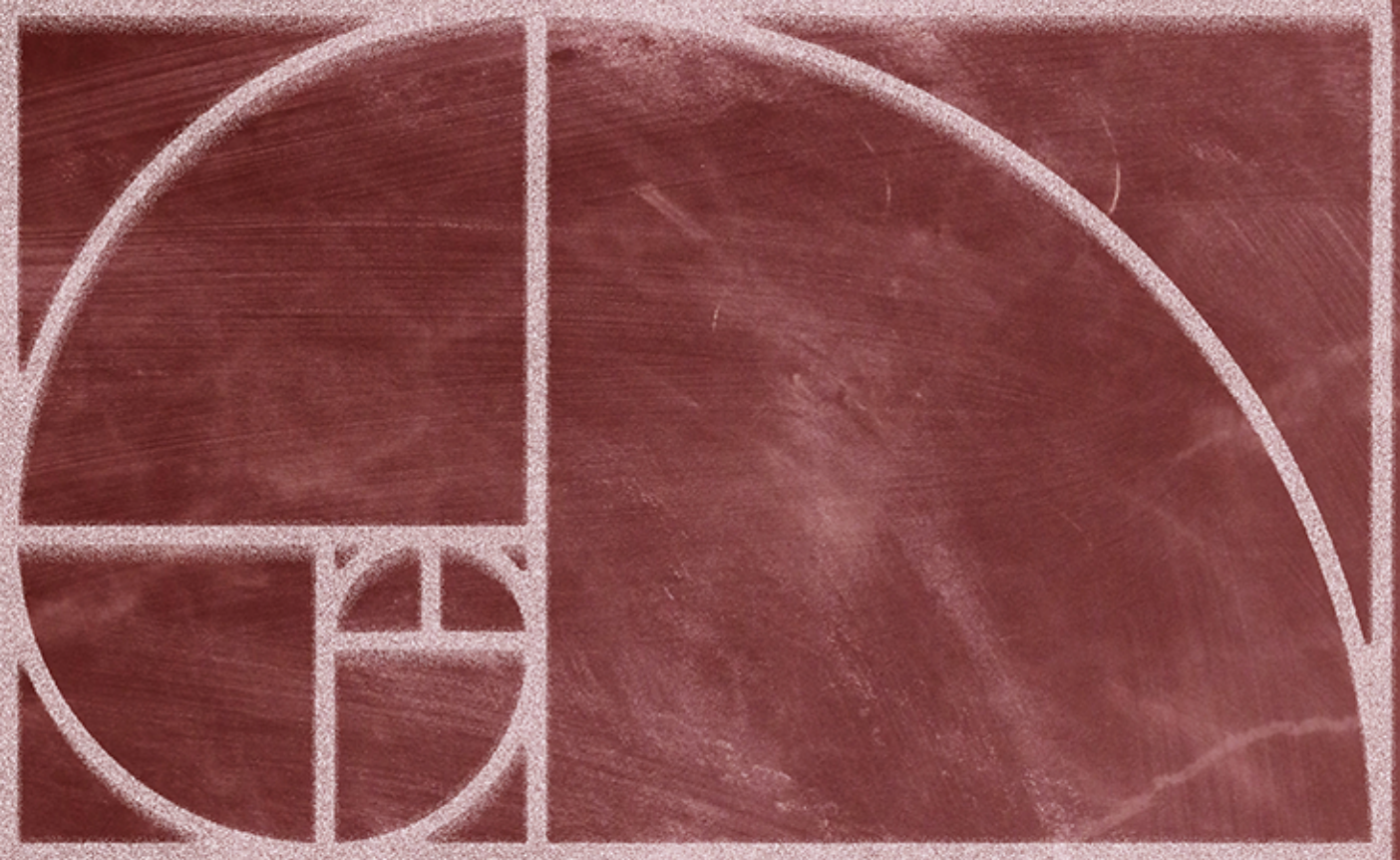

# Teaching-Learning-Research

## Design and Environments

AMPS Proceedings Series 22.1

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# Teaching-Learning-Research: Design and Environments

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# INTRODUCTION

## Teaching-Learning-Research: Design and Environments

This is Manchester: We do things differently here

Manchester, once the ‘Industrial Capital’ of the world, has long been a test bed for architectural and urban experimentation. From the early settlements that challenged the resilience of the Romans, and then the Vikings, through the massive boom of the industrial period, when such was the frenzy in the city that it earned the sobriquet Cottonopolis, beyond the economic melancholia of the late 20th century, to the unbridled optimism of the 21st. As a progressive city, Manchester has continually reinvented itself. The present reincarnation was led through cultural regeneration facilitated by the adaptive reuse of those great redundant industrial structures, it is a city that encourages smart technologies and embraces a community of 24 Hour Party People.

Where better then to hold a conference that explores progressive architectural pedagogy – especially a virtual one!

