

Fostering Innovative Vision: Empowering Architectural and Urban Design Students through Practical Projects within University Campuses

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Abstract

The relentless urban evolution and urbanization processes have given rise to myriad challenges in cities, surpassing the capabilities of traditional problem-solving approaches. In this context, the infusion of innovative design concepts by architects and urban planners becomes imperative in the development of smart cities. Hence, to cultivate a young generation equipped with the capacity for unconventional thinking and the ability to devise innovative solutions, universities must establish conducive environments for practical application. In particular, creative majors such as architecture, landscape architecture, and urban design necessitate ample opportunities for students to engage in hands-on experiences. These practical encounters are pivotal for honing their skills and nurturing their innovative acumen. Given the evolving demands of the job market, undergraduate programs must adopt creative pedagogical approaches to enhance student learning efficacy and foster their propensity for innovation.

Within the university's educational sphere, academic programs bear the responsibility of fostering inventive concepts among students, particularly those poised to contribute to the construction of smart cities in the future. Achieving this within an education duration of 3-4 years necessitates adept integration of real-world scenarios into the curriculum by lecturers. Simultaneously, ample opportunities for students to explore and address urban challenges across diverse contexts must be provided. This study provides a specific process from developing assignment requirements to effectively integrating the above exercises into the course so that students can immediately practice their skills. In addition to regular classes, workshops are also added appropriately to the subject to provide students with the necessary skills when completing assignments. Each week's tasks are designed for students to practice a workflow like in a real project. More precisely, the tasks and exercises assigned to students entail the development of initiatives and design concepts tailored to specific areas within the university campus. Empirical evidence underscores the profound significance of such applied teaching scenarios.

If the University is considered a miniature city full of work and study activities, then the students and employees are the residents. Considering an area in the University as a design project for students not only helps practice students' design thinking ability but also helps students train their habit of always exploring innovative ideas to improve their quality of life. Above all, contributing design ideas to the university campus creates a great motivation for students to go beyond their limits in studying.

Keywords: design thinking, innovative thinking, practical case study, smart city, urban design education

Introduction

The swift urbanization and development of urban areas have spawned numerous challenges that demand resolution. Concurrently, the advent of the 4.0 industrial revolution has engendered novel societal needs while presenting abundant opportunities for technological innovation aimed at enhancing the quality of life. Consequently, smart cities have emerged as an indispensable developmental trajectory for numerous cities worldwide (Trinh, Le, Do, Pham, & Phan, 2022). Initiatives of smart city development, especially in the fields of architecture and urbanism are extremely essential. In the contemporary landscape, designers face the dual imperative of prioritizing human-centered design and ensuring the sustainability of their proposals. External design endeavors necessitate continual innovation, transcending outdated frameworks to address contemporary challenges with fresh solutions. Throughout the design process, projects emerge through collaborative efforts among stakeholders, particularly the community (Bason, 2010; Caldwell, Foth, & Guaralda, 2013; Sennett, 2005). Therefore, in envisioning the cultivation of future architectural and urban designers capable of shaping vibrant, livable cities, the university training environment must undergo suitable adaptations.

At the undergraduate level of universities and colleges, programs such as architecture, landscape architecture, and urban design have traditionally held prominence due to their direct contribution to shaping the workforce of emerging generations. In these disciplines, educators have consistently engaged in research and experimental pedagogical approaches to enrich educational practices and enhance student outcomes (Legény, Špaček, & Morgenstein, 2018; McLaughlan & Chatterjee, 2020; Soliman, 2017). The final goal is to assist students in adapting to the swiftly evolving demands of their careers post-graduation. In response, instructors must explore diverse pedagogical approaches to incorporate practical tasks into studio and theory courses, providing students with ample opportunities to engage in realistic practice projects. Furthermore, meticulous attention must be given to the curriculum of each academic intake, ensuring a balance of pertinent knowledge dissemination, time allocation, hands-on skill development, and immersive project experiences. This holistic approach aims to equip students with the requisite skills and knowledge to excel in their professional endeavors upon graduation (Choi & Kim, 2016; Soliman, 2017). Education always remains one of the most updated knowledge areas for mankind and University education plays a significant role in this context. In nowadays context – the era of Industrial Revolution 4.0 and smart city strategy, students working in the field of architecture and urbanism must cope with the change of their careers' requirements as well. To solve new urban problems, architects, urban designers, and landscape designers should propose innovative ideas as smart city intervention while changing their design perspective towards co-design or co-creation (Dameri & Ricciardi, 2015; Ferraris, Belyaeva, & Bresciani, 2020).

