



What can first-year undergraduate students “envision” from a pandemic?

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Accepted: 8 February 2023 / Published online: 18 February 2023
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Abstract

The COVID-19 pandemic has further compounded the inherent complexities of design pedagogy. At the same time, offering an online teaching method made it imperative to incorporate the pandemic’s implications in the design process upon experiencing its adverse impacts. This study investigates landscape architecture students’ design approaches and understandings in a real-world studio based on the before and after COVID-19 scenarios. The findings show that most students designed multi-functional public open spaces before the COVID-19 period while they envisioned post-pandemic uses after the COVID-19 period. The study results not only offer insights for online or distance learning for design students, but also prepare design-oriented solutions for the pandemic-related episodes.

Keywords Teaching · Pedagogy · COVID-19 · Design studio

Introduction

Following the first COVID-19 outbreak in China, the whole world has faced various social, economic, and environmental challenges. In order to tackle these issues, countries have resorted to critical responses, including new health policies, transportation updates, social life restrictions, pedagogical shifts, and so on.

As regards the educational aspects, many countries have immediately shifted from face-to-face to distance education by utilizing online platforms. Since this transformation occurred abruptly, it led to unexpected experiences and outcomes. While some theoretical-oriented disciplines, i.e., humanities, reasonably suffered less from this transformation (O’Malley, 2021), even though online education is not a newfangled approach, hands-on and visual-related disciplines, including health and architecture fields, experienced additional negative consequences, including the lack of practice and guidance (Tuah & Naing,

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2020). So, the shift to online learning has radically changed teaching in academia, although this is perhaps less positive in the design and hands-on disciplines that rely on face-to-face contacts particularly in studio-based learning (Corazzo, 2019; Charters & Murphy, 2021), compared to the more theory-based disciplines.

Landscape architecture, along with other design disciplines, has faced such hardship during the COVID-19 period. Design courses compose the core aspects of the program as they generally rely on integrating theoretical design knowledge within the real-world design praxis, as opposed to the other parts of its curriculum (Schön, 1985). As many other studies also highlight, studio courses offer the optimum settings to establish a lifelong learning experience, due to the complex design pedagogy, including self-learning, creative cogitation, contemplative site analysis, and profound thinking (e.g., McClean, 2009; Al Maani et al., 2021). While design studio courses already struggle with complicated procedures, the COVID-19 pandemic imposed unpredictable restrictions by adding further complexities. For instance, lack of technical infrastructures and experience on online education and related platforms were the main concerns as many other studies have also highlighted (Zhang et al., 2020; Ozorhon and Lekesiz, 2021). These changes broadly include not only complete distance learning but also hybrid education learning based on the institutional circumstances.

Several other studies (Greenhow et al., 2021; Karakaya, 2021) have already actively addressed the consequences of these educational transformations on various design pedagogy stakeholders – students, instructors, or both. Such studies generally conduct surveys to understand the student perceptions and instructors on their experience with the “new normal” education. Such studies have somehow showed how both students and instructors have a tendency to adopt online education in their existing curricula in the architecture-related disciplines (Varma & Jafri, 2020). While grasping ideas on perception and preference is an integral approach, studies fall short on responding to how students’ intellectual knowledge articulates in response to COVID-19-related design solutions in studio courses (Charters & Murphy, 2021; Yorgancioglu, 2020). Instead of perception or preference, assessing the students’ perspectives with regard to their particular design visions seems imperative.

This study aims to fill this gap in the literature by pre-organizing a first-year design studio for the real-world project sites for students to create design solutions for the same areas both before and after the COVID-19 period scenarios. The study aims to respond to the following research questions: What are the freshman students’ design visions for the pre-and post-pandemic? What did the landscape architecture students concentrate on in their projects? Do their works follow specific themes? How are their class engagements in terms of grades for before and after COVID-19 periods?

