

AASA Digital Learning Research Grant 2022 Activity Report

Experiential and Integrated Learning Environments Teaching Urban Design Studio at
Curtin University

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Introduction

The Digital Urban Lab project focuses on testing solutions for integrated learning experience in a digital environment in the field of Architecture and Urban Design and the impact of this practice in both learning and professional fields. Urban Design Research Studio (UDRS) units offered at Curtin University are used for this project as in these units we challenge the traditional notion of the learning environment in Architectural Design. According to Lawson (2018), traditional learning environments in Architecture constitutes of “studio space, design library, design tutorial run by academic staff and the design critiques conducted by industry guests and academics” (Manini and Glusac, 2020, 81). In UDRS we challenged this model including the belief that “24/7 studio culture is de facto irreplaceable” (Mancini and Glusac, 2020, 81) by replacing the time-consuming master-apprentice model through the proposition of a project based on teamwork and experiential and integrated learning environments that are heavily reliant upon technology.

The focus of the Digital Urban Lab and of its associated URDS units is on students developing the design and critical analysis skills to research the site, its pre- and post-colonial cultural conditions, and global precedents to conceive and test new urban possibilities in a real context. Students are expected to work in teams to present an urban analysis of the selected site, a master plan and a schematic design proposal for one or more significant areas within their assigned precincts and investigate and expose the layers of the built environment and how people use it. The proposed design interventions are to derive from and build upon urban analysis and research following UNESCO's Recommendation on the Historic Urban Landscape (HUL Approach, UNESCO 2011).

To enable the achievement of the above learning outcomes we developed four fundamental principles informing Experiential and Integrated Learning Environments in Architecture¹:

1. engagement with the perceptual experience of the physical built space of the city and its abstract conceptualisation, also the subject of learning, as an alternative to in-class lectures and the study of the built environment through literature;
2. work in the classroom expressed through the substitution of traditional one-on-one desk critiques in the studio with a collaborative methodology of work supported by robust work ethic procedures producing and exchange knowledge to complement tutorials;
3. Expanded learning environment by extending the learning design and experience through flipped classroom, engagement and collaboration with industry and international academics, including fish-bowl techniques;
4. incremental integration of traditional and advanced digital technology methods enabling guided access to online information, examination of unit digital resources and real-time design constructive critique.

¹ The four principles listed here are directly quoted from Mancini and Glusac (2020, 81-82).

This research project specifically concerns point four of the framework, as a way of testing the way technology is augmenting the learning environment as described in the first three points. The fourth principle describes how a digital immersive, web-based learning and practice environment can assist with students' research, data analysis and sharing related to controlling planning, development and design principles of urban contexts to create speculative urban propositions via a shared digital Urban model.

The role of digital technology

For the Urban Design Research Studios, we selected both the area of study and the teaching spaces in Perth CBD. With students being immersed in the very location that they were investigating effectively augmented the learning experience. The advanced digital video and audio technology available on the teaching premises located at St Georges Terrace further enhanced knowledge exchange and online connectivity amongst team members. More specifically, the learning space features six wall screens that were used to project information from four different sources at the same time.

Connecting iPad Pros to the room screen system enabled capturing and sharing information concerning project site, precedents, and students' work with the entire class synchronously and asynchronously. Such use of technology allowed tutors to critique students' work in real-time as well as digitally record and forward feedback via email to students and teams.

In addition, students were able to connect and share their work on ePinup² and receive further feedback from tutors. By doing this, we 'replaced the master-apprentice model based on one-on-one feedback and enabled everyone to share the traditional 'drawing conversation', typical of the one-on-one desk critique, with the whole class' (Mancini & Glusac 2020, 84).

While the Digital Urban Lab did not intend to overcome or replace analogic design practices, it made it possible to transfer some of the traditional studio practices into a fully digital environment, with the intent to expand accessibility, community participation and collaborative design as a base for practice innovation in Urban Design and Architecture. To that end, technology also allowed us to share pre-recorded site visits with students located in different countries, such as Malaysia and India, and meet with them via Collaborate Ultra during class and study time to mitigate COVID travel limitations. Equally, the Giraffe data-informed design software platform (<https://www.giraffe.build/>), enabled students to work remotely on the same web-based project file of their designated site/precinct.

AASA contribution to the Digital Urban Lab

The project was made possible thanks to the AASA Grant funding that enabled:

- 1) The construction of a digital, cloud-based Host Platform on which the work produced via Giraffe is stored, shared and made accessible.
- 2) The purchase of 500 2-year software access licenses available to students and staff. Further funds have been allocated for two researchers to implement routines and plug-ins enabling inter-software communication (export and import from and to Giraffe from Rhino, etc.)

