

## Article

# The Future of Design Studio Education: Student Experience and Perception of Blended Learning and Teaching during the Global Pandemic

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**Abstract:** Urban design studio education aims to prepare future urban designers to more effectively understand how cities work and critically engage with the role of design intervention in the built environment. A design studio is an appropriate setting where this can take place. This paper details the design and delivery of a postgraduate urban design studio subject in the MA Urban Design programme at Cardiff University during the COVID-19 pandemic in the UK. We particularly investigate the capacities and challenges of blended learning and teaching, with a primary focus on the experience and perception of students in the context of design studio pedagogy. To this end, we discuss the findings from an online survey of postgraduate urban design students and reflect on their experience and perception of the related learning and teaching activities, assessment, feedback, field study visits, workshops, and digital platforms during the subject delivery period in the 2021–2022 academic year. The outcomes of this paper can inform future practices of blended learning and teaching incorporating a mix of face-to-face and online modes of delivery in relation to design studio education, particularly in the context of unprecedented global health challenges such as the COVID-19 pandemic.



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**Keywords:** student experience; blended education; higher education; online education; design studio; COVID-19; public health; urban design; remote education; distance education; virtual education; face-to-face education; on-campus education; in-person education

## 1. Introduction

The design studio has been an integral component of urban design pedagogy and education which, according to Lang [1], enables students to learn and/or test various skills that are fundamental to the creative processes and practices of urban design. Beginning in the 19th century, the academic design studio and its distinct culture have primarily held a pedagogical potential to help educate individual learners as future urban designers. A review of existing literature shows that there has been increasing interest in understanding the capacities of online or blended learning models for design studio pedagogical transformations [2,3]. Despite their pedagogical merits (e.g., students' improved capacity to undertake independent research and learn computer-aided software), online design studios have been subject to a range of critiques (e.g., students' reduced capacity for peer learning, social interaction, and background learning) [4]. At stake here is the question of how to design and implement a flexible and adaptive learning model integrating traditional education into web-based education, particularly when space and time constraints are in place in design studios [3]. Over the past few years, the global COVID-19 pandemic has had significant implications for higher education, prompting course redesigns and pedagogical transformations [5,6]. For instance, given the increased demand for the design and implementation of adaptive learning approaches, many campus-based built environment courses worldwide adopted online, blended or hybrid modes of delivery for the design

studio subjects [4,7]. While a few studies have pointed to the importance of developing a blended pedagogical approach for the design and delivery of design studios [4], we found limited scholarly focus on exploring the perspectives and experiences of students concerning the ways in which adopting a blended approach (which incorporates a mix of rigorously selected face-to-face and technology-mediated online teaching and learning) plays out in the context of design studio pedagogy and education. In this paper, we draw on evidence from a case study of developing and delivering an urban design studio (a key component of urban design education and pedagogy) adopting a blended approach in the 2021–2022 MA Urban Design programme at Cardiff University to investigate the learning experiences and perceptions of students. The aim is to develop a more sophisticated understanding of the role the blended approach plays in the context of design studio education during the COVID-19 pandemic.

This paper is exploratory in nature and adopts a case-study research design approach. While the case study approach and its importance have been previously highlighted in education research [5,6,8], limited scholarly focus has been given to exploring case studies in the context of design studio pedagogy and education. We report and further discuss the findings from an online survey of the MA Urban Design students enrolled in the urban design studio subject in the 2021–2022 academic year during the COVID-19 pandemic. The importance of understanding student experience for the learning and teaching community has been acknowledged in the existing literature [6,9]. “Learning by doing” and “reflection in action” have been highlighted in the context of design studio education as a student-oriented approach [4,10]. The online survey we designed for this study included specific questions about students’ experience and perception of the blended mode of delivery, particularly those related to the capacities and challenges of learning and teaching activities, assessment, formative feedback, field study visits, workshops, and digital platforms during the subject delivery. We carried out a review of the relevant literature on blended learning and teaching in higher education and design studio pedagogy. The literature review in this paper is followed by a discussion of research methods, with a particular focus on the development and dissemination of the survey as well as the limitations and challenges concerning online surveys in the context of a design studio. We then present and discuss the findings from the online survey in relation to the three themes of learning and teaching activities, assessment and formative feedback, and digital platforms. This paper concludes by drawing on the experiences and perceptions of students to explore the capacities and challenges of the blended mode of delivery in the context of higher education and design studio pedagogy.