In this study, the research team will focus on the experiment of integrating the practical projects that take University Campuses as the context for research. Students have to conduct site surveys and propose new solutions for design as smart interventions for different circumstances within the University Campus boundary. The problems can be proposed by lecturers when assigning the tasks or can be found by students themselves. Different assignments and tasks provide opportunities for students to practice quick design or propose quick initiatives continuously integrated within the normal theoretical courses. Besides the big projects in the program, these are solid experiences that are necessary for students to foster their innovative thinking. For output standards of autonomy and responsibility, students will practice research skills, design idea generation, and concept design production. Most importantly, students are empowered to suggest changes in their working and living environment with new initiatives towards a sustainable high quality of life. Certain courses utilize applied teaching methodologies, employing practical case studies to cultivate students' innovative vision through tailored interpretations implemented by the research team are also illustrated in this study. *The courses and students belong to Bachelor of Architectural and Urban Design, Institute of Smart City and Management, UEH University, Vietnam.*

Conceptualization

Urban design contribution in smart city intervention

During research and experimentation, the paradigm of smart cities has evolved from its initial iteration, referred to as 1.0, progressing through 2.0 and 3.0, and now advancing towards the forthcoming era of generation 4.0. City administrations have come to acknowledge that technological platforms serve merely as instruments, and the realization dawns that smart cities represent a trajectory toward sustainable development goals and the enhancement of citizens' quality of life (Echebarria, Barrutia, & Aguado-Moralejo, 2021; Gracias, Parnell, Specking, Pohl, & Buchanan, 2023; Hollands, 2020; Trinh et al., 2022). Contemporary governments concerning smart cities do not exclusively center on technological advancements but instead emphasize the pursuit of innovative solutions to persistent challenges. Fostering innovation requires the cultivation of fresh ideas and, notably, the facilitation of innovative thinking to foster development (Hollands, 2020; Schiavo & Magalhães, 2022; Trinh et al., 2022).

In addition to various occupations within architecture and planning, urban design plays a significant role in shaping human habitats. By considering shifts in human requirements, grappling with urban challenges stemming from urbanization, and embracing novel methodologies, urban designers can formulate inventive solutions aimed at enhancing human well-being and fostering sustainable urban progression (Caldwell et al., 2013). With urban development trends evolving, urban designers must be mindful of the shifts induced by smart urban strategies in their projects. There are many urban transformations can be named as sentient urbanism, city as interface and platform, adaptive and resilient design, programmable city, interactive experience, etc. (McCullough, 2004; Mitchell, 1996; Shepard, 2011; Willis & Aurigi, 2017). Through the ingenuity and concepts of urban designers, urban spaces are tailored to address the requirements of individuals and enhance their quality of life. Renovation of older spaces to accommodate evolving functions and dynamic needs also stands as a focal point for urban designers. Furthermore, to grasp the genuine needs of the design locale, urban designers must engage directly with involved stakeholders, particularly residents, to embrace their input.

Urban designs in nowadays are described likely as a co-creation process, rather than being decided solely by individual preferences (Bason, 2010; Caldwell et al., 2013; Sennett, 2005).

Smart education to leverage the innovative thinking in university environment

A diverse range of pedagogical approaches proved indispensable in cultivating innovative thinking among urban design students. Two traditional but effective methods, case-based and project-based learning (PBL), stand out for their ability to promote critical thinking and practical skills. Case-based learning (CBL) immerses students in real-life situations, challenging them to analyze and propose solutions to complex urban design problems. In contrast, PBL empowers students to apply theoretical knowledge to tangible projects, encouraging creativity and collaboration (Blumenfeld et al., 1991; Savery, 2015). In the modern context, the concept of smart education is intertwined with these methods, leveraging technology and data-driven approaches to enhance learning outcomes. Smart education complements CBL and PBL and enriches learning by providing access to real-time information and interactive tools. By applying these pedagogical approaches and embracing innovation, urban design students are equipped to tackle the multifaceted challenges of modern cities with creativity and ingenuity. Overall, these pedagogies promote innovative thinking by cultivating essential skills such as critical thinking, creativity, collaboration, and adaptability, while leveraging technology and practical experience to inspire students to think innovatively and creatively in the field of urban design.

Evidence from US universities highlights the interaction between CBL and PBL and collaborative design, emphasizing their role in promoting innovative thinking among learners. At Smith College in Northampton, MA, and many other campuses nationwide, Collaborative Design Thinking courses are actively used. These courses use a human-centered approach to problem-solving, emphasizing collaborative information-seeking and processing while considering human experiences and responses in the context of the real world (Cohen & Mule, 2019). Through collaborative efforts such as co-teaching, student group collaboration on design projects, and co-design initiatives in which faculty and students consult with experts, universities emphasize the importance of collaboration in the learning process. Such collaborative efforts help students gain a deeper understanding of design thinking and introduce them to innovative teaching methods. Furthermore, the integration of smart education further enhances the application of collaborative design in promoting students' innovative thinking. Smart education leverages technology and data-driven approaches to provide students with access to real-time information, interactive tools, and diverse perspectives. By incorporating smart education into collaborative design initiatives, students gain the ability to analyze complex problems more effectively, create innovative data-driven solutions, and collaborate seamlessly between industries and fields. This integration not only enhances students' innovation capabilities but also prepares them to tackle the multifaceted challenges of the modern world with creativity and ingenuity.