² Socibid Platform is used by Curtin as a students' social media platform commonly referred to as ePinup. <https://curtinepinup.socibd.com/groups/ePinup>

- 3) Supporting students' presentations, exhibitions and events in blended mode to disseminate the outcomes, enhance participation and facilitate constructive critique of the current studio model taking advantage of innovative policy and industry practice, such as the implementation of Design WA Review.

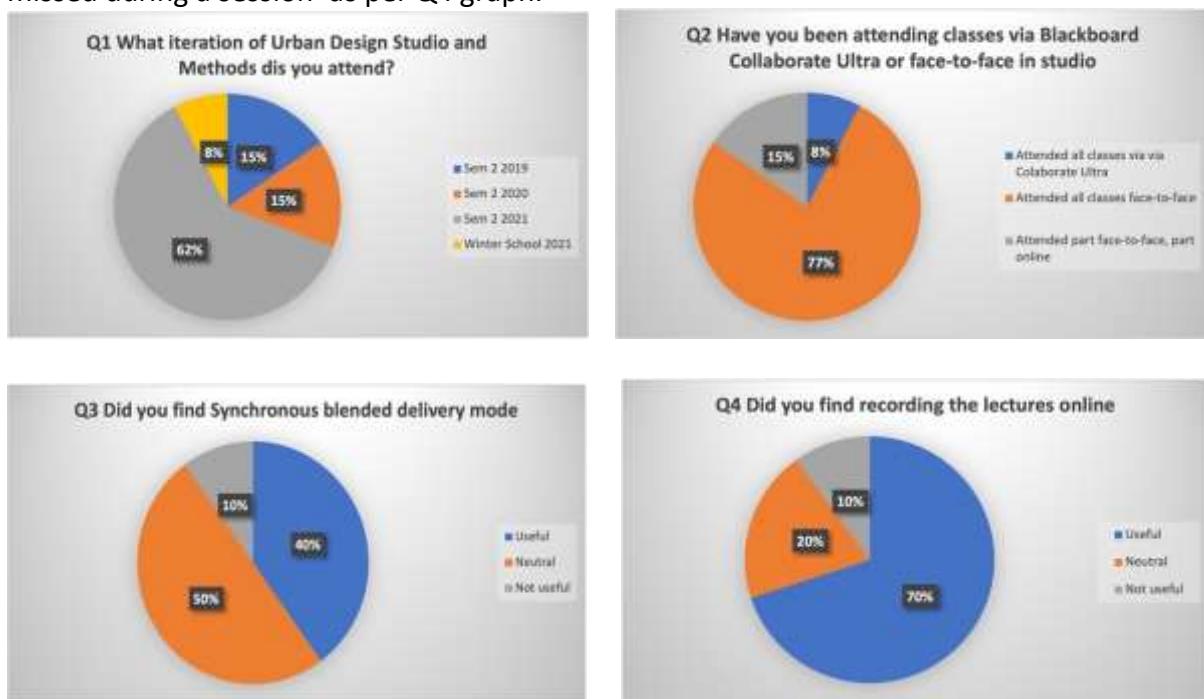
Analysis of the role of digital technologies

As part of the AASA Grant, the teaching team carried out a small research project (Ethics approval number HRE2021-0362) surveying students' opinion in relation to the impact of digital technologies on their learning in Urban Design Research Studio units.