The architectural, landscape, and design studio is a laboratory for experimentation where students are encouraged and expected to question and disrupt the status quo, to explore possible different futures, and to propose radical solutions to unsolvable problems. The need to fuel this move away from more traditional tabular rasa education is the responsibility of academics, and this conference was a wonderful vehicle to explore, expound, discuss, and debate the future of architectural education.

During the pandemic we have had to learn to do things differently, not to be down heartened by the difficulty of interacting solely through the computer, but to embrace the nearness that digital communication provides. We have adapted methods of teaching and learning to accommodate this extraordinary situation, we have creatively responded to the pandemic and developed strategies that encourage endeavour, promote wellbeing, and support scholarship. Extraordinary strategies are needed for an extraordinary situation.

It was a great pleasure to be able to host the AMPS Teaching – Learning – Research: Design and Environments conference at the Manchester School of Architecture. It was lovely to welcome so many virtual guests to the city. The great success of the online event was the demonstrated by the enthusiasm with which speakers engaged with the conference, the quality of the post-session debate combined with the international dialogue and collaboration, (especially in this time of uncertainty) created by such global citizens. It is an honour to introduce the conference proceedings, presented here as collection of well argued, forward thinking, deliberately controversial, and valuable papers.

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# CINEMATIC INVESTIGATIONS: SHORT FILMS AS RESEARCH METHOD FOR STUDENTS TO EXPLORE HONG KONG'S URBAN SPACES

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## INTRODUCTION

Films move with 24 images (or frames) per second, while the stories they convey emotionally move us. Beyond the general understanding of films as entertainment, this essay tries to argue for films as a potential research method for contemporary design pedagogy. Thereby, the following will briefly look at the implementation of films in higher education, in order to open a discussion on moving images as investigation tools for students. This, then, argues through the work of student short films that particular urban spaces, such as back alleys, are best explored through the cinematic lens.

Given the current rise of online streaming platform subscriptions,[1] motion pictures are inevitable present in the twenty-first century. This inescapability is either in the form of daily-shared stories on our phones, streaming platforms at home, or digital billboards on our streets and airplanes; films have been integrated in almost every part of our private and public life. In regards to their appearance in the public domain, airplanes are particularly interesting as example for the integration and adaption of films as attention devices. Despite the lack of published literature, the following tries a closer look to the changing dynamics of airline safety briefings. In recent adaptations of in-flight safely instructions, the serious aspect of communicating aviation regulations and instructions to passengers has shifted towards gaining passengers attention by telling a story. This chase for an increase attention is even stated in the latest Federal Aviation Administration's (FAA) Advisory Circular (AC), namely that: "[a]n alert, knowledgeable person has a much better chance of surviving any life- or injury-threatening situation that could occur during passenger-carrying operations in civil aviation."[2] Hence, due to the increase of passenger's distraction by mobile phones, tablets or similar technical devices, the FAA's AC continues that airlines should focus their attention on the "content"[3] and "delivery methods"[4] for their safety procedures. In order to successfully brief passengers and update them about the ever-changing aircraft configurations, airlines should considerate effective ways of communicating this factual content to their clients. In doing so; "every passenger should be motivated to focus on the safety information in the required passenger safety briefing; however, motivating people, even when their own personal safety is involved, is not easy. One way to increase passenger motivation is to make the safety information briefings and safety information cards as interesting, entertaining, and attractive as possible."[5] Therefore; "[t]his AC encourages individual operators to be innovative in their approach to imparting such information."[6] This call for innovation has gained wide

recognition within the aviation industry and has led to a variety of narrative experiments. In a number of safely briefings, such as Air Tahiti[7] or Uzbekistan Airlines,[8] the physical airplane has disappeared entirely and is only represented by vague outlines and abstract hints that should remind passengers to its physical origin. In the case of Air Tahiti, the well-known seatbelt buckle has moved into a golf caddy cruising an idyllic landscape, while Uzbekistan Airlines projects their overhead baggage cabin to a traditional hay-covered street bazaar. Here, traditional wickerwork and sunlit wood tent structures merges well-known airplane parts with local craftsmanship. The aircrafts key elements such as passenger seats, storages, or cabin lighting have been taken out of context in order to portray either a new airline company branding, or the local identity of their homeland. Other airlines companies are using similar storytelling devices to reflect on nationally branded film locations, as seen in Air New Zealand[9] with their recent cooperation with the *Hobbit* franchise. Further examples show traditional Japanese drawing techniques such as ANA's[10] "*Suiboku-ga*," in relation to KLM's[11] local Dutch artisanship filmed within an original Delftian pottery. Another example of briefing adaption is *Korean Air*,[12] which has adopted the visual language of a Korean-Pop music video, featuring iconic boy group stars and catchy soundtracks while having an unusual narrative structure to keep passenger's attention. This clip has successfully attracted nearly 15 million views on YouTube;[13] an audience that represents more than half of Korean Air carried passengers in 2019.[14]

Hence, along with certain benefits of film-based safety briefings, such as clear multilingual presentation of safety instructions, including close captions for the deaf passengers - these films have shown a variety of innovative and inspiring forms of storytelling within a rather difficult topic. In order to reflect on possible adaptions to student short films in architectural studies, the following will briefly look into the development of films within the architectural discourse.