Co-creation in education and smart city intervention

“Co-creation” was first demonstrated in the early 2000s in business and marketing as customer standards increased (Leino & Puumala, 2021). There, is a form of “Collaboration” in which the interaction between consumer and product needs has an impact on the production process and the final product. “Co-Creation” or “Co-Design” has been adopted by public sector policymakers and is now in decision-making (Brandsen, Steen, & Verschuere, 2018). At the same time, it emphasizes the role that co-creation can play in value-sharing activities, the importance of dialogue, and the development of appropriate interactions between social actors in achieving

proposals' effective value (Ballantyne, Frow, Varey, & Payne, 2011). Co-creation is a collaborative process in which multiple stakeholders actively participate to create mutually beneficial outcomes. This approach goes beyond mere participation, as all parties must cooperate, recognizing both benefits and risks. In educational contexts, co-creation is particularly relevant, especially in design-focused fields such as urban design, especially the field of smart city development.

In education, the first form of co-creation involves the participation of faculty, students, government representatives, and industry stakeholders in the design of programs and courses. This collaborative effort ensures alignment with industry needs, government priorities, and academic goals, resulting in innovative and relevant educational initiatives. In the second form of co-creation, the focus shifts to citizen participation in teaching situations. Here, students were tasked with conducting civic engagement activities as part of their solution proposal design. Through engagement with local communities, residents, and stakeholders, students gain insight into the social, cultural, and environmental dynamics of urban environments. This hands-on experience fosters a sense of civic responsibility and empathy, preparing students to become socially conscious and ethically grounded designers in the context of smart city development.

Both cases of co-creation distinguish themselves from mere participation by emphasizing active collaboration and shared responsibility among the parties involved. Through these collaborative efforts, co-creation catalyzes innovation, cross-sector collaboration, and the co-creation of meaningful solutions that contribute to the sustainable and inclusive development of smart cities.