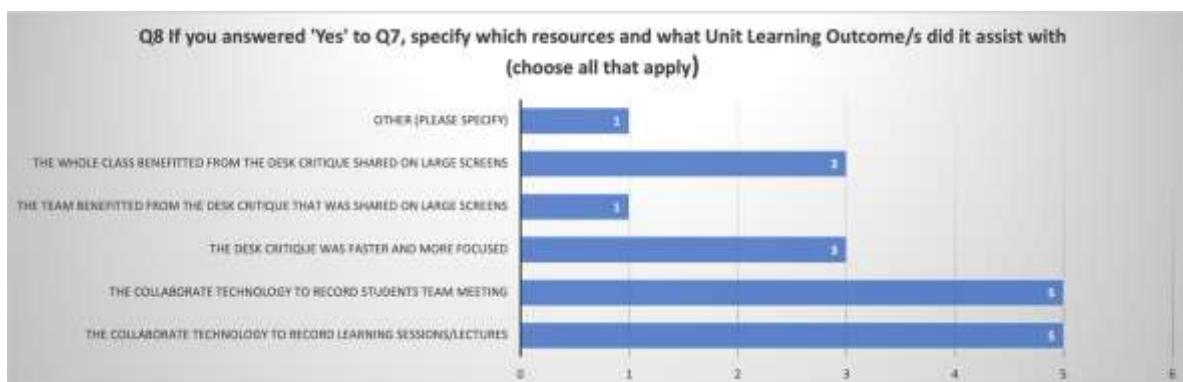
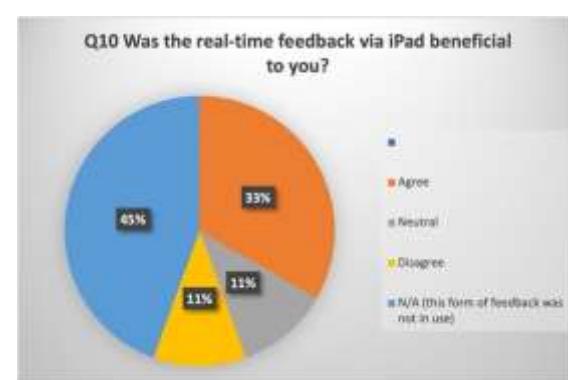
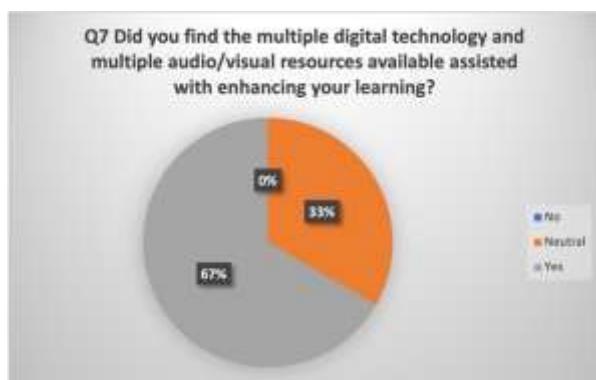
In total 108 students attended the above units between 2019 and 2021 (32 in 2019, 41 in 2020 and 31 in 2021 and 4 attended winter school in 2021), out of which 13 students engaged with the survey set through the Qualtrics Platform. Following are some of the key observations emerging from the survey results.

The majority of students participating in the survey (62%) attended the 2021 version of the studio as evidenced in Q1 graph. Though only students who attended classes either purely or partially online (23%) a higher percentage of students (40%) valued blended mode valued the synchronous blended delivery as shown in Q3 graph.

Even a greater percentage of students (70%) found online lecture recording useful since it enabled them in their own time to review lectures 'identifying key points that may have been missed during a session' as per Q4 graph.



90% of students also found advantageous the video recording of site visits (Q6), while 67% considered the use of digital technology during studio as a way to enhance their learning experience (Q7) through Collaborate Ultra teams' discussions and sharing desk crits on large screen to benefit the whole class (Q8). Since the iPad feedback was not used in 2021, the Q10 data suggests that all 2019-2020 students participating in the survey found this form of feedback useful.

