus non-formal learning approaches in higher education institutions (HEIs), prompting new pedagogical models. This paper presents one case study from Croatia, highlighting how divergent educational methods can empower future architects to address public health challenges, including pollution, inadequate infrastructure, and lack of accessible green spaces. By emphasizing experiential, project-based learning, non-formal education fosters creativity, critical thinking, and an understanding of community health needs. Findings suggest that such an approach better prepares students to design sustainable, user-centered spaces that enhance well-being and mitigate environmental risks. Ultimately, these insights advocate for broader adoption of non-formal education in architecture curricula across Southeastern Europe and globally. As public health remains a pressing concern in the region, integrating innovative teaching methods can serve as a catalyst for improved built environments that reflect contemporary standards in architecture education while positively impacting overall population health.

1. Introduction

Architecture education continues to evolve in response to societal, environmental, and technological shifts worldwide. While traditional, formal educational methods—predominantly classroom-based lecturing and theoretical instruction—remain prevalent, increasing recognition has been given to non-formal pedagogies that emphasize hands-on, interdisciplinary, and experiential learning [1]. Non-formal education (NFE) can manifest in various forms, such as workshops, community-based projects, field visits, design charrettes, and collaborative problem-solving sessions. These approaches often align more closely with contemporary professional requirements, which call for adaptability, creativity, and a strong sense of social responsibility.

In Southeastern Europe, architecture education has gained momentum due to growing concerns related to urban regeneration, heritage conservation, and public health [2]. Countries in this region grapple with preserving cultural identity in a globalized context while also addressing environmental stresses that demand innovative design solutions [3]. As a result, academic institutions have begun to adopt non-formal strategies aimed at preparing future architects to meet evolving societal needs. Urban sprawl, deteriorating infrastructure, and limited green spaces highlight the importance of integrating real-world concerns into the learning experience [4].

Public health considerations are particularly relevant to architecture, as built environments significantly influence individual and community well-being. Issues range from air quality and building density to the availability of recreational spaces [5]. Such connections underscore the need to cultivate a broad understanding of how design decisions affect public health outcomes [6]. In response, educators are developing cross-disciplinary programs and participatory studios that prompt architecture students to address real-world challenges, placing an explicit focus on physical and mental well-being [7]. Croatia, along with other Southeastern European nations, has begun to reflect this shift by incorporating community engagement, policy considerations, and health-oriented objectives into curricula.

Formal and non-formal educational modes each have distinct merits and limitations. Traditional methods excel in delivering structured theoretical content and established technical knowledge while offering clear assessment metrics [8]. By contrast, non-formal models encourage students to engage with messy, real-life scenarios, honing soft skills such as teamwork, problem-solving, and communication [9]. These methods also align with global calls for learner-centric pedagogy from organizations like UNESCO and the European Association for Architectural Education (EAAE) [10]. The Bologna Process, aiming to standardize and improve higher education within Europe, further emphasizes the value of innovative teaching methods that can be adapted to local contexts [11].

In Croatia, ongoing reforms in architecture education mirror these wider trends. Universities and faculties increasingly promote design-build projects, fieldwork, and stakeholder consultations that bring students into contact with a variety of actors, from local residents to municipal authorities [12]. Engagement with community stakeholders equips students to navigate practical constraints—budgetary, legal, or cultural—that directly shape the built environment [13]. This hands-on experience demonstrates how thoughtful design can improve air quality, foster social cohesion, and enhance mental health through carefully planned public spaces [14]. Moreover, the region's emphasis on heritage preservation adds another layer of complexity, as students must balance innovation with respect for historical contexts [15].

Despite these promising practices, comprehensive research that evaluates the long-term impact of non-formal teaching methods in Southeastern Europe remains limited. Existing studies tend to be fragmented, lacking consistent frameworks for assessing outcomes such as student performance, community benefits, and professional readiness [16]. This gap underscores a pressing need for systematic inquiry into how non-formal interventions can complement traditional learning, particularly in contexts that demand multi-faceted problem-solving [17]. As architecture moves to the forefront of public health discourse, case studies detailing integrative, community-based projects stand to offer valuable insights into effective pedagogy [18].

This paper addresses this need by analyzing the methodologies, results, and potential challenges of a non-formal education project conducted at a Croatian architecture faculty. While the content centers on a single case, it reflects broader regional shifts and demonstrates how local priorities—in this instance, public health—can be woven into architectural curricula. The research approach and data collection strategies are detailed in the next section, followed by an in-depth examination of the project itself. Subsequent sections offer a detailed analysis of project outcomes, discussion of implications, and acknowledgment of certain limitations associated with publicly available sources.