Course and assignments design methodology

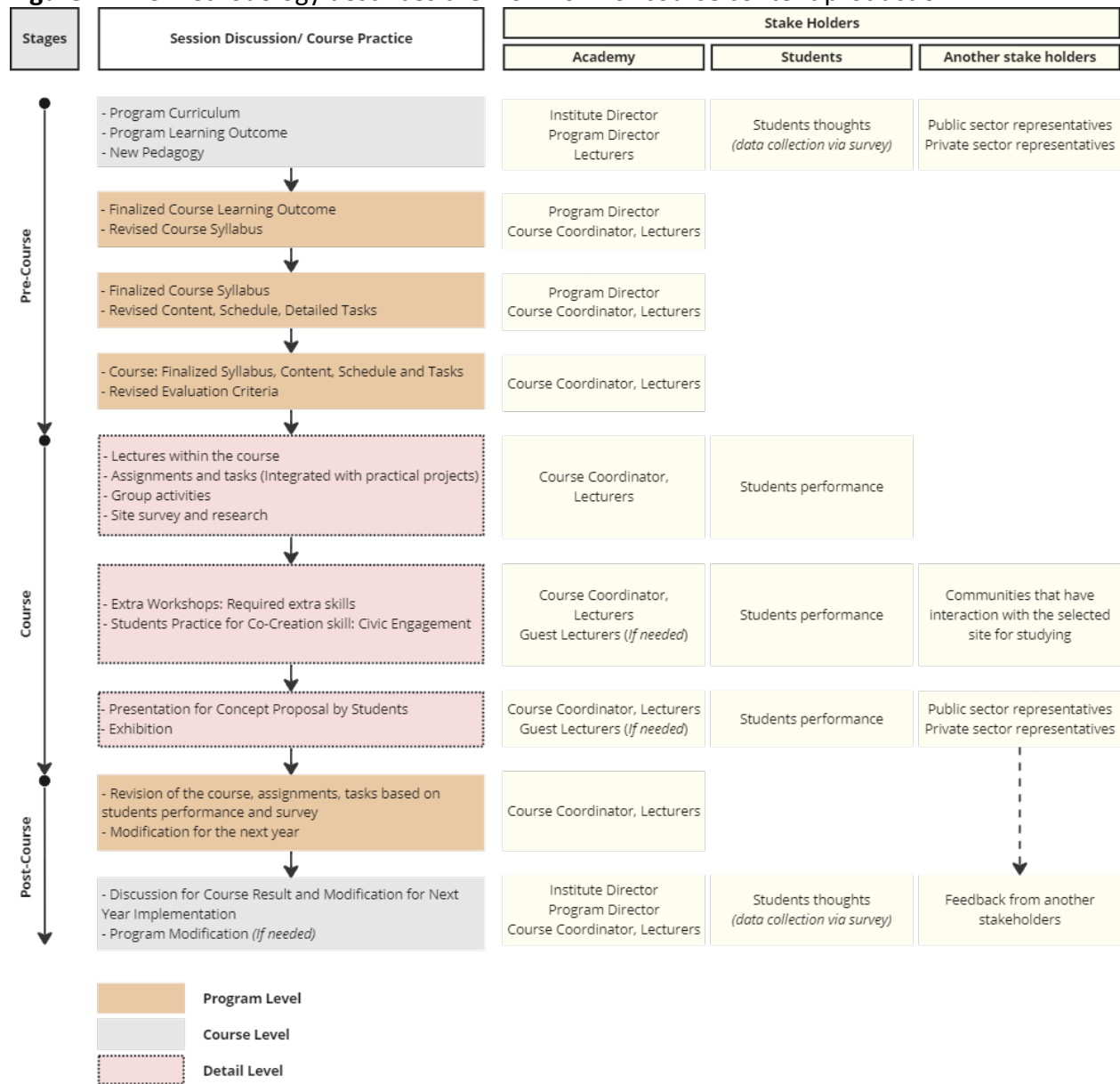
Co-creation in courses syllabus design

Crafting course content and designing assignments that incorporate practical case studies is a meticulous process demanding considerable time and extensive discussion among relevant stakeholders. Indeed, the process appears time-consuming and demanding across various subjects. However, meticulous deliberation and comprehensive consideration, drawing from diverse perspectives, are essential for effectively crafting subject content. Furthermore, the interconnection of different courses within the program ensures coherence and fosters high academic performance among students. The process for course content generation includes many steps from learning outcome revision to discussion and modification for the next year (Fig 1). There are three main stages which are:

- *Pre-course*: All the sessions and discussion for the course content before it is organized with the participation of all relevant stakeholders.
- *Course*: The activities within the course between lecturers and students.
- *Post-course*: The discussion for revision and modification based on the course outcome and feedback from different stake holders.

The session discussion for pedagogy of the whole program must be included in the research methodology process because all the courses result must follow the program learning outcome (PLO) and contribute efficiently to the student's performance in their whole learning before graduation. The participants of each level (Program, Course and Detail) for discussion are different based on session objectives.

Figure 1. The methodology describes the workflow for course content production.



Note. Each course has a different course coordinator.

Firstly, in the Pre-course stage, there is a general discussion about the program curriculum, learning outcome, and new effective pedagogy that can be applied. To secure the multiple perspectives for decision-making, the student's thoughts collected by the survey are included. Besides the academic group, representatives from the public and private sectors in the field of architectural and urban design are invited to give comments about the program, and the suitable outcome for students according to the real working circumstance. The institute and program leaders can arrive at their final decisions through comprehensive discussions and deliberations. Subsequently, a series of individual meetings ensue, involving instructors engaged in the respective subjects. Each subject typically features a lead lecturer responsible for coordinating and overseeing the course's quality. Additionally, the course coordinator is tasked with preparing materials, facilitating instructor meetings, and organizing related workshops. These discussions

are organized for the determination of finalized Course Learning Outcomes (CLOs), syllabus, schedules, assignments, and evaluation criteria.

Secondly, during the course process, while much of the course content aligns with conventional syllabus to theoretical subjects, tailored methodologies are employed in architecture and urban design education. These include flipped classrooms, presentations, group discussions, rapid problem-solving exercises, and research materials. For subjects integrating practical case studies, additional skills are imparted through supplementary workshops to uphold quality standards. Extra activities such as site surveys, in-depth research, civic engagement, and co-creation are incorporated based on the specific content and requirements of the case study. In certain instances, case studies simulate real projects, focusing on researching and designing areas within the university campus to address genuine needs and challenges. Students are tasked with maintaining a professional standard in their design documentation equivalent to industry standards for actual projects. Assignments are designed to simulate real projects, often situated at specific locations on the school campus. Aligning with the course objectives, students are encouraged to engage directly with the community inhabiting the designated area, including lecturers, students, and workers. As part of their civic engagement, students collaborate with community members to address relevant issues and implement solutions. Upon completion of the course, during the presentation of design ideas or proposed solutions, representatives from both the public and private sectors are invited to provide feedback and comments to the students, fostering a holistic learning experience.