Overview of literature

First-year design education/pedagogy at a glance

Design pedagogy in the first year landscape architecture programs initiates the foundation of basic design and graphic expression, and illustration courses. Students then simultaneously apply their learning outputs in the design studio. Design studio courses either apply simple or more complex conceptual considerations with tangible design solutions at the end of the fourth year. Ideas could also start from small scale design thinking through to large scale

urban planning and design. No matter what approaches landscape architecture programs adopt, the freshmen learn the roles of basics of design in studio courses. This is particularly critical as many students directly join the program with various challenges, including going from basic mathematics to complex calculations or intermediate creative courses, or starting a new phase right after finishing high school. Thus, establishing the abstract and concrete level of knowledge for the program occurs in this period, when performance and achievement feelings grow proportionately in it (Tinto, 1993; Kahu et al., 2017). These design expectations and students’ experience are affected by sudden changes in education in the case of extraneous circumstances, such as the COVID-19 pandemic. Such changes may range from study settings of manual drawings to going completely digital in hands-on creative courses, i.e., basic design, formation in online platforms.

COVID-19 and design pedagogy challenges

After witnessing the first COVID-19 case in December 2019, nations made a critical decision to keep abreast of their educational conditions during the pandemic. Some countries opted for the hybrid courses, while some others preferred online education. As in many other disciplines, landscape architecture programs were also required to move to virtual platforms (Dreamson, 2020; Varma & Jafri, 2020).

Shifting from face-to-face to online education platforms in design disciplines involves two-fold difficulties with both technological and educational attributes. On the one hand, technological attributes are particularly vital as distance education highly depends on advanced technological requirements during the COVID-19 period. Knowing that each student must attend the design studio virtually from home, these technological factors include hardware, software and the network infrastructure (Milovanović et al., 2020; Ozorhon & Lekesiz, 2021). On the other hand, students and instructors typically face similar obstacles, such as unfamiliarity with online platforms (how to share screen, folder, video, and audio setting, etc.), and also between students and instructors. Since students transition from high school to landscape architecture programs in their first-year education, they may have less motivation and concentration (Varma & Jafri, 2020). Similarly, instructors may have less interaction and lack preparation for distance learning (Varma & Jafri, 2020).

Shifting through distance education and design studio approach

The first case of the pandemic occurred in Turkey in March 2020 (MoH, 2020), causing a complete temporary shutdown of all teaching platforms. With various forms of online education tools, i.e., Adobe Connect, Zoom, Microsoft Teams, etc., teaching in the same semester shifted into distance learning. With the increase in the COVID-19 and related death tolls, all courses in the 2020–2021 academic year also operationalized distance education in landscape architecture. This transition from face-to-face to online design studios took place with various changes in terms of organization and plan, including moving courses to various online platforms.

These changes include two core facets: while course structure was organized for distance education, student projects and course deliverables were also formulated to address the COVID-19 effects in design solutions. This formulation consists of grasping the pandemic-

related design ideas for the same project sites. As regards the former, this study reflects the design studio in the spring semester of 2020–2021. The studio had thirty first-year students with three instructors and two critical juries during the semester. One of the jury review sessions occurred midsemester and the other one took place at the end of the semester to assess the students' entire projects. The purpose revolved around understanding two real-world project sites as longitudinal design project scenarios before and after the COVID-19 pandemic. The course focused on "raising awareness on the landscape design of public space in light of the COVID-19". Microsoft Teams became the primary communication tool with both synchronous and asynchronous course structures for conveying the class materials, critiques, and feedback. Meanwhile, all course materials and details set out to handle through online platforms. Students submitted their assignments both for weekly and milestone projects through those online platforms, such as Google Drive folders. They also reviewed each other's assignments to offset the partial online limitations on creativity by not observing or learning from other students' ideas. Also, all students and instructors could access a WhatsApp for responding to the students' swift questions and provide motivating conversations during the pandemic circumstances.

Operating online critique and feedback

Since providing feedback on student projects plays an essential role in the design pedagogy (Fleischmann, 2020), how the instructors retain this routine in the virtual platform seemed crucial. Microsoft Teams offers virtual screen sharing for students and instructors for presentations, jury, and critiques. However, the platform is not sensitive enough as it does not allow high-resolution sketching or drawing the students' projects. So, some other CAD software (Adobe Products), graphic tablets, and hand-drawing techniques proved relevant in this case. As a typical pattern, students uploaded their assignments to Google Drive by the due date, and the instructors shared them on the screen and gave comments by drawing over software, graphic tablets, or hand drawings during the synchronous class time and also allowed other students to learn various relevant knowledge that may or may not relate to their projects (Fig. 1). So, this method also aimed to convey the studio knowledge both visually and aurally. The same procedure also applied to the two jury sessions held.