By situating the Croatian case within global trends, the paper aims to highlight how non-formal education can enhance architecture students' readiness to address urgent public health needs. Policy makers, educators, and institutional leaders may find these insights particularly useful in designing programs that are contextually relevant and societally impactful [19]. The analysis underscores the importance of interdisciplinary collaborations, stakeholder engagement, and adaptive pedagogical models that reflect local cultural and environmental contexts. Ultimately, this work contributes to the growing body of literature advocating for more holistic, socially responsible, and health-conscious architectural education.

2. Methodologies

A mixed-methods approach was employed to examine the effectiveness of non-formal educational strategies and their implications for public health in architecture curricula. Qualitative and quantitative data were analyzed to capture both the tangible learning outputs and the more nuanced shifts in student perspectives, community engagement, and project feasibility [20].

A. Selection of Case Studies

The study targeted Southeastern European higher education institutions (HEIs) that incorporated non-formal learning components into architecture programs. An initial review of academic databases and institutional websites was undertaken using keywords related to architecture education, non-formal pedagogy, and public health [21]. Projects were included if they featured explicit non-formal components, had discernible public health or community-oriented aims, and occurred between 2020 and 2024.

Among the identified initiatives, a faculty-led project in Croatia was deemed suitable due to bilingual (Croatian and English) documentation and its cross-disciplinary focus. The project's timeframe (late 2023 to mid-2024) allowed for near-real-time data collection and an in-depth look at stakeholder engagement. While additional examples were noted in other Southeastern European countries, emphasis was placed on a single representative project to allow a more concentrated exploration of pedagogical and community dynamics [22].

B. Data Collection and Analysis

Data collection unfolded in two phases. The first phase involved an examination of official documentation, including syllabi, workshop outlines, and student project reports. Online resources—such as local government portals and organizational social media pages—were also consulted to understand broader stakeholder perspectives and contextual factors [23]. When accessible, blog posts and newsletters provided real-time reflections on project activities.

The second phase consisted of a structured content analysis of online discussions and publicly available interviews with faculty, students, and community members. This step helped corroborate and elaborate on the information gleaned from official documents, allowing for a more robust thematic understanding of the project's progress [24]. A coding framework was developed to systematically identify recurring themes, such as collaborative learning, community empowerment, and attention to public health metrics. Where feasible, quantitative metrics (e.g., participant numbers, workshop attendance, design proposals submitted) were included to contextualize the scope of engagement [25].

Data interpretation was guided by a hermeneutic methodology, focusing on contextual readings of the texts and materials within the socio-cultural environment of Southeastern Europe [26], [27]. The study aimed to capture an integrated view of how non-formal learning strategies intersect with formal instruction, community priorities, and institutional goals. The insights derived from this analysis form the basis of the subsequent sections, which present a detailed look at the selected Croatian project, its outcomes, and broader pedagogical implications [28], [29], [30].

3. Designing Healthier Urban Environments (DHUE)

A. Overall

In 2023, the Faculty of Architecture at a major Croatian university launched "Designing Healthier Urban Environments" (DHUE). The initiative ran from October 2023 to June 2024, aiming to promote health-conscious design in urban neighborhoods. Funding support from the Croatian Ministry of Science and Education and collaborations with municipal planners, public health experts, and local NGOs underscored the project's interdisciplinary and community-focused ethos.

Students were encouraged to transcend standard lecture-based learning by engaging in workshops, field research, and virtual knowledge-sharing sessions. Teams composed of architecture, public health, and environmental engineering students visited urban neighborhoods with recognized infrastructural and environmental challenges [12]. Through dialogues with local residents, participants built an understanding of how issues like air pollution, noise levels, and insufficient green space affected daily life.

B. Objectives and Aims

The project pursued four core objectives. First, it sought to firmly embed health considerations within design thinking by addressing both physical and mental well-being. Second, it aimed to involve community stakeholders at each stage, from data gathering to proposal evaluation. Third, it promoted cross-disciplinary collaboration to deepen the theoretical and practical insights gained by students. Fourth, it provided a test bed for innovative pedagogical methods, offering critical reflections on how non-formal strategies contribute to creativity, critical analysis, and problem-solving skills [2].