Thirdly, after the practice of the course, the course coordinator meets with participating lecturers and reviews if the student's performance meets CLOs. This is the foundation for course modification in the next student's intake. The workflow culminates in an official meeting attended by lecturers, institute and program directors. This gathering serves as a platform for discussing student feedback regarding the subject and assignments, alongside input from other stakeholders. Collaborative discussions are held to evaluate the effectiveness of the course and identify areas for improvement, ensuring ongoing refinement of the educational experience.

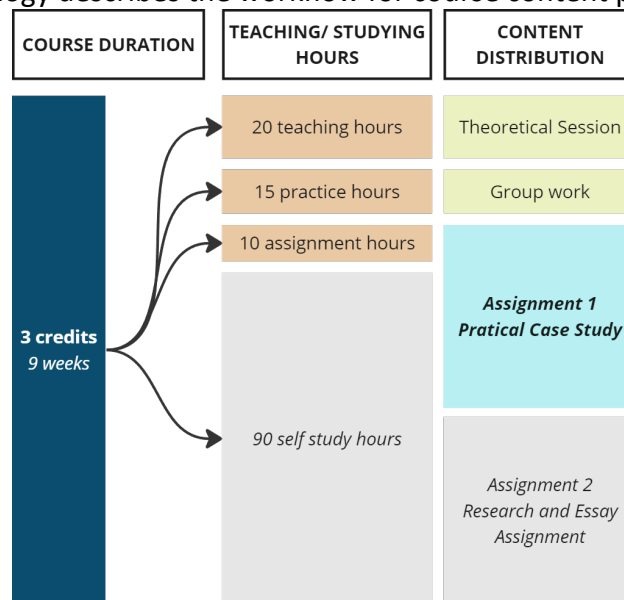
The integration of practical case study in course assignment

The frequent mention of utilizing the University campus as a practical project location integrated with theoretical subjects underscores its significance as an ideal miniature setting mirroring real-life living and working environments. Students, being users themselves, possess firsthand experiences within this environment, fostering a deep understanding of its intricacies. Consequently, they are highly motivated to devise innovative design initiatives, drawing inspiration from their interactions and observations within the campus setting. Integrating an exercise wherein students propose practical solutions or designs enhancing the University campus environment within theoretical subjects necessitates addressing three key considerations for lecturers: (1) *Mitigating task overload by carefully managing the volume of assignments and tasks*, and (2) *Facilitating students' swift application of learned theory to develop intelligent initiatives* (3) *Select the suitable study site for the assignment inside the University campus*. The solutions proposed to solve the above problems are explained as follows:

(1) In typical theoretical subjects at UEH University, Vietnam, with 3 credits, the duration spans 9 sessions over 9 weeks. Each session comprises 5 teaching hours, totaling 45 hours of class time. Additionally, students are expected to dedicate 90 hours to self-study at home (Fig 2). From the total allocated time, it can be observed that around 35 hours are designated for learning

theory and theory-related tasks during class sessions. Within these sessions, students have 10 hours to collaborate directly with lecturers on assignments. Furthermore, students are expected to engage in self-study and independent research outside of class hours. The role of lecturers is pivotal, as they must closely monitor students' progress while also fostering a flexible environment that encourages innovative thinking. Rather than just assigning assignments for students to work by themselves, lecturers devise a sequence of tasks for each class session that aligns with the theoretical content being covered. These tasks are organized systematically week by week, providing students with a comprehensive workflow to complete their assignments. This approach enables lecturers to monitor students' progress effectively while also facilitating students' understanding of applying theoretical knowledge to practical case studies.

Figure 2. The methodology describes the workflow for course content production.



Note. 10 hours assignment hours is the time for students to discuss directly with lecturers in class about their assignment progress.

(2) As noted, the tasks in each theoretical lesson consist of practical exercises embedded within the framework of the assigned practical case study. To enhance the efficacy of merging scientific research with practical case studies, the subject entails two major assignments: one for students to conduct thorough research and write essays, while the other requires students to propose solutions and designs for the presented problem. Along this progress, students are encouraged to come up with smart initiatives. Lecturers can base on students' performance to advise them individually. The teaching method is based on the pedagogy PBL and CBL. Lecturers start by presenting students with a wide range of questions, problems, and scenarios to work through. They then keep posing challenges and encouraging them to use a variety of resources to find solutions.