Conceptualizing landscape design studio framework: two tales of envisioning public open space

Landscape architecture deals with rather complex systems and conveys knowledge to undergraduate students, particularly in studio contexts, which need additional efforts and methods. For instance, while students offer solutions for climate change, they also consider social, and landscape changes, and other relevant effects (Park, 2020). Researchers adopt specific learning approaches to minimize such complexity and concerns. Therefore, the studio utilized a "content-based" syllabus with a "synoptic" skillset, as opposed to task-based, as many other studies also utilized them (Kitchen, 2006; Arefi and Ghaffari, 2020). A content-based syllabus gained priority as the core aim was to assess the COVID-19 implications of landscape design according to the students relative understanding on their assignments. Considering the skillset, the research included the "synoptic" over the "integrative" method of understanding complex landscape. In other words, the synoptic approach makes students

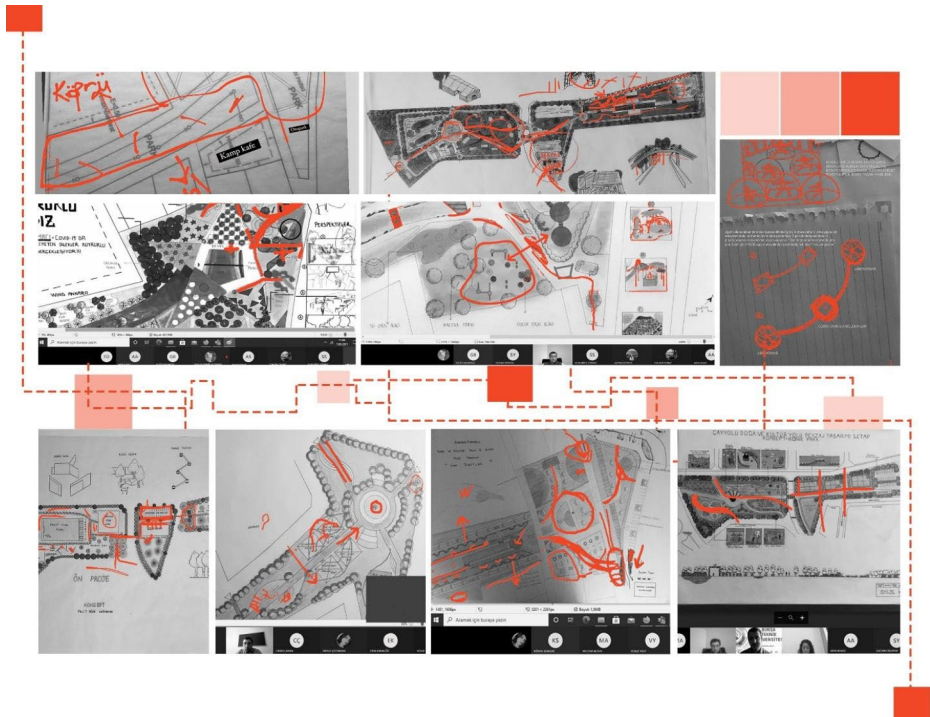


Fig. 1 Online teaching illustrations

think more critically based on self-discovery rather than relying heavily and passively on different contents, in this case the COVID-19 pandemic (Arefi & Ghaffari, 2020). On top of that, an integrative skillset seems more beneficial to advanced graduate and interdisciplinary studies, and this study concentrated on first-year undergraduate students (Grant Long, 2012; Arefi & Ghaffari, 2020). In this case, synoptic skills contribute to a broader understanding of COVID-19 characteristics design features, individuals, and environmental changes through self-exploration and critical thinking.

After delineating the syllabus and skillset varieties, since as a core aim of the studio aimed to assess the learning outcomes, the syllabus and related materials were designated based on establishing an appropriate evaluation method that evaluated the student projects. The studio defined the real-world projects that were currently “almost abandoned” public open spaces. The students received initial information on the sites as an introductory class presentation for the expectations of the phases. Rather than a strict typology or structure, they made their initial analyses, i.e., existing conditions, envisioning ideas, and surrounding conditions to independently develop their own design concepts.