By articulating these goals from the outset, DHUE positioned itself to generate evidence of how architecture students can tackle real-world health concerns while learning to manage diverse stakeholder interests. The explicit emphasis on public health further distinguished it from traditional design studios that focus primarily on aesthetics or construction techniques.

C. Learning Structure

The project was divided into phases of exploration, co-creation, and evaluation. During the initial exploration stage, students attended seminars on environmental psychology, epidemiology, and urban planning. They then conducted field visits to observe and record conditions related to air quality, accessibility, and walkability. These experiences exposed participants to practical challenges, laying the groundwork for subsequent co-creation activities.

In the co-creation phase, interdisciplinary student teams engaged in intensive design sessions known as charrettes. These sprints involved conceptualizing interventions to address identified community health issues, with guidance from faculty mentors. Public exhibitions and online forums facilitated ongoing stakeholder feedback, ensuring residents' insights shaped each iteration of the designs.

The concluding evaluation phase featured a formal presentation of finalized proposals to a panel of experts, including public health officials and local government representatives. Students produced reflective journals to document their learning experiences, offering insights into the benefits and difficulties of applying non-formal methods alongside more traditional coursework [12].

4. Achievements

The project's achievements spanned academic, community, and institutional domains. From an academic standpoint, students reported a heightened awareness of how architectural decisions influence physical and mental health outcomes. The interdisciplinary format honed their ability to communicate design concepts across fields. Community members, likewise, appreciated having a platform to voice concerns and shape the improvement of their neighborhoods. Several design proposals garnered interest from local authorities, suggesting a path toward practical implementation.

In terms of institutional impact, DHUE sparked discussions about forming a permanent interdisciplinary research center, bridging architecture, urban planning, and public health. Administrators also began reviewing possibilities for integrating non-formal components into standard curricula, recognizing the value in problem-based, community-oriented learning. These evolving institutional commitments mark a notable shift toward embedding health-focused design philosophies into academic norms [4].

Collectively, these developments affirm the capacity of non-formal education to produce both immediate learning benefits and potential long-term transformations in teaching culture. Although not without challenges—such as balancing project demands with other academic responsibilities—the experiences gained through DHUE underscore how active collaboration, stakeholder dialogues, and iterative design practices can enhance architectural education.

5. Results and Findings

A. Quantitative Outcomes

An enrollment of 65 students surpassed original projections of 40, indicating robust interest in interdisciplinary, community-centric design experiences [23]. Workshop participation remained above 90%, pointing to sustained commitment throughout the academic year. By the end of the co-creation phase, teams had produced 15 separate design proposals, five of which garnered serious consideration from local officials for pilot implementation. Although economic and regulatory constraints ultimately influence feasibility, these figures highlight a meaningful transition from theory to practice [26].

Feedback surveys from 28 community members revealed that over 80% gained substantial insight into urban design principles and processes. Moreover, 70% felt confident that implementing at least some proposals would yield beneficial health outcomes for local residents. These results suggest high levels of project acceptance and demonstrate community willingness to partner in collaborative planning.

B. Qualitative Findings

Themes emerging from content analysis included a strong ethos of collaboration, a sense of community empowerment, a recognition of iterative learning as vital to design, and an acknowledgment of practical challenges. Students often noted that engaging with public health experts expanded their appreciation for the broader social implications of architecture [7]. Community members described a heightened sense of ownership over the development process, crediting the project for moving beyond top-down planning models.

At the same time, participants acknowledged hurdles such as scheduling conflicts with other coursework and navigating bureaucratic systems. These observations underscore the complexities of sustained stakeholder partnerships and indicate that formal institutional support is key to integrating non-formal methods effectively [8]. Nonetheless, results broadly support the proposition that hands-on, collaborative activities enrich learning in ways conventional lecture-based systems may not.

Taken together, the quantitative and qualitative data reflect the project's efficacy in linking educational objectives with tangible community benefits. The high level of engagement, the number of actionable proposals, and the generally positive stakeholder feedback all point to the effectiveness of non-formal, health-oriented design initiatives. Yet, caution is advised: translating design concepts into lasting infrastructure improvements necessitates long-term funding, political will, and continued collaboration among all parties [11].

6. Discussion

Findings from DHUE underscore the transformative potential of non-formal education in architecture, especially when addressing public health goals. Traditional design studios often relegate real-world complexity to hypothetical scenarios, whereas this project immersed students in the full spectrum of environmental, social, and institutional factors shaping urban contexts. The result was a richer, more immediate learning experience that bridged theoretical constructs with on-the-ground realities.