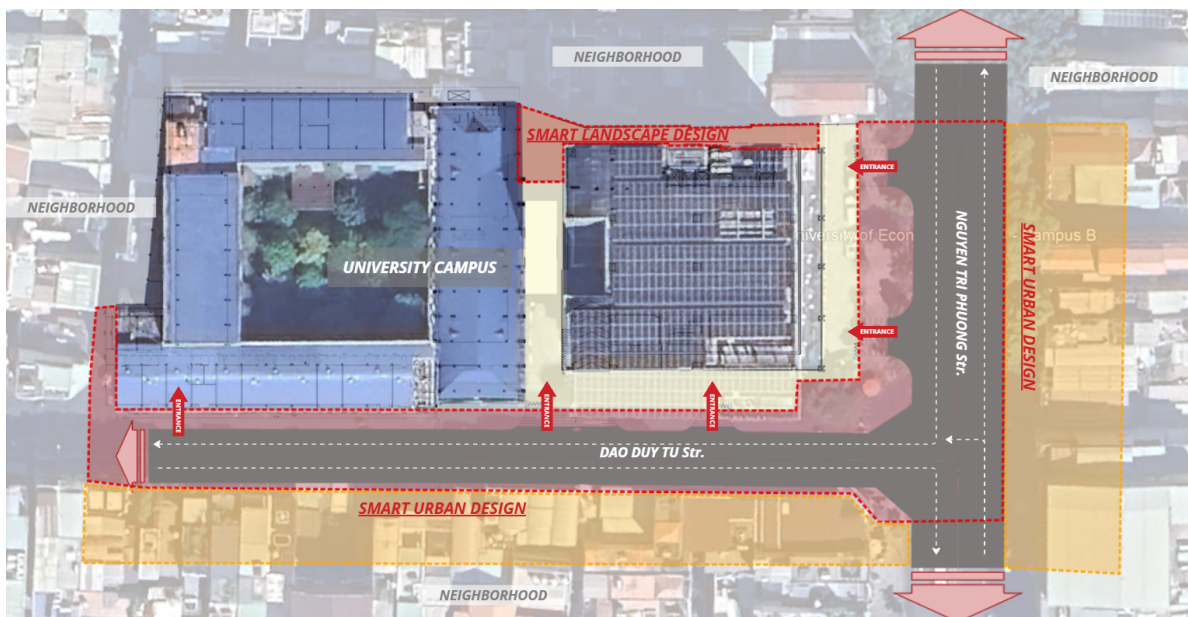
(3) The selected research area located within the University campus area can be proposed from the beginning when the lecturer introduces the assignment or proposed by the students themselves through their own experiences. In both cases, the issues being researched must be based on a topic framework that the lecturers have built to ensure CLOs. The topic should be designed strategically following PBL to embrace the creativity and critical thinking skills, holistic problem-solving techniques, in depth research, human centric design. This pedagogy focuses

primarily on using real-world situations as a catalyst for students to learn conceptual knowledge and principle. By utilizing the site within the University Campus, students can readily be motivated to visit the location weekly to gather additional data and develop a stronger connection with the site. The interaction outside the class with different communities and the discussion among designers embrace the innovative thinking of students. It facilitates the bridging of theory and practice for students, leading to a more comprehensive and well-rounded educational experience. Furthermore, studying outside of the classroom gives students the chance to hone crucial abilities including observation, analysis, critical thinking, and problem-solving.

Application in smart education and discussion

The courses mentioned in this study are in the program Bachelor of Architectural and Urban Design, Institute of Smart City and Management, UEH University. This approach of employing practical case studies is trialed across two distinct subject categories: design and social studies. All scenarios presented for problem-solving originate within one University campus for one student batch, addressing the real needs of the student and working communities present therein.

Figure 3. The location of design areas given in the education study of design course inside the University campus



Note. For the sociology course, students look for the problem inside the university campus by themselves and propose the solutions

Design study course

(1) Smart and Resilient Landscape Design

Course descriptions: The course provides students with foundation knowledge about landscape architecture design: terms and definitions, a brief history of landscape architecture, elements of landscape architecture, landscape architecture form and space, landscape design process, and representation. The course also explains landscape designers' role in the planning

and design teams helping to make new developments more resilient, where students can learn about the various resilient landscape design solutions and nature-based design materials, and the professional scope of landscape design projects. This course has 3 credits and 9 weeks as described in Fig 2

Practical case study assignment topic: The research and design area are located inside the university campus including a fire escape small alley connecting to an empty space that is not being used appropriately (Fig 3). The University is using the empty space as a multi-functional space for events and a small alley to keep used furniture. However, it can be observed that because of the big shadowing coverage area and cool air ventilation, many students and workers were using the mentioned places for resting during the afternoon. The objective of the assignment is renovating this area and orienting new functions while keeping the emergency escape and fire prevention role for the setback/ alley space. In addition, this will be an open space for students and employees of the university to relax, live, and interact with each other. Because this is a project based on the actual needs of the University, besides impressive ideas, the proposals also have to ensure feasibility.