Project area description

Two real-world project areas were selected for the class materials. Project site one is 5.2 acre surrounded by heavy traffic lanes, while project site two is a sacred location with a 3.6-acre area. However, the latter is located near a historical tumulus protected with high-level

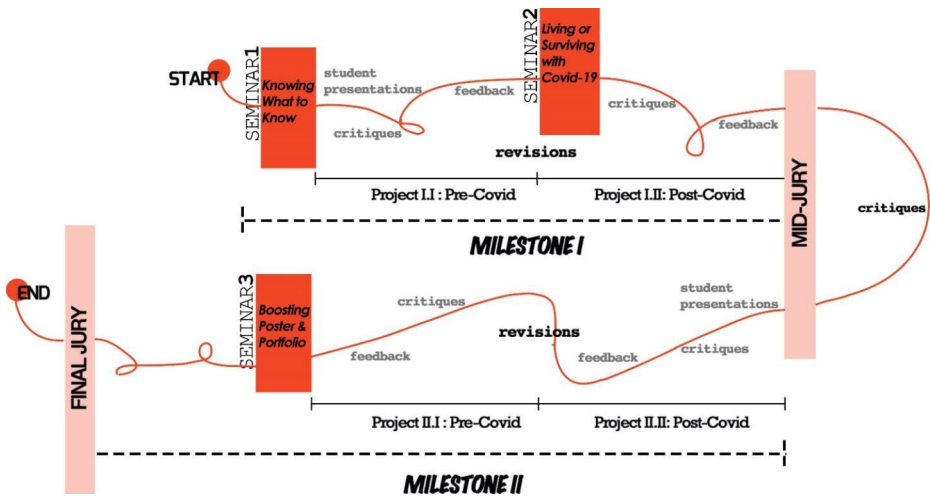


Fig. 2 Study framework

priority laws with no constructions allowed near or around it. The difference between sites one and two could potentially limit the students' design concepts in the case of not being allowed to change the concepts. So, while the students were strict about keeping both their pre-and-post COVID-19 period concepts for site one, they could change the concept for site two. While the restricted phase aimed to observe the student abilities on the limitations, the flexible concept targeted to provide infinite creativeness of their conceptual thinking scopes.

Class structure and instructions for the assignments

With the COVID-19 period (Tartavulea et al., 2020), the studio followed a hybrid assessment of formative and summative formats while the latter seemed more dominant. Students used the former for presentations and weekly critiques of drawing/design progress both for giving feedback and monitoring learnings (Black & Wiliam, 2009; Andersson & Palm, 2017). The latter was used for mid and final jury presentations where students made verbal presentations along with visuals and written deliverables. Each student had 8–10 min of presentation time during mid and final juries.

The studio included two milestones: site one before and after the COVID-19 scenario; site two before and after the COVID-19 scenario- along with three essential “pit stop” seminar series during the semester (Fig. 2). The studio started with the first seminar –knowing what to know- by focusing the overall project goal, site details, expectations, virtual tour around the site, drawing material and base map sharing, etc. The semester included two project sites for four design projects: site one before and after COVID-19, and site two before and after COVID-19 design scenarios. At the end of this introduction, students were asked to prepare some visual materials, i.e., presentations, collages, etc., whether they grasp the overall expectations from the class or not as they are first-year students and may not be familiar with the studio contexts.

Next, the following weeks proceeded with site surveys, conceptual diagrams, bubble diagrams, schematic design, and design development phases for the two project sites. While