## FILM AND ARCHITECTURE

Inevitability, films has sneaked into the architectural discourse. Besides their attractive multi-dimensionality, the following tries to argue that the creative engagement of filmmaking may additionally offer a potential research method for architectural studies. Hence, more generally, film and architecture are two disciplines dealing with the realization of an idea; arguably - a narrative. The similarities and differences between film and architecture have been long investigated, and famously brought to a wider public by Maggie Toy's edited volume "*Architecture & Film*"[15] in the early nineties'. This *Architectural Design* edition invited scholars to contemplate on both disciplines, such as Murray Grigor's "*Space in Time; Filming Architecture*," who focuses on the aspects of time and space, while discussing how different techniques help the act of storytelling. Grigor starts with an illuminating statement, that; "[a]t its best, architecture is a celebration of space. Cinema, on the other hand, (…), gives people 'tiny pieces of time."[16] Furthermore, François Penz's essay in the same edition "*Cinema and Architecture; Overlaps and Counterpoints: Studio-Made Features in the Film Industry and Studio-Based Experiments in Architectural Education*"[17] investigates the implication of films in education and thereby explain how student could deal with the cinematic aspects of architecture. Here, students from the Department of Architecture at the University of Cambridge experiment with different story line visualizations, either through video or physical models in order to represent "(…) spaces, streets, cities, not yet built.… This world of illusion is, of course, even more poignant in the world of architectural education where architect students very rarely get the chance of seeing one of their projects built."[18] Due to the fact that mentioned *AD* edition was published in the early nineties', Penz's paper concludes on the new craft of digital illusion and contemplates about the emergent changes and possibilities of computer-animated design with the possible implication on both disciplines. A quarter-century later, it might not be wrong to say that architectural students are

completely immersed by computer-animated design tools, so much so that it seems as an unquestionable part of their communication toolbox. Hence, given our current challenges and restrictions due to the global pandemic, most student work today has been produced, presented and additionally discussed digitally.

Various digital tools not only allow student to visualize their spatial ideas, but may offer an additional step into the world of "*architectural essay films.*"[19] The architectural essay film, a term discussed by Penelope Haralambidou in *arq*[20] that tries to establish a new form of storytelling, "a genre between architectural design and filmmaking, theory and practice."[21] By defining this sub-genre, Haralambidou explores the cinematic potentials of architecture through student work of her design Unit 24 at the Bartlett School of Architecture, University College London. In her unit, students learn to communicate and visualize spatial ideas in the form of films and animations,[22] while techniques may range from stop motion animation, as presented by student Lee Chew Kelemen with *Próxima Estación: vía (De)Colonial*[23] from 2019, or using the genre of dystopian science fiction, such as *Subterranean Singapore 2065*[24] by Finbarr Fallon from 2016. Fallon's awarded seven-minute long live-action animated film imagines the potential expansion of Singapore into a "habitable and attractive subterranean environment,"[25] hence reflecting on "a cautionary tale against unsustainable and exclusionary socio-political infrastructures."[26]

## URBAN OBSERVERS

A different pedagogical approach can be seen at the current Diploma Unit 16 *Homo Urbanus: Laboratory for Sensitive Observers*[27] at the Architectural Association in London. This film-based unit taught by Ila Bêka, Louise Lemoine, and Gili Merin may represent the most recent inspirational integration of film studies within the architectural pedagogy. Their teaching method is based on observing *"(...) the city as a laboratory of living and a landscape of exploration."*[28] Matthew Ho, one of their recent graduates, has received the AA Diploma Honours 2020 for his documentation "*Urban Nomadism – The City as a Space of Exclusion.*"[29] In his ten-minute long documentary, Ho follows a Kurdish-Iranian asylum seeker through the streets of Central London over a period of nearly half a year. Thereby, he explores the potential of participatory observation and discusses the exclusivity of Central London through his *"(...) extreme level of intimacy and trust."*[30]

*"Is there anything that strikes you? Nothing strikes you. You don't know how to see."*[31]

To shift gears and discuss films as a research method, the following will look closer to the productive interplay of student's short films and their urban studies from the Common Core Course *24 Frames: Communicating ideas through Film*[32] in the Faculty of Architecture at the University of Hong Kong. In this course, students experiment with a method inspired by Jay Bolter and Richard Grusin's media theory "*remediation*."[33] The concept of *Remediation* is briefly described as the "*representation of one medium in another,*"[34] in other words; it is here understood as a form of reenactment. In this film-based course, students are asked to analyse a chosen scene from a previously discussed film. This analysis becomes the base for their own remediation. Here, student groups additionally choose a site in Hong Kong and test their urban observation skills through the prism of their chosen film. Thereby, the final short-film explores a relevant issue of student's built environment, while incorporate the cinematic DNA of their analysis. The aim of this method is to incite a visual reading of students immediate built environment and to challenge their awareness on how films can transform the way we examine and narrate urban spaces. By pursuing this cinematic method, students not only learn essential visual communication skills by experimenting with short films, but also start to appreciate films as sources of inspiration; namely as narrative libraries.