Figure 4. Students design proposals for the renovation inside the University



Note. Three selected proposals from students

Assignment general requirements: The assignment required students to produce a proposal at the level of pre-concept design. The design included all fundamental components in this stage as an idea to design explanation; story; site analysis; master plan described in ground plan, elevation, and section; 3d models; amenities, plant and lights lists; detailed illustration of special design; and other illustration if needed. Each team's contents are shown in one presentation slide and one to two A1 posters. During the design process, students also have to organize civic engagement through online questionnaires and onsite interviews to gather the opinions of students and employees in the university about their design proposals.

Assignment Final result: The research teams were truly surprised when students not only completed all the components of the output requirements for the Pre-concept proposal but also completely built their ideas. The design proposals all follow very different directions that can be feasible, innovative, effective, or affordable. Some options are highly appreciated by experts in terms of content, aesthetics, innovation, and application.

(2) Smart Urban Design

Course description: this course provides an understanding of urban design theories with a variety of precedent practices that pursue sustainable design techniques, environmental conservation, restraint of urban sprawl, minimization of transport costs, prevention of land use conflicts, etc. By and large, the course determines the diverse socioeconomic activities that occur in a specific area, the patterns of human behavior they produce, and their impact on the environment. From that, students can demonstrate how to effectively utilize design and planning instruments to manage urban growth and achieve sustainable, equitable, and efficient development outcomes. This course also has 3 credits and a duration of 9 weeks (Fig 2)

Practical case study assignment topic: In this course, the study area surrounds the university campus (Fig 3). This is an old residence that is spontaneously built with no identity, lacks parking space, full of unoriented street vendors. There is no clear connection between the space of the university and the surrounding area. The T-Junction between Nguyen Tri Phuong and Dao Duy Tu usually faces traffic congestion during peak hours. The streets are not friendly with pedestrians and usually put them at potential threat of traffic accidents. The assignment aims to rethink this area with a fresh approach aimed at addressing existing critical urban challenges and enhancing the coherence between the University campus and its surrounding area. To stimulate students' innovative thinking, a total area of 500 square meters of adjacent land is designated for transformation into public space.

Figure 5. Students design proposals for rethinking the urban area surrounding the campus



Note. Three selected proposals from students

Assignment general requirements: Because of the area scale and complication, each group of students is required to propose a pre-concept idea with a design explanation; story; site analysis; the site program and master plan; 3d models, and rendering scenes. Students are required to present their final design proposals using presentation slides and two to four A1 posters. During the site analysis, students must interact directly with local residents, students, and employees in civic engagement.

Assignment Final result: Despite the relatively shorter timeframe allocated within the context of a theoretical subject, students demonstrate commendable proficiency in completing the output product and effectively applying the theoretical knowledge they have acquired. In addition to researching the current situation in the area and surveying the community, they also

examine numerous successful case studies for experiential learning. Many innovative ideas, largely unprecedented in Vietnam, are proposed, including smart bus stations, smart open-space libraries, integrated street food business areas with parking facilities, multifunctional community hubs, zero waste stations, renewable energy collection facilities, and living labs. Students envision the university as being accountable for orchestrating community engagement endeavors and providing education opportunities not only within the campus confines but also extending to the surrounding vicinity.