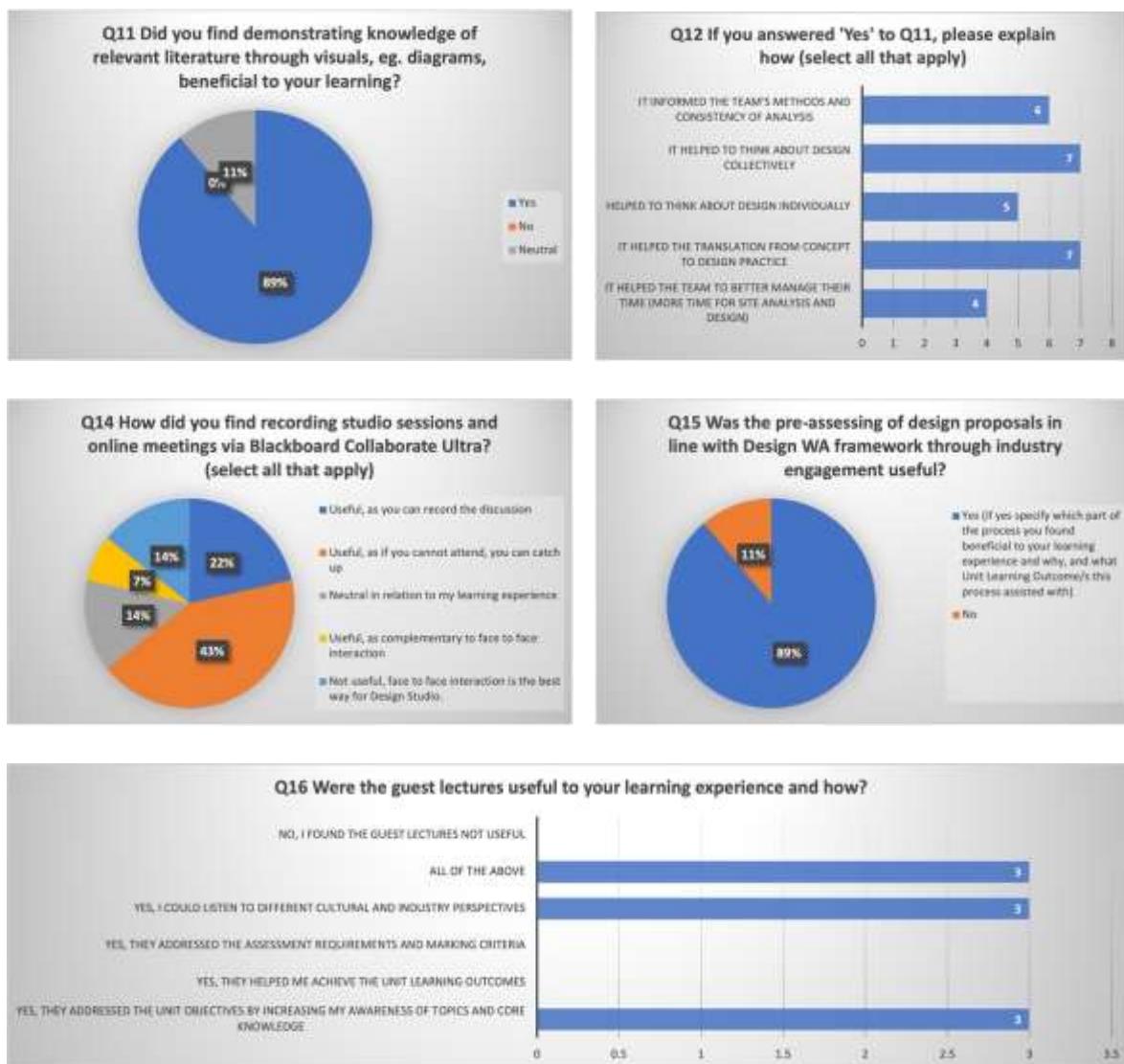


The next group of questions - from Q11 to Q16 - focuses on the value of collaborative learning activities and industry engagement to develop critical thinking skills during studio sessions and the usefulness of digital tools in expanding the impact of the learning experience. Q11, on the visualization of theoretical concepts, shows that 89% of the respondents found it useful in substitution of extensive readings. Q12 highlights the benefits of such techniques for the whole team rather than individuals with 14 preferences out of 29 who suggested it facilitated a consistent approach to transfer concepts into design practice and collegial thinking about the design proposal.

Q13 did not receive any answers, as all respondents answered yes to Q11. Q14 shows that recording such sessions is of a lesser impact since out of 64% of students who valued this tool, 43% of respondents considered it helpful to catch up if you cannot attend class, rather than an opportunity for further analysis of teamwork in a remote mode. Q15 has validated the importance of face-to-face industry engagement via the design review panel, with 89% agreement on its usefulness. Q16 got an unanimously positive response on the value of industry guest talks.

Albeit the Design review sessions were recorded and made available to students, both students and industry partners anecdotally confirmed the preference for live industry

engagement. The answer to Q5 partially supported such an opinion, with 60% of respondents valuing the location of the learning space in the city that de facto facilitated face to face connection with industry.



The last set of questions, from Q17 to Q21, focuses on the innovation brought by a specific set of digital tools to facilitate remote connectivity and web-based collaboration. Most respondents to Q17 and Q18 considered the GIRAFFE.build web platform valuable as a modelling and mapping tool with an embedded data set, while answers to Q18 and Q19 and Q20 show a preference for digital tools that support group work by expanding traditional face to face discussions, such as Emails and Blackboard Collaborate Ultra, over production tools such as Giraffe which, on the other hand, attracts student's interest in terms of future learning.

Conclusion

Research indicates that using different formal manipulation techniques develops designer and students' curiosity, empathy and lateral thinking when looking for design solutions (Brown, 2008; Munari, 1971 and 1977). The data emerging from the Digital Urban Lab research project suggest that design students value dialogic thinking in a collaborative learning process very high. The survey also shows that students may benefit further from an integrated learning environment once they get more acquainted with innovative technologies, such as visualization of theoretical information and web-based applications.