**ZOOM-IN**

In particular, three student film projects have successfully applied their film analysis for their own understanding of remediation. The first example is "*The Hong Kong Appétit*"[35] by Mikhail Frantsuzov, produced in 2019, followed by "*Day on Uber*"[36] by Chak Leona Ka Yan; Fung Tsz Yan; Lam Yun Him; and Yip Tsun Yin which was produced in the same year. The last example is a 2020 produced short film "The Blue Mist"[37] by Oscar Wong, Frankie Chi, Max Lai, Eunice Mak, and Millie Lee.

*The Hong Kong Appétit* is a remediation of Peter Greenaway's *The Cook, The Thief, His Wife, and Her Lover* (1989) and plays in a back alley in Central Hong Kong. Mikhail Frantsuzov has chosen this location to re-shoot Greenaway's famous dining scene. He used HKU students as actors in between local street food stalls, called "*Dai Pai Dong* 大牌檔," which literally translates to "*big license plate stall.*"[38] His main sequence, a long continues shot that spans from a green-lit *Dai Pai Dong* kitchen towards a red-lit dining table while following the main protagonist into a white-lit washroom area is to discuss the consumerist mind-set of Hong Kong's wealthy society. The film set derived from his previous film analysis in which the theatrical setting of distinctive colors in this location refers to the undefined spaces of Hong Kong's back alleys. Hong Kong's back alleys are vital used spaces, yet often, legally not clearly defined. Alley lanes, known as "service lanes"[39] or previously named "scavenging lanes,"[40] exist for technical necessities such as trash disposal, fire escape routes, or light and air wells. Hence, while being an important neighborhood connector through shortcuts and additional living spaces, most back alleys operate on various legal layers. This informality leads to observations that erected restaurants or barbershops may exist for generations, while other spatial extensions disappear overnight. *The Hong Kong Appétit* takes this tension of temporality and legal eventuality to cinematically highlights non-visible legal boundaries into colorfully blurred zones of public and semi-private spaces. Thereby, it questions their use and subsequently polyphony of mundane back alley functions. Recently, the Hong Kong government has funded several back alley "face-lifts"[41] that tries to re-integrate mentioned shortcuts into the existing pedestrian network, and thereby highlight the importance of these under-investigated trivial spaces as vital urban connectors.


*Figure 1. The Hong Kong Appétit (2019) by Mikhail Frantsuzov. HKU.*

*Figure 2. The Hong Kong Appétit (2019) by Mikhail Frantsuzov. HKU.*

The second short film example, *Day on Uber* represents a different Hong Kong public space - a taxi. It remediates Jim Jarmusch's *Night on Earth* (1991), which depicts intimate taxi conversations in five cities to reflect on, mostly clichéd, aspects of territorial specificities. *Night on Earth* offers five particular visons of cities; starting with a taxi drive from Los Angeles International Airport to Beverly Hills, followed, yet temporally simultaneous, by the episode of a taxi in New York, then Paris, Rome, and finishes with an alcohol-fueled, emotional rollercoaster in Helsinki. Each episode comments in a particular way on the urban structures each driver and passenger view from their seats, while reflecting in a dialogue with the culture that is associated with these urban spaces. Hence, significantly, *Night on Earth* portrays only urban exteriors. Besides the LAX Arrival hall at the beginning of the film, the only architectural interiors are the intimate taxi cabin spaces allowing different actions and dramas to unfold. This aspect of urban identity is reworked in *Day on Uber* as their short film portrays a dialogue between three Hong Kong citizens, played by HKU students Chak Leona Ka Yan; Fung Tsz Yan; Lam Yun Him; and Yip Tsun Yin, mimicking a contemporary taxi drive – an Uber ride through the city center. This condensed automobile space subsequently turns into a reflection on questionable identities and changing anxieties of Hong Kong's citizens.