## 2. Blended Learning and Teaching in Higher Education

Blended learning designs have long been among the most favoured course delivery models and pedagogical approaches worldwide [11]. As an established component of higher education, the blended learning model is typified by the integration of thoroughly-selected face-to-face and online approaches and designs that are in line with the learning outcomes of the course and student performance [12]. Adopting blended learning models takes advantage of a range of traditional face-to-face and online learning and teaching activities that can be offered using a diverse mix of learning environments such as seminars, lectures, self-paced study, online communication activities, and interactive simulations with the use of multimedia technologies [13]. Discussing the transformative capacity of blended learning, Garrison and Kanuka [14] find that this approach and strategy have the potential to preserve the traditional values and goals of higher education and, over time, enable the effectiveness and efficiency of a profound and meaningful learning experience. As Alexander et al. [11] argue, “ease of access”, “flexibility”, and “integration of sophisticated multimedia” have been among the highly-cited features of blended learning environments. In a recent study, certain forms of blended learning and teaching were supported by students mainly due to on-campus lectures with the capacity to facilitate effective engagement with peers, educators, and subject content [15]. In this form of blended

environment, digital technology is adopted as a means to enable engagement and further support learning, teaching, and creative inquiry. Despite the enhanced capacities of blended learning in higher education, Vaughan [16] (p. 81) identifies “time management”, “using sophisticated technologies”, and “taking greater responsibility for their own learning” as associated challenges faced by students. As such, it is quite important to evaluate the quality of blended learning and teaching in a coherent way, which requires relating the online learning and teaching context to student experiences [9].

Higher education providers are coming to understand the importance of blended learning and teaching designs in enabling deep and meaningful student experiences, particularly given the past few years’ transformations of the higher education landscape as a result of the unprecedented spread of the COVID-19 pandemic. According to Graham et al. [17], there has been limited available data that accurately demonstrate how and the extent to which blended learning designs have been adopted in higher education. This has been partly due to the lack of agreement on the ways in which different institutions define and measure blended learning [17]. For instance, while many higher education providers distinguish between traditional face-to-face and entirely online course delivery modalities, they often do not clearly identify what lies in between [18]. Institutions appear to remain at the incipient stages of adopting blended learning, namely, stage 1: “awareness/exploration”, stage 2: “adoption/early implementation”, and stage 3: “mature implementation/growth” [17] (p. 7), or what is called “enhanced blended learning” [18] (p. 2). While it is suggested that a well-designed blended learning model has the capacity to achieve the best of both online and face-to-face learning [19], there has been limited scholarly focus on how to enable an effective transition into enhanced blended learning [17,18]. Addressing this gap is a critical step towards developing resilient and adaptive approaches to blended learning and teaching, pedagogical transformations, and course redesign in the post COVID-19 era.

### 3. Design Studio Education

The design studio forms an integral component of urban design and planning pedagogy. According to Lang [1], design studios are a key pedagogical means for providing students with a setting where they can learn and/or test a range of skills that are key to the creative act of design and planning. Having its roots in the 19th century, the academic design studio culture emerged at Paris’s Ecole des Beaux-Arts [20]. Subsequently, design studios and their distinct culture have predominantly held a pedagogical potential to help educate students as future designers. As argued by Anthony [20], unlike many other academic courses, studio subjects should be designed and delivered in a way that extends beyond the classroom to enable students to use a range of pedagogical benefits and learn from valuable real-world experiences. This is particularly at stake even in today’s design studios, as most activities take place in the classroom using computer-aided design software and do not provide students with opportunities to spend time observing and understanding urban environments and their complexities.