Data also suggest that students prefer to use digital technology and online resources to strengthen the face-to-face experience through accessing recorded resources and enhanced connectivity, even without tutorial guidance.

Further, it appears that remote students benefit from the connection with a team that can operate in a remote and face to face mode. In conclusion, the research suggests that face to face experience can still be at the core of collaborative learning environments, while the role of technology is to augment the experience rather than provide a virtual substitute for it.

Appendix 1 - Impact:

The Urban Design Studio enrolments (Sem 2 internal offer) are the highest since 2015. The number of enrolments has increased from 16 to 40 students in 2019 and is steady since then. The City of Perth is looking at the studio model with interest, discussing opportunities to collaborate via an MoU with Curtin to assist with a shared Digital twin project for Perth.

Hassell Studio has expressed interest in knowing more about the proposed design process which underpins the studio culture, valuing the enhanced form of collaboration and the use of a web-based platform as a fundamental pillar of sustainable Urban Design future practice. Francesco Mancini has presented the Studio at 2 Webinar events on teaching and Learning. Complex Design Studio Coordinator, Dr Parisa Izadpanahi and Dr Francesca Perugia have recognised the value and potential of the urban Studio Model and implemented the same model in their Architecture and urban Planning Studios respectively. In 2021 Ms Lee Symington has implemented the same model in the Curtin Architecture Practice Studio.

The number of students who attended all studios to date is over 200. It is worth noting that not all the teaching practices described above have been implemented in each studio. With that being said, the teaching model has been rewarded with four teaching awards at Faculty and University levels, which constitute a sound further benchmark of the validity of this learning framework.

The Urban Studio Model will be transferred to OUA offer at the end of 2022, taking advantage of the Curtin Server and the availability of new routines and plug-ins for students to work collaboratively on a shared urban digital model.

A simplified version of project has been tested with a number of interested partners through an intense-mode Summer School in January-February 2021, run in collaboration with DR Hank Haeusler (UNSW), Professor Douglas MacLeod - RAIC Centre for Architecture at Athabasca University and Jolanda Morkel, STADIO, South Africa.

Appendix 2 - Timeframe of the Project

Time frame	Grant Objective/activity	Lead	Status
April – May 2020	setting the project brief: “Health, Healing, Heritage: decolonising Urban Design through blended learning”	Francesco Mancini	Completed
May – June 2020	<p>launching the project EoI open to AU and International Institutions for academic and students' participation.</p> <p>AASA Funds have been deployed:</p> <ul style="list-style-type: none"> • 3000\$ to purchase 500 GIRAFFE 1 year full licenses for students and staff for to test and experiment with this practice. • Curtin Digital Technology Services set a Curtin Server; <p>Curtin DBE funds have been deployed to support:</p> <ul style="list-style-type: none"> • two researchers to implement routines and plug-ins enabling inter-software communication (export and import from and to Giraffe from Rhino, InfraRed etc.) 	Francesco Mancini	<p>Completed. Academics from UNSW, Athabasca University and Stadio – South Africa participated in the Winter School version of the project</p> <p>Web platform implementation, acquisition of space on a server and UNSW/Giraffe license Partnership completed.</p> <p>Completed</p>
June - July 2020	<p>setting the Urban Lab at Curtin/137 St George's Terrace premise to enable blended learning</p> <ul style="list-style-type: none"> • two teaching sessional to assist with implementation • additional set of mobile high-connectivity equipment 	<p>Francesco Mancini <i>Curtin</i></p> <p>Daniel Giuffre <i>Intensive Field Labs</i></p> <p>Tristan Morgan <i>COX</i></p> <p>Rob Asher <i>Giraffe.build.com</i></p>	Completed
August – Nov 2020	Semester 2 project run	<p>Francesco Mancini <i>Curtin</i></p> <p>And teaching team Tanja Glusac Justin Owen Tristan Morgan Francesca Perugia Daniel Giuffre</p>	Completed. Successful integration of online teaching and face to face interaction. Students built a shared model using the Curtin Server. Students have been successfully interacting in blended mode delivering high quality outcomes
September/Nov 2020	• presentation to AASA (live or WEBEX)	Francesco Mancini <i>Curtin</i>	Completed
September 2020	Report/submission of a L&T paper	Francesco Mancini Tanja Glusac <i>Curtin</i>	Completed.

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