*Figure 3. Day on Uber (2019) by Chak Leona Ka Yan; Fung Tsz Yan; Lam Yun Him; and Yip Tsun Yin. HKU.*

The last student short film example remediates a timeless masterpiece; Wong Kar Wai's *In The Mood for Love* (2000). As stated by the Criterion Collection; "*In The Mood for Love is a masterful evocation of romantic longing and fleeting moments.*"[42] Following the film's outlines of erotic restraint and memories, Oscar Wong, Frankie Chi, Max Lai, Eunice Mak, and Millie Lee created a cinematic journey back to their teenage spaces. Their short film *The Blue Mist*[43] is shot entirely in spaces that made a significant imprint on their life's, such as a particular high school's toilet, where they tried their first cigarette together, the courtyard sport field, a place of fights and glories, or the student dining hall. Hence, at the core of their memory-lane journey is the unconventional love of two male protagonists and their struggle to commit their queer love to each other in a rather conservative society. Similar to *In The Mood for Love*, their romance is condemned and exist merely in interrelated memories and fictions. This unusual urban love story allows for a reflection on its used built spaces, as Homay King has written in *Cinema's Virtual Chinas;*[44] Hong Kong is*:* "(…), an island haunted by the surrealistic temporal shifts that history imposed on it during its transitions from Chinese to British sovereignty and back again. Intertitles inscribed with poetry coat the film [In The Mood for Love] in the varnish of bittersweet nostalgia: "That era has passed – nothing that belonged to it exists anymore…He remembers those vanished years though looking through a dusty window-pane…everything he sees is blurred and indistinct." This sentimental tone follows Ackbar Abbas' concept of d*éjà disparu*,[45] or spaces of disappearance, because Wong Kar Wai films perfected the exploration of "Hong Kong's problematic spaces."[46] In *Culture and the Politics of Disappearance*,[47] Abbas discusses the dynamics of the rapid changing Hong Kong's cultural landscapes through his contemplation of "mutation[s] of disappearance."[48] In short, he calls for a critical discourse on Hong Kong's visual urban spaces, as "Architecture, because it is always assumed to be somewhere, is the first visual evidence of a city's putative identity."[49]


*Figure 4. The Blue Mist (2020) by Oscar Wong, Frankie Chi, Max Lai, Eunice Mak, and Millie. CCHU9082, HKU.*

**ZOOM-OUT**

Conclusively, the aim here is not to focus on the distinction between the disciplines of film and architecture, but rather to use student produced short films to go beyond the common appreciation of motion pictures as purely entertainment. As discussed through online airline safety clips and selected short films; the exploration of films as a potential research method for urban studies is a shift towards a critical engagement of students' observational skills and applied research. This shift may lead to appreciate films as investigation tool, hence being a critical outlet of student's analytical skills. With an assignment structure based on interdisciplinary, grading rubrics focused on creativity, and intensive student debates, films continue to be a fruitful medium for architectural studies. Here, students may learn to appreciate that the aspects of storytelling are not limited to a single discipline, but to see space and time as potential fields of interdisciplinary engagement in higher education, while additionally offering a shared platform of creative student collaborations. Subsequently, new cinematic tools may offer a glimpse into the future of this field; this can be in the form of 360-degree filming techniques, as adapted by state theatre Augsburg with *vr-theater@home*[50] which allows its audience a selection of newly adapted stage performances filmed in 360-degree. Or, alternatively, LiDAR scanning tools, which only have been implemented in the latest mobile devices hint to more data-driven outcomes, such as *Favelas 4D,*[51] a project conducted by researchers from the MIT's Senseable City Lab on Brazil's largest favelas Rocinha.

After all, the aim is to transform the way students see and explore their immediate built environment, and one can only image the continuous developments and implications of films in prospective architectural education.

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# ‘DOING GENDER’ ON A CREATIVE DEGREE COURSE

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## INTRODUCTION

Although more than 50% of creative advertising students are female, male students reach higher levels of influence within the industry, becoming creative directors and winning awards. Whereas research shows that significant numbers of women to leave their careers at around 3-5 years. Rather than look at why this is happening, I found creative advertising courses ignore this issue and often explain it as being the result of the personal choices women make, their ‘natural’ desire to have babies and their lack of emotional resilience. In other words, women are blamed for their own inability to succeed. I argue that gender issues such as the homosocial ‘boys club’ of the advertising creative department, the gender double bind, where women are required to take on masculine traits, yet remain stereotypically ‘feminine’, and the masculine construction of advertising creativity cause women to face complex challenges. Because these issues are not discussed as part of their training on creative advertising courses, women students are unprepared for them when they graduate. This paper looks at the existing challenges for women creatives working in creative advertising and the difficulties they face when they don’t understand the impact of ‘doing gender.’[1] By observing teaching and learning practices on creative advertising courses, and talking to students and ex-students, I conclude that only by knowing how to negotiate an environment where men decide what ‘good’ creative ideas look like, and women are judged by whether they can tell a decent ‘bloke joke’, will they be able to succeed and stay long enough change the status quo.

Most creative advertising courses are run along similar lines to advertising agency creative departments which are known for their informality and highly masculine, homosocial cultures.[2, 3, 4, 5, 6, 7, 8] In the industry, creative directors run the creative department and oversee the work of the creative teams – made up of an art director and copywriter working together. The creative director is the gatekeeper, responsible for quality control of the creative output of the agency. Research shows that in the UK, 83% of creative directors are male,[9] meaning that creative ideas are judged from a male perspective using men’s lived experiences and value systems and subject to their conscious and unconscious biases.[10] On a creative advertising course, staff are often seen as ‘creative directors’, setting creative briefs for students and giving feedback on creative solutions. These courses aim to develop students who are career-ready; armed with a portfolio of industry-standard advertising campaigns.