Design studio culture has inevitably drawn a range of critiques over time. Among the earliest critiques is that of Schön [10], who put forward the idea of training future professionals through “reflection in action” and “learning by doing”. While Schön views educating designers as an extensive dialogue between the instructor and students, he does not offer further details on the ways to structure and organise design studios [21]. Anthony’s [22] (p. 167) research reveals that the call for design studios and juries to train future designers as solo artists does not seem to be consistent with the “complex nature of the professional world”. In the 1960s and 1970s, the emergence of the civil rights movement influenced a number of urban design and planning programmes that started to organise studios with a focus on community engagement [20]. In the following decades, there have been similar attempts that emphasised the role of urban design studios in providing future urban designers with a better understanding of how forms of informality work and how they can enable a more critical approach to design interventions [21,23]. Such

studio approaches can allow students to focus on knowledge building, spatial thinking, design creativity, teamwork, effective communication [24], and multiscale thinking [23]. In this context, the role of the studio tutor is to support future designers in their learning process and enable their capacities to become critical thinkers and independent learners. In addition, the design studio sits at the core of any urban design pedagogical approach. Unlike a typical classroom setting, “studios are active sites where students are engaged intellectually and socially, shifting between analytic, synthetic, and evaluative modes of thinking in different sets of activities (drawing, conversing, model-making)” [25] (p. 16).

There has been a growing scholarly focus on exploring the capacities of online or blended learning approaches for design studio reconceptualisation and pedagogical transformations [2,3]. While the online design studio learning approach has been viewed to have pedagogical merit in areas such as students’ enhanced capacity to become independent researchers and learning to work with computer-aided design software, key challenges such as constrained opportunities for social interaction, background learning, and peer learning persist [4]. A key question relates to exploring ways to support adaptive and resilient learning approaches utilising web-based education systems to supplement the traditional education systems, particularly where time- and space-related issues are in place for both design studio subject educators and students [3].

Urban design studio education and pedagogy have evolved over time to allow for adaptation to new and changing circumstances. The rapid transformations and disruptions over the past few years due to the COVID-19 pandemic have forced many of the built environment courses in higher education worldwide to move their learning and teaching activities to online, blended, or hybrid domains [5]. Such a fast-paced transition instigated widespread adoption of innovative remote technology and digital networks for design studio pedagogical transformations. Hepburn and Borthwick [7] draw on student learning experiences from two case studies, discussing the role of synchronicity in delivering online design studio during the pandemic, with a particular focus on the four key themes of interaction, feedback, assessment, and design learning. Another study seeks to explore the capacities and challenges of online design studio pedagogy from students’ perspectives during a state of uncertainty [4]. Despite the enhanced capacity of students to undertake independent research and learn new software skills, the study finds that peer learning declined considerably when using the online mode of delivery. As such, the study calls for the need to develop a blended pedagogical approach for design studio subjects, utilising potential of both online (virtual design studio) and face-to-face (traditional physical design studio) modes of delivery to improve the student learning experience. Nevertheless, limited scholarly attention has been directed towards understanding students’ learning experience in relation to the capacities and challenges of adopting a blended approach in design studio education.

#### 4. Methods

This research is exploratory in nature, adopting a case study approach [26] to describe and analyse complex processes by observing the elements they comprise, the relationships between those elements, and their development, as well as contextual influences [27]. The importance of using a case study approach as an effective method in education research has been outlined in the existing literature [5,6,8]. This approach has been argued to enable researchers to develop policies and set learning and teaching standards, and provide educators with a range of experiences to effectively manage various situations in the classroom [8]. In this paper, we explore the perceptions and experiences of postgraduate students regarding the blended framework we developed for the design and delivery of an urban design studio subject with a view to informing future practices of blended learning and teaching, particularly in the context of unprecedented global health challenges such as the COVID-19 pandemic. The primary data were collected using an online survey that we specifically designed for this study, considering the context of design studio pedagogy

and blended subject design and delivery. The paper was written after the completion of the online survey in December 2021.