One key insight involves the integration of public health expertise into architectural curricula. Although architectural history features numerous intersections with health (e.g., sanitation infrastructure, hospital design), these considerations have rarely been systematically embedded in course frameworks [3]. By partnering with municipal health officials, DHUE formalized the notion that well-designed spaces can promote physical exercise, reduce pollution, and foster social cohesion. In doing so, the project reflects a growing worldwide trend to encourage interdisciplinary approaches for tackling urgent challenges, including global pandemics and climate change [16].

The project's reliance on workshops, community dialogues, and iterative design processes exemplifies non-formal learning. This mode of instruction places learners at the center of problem definition and solution generation, requiring them to interact continuously with stakeholders and adapt to new

information [9]. Constructivist theories contend that such experiences lead to deeper cognitive engagement and a lasting capacity for innovative thinking [29]. Students who participated in DHUE often emphasized the value of real-time feedback, both from mentors and residents, in refining their proposals and shaping new perspectives on design's societal function.

Community engagement proved essential to anchoring the project in relevant issues and mitigating the risk of purely aesthetic or abstract solutions. Residents served as co-creators, not passive recipients, offering critiques and insights shaped by lived experience. This approach can be especially significant in Southeastern Europe, where historical legacies and centralized planning structures have sometimes limited public input [2]. Nonetheless, the project also revealed that effective participation requires logistical coordination, transparent communication, and a careful balancing of divergent interests. Students learned to navigate delicate negotiations between what might be architecturally ideal and what was culturally or financially viable [25].

From a policy and institutional standpoint, the Croatian example offers broader implications for Southeastern Europe. Many countries in the region share transitional dynamics—modernizing urban systems while safeguarding cultural heritage—which sets the stage for adopting health-driven architectural practices [5]. Policy support, whether through grants, curricular guidelines, or accreditation standards, can be instrumental in scaling up such initiatives beyond pilot phases. Regional and cross-border collaborations can also accelerate the exchange of ideas and best practices, fostering a network of institutions committed to improving both educational outcomes and community well-being [11].

Despite its achievements, the project faced limitations. The reliance on publicly available data raises concerns about completeness and potential biases in documenting outcomes [23]. Also, the lack of long-term studies means the full impact on urban health remains unknown. Further research could address these gaps by systematically tracking whether design proposals are implemented and measuring subsequent changes in environmental and health indicators [17]. Enhanced resource allocation and institutional backing might also enable a more integrated and sustained approach, ensuring that non-formal education complements rather than competes with formal coursework demands [9].

Scaling these methods beyond localized, short-term projects presents another challenge. Non-formal learning often requires smaller student-to-faculty ratios, specialized technical resources, and partnerships with external agencies [8]. Some HEIs may struggle to commit the time and funding necessary to maintain these initiatives. A gradual approach—perhaps starting with partial integration of stakeholder consultations or design-build activities—could serve as a stepping stone toward a more comprehensive transformation of curricula.

Future research might further examine differences across cultural contexts, comparing how non-formal architectural projects unfold in various Southeastern European locales. Metrics of success could include not only academic performance and community satisfaction but also measurable improvements in environmental quality, accessibility, and residents' health. Establishing robust data collection protocols in collaboration with public health departments could yield valuable longitudinal studies that inform policy decisions and guide curricula refinement [7].

Overall, the Croatian experience illustrates the feasibility and value of weaving public health imperatives directly into architecture education. By fostering teamwork, contextual awareness, and reflective practice, non-formal models can help cultivate professionals equipped to address the multi-dimensional challenges facing modern cities. As the global community increasingly recognizes the inextricable link between design and well-being, initiatives like DHUE serve as practical demonstrations of how academic programs can adopt transformative, socially responsive pedagogies. Southeastern Europe, with its unique blend of heritage concerns and developmental aspirations, is particularly ripe for such innovations, holding lessons that resonate far beyond the region.

7. Disclaimer

This paper is based on publicly available information from webpages, official project documents, and social media platforms. Because some data may be incomplete or subject to errors, certain details might not reflect the actual projects or activities. Therefore, the accuracy or completeness of the information presented cannot be guaranteed. The authors assume no responsibility for the reliability of this content or for any loss, damage, or other consequences arising from its use. Readers are advised to consult official project documentation and participants for the most accurate and current information.

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