Advertising is an industry with deeply ingrained sexist and misogynistic views and a history of rejecting female creatives as unable to do the job. In 2005, Neil French, ex-CEO of WPP said, 'Women don't make it to the top because they don't deserve to … They're crap.' Adding that they

'wimp out and go and suckle something'.[11] And in 2011 Dave Trott, ECD of The Gate, said 'the creative department tends to be like the school playground. Boys muck about' and 'women are not like that'. He adds that 'girls' make better account handlers, CEOs, producers, planners'.[12] More recently, in 2016, Kevin Roberts, the executive chairman of Saatchi & Saatchi declared that gender bias was 'over' and implied that women lacked the right kind of ambition for leadership. In 2017, Justin Tindall, the chief creative officer of M&C Saatchi wrote that he was 'bored of diversity being prioritised over talent', and in 2018, Creative Director, Paul Martin sent an email where he ranked his female colleagues according to attractiveness.[13] However, the industry appears to be ready for change. Around eighty-five percent of all advertising aimed at women,[14] and around eighty percent of all purchase decisions are made by women.[15] [16] [17] So clients are asking if agencies understand gender well enough to communicate with today's women, who've had enough of the sexism and stereotyping that creeps out from the creative department and onto billboards, screens and the pages of magazines. Clients are looking for 'gender positive' advertising – that is advertising that portrays men and women in progressive and non-stereotypical ways. For example, Starbucks recently ran the first ever TV commercial featuring a young transgender man. To make advertising with such sensitive content, tackling relatively new issues, agencies need to understand gender in depth. Clients are aware that female consumers will reject brands that don't connect with them. Many studies show this lack of connection is a big issue, with women reporting they feel patronised, sexualised, misunderstood and/or objectified.[18] [19] A recent study by Kantar[20] reported that brands need to produce advertising that's 'free from stereotypes and depicts people in progressive, forward looking roles' because they 'substantially outperform ads which consumers consider to be less progressive'.[21] Kantar's study showed that both men and women dislike advertising where 'women are portrayed in a way they see as inappropriate. And the same for portrayals of men, for example, one of the most complained about TV adverts of recent times was the 2013 Asda Christmas ad which features a mum doing all the hard work getting Christmas done, and the husband at the end asking, 'What's for tea love'.[22] The advert received 600 complaints, many from husbands and fathers who were outraged at such a negative portrayal of themselves. In 2019 pressure from consumers led to the industry's watchdog, The Advertising Standards Authority, banning advertising that uses unhelpful stereotypes, and advertising giant Unilever is chair of The Unstereotype Alliance [23], a platform convened by UN Women in 2017 to eradicate harmful gender stereotypes in all media and advertising content. In this climate, agencies need to hire creative teams who possess the gender-sensitivity and understanding to meet their clients' needs.

Drawing on the literature and personal experience of working as both an advertising creative and a creative advertising lecturer, this paper looks at the gendered environment of the advertising agency creative department and the issues surrounding it. It then explores how creative advertising courses are 'doing gender' and how their approach effects the students and their work before moving on to examine how 'doing gender' in a professional environment effects the work and career success of women creatives. Finally, it discusses the construction of advertising creativity, both in the industry and on creative advertising courses, and concludes by looking at how students, both male and female would benefit from the inclusion of gender as a serious issue on creative advertising courses.

## 'DOING GENDER' ON THE CREATIVE ADVERTISING COURSE

I've taught on three creative advertising courses, each of which are highly rated for student satisfaction (gaining 80-100% in the National Student Survey regularly) and have excellent employment statistics. However, although all these courses employ both male and female lecturers, staff do not acknowledge gender issues or discuss how to prepare students for the barriers to success

they may face in industry. I worked as an advertising creative for 28 years and have also studied gender at masters level. This has informed my perspective that understanding and 'doing gender' is a crucial part of a career in advertising, and something creative advertising courses need to engage with. My position on gender aligns with West and Zimmerman who assert that 'Doing gender involves a complex of socially guided perceptual, interactional, and micropolitical activities that cast particular pursuits as expressions of masculine and feminine "natures".'[24] Their approach theorises that doing gender correctly means creating differences between men and women that are not natural or biological and 'Once the differences have been constructed, they are used to reinforce the 'essentialness' of gender.'[25] For example, it's often believed that women to 'womanly' things in organisations because it comes naturally, but as Salminem-Karlson point out "being a woman and doing ''womanly'' things at a workplace is not something that arises naturally for an individual of the female sex. Rather, it is something that is accomplished.'[26]

In my experience, many staff on creative advertising courses adhere to an essentialist view of gender as innate and linked to biological sex. This often leads to misunderstandings about gender characteristics and roles of both students and the target audiences they are aiming their ideas at. In perceiving gender as something we cannot affect – something that we 'are' rather than something we 'do' - female students are less-prepared than they could be for the industry that awaits them. When women graduates don't do as well as the men, their supposedly innate gender characteristics are often accepted, by both themselves and others, as the main contributing factors. There's a belief among some of the creative advertising staff I've worked with that women 'choose' less demanding 'non-creative' roles as a result of their biology and innate femininity. For example, they are seen to be, stereotypically, not emotionally resilient enough to cope in high-pressure creative roles and their 'natural' desire to have babies overrides their career ambition.[27] It's easy to lay the blame on female biology or outdated and de-bunked theories of the 'female brain'[28] [29] [30] because it means there is no need to make changes to address the problems and help female students succeed.