#### *4.1. Survey Design and Dissemination*

In this paper, we discuss the findings from an online survey of postgraduate students enrolled in the urban design studio subject as part of the 2021–2022 MA Urban Design programme at Cardiff University. We further reflect on the experiences and perceptions of students in relation to blended learning and teaching activities in the context of design studio pedagogy. Given the importance of student experience for the learning and teaching community in higher education [6,9], the key questions in the survey asked about the student experience and perception of the blended mode of delivery, particularly regarding the capacities and challenges of blended learning and teaching activities, assessment, feedback, field study visits, workshops, and digital platforms during the subject delivery. To do so, we designed and disseminated an online survey using Google Forms. The related information regarding the research aim and questions was provided to the participants once the survey was commenced. It was stressed that participation was entirely voluntary and anonymous, and that the participants could refuse to answer any questions or withdraw from the survey at any time. The students were notified that the survey would in no way impact their studio subject assessment. The survey was launched after receiving ethics approval from the Welsh School of Architecture Research Ethics Committee at Cardiff University (SREC reference: 21105). We noted in the online survey that participants' responses would be kept confidential in compliance with the relevant ethical principles and considerations. We gathered data about demographic information (i.e., gender) and included a question about whether the respondents considered themselves as international students. Following this, we designed closed-ended Likert-scale questions to explore participants' degree of agreement regarding various statements in relation to different learning and teaching activities in the blended mode of delivery. A final question was included asking participants to share any other comments that were not covered in the previous questions.

We tested all the survey questions to ensure ease of understanding and accuracy. We then shared the questions with the Welsh School of Architecture Research Ethics Committee and received comments and suggestions on the overall performance and clarity of the survey. Following the Ethics Committee's review procedure, we modified and updated some of the outlined questions before disseminating the online survey. The total target population was about 100 enrolled students in the design studio subject in the 2021–2022 academic year. We sent an invitation email as well as multiple reminders with relevant information and the online survey link to the students' university email addresses. Students were reminded of their participation in the survey in the design studio tutorials and the live online lectures by tutors and/or subject leaders. The survey remained active online for about a month. We collected  $N = 49$  responses from students; the survey sample consisted of 32 female students (65.3%) and 17 male students (34.7%).

#### *4.2. Online Survey Limitations*

Here, we list a number of the limitations and challenges that we faced in using the online survey to explore student experience and perception of the blended mode of delivery in the design studio context. The challenges were primarily related to the issue of non-response and the design of the survey questions, among others. While students were notified that the findings of this research could be beneficial for the relevant learning and teaching community, they were not provided with various incentives for participation. As such, to address the non-response challenge and increase the response rate, the process of communicating and sending multiple reminders became time-consuming and demanding. Designing survey questions that seemed intriguing for the respondents to answer within a reasonable time was crucial. Another key limitation of survey methods is that the data may not be entirely reliable. The majority of the survey participants involved were international

students (47 out of 49 students) with different English language skills and may have had difficulties in interpreting the survey questions. Only 66% of the students thought that their English language skills enabled them to effectively engage with learning and teaching materials and activities in the subject. In this sense, if the meaning of the survey questions was not discerned properly, the participating students may have found it challenging to communicate their actual perspectives on their experience and perception of the blended mode of delivery in the subject.

### 5. Case Study Analysis

The urban design studio subject was primarily developed and delivered adopting a blended approach, which comprised an integration of rigorously selected face-to-face and technology-mediated online learning and teaching activities in line with the related learning outcomes. Table 1 summarises the blended delivery of the urban design studio subject in relation to the key themes of learning and teaching activities, assessment and formative feedback, field study visits, workshops, and digital platforms. The participants' responses to the online survey are further illustrated in Table 2 (N = 49).