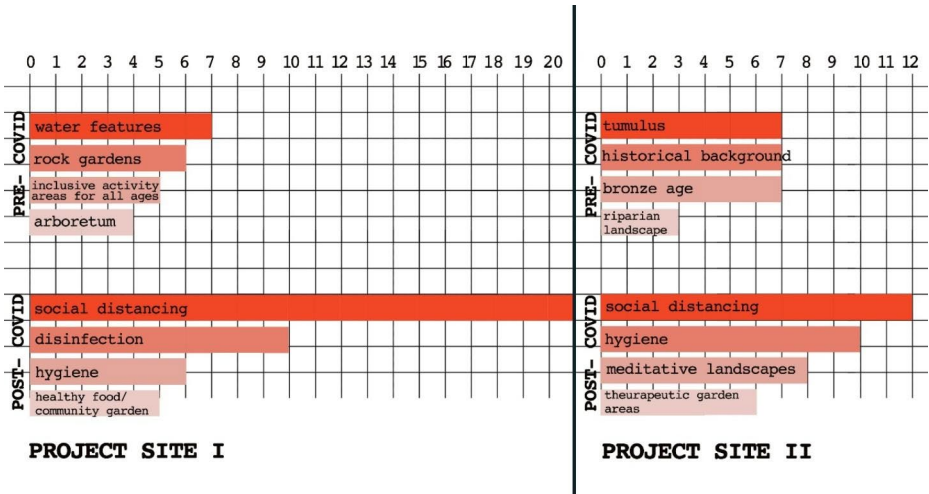


Fig. 3 Concept themes of the students’ projects

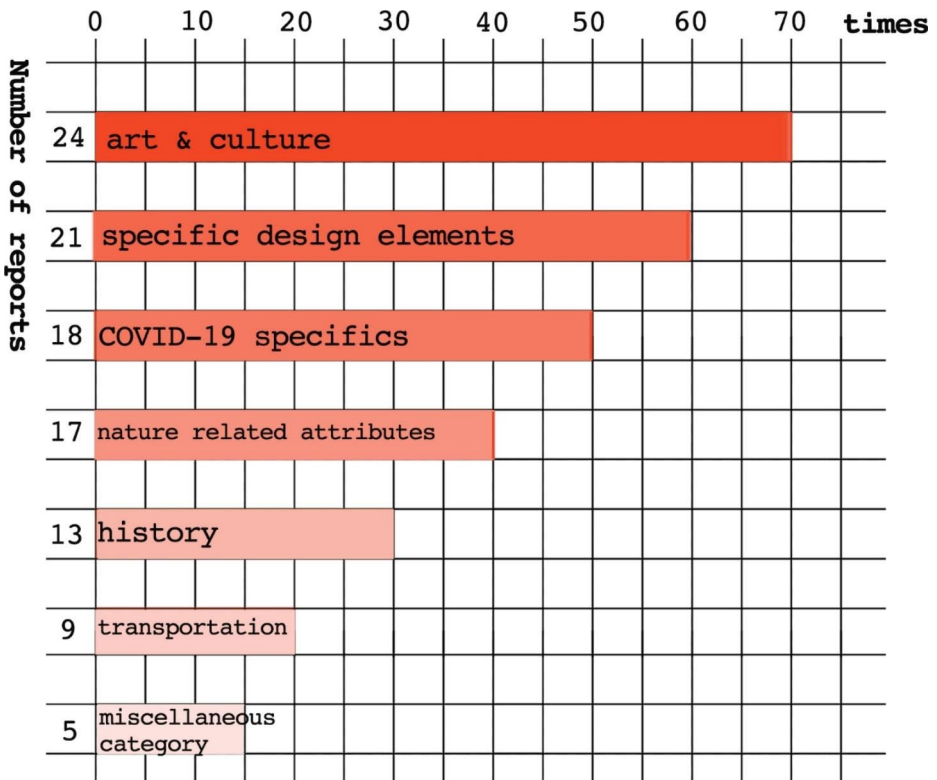


Fig. 4 Emerged themes of the context analysis

site survey and initial analyses were standard between pre-and post- COVID-19 periods, the rest of the phases emerged distinctly. The instructors asked the students to present their products in each phase, ask questions, and get feedback. The mid-term jury invitation occurred at the end of designing the first site based on both before and after the COVID-19 periods. Project sites one and two also showed some differences. While students had restrictions to keep the same design concept for the pre- and post- COVID-19 period for the first phase, they had the option of changing their concepts in the second phase. This method helped track and observe how students engaged or showed enthusiasm in the face of limitations. For instance, some students had difficulty limiting the same concept for before and after the COVID-19 pandemic as some design elements proved unsuitable for after the COVID-19 period, i.e., community-based social recreation. Furthermore, the second seminar –living or surviving with the COVID-19- shared various global examples of how public spaces can change during the COVID-19, including closing roads to allow cyclists and pedestrians to use such areas as public spaces as well as pandemic-related hygiene and distance regulations outdoors (Honey-Rosés et al., 2021). This provoked the students’ design intelligence to grasp the pandemic effects on public space. The students, then, continued with the second site for both scenarios. The last seminar session –boosting poster and portfolio- sought to improve the quality of students’ final products by providing various critical poster and portfolio techniques about a couple of weeks before the final jury (Fig. 2). The students submitted a project narrative at about 10–15 pages to grant instructors to conduct a context-based qualitative analysis on what they envisioned with their design solutions.