## WHAT'S GENDER GOT TO DO WITH CREATIVITY?

Eighty-three percent of creative directors are male, so they set the agency culture. This means the gender of a creative department is masculine, even when there's a high proportion of women at junior levels. Studies show that in this environment, female creatives can become disillusioned early in their careers and tend to leave the industry after 3-5 years.[31] [32] This is a problem that's been well documented in industry, and organisations such as Creative Equals and She Says have sprung up to help tackle it. Yet because they tend to concentrate on solutions aimed at 'fixing' women, such as mentoring,[33] championing flexible working policies and helping women get back into work after lengthy maternity leave,[34] they tend to reinforce women's 'natural difference' and inability to work on the same terms as men. I argue that these are not the 'real' problems, and we need to look at how the highly prized 'creative' product is constructed. Because in an agency, the 'idea' is king – and nobody cares if the creative has been out of the office on a month-long golf tour, leaves early to go to see an art house movie or spends three months in rehab. Giving women more time off for childcare won't help because babies, school runs, maternity leave are not seen as conducive to 'creativity'. In advertising, the traits linked to being able to produce 'good' creative ideas are highly masculinised (bravery, fearlessness, playfulness, non-conforming etc.),[35] so while a creative who 'pulls an all-nighter' and over does the alcohol will be applauded for coming in at midday the next day, a creative who's been up all night with a new baby will be frowned upon for coming in late as this is not seen as linked to either creativity or doing a good job. Acker points out that organisations consider 'jobs' as gendered masculine and therefore separated from 'feminine' domestic life.[36] Therefore issues related

to domesticity are seen as problematic; creative mavericks are found in nightclubs, not nurseries. This double-standard is persistent, and until it is challenged, it's not likely to change.

Despite the gendering of creativity and the role of advertising creative as masculine, studies have failed to show any significant difference between the 'creative' ability of men and women.[37] [38] If anything, they show that women tend to outperform men in divergent thinking tasks.[39] Csikszentmihalyi points out that the applied creativity necessary in developing creative advertising ideas is highly subjective and reliant on 'gatekeepers' to validate whether or not the idea is 'creative'.[40] [41] [42] When decisions on what is 'creative' are made by staff who have masculinised industry experiences, values, ideals, cultural references, sense of humour etc. on which to base their judgements, creativity becomes gendered.[43] 'As Windels and Lee point out that 'even ads for women's products are judged based on a male sensibility.' [44] Proudfoot et al's study showed that 'a man is ascribed more creativity than a woman when they produce identical output' and 'men's ideas are evaluated as more ingenious than women's ideas'. When speaking to female creatives working at top London advertising agencies about whether advertising creativity is gendered, they misunderstood. They thought I was referring to stereotypes about what men and women will be good at without realising that concepts of creativity, excellence, merit etc. are themselves gendered. By focussing on how men and women were equally able to produce 'good' ideas for all products and services, whether aimed at male or female consumers, they didn't comment on the construction of creativity and how value judgements about what makes a 'good' advertising creative idea are mainly made by men in a masculinised context. Proudfoot et.al's study showed that 'men are often perceived to be more creative than women' because '"outside the box" creativity is more strongly associated with stereotypically masculine characteristics (e.g., daring and self-reliance) than with stereotypically feminine characteristics (e.g., cooperativeness and supportiveness').[45]

A study by Lebuda and Karwowski, showed that judgements on creativity were affected by whether or not the name of the creative was male or female, 'works signed by men scored higher and were perceived as more creative.' And 'Works signed by women scored even lower than anonymous works.[46] They also showed evidence that 'men's ideas are seen as more inventive than women's ideas' and that a product is judged to be more creative when it is attributed to a male creator compared to when the exact same product is attributed to a female creator.[47] In missing this crucial point, women can often feel their work is rejected because it is actually 'bad' and not that it's because the creative director is basing their judgement on gender biases. In fact, the persistence in denying that creativity is gendered (which starts on the creative advertising course) can cause women to question their own creativity, become disillusioned with themselves and the industry and leave.[48] Studies also show that when faced with male gatekeepers, women will often adopt masculine values and learn to 'think like a man' when coming up with ideas. [49] [50] Which may not have the desired effect because, as Proudfoot Et observe that, 'stereotypically masculine behaviour enhances a man's perceived creativity, whereas identical behavior does not enhance a woman's perceived creativity."[51] Furthermore, this may not be such a good strategy for students entering an industry which, as pointed out above, is changing fast and increasingly putting emphasis on the importance of developing campaigns that connect with people of all genders in new and better ways.