**Table 1.** The design studio module blended mode of delivery.

		Delivery Mode
Learning and teaching activities	Field Study Visits	Face-to-face field study visits in small groups with the studio tutors; Online field study visits with the support of alternative virtual platforms such as Google Earth and Google Street View for remote study students or students in self-isolation/quarantine
	Small Group Studio Tutorials	Face-to-face tutorials with the studio tutors; Live online tutorials with the studio tutors for remote study students or students in self-isolation/quarantine (with the support of asynchronous online material)
	Small Group Reading Seminars	Face-to-face reading seminars with the studio tutors; Live online reading seminars with the studio tutors for remote study students or students in self-isolation/quarantine (with the support of asynchronous online material)
	Lecture/Guest Lecture	Live online lecture/guest lectures with the subject leaders/guest lecturers with the support of asynchronous online material
Assessment and formative feedback	Formative Feedback	Sessional oral feedback During face-to-face studio tutorials and reading seminars by the studio tutors; During live online studio tutorials and reading seminars by the studio tutors with the support of asynchronous online material
	Studio workshops	Live online studio workshops with the format of individual student presentations of the paired studio sections followed by feedback from the paired studio tutors
	Summative Assessment	100% Individual urban design portfolio; Electronic submission online; Online marking and written feedback using a consistent structure
Digital platform	Synchronous	Zoom (e.g., live online studio workshops)
	Asynchronous	Learning Central (e.g., subject schedule, subject outline, reading lists, learning materials, lecture/guest lecture slides and recordings)

**Table 2.** Online Survey Questions (Q1–Q13) with responses (N = 49).

Survey Questions	Response (%)
Q1. What is your gender?	65.3% Female 34.7% Male 0% Prefer not to say 0% Other
Q2. Do you consider yourself as an international student?	95.9% Yes 4.1% No 0% Prefer not to say
Q3. [If English is not your first language] My English language skills have enabled me to effectively engage with learning materials and activities in the urban design studio.	29.8% Strongly agree 36.2% Somewhat agree 27.7% Neither agree nor disagree 6.4% Somewhat disagree 0% Strongly disagree
Q4. Field study visits have been helpful for my learning experience.	55.1% Strongly agree 34.7% Somewhat agree 4.1% Neither agree nor disagree 6.1% Somewhat disagree 0% Strongly disagree
Q5. Face-to-face field study visits will be more helpful than online field study visits.	67.3% Strongly agree 26.5% Somewhat agree 2% Neither agree nor disagree 4.1% Somewhat disagree 0% Strongly disagree
Q6. I have been satisfied with my interactions with my studio tutor in the face-to-face tutorials.	71.4% Strongly agree 22.4% Somewhat agree 4.1% Neither agree nor disagree 2% Somewhat disagree 0% Strongly disagree
Q7. I have been satisfied with my interactions with other students in the face-to-face tutorials.	53.1% Strongly agree 38.8% Somewhat agree 6.1% Neither agree nor disagree 2% Somewhat disagree 0% Strongly disagree
Q8. Attending face-to-face studio tutorials will be more helpful than attending live online studio tutorials.	67.3% Strongly agree 28.6% Somewhat agree 4.1% Neither agree nor disagree 0% Somewhat disagree 0% Strongly disagree
Q9. Face-to-face small group studio tutorials (for example: 4–5 students and a tutor) will be more helpful for your learning experience than large group studio tutorials (for example: 8–9 students and a tutor).	67.3% Strongly agree 22.4% Somewhat agree 6.1% Neither agree nor disagree 4.1% Somewhat disagree 0% Strongly disagree
Q10. The live online studio workshops and formative feedback by paired tutors have been helpful for improving my learning experience and developing my urban studio portfolio.	68.1% Strongly agree 25.5% Somewhat agree 6.4% Neither agree nor disagree 0% Somewhat disagree 0% Strongly disagree
Q11. The live online studio workshop has enabled me to engage with other presentations and learn from others as well.	59.2% Strongly agree 30.6% Somewhat agree 8.2% Neither agree nor disagree 2% Somewhat disagree 0% Strongly disagree

Table 2. Cont.