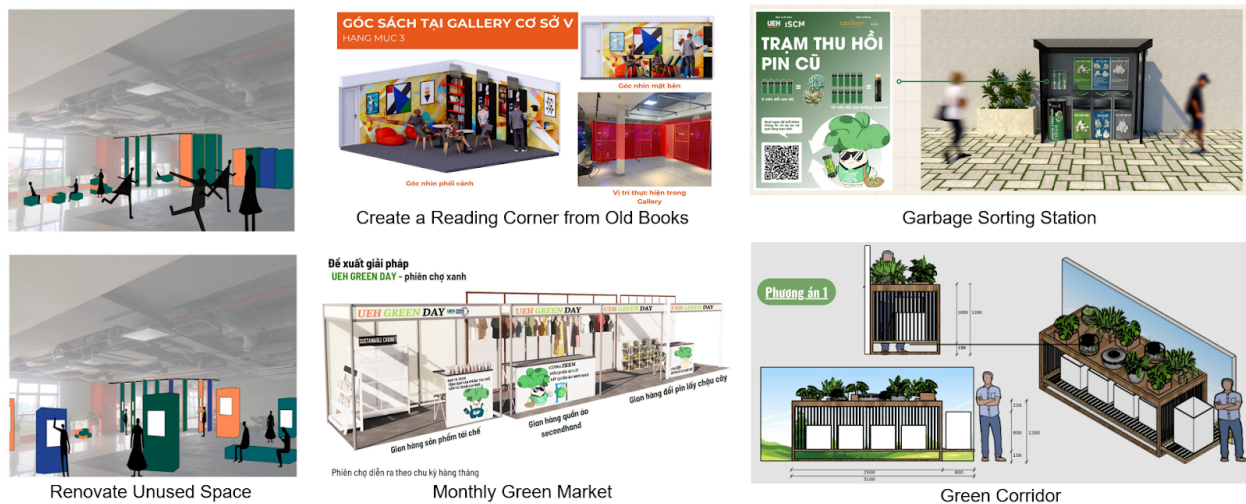
Social study course

(1) Sociology in Smart City

Course descriptions: This course helps students explore from the basic concepts to the principles and techniques of Co-Design, focusing on community engagement and stakeholder collaboration, while supporting diversity, equity, and inclusion in urban areas. Students will develop the knowledge and skills required for the Co-Design process and apply them to various real-life situations. Through interactive discussions, case studies, and group projects, students will learn how to leverage the knowledge, expertise, and perspectives of diverse stakeholders and build consensus to create a more comprehensive and effective planning.

Practical case study assignment topic: In this course, the study area surrounds the university campus. In the context of universities moving towards a waste-free green campus, creating awareness about waste segregation and recycling has become important. The goal of the student's task is to identify subjects related to the process, collect opinions, and propose specific solutions. The special point in this subject is that when you bring a solution, that solution must be implemented in reality and must have the participation of at least one unit/organization such as revenue and collect trash, the group creates recycled products from trash to solve the selected problem (Fig 6). In addition, because this is a practical project, it emphasizes feasibility and requires students to have objective assessments and convince the target audience.

Figure 6. Students came up with the survey process and solicited participation.



Note. Five selected proposals from students

Assignment general requirements: The exercise requires students to research and propose a working process at a level that can be applied in practice. The process includes processes such as teamwork, planning, surveying, evaluating the current situation, finding solutions, presenting ideas to relevant units, and applying them to problem-solving. The content

of each team is presented in a presentation and a report. During the implementation process, students must organize the participation of relevant parties through questionnaires, interviews, and reports with other units/organizations to persuade and call for funding.

Assignment final result: Although relatively short for a project that requires the participation and investment of organizations, students still showed their enthusiasm and bravery when presenting their solutions to call for participation. Not only assessing the current situation and coming up with solutions like traditional theoretical subjects, but students must also think about possible risks. This helps students gain practical experience and gives them the ability to evaluate and solve problems more realistically.

Conclusion

With the positive results of students' work and positive feedback from students, the research team believes that taking university campus for practical site study in assignments is a potential method in urban design education. Viewing the University as a microcosm of a bustling city, bustling with work and study activities, positions students and employees as its inhabitants. Assigning a designated area within the University as a design project for students serves multiple purposes: honing their design thinking skills and fostering a habit of continuously seeking innovative ideas to enhance their quality of life. In the mentioned case studies, the key changer lies in the thorough comprehension of students regarding the demands of university campus life and real-life demands, which they encounter firsthand everyday. Additionally, contributing design concepts to the university campus ignites a profound motivation among students, propelling them to surpass their academic boundaries.

The flexibility in learning empowers students to cultivate innovative concepts, formulate various interventions for smart cities, and enhance the university campus environment. Moreover, students gain insights into organizing civic engagement and recognize the significance of co-creation in urban design for future endeavors. In terms of course syllabus development and assignment creation, involving diverse stakeholders enables the research team to comprehensively gather opinions from multiple viewpoints. The practical case study assignments within these courses not only afford students the chance to undergo genuine project procedures but also acquaint them with contemporary urban development strategies. Students did truly successfully perform learning by doing during the courses.

However, several challenges were acknowledged throughout the courses. Both lecturers and students expended significant effort during the course duration due to the workload of assignments. Additionally, the effectiveness of civic engagement varied across different circumstances, as students often lacked experience in data collection at the bachelor level. Lastly, team-based assignments posed challenges for lecturers in assessing individual contributions. To overcome the mentioned challenges when applying this education methodology in the future, lecturers have to consider carefully the workload of all the courses in the same semester, which requires effective communication among lecturers of the department. Several workshops about extra skills training can be organized annually to prepare the necessary abilities for students in practical projects, civic engagement, etc. As technology advances and its applications enhance productivity in urban design and planning, various tools can be explored for student training purposes. These tools encompass diverse functionalities including site surveying, data collection and analysis, collaborative design, exhibition, among others.

Acknowledgement

Thanks to all the lecturers at Institute of Smart City and Management have participated into the three courses which have been mentioned in this research as case studies. The research team also appreciate the hard work and effort of students majoring in the Bachelor of Architectural and Urban Design Inclusive Smart City. Their final proposals are also being used in this research as the result for discussion.

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