## DO WOMEN CREATIVES JUMP OR ARE THEY PUSHED?

Windels and Lee identify how advertising creative departments exclude women creatives by maintaining 'a competitive environment in which masculine personality factors such as perseverance, toughness, competitiveness, and a thick skin are seen as important for success'.[52] Averell also argues that, 'Day-to-day ad agency culture is a strong force, and a reminder to women that they are not as

welcome in this particular business as men, by telegraphing they don't completely belong".[53] Exclusion is signalled through the permitted behaviours and those that are implicitly or explicitly nor approved of. Averell points to agency culture being like a 'frat house' or 'playground', with sexist humour being participated in and being tolerated (by men and women), sexual images visible on walls, sexual innuendo, pool tables or table football provided, discussion of porn and sexual acts, visits to strip clubs as entertainment, golf trips, football discussion, heavy drinking, drug-taking, late nights, having sex with women at work, being unfaithful, partying, competitiveness, combativeness.[54] [55] To 'fit' into this culture, means accepting it, and the women who survive are complicit and become seen as 'cool girls' as they laugh along with the knob jokes, go to strip clubs, drink with the boys and don't make a fuss.[56] [57] [58] Unaccepted and untollerated behaviours and attitudes include any that threaten, or expose, the 'playground', such as being feminist, objecting to sexist humour, making jokes about men, wanting to leave work on time, not drinking, complaining about sexist behaviour, being 'PC', being emotional etc. Women also need to carefully tread the double standard of the boys' club, known as the gender 'double bind'. They need to be masculine enough to fit in, yet still adhere to codes of femininity.[59] So the way they behave and dress is constantly evaluated and 'policed'.[60] However, Averell points out, this behaviour is mostly not intended to exclude women, its purpose is to foster creativity and, as discussed, creativity is gendered 'masculine'. Averell asserts that ''Bro' culture is not anti-woman by definition, but it leaves many women feeling on the outside of it, never a full part of it - women largely feel the unintentional consequences of the culture of agencies'.[61] Both Averell and Nixon say that women make huge efforts to 'do gender' in a way that helps them fit in, Averell says, 'Women feel they have to participate in agency culture in order to preserve their jobs and careers, "You go along and you try to fit in— be accepted, not rock the boat. The idea is 'in advertising, we do stuff people would not be able to get away with'".[52] Talking to female creatives (working in top twenty London advertising agencies), I found that women are encountering the same problems and obstacles to success that women experienced 20 years ago. And while they are finding ways to 'do gender' that will help them negotiate these issues, they are not strategies which will affect change. For example, one female creative said the advice she got was to soften her approach and stroke male leaders' egos. While she didn't like doing it, she found it effective.

## CONCLUSION

In order to provide the advertising industry with a generation of creatives who understand gender, and female creatives who are equipped to negotiate the issues they face, I argue that creative advertising courses need to address gender issues head on. Because by not acknowledging the reality of 'doing gender', these courses are lagging behind cultural change and will continue to facilitate the reproduction of the status quo in the advertising industry. By addressing the very obvious gender issues that are holding back women creatives and disabling progress in creativity, we can help produce a new generation of advertising creatives, both male and female, who can effect change in the industry that will be beneficial for both agencies and their clients.

In my experience, staff believe they make no gender distinction and think they treat male and female students 'the same'. However, in order to address gender issues, 'difference' needs to be acknowledged. Equality does not mean 'sameness'. What's more, despite the belief that males and females are seen as 'the same', unconscious biases in both male and female staff mean they interact differently with female and male students, and those students interact with the staff differently too. For example, I've experienced a female lecturer express a view that male students will be disadvantaged in industry because agencies are looking to hire more women, a 'fact' that has no basis in reality. And a graduate team told me they'd been told it would be easier to get a job as a woman,

but they discovered this was absolutely not true, they said the whole issue of being female in the industry was not addressed on their course outside of celebrating that 50% of the intake were women.
I've heard lecturers of both sexes, including myself, encouraging female students to 'be more ballsy', 'edgy' and 'brave'. Essentially, they are encouraged to take on stereotypical male behaviour and traits and develop 'masculine' creative ideas. I've noticed a tendency in the female creative advertising students to either adopt masculine behaviours and develop work that fits the male model, or to become quiet and accepting of their difference and 'lower status'. Among those who take on a masculine approach, there is also a tendency to react against any mention of 'gender' and, in particular, feminism. Those who accept their 'difference' tend to be less ambitious and tend not to look for roles as advertising creatives when they graduate. Instead, they become marketing assistants or account managers – roles which serve the creatives and are seen in the industry as 'more suitable for women's