Survey Questions	Response (%)
Q12. The module has been well structured with a range of appropriate learning and teaching activities.	51% Strongly agree 34.7% Somewhat agree 12.2% Neither agree nor disagree 2% Somewhat disagree 0% Strongly disagree
Q13. I could easily access the related learning materials on Learning Central.	63.3% Strongly agree 30.6% Somewhat agree 4.1% Neither agree nor disagree 2% Somewhat disagree 0% Strongly disagree

### 5.1. Learning and Teaching Activities

We adopted a blended learning and teaching model to deliver the urban design studio subject. This mode of delivery featured the integration of rigorously selected face-to-face and technology-mediated online (synchronous and asynchronous) learning and teaching activities that were developed in line with learning outcomes of the subject and the changes following the repercussions brought about by the COVID-19 pandemic.

Two face-to-face field study visits were designed as a part of the urban design studio subject with a view to providing opportunities for students to get a first-hand experience of visiting the studio sites in Cardiff with their studio tutors. Students and their studio tutors mostly used active modes of travel (e.g., walking, cycling) or public means of transportation to access the related sites. Students then walked in small groups with their studio tutor and took field notes and photos during their visits as appropriate in accordance with the related Ethics and Risk Assessment documents for data collection and field study visits. Such field study visits in the design studio can enable students to explore how different urban design aspects work in reality and provide opportunities for students to select an appropriate site for further urban design analysis and intervention. The key activities in each field study visit were further specified in the module outline document, which was made available using the Learning Central online platform. Remote study students who were enrolled in the subject yet arrived in Cardiff with a few weeks delay or students in self-isolation/quarantine could alternatively undertake online field study visits with the support of virtual platforms such as Google Earth and Google Street View. A considerable number of students (89.8%) agreed that field study visits were helpful for their learning experience in the urban design studio subject. It is notable that many respondents (93.8%) found the face-to-face field study visits more helpful than the online alternatives.

The design studio tutorials took place face-to-face in the allocated studio spaces to enable peer learning, engagement, and discussion within small groups. Multiple design studio sections were run parallel to each other during the studio teaching days. A total of 8–9 students and a studio tutor were allocated to each design studio section, and each design studio section was further divided into two groups of 4–5 students. According to the survey results, the satisfaction rate was 93.8% for students' interactions with their tutors and 91.9% for their interactions with other students in the context of face-to-face studio tutorials. Only one respondent (out of 49) was somewhat dissatisfied with their interactions with the related studio tutor and their peers in the face-to-face studio tutorials. The importance of attending face-to-face (rather than live online) studio tutorials was highlighted by the majority of the survey respondents (95.9%). Another striking finding was that the face-to-face studio tutorials in small groups (4–5 students) were favoured over the tutorials in large groups (8–9 students) by 89.7% of the students. As Table 1 shows, the design studio subject comprised face-to-face reading seminars in small groups where students discussed two readings per week with their tutors. The readings were carefully selected in relation to the scope of the urban design studio and the related weekly activities in order to further enrich the students' learning experiences and provide opportunities to

critically engage with the readings and discuss them at the beginning of the studio teaching days. The subject included live online lectures/guest lectures (using Zoom as the primary online platform) delivered by subject leaders and guest lecturers in the context of the design studio topic, as appropriate. They presented supplementary knowledge to further support students in developing their individual design studio portfolios. A significant number of the survey respondents (85.7%) indicated that the design studio subject was well-structured, with a range of appropriate learning and teaching activities.

### 5.2. Assessment and Formative Feedback

The urban design studio subject included both summative assessment and formative feedback. The summative assessment of the subject was the assessment of an individual urban design portfolio attracting 100% of the total mark. A detailed document called "Assessment Proforma" was developed for the module assessment and made available for students on Learning Central from the beginning of the subject. This document included critical information regarding the assessment type, length, marking criteria, submission, feedback, format, and the related instructions. Such detailed and structured information could enable individual learners to more effectively develop their design portfolios for the summative assessment of the subject and ensure a degree of consistency in this regard.