Evaluation of Studio materials

The study aimed to examine the students’ final projects as outputs of drawing general representations from their perspectives. The instructors advised the students to have their project solutions as well as the final report brief. This content-based course structure stimulated students to learn at their own pace for COVID-19 concerns, such as lack of public space access as well as public health problems, and possible solutions from their point of view. Further, the students made relevant article and report readings, presentations, personal mini-reports, and the critical seminar series. Hence, it is imperative to assess their products individually to observe possible patterns.

Emerging patterns of pre- and post- COVID-19 projects

Having two different project sites with different contexts and backgrounds resulted in different student projects. Also, those projects revealed common themes based on their core design concepts.

Scenario building for the pre-COVID-19 pandemic, mainly involved designated public open space attributes in the first project site. While there are various program elements, common emerging themes include: water features (7 students), rock gardens (6 students), inclusive activity areas for all ages (5 students), and arboretum (4 students), respectively, among students’ works. When students delivered post-COVID-19 design solutions, the odds changed for pandemic-oriented solutions. There were also emerging patterns for post-pandemic design scenarios, including the most notable vital attributes are social distancing

(21 students), disinfection (10 students), hygiene (6 students), and healthy food/community garden concepts (5 students).

The second project site showed a different pattern, particularly for the pre-COVID-19 design part. Based on this observation, students highlighted the historical and cultural heritage of the site by designing tumulus (7 students), historical background, i.e., bronze age (7 students), and riparian landscape (3 students). Looking at the student design after the COVID-19 period, the themes include similar patterns with varieties and different weightings. For instance, social distancing is still the dominant factor with fewer concentrations (12 students), and it is followed by hygiene-related concerns (10 students). Surprisingly, students designated various meditative landscapes (8 students) and therapeutic garden areas (6 students) in their projects and this might be related to the students' designation on individuals' mental health per their verbal and visual presentations in mid-term and final juries.

What did the students concentrate on in detail in their project brief?

In addition to overall project themes, the study conducted context analysis for the final project reports of students as part of their final deliverables with the Microsoft Word or Adobe PDF versions, the students described their projects verbally along with writing reports ranging from 10 to 15 pages. Analyzing final reports also allowed the study to observe some patterns from the students' projects. These themes were identified by the frequently used words within the final design reports of students. Using the NVivo 12 software (Welsh, 2002; Zamawe, 2015), each project report assessed the commonly-used words, and this process was applied to all project reports. Then, a categorization procedure helped perform a general scope out of these reports. Based on this technique, seven key themes emerged after analyzing the reports by the software including: art & culture, specific design elements, COVID-19 specifics, nature-related attributes, history, transportation, and a miscellaneous category. Art & culture was the most frequently-used theme (at least more than 70 times in 24 final project reports). The reports included several sub-categories, such as a workshop, exhibition, sculpture, art hall, museum, amphitheatre, and movie, respectively. These themes were followed by specific design elements within the project sites (at least more than 60 times in 21 final project reports). The proposed key design elements included children's playground (6), public square (5), creek revitalization (3), topographic change (2), bridge (1), and camping areas (1).