Sessional oral feedback in the context of face-to-face design studio tutorials enabled studio tutors to gauge their students' overall performance and learning progress. As shown in Table 1, two live online studio workshops were designed in order to provide further opportunities for individual learners to present a copy of their work-in-progress, receive formative feedback from two studio tutors, engage with other presentations, and learn from their peers. Studio tutors were paired differently for each studio workshop to allow students to receive feedback from other studio tutors (in addition to their own studio tutors) throughout the process. In addition to the feedback provided in the context of face-to-face studio tutorials, students could further improve their work-in-progress based on the feedback they received in the live online studio workshops as well. Further details regarding the indicative format and structure of the studio workshops were specified in the module outline document, which was accessible for tutors and students on Learning Central. Of the survey respondents, 93.6% thought that the live online studio workshops and formative feedback by paired tutors were helpful for enhancing their learning experience and developing their individual urban design studio portfolios. The importance of these live online studio workshops in improving student engagement with other presentations and peer learning was outlined by a considerable number of the survey respondents (89.8%).

### 5.3. Digital Platforms

For the online component of the blended mode of delivery, we adopted Zoom and Learning Central as the main digital platforms enabling student engagement and supporting learning and teaching activities. In this section, we point to some of the primary capacities and challenges of these platforms in the context of the urban design studio subject. All synchronous sessions took place online using Zoom, whereas asynchronous learning and teaching activities were facilitated using Learning Central. To support asynchronous learning and teaching, the key subject materials (e.g., module outline, module schedule, weekly module map, assessment materials, reading lists, recorded lectures, lecture slides, etc.), as well as other supporting links and documents, were made available on Learning Central. This allowed students to take their own path through the key learning materials at their own pace. The majority of survey respondents (93.9%) agreed that they could easily access the related learning materials on Learning Central. The use of Zoom for synchronous learning and teaching activities (e.g., live online studio workshops and lectures/guest lectures) provided individual learners with opportunities to communicate in oral and written forms. However, encouraging students to switch on their cameras during the synchronous sessions to enhance learning and teaching experiences and engagement remained a key challenge in the context of the urban design studio subject.

## 6. Discussion and Conclusions

While the blended learning and teaching approach has become an established component of higher education, its development and adoption in the context of design studio education remain a key line of enquiry. This has particularly come to the fore given the growing demand for developing adaptive learning and teaching models through the integration of innovative technology-mediated approaches and designs during the COVID-19 pandemic. While the extent to which the higher education transformations instigated by the pandemic will persist into the post-COVID-19 future remains unknown, it is critical for academia to critically reflect on its pedagogical praxis and the associated affordances and challenges in times of uncertainty. In this sense, understanding and gauging students' learning experiences can be an important step in the process of developing and implementing blended learning and teaching frameworks that can effectively embrace the affordances of face-to-face and technology-mediated approaches and designs [28]. It is important to avoid privileging (however unintentionally) a technologically deterministic mindset for shaping the future of learning and teaching in the context of higher education to enable enhanced learning and teaching experiences. In what follows, we will further elaborate on the capacities, limitations, and challenges associated with developing and implementing a blended mode of delivery in the context of design studio education with a particular focus on student learning experience and perception.

One of the key findings of this paper is that most of the survey respondents favoured face-to-face design studio tutorials and their interactions with their studio tutors and fellow students in the context of face-to-face studio tutorials. More particularly, students outlined the value of face-to-face studio tutorials in small groups (4–5 students) rather than in large groups (8–9 students) for their learning experience. This may be linked to the ways in which small-group learning and teaching activities provide opportunities for sustained and meaningful tutor–student interaction, personalised individual feedback from the studio tutors, peer learning, and engagement. This finding supports the argument made by McClean and Hourigan [29] (p. 51), drawing on students' learning experiences, that is, “the informal, socially-based peer interaction that characterises the studio is complementary to, and quite distinct from, the learning derived through tutor interaction.” Such peer interaction facilitated in the small group tutorials is viewed to be critical for formative learning processes. Contrastingly, running large group tutorials can become relatively challenging, primarily due to less meaningful tutor–student contact and less consistency regarding the quality and quantity of personalised feedback [30]. It is important to note that developing and implementing forms of design studio learning and teaching in smaller groups can be quite resource-intensive and challenging from the management point of view.

According to the survey results, undertaking field site visits throughout the urban design studio subject has been considered helpful for learning experiences. This lends itself well to the discussion that field site visits are critical in enabling encounters between the shared body of knowledge in the field and the conditions of real cities, encouraging comparative approaches to the narratives of urban development, challenging the related urban design theories, and testing their relevance to design thinking and intervention [23,31,32]. We found that while using virtual platforms such as Google Earth and Google Street View can enable students to navigate the studio sites and conduct preliminary remote site analyses, face-to-face field site visits are favoured by many design studio students. This may link to the idea that face-to-face field site visits provide urban design students with opportunities to obtain first-hand experience visiting sites while walking in small groups, taking notes, documenting photos, interacting with their peers, and further discussing their field observations with their studio tutors. The face-to-face field site visits were designed to provide opportunities for individual learners to explore how various urban design aspects work in reality and enable more effective engagement with the complexities of the public realm.

Unlike the finding that suggests critique sessions and the associated formative feedback and assessment as a common source of student dissatisfaction [33], the value of live

online studio workshops and their affordances for enabling peer learning and receiving timely formative feedback from various studio tutors were highlighted by a significant number of the survey respondents (about 94%) in this study. This finding supports the observation that timely formative feedback can enable students to reflect on their overall performance and learning progress [34–36]. The inclusion of multiple live online studio workshops (e.g., one in the earlier weeks of the urban design studio subject and another towards the end of the subject) can further support students in becoming more attuned to their learning journey and reflecting on their progress. Students in paired studio sections can present a copy of their work-in-progress at different stages, receive timely and focused formative feedback from different studio tutors, develop their individual urban design portfolios based on the formative feedback, engage with other presentations, and learn from their peers in the context of live online studio workshops. This finding can be considered as an attempt to address a gap outlined in previous research [33] regarding student views on the value of the critique session as a method of providing formative feedback and assessment.

According to the survey results, sessional oral feedback in face-to-face design studio tutorials can help individual learners to actively build upon their knowledge from week to week and continuously improve their work-in-progress before the summative assessment. We argue that this framework in the face-to-face studio tutorials within small groups (4–5 students) can offer students opportunities for interpersonal reflection and interaction. Studio tutors can also monitor student performance and progress, reflect upon learning experience at staged points during the teaching weeks, assess which trajectory can be the most effective for small groups, and identify what common points of confusion can emerge from different learning activities. It is notable that while formative feedback is an integral part of the learning experience in higher education, there has been little research on the capacities and challenges of formative feedback provision in the context of design studio pedagogy and education. As such, there is scope for further empirical research into the practice and effectiveness of meaningful and timely formative feedback and student experience in relation to design learning activities and assignments, particularly in the context of blended learning and teaching.

In closing, as we focus on the design and adoption of blended learning and teaching frameworks in higher education, it is critical that we investigate their affordances and challenges in enabling effective communication and engagement and enhancing learning and teaching experiences in design studio pedagogy. Exploring the experience and perception of students regarding the ways in which blended models play out in the context of design studio education can inform future endeavours seeking to enable more meaningful and effective learning and teaching experiences by adopting a blended approach. Researching the dynamics of blended learning and teaching and exploring the capacities and limitations of blended design studio pedagogy in relation to the experience and perception of students across different contexts remain tasks for future research.

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