As an emerging category and the aim of the study, the COVID-19 related themes, have been mentioned in all project reports. Looking at the frequently used words, as expected, reports include social distancing (13), disinfection (3), fresh (3), breath (3), air quality (3), and pandemic (2) the most (these words were obtained in 18 reports by mentioning more than 50 times). The nature-related theme followed the former categories by having mainly nature (10), green (8), passive recreation (4), garden/hobby garden (4), plant (3), green roof (2), respectively (at least 40 times within 17 project reports). Mentioning history attributes is also noteworthy in the reports by utilizing history (5), archaeology (4), antique (4), monument (3), and tumulus (3) words (at least 30 times in 13 project reports). One of the least mentioned categories is transportation attributes that include vehicle (4), parking lot (3), circulation (2), pedestrian (2), and bikeways (2) as commonly used words (at least 20 times in 9 project reports). The final theme was the miscellaneous theme with smellscape (4), peace

(3), harmony (2), technology (2), robotics (1), and digital (1) as commonly used words (at least 15 times in 5 project reports).

Do the grades of students matter?

While class grades played crucial roles for students, they did not provide much comparison for the study scope. Simply looking at the grades, the study concentrated more on the design education process for the pandemic circumstances. However, overall the students received higher grades for the pre-pandemic design solutions. This finding implies that design solutions of post-COVID-19 periods seemed more challenging for students as expected. Another explanation had to do with the concept distracting the students from or creating uncertainties during the COVID-19 pandemic, and that the students were either more familiar with the public space concerns or they just could not grasp or reflect its priorities or simply, it might have been caused by the assessors' expectations and subjective ideas that imposed limitations on the study.

Reflections

Using the design solutions of first-year landscape architecture students for a real-world project, this study sought to assess the causes and consequences of the COVID-19 pandemic on public space. By doing so, the students intended to understand the primary environmental conditions better, "reading" a place through all possible circumstances, conduct analyses, and propose designs as part of their studio projects.

First, student projects showed less variability on scenario-making with limitations for keeping the same concept for before and after COVID-19 periods in their first project site. The key purpose was forcing them challenging circumstances so that they could learn and improve the functions and design details as well as adopt the pre-COVID-19 design into the after-COVID-19 in their projects. They generally reformulated the pre-COVID scenario by adding a routine mask, social distancing, and hygiene concepts into the post-COVID solutions. While this was not surprised for the pandemic-related scenarios, it implies that students could have difficulty, like many other disciplines and fields, understanding and addressing design solutions of unknown and unpredictable attributes during the COVID-19 breakout.

As the offshoot of the first reflection, the second reflection had to do with observing a range of solutions after allowing them to choose the desired concepts for their before and after COVID-19 scenarios pertaining to the second project site. Furthermore, students showed more original themes, particularly for the post-COVID-19 projects. The instructors recognized these projects as more innovative and appropriate in terms of addressing the concerns.

The third reflection shows the highlighted in the student projects. Art & culture, innovative program elements for the project sites, and the COVID-19 related aspects turned out to play critical roles in their design solutions, and almost all of them have covered those themes in their projects. Even though not all of them showed in their drawings, they could state those specific design solutions in their reports. This is particularly significant as draw-

ing and written skills on design pedagogy should move forward hand in hand and complement each other for better outcomes.

Another reflection had to do with the barriers on student assessments. Evaluating students both individually and collectively faced issues. Looking at the individual assessments, such as weekly personal feedback and jury, they resulted in enormous time constraints. While the studio was eight-hour/week class, during personal feedback and jury the studio class time doubled (if not more). This was also problematic for class recordings as the online platforms sometimes were not friendly enough to record the entire excessive time. Collective assignments proved challenging as there were some group assignments difficult to standardize their grading as it was unclear which student put how much effort into collective assignments. In both cases, there were also some common concerns, such as cheating and the students complained about their internet/technology infrastructure and requested face-to-face class settings. Furthermore, as soon as the students were getting the feedback, it was challenging whether they were purely listening to other students' feedback or not even though they were shown online in the class system.

As for the quality of online design education, however, various concerns with some significance in offering online design studio showed up. First and foremost, both instructors and students encountered difficulties with online project critiques due to internet connection problems. Low or moderate project resolutions can hinder online education. Also, project scale and proportion problems in students' projects caused some technical issues, particularly during presentation and jury times, since any single or minor zoom in or zoom outs resulted in losing track of the drawing, comprehensiveness, and readability of the entire project. Another major problem had to do with student attendance, the classes from various urban and rural areas. So, not having equal online education standards, including the internet speed, not owning graphic tablets or high-quality laptops and other studio materials could cause problems for potential future online design studios.

Conclusion

The COVID-19 pandemic has made tracking and adopting online design education an abrupt but inevitable instrument in recent years. Different consequences of the COVID-19, design education has remained under-explored in context-based learning. This study particularly dedicated a studio structure to observe the students' learning outcomes for unexpected life circumstances -in this case, the COVID-19. To address this concern, the designated studio course evaluated two real-world project scenarios by including both before and after COVID-19 periods.

Student projects underline that the COVID-19 has shaped both actors and public open spaces from different reasons. While some of those include namely for the former, i.e., personal improvement of distance presentation (oral and digital presentation), independent study (research on public open space and COVID-19 implications), the latter is more about the design context, including program elements (landscape therapy, proximity on activities), site users' preferences (changing park use habit of frequency, the use of open space). Even though there were various biases and concerns at the beginning of the distance online studio, it assisted students to improve their visual and sense-based capabilities. The study recognized that digital tools and services could have utility in such cases. However, replac-

ing face-to-face studio courses with the online studio is the elephant in the room and needs more studies and shreds of evidence in terms of comparing and contrasting; that was not the scope of this study.

Instead, the study aimed to evaluate the circumstances where individuals familiarize themselves with the unexpected conditions relying on their own personal survival instincts; the COVID-19 exemplifies such a circumstance by keeping the label of “new normal life.” The study assessed the students’ project outputs systematically by shedding light on design-related pedagogy aspects of obtaining some takeaways. Furthermore, public open spaces, as many other urban environments, constitute versatile core urban areas, and students envisioned different design solutions. These areas should be prioritized, particularly from the people-environment relationship, in the case of pandemic-related circumstances, including war, natural disasters, and recent COVID-19 pandemic.

This study makes two contributions to the field. On the one hand, the COVID-19 shows an inevitable and applicable shift in design education from face-to-face to online, though challenging, with the changing habits and expectations of educators and students. While the physical environment seems vital for studio-based courses for the sake of nurturing creative design skills, using virtual platforms for course material sharing as well as individual communications cause additional burdens for ideal studio settings. Virtual environmental design studios could contribute to some positive outcomes. For instance, students felt more informal in communications, which enhanced their social interaction with each other on how to use, upload, and share class materials in online learning platforms. Considering the continuous momentum of such innovative and technologic platforms even after the pandemic, students may gain different social and technical experience. The future design pedagogy, despite the study or work-at-home options, helps students to gain experience with their “future work environments” in advance.

On the other hand, from the studio specific angle, students enhanced pandemic-related solutions by thinking about hygiene, social distancing, and mask usage concepts as expected. This study concentrated on the implications that transcend specific design studios, where students can incorporate the pandemic circumstances into their academic and professional practice too. So, the students had the opportunity both to learn digital and technological tools, and develop scenarios for adapting to studio learning skills for any unexpected circumstances such as the COVID-19. Such an experience invokes key ideas on how these habits continue and grow even after the pandemic period as future design studios unfold. There is no doubt that the pandemic has transformed the learning environment (Charters & Murphy, 2021; Eckert, 2021) while at the same time, altered the attitudes and habits of students and educators as well. This study sought to understand such an experience both from the point of view of distance learning and design studio-related concepts. Even though some further study gaps such as new normal pandemic periods or more specific design scenarios exist for students, this study calls for attention on impacts of shifting to online education in design pedagogy.

From the instructors’ perspectives, the design studio initially seemed extremely difficult on online teaching. However, the design pedagogy can also occur with ideal circumstances, i.e., technical infrastructure and familiarity with using online platforms. While face-to-face contact is still the key for successful pedagogical outcomes, almost uni-direction communication between instructors and students might be successful with the advantages of the technology. Instructors should engage more with the technology and online teaching after the

COVID-19 pandemic as virtual teaching might yield some key objective educational goals in the near future. Consequently, the design pedagogy inevitably and continuously seeks for novel ideas on approaching to students with creative ideas and perhaps the COVID-19 pandemic raised awareness and reinforcing the digital and online technologies in design specific outcomes for future learning.

Declarations

Conflicts of interest The authors have no relevant financial or non-financial interests to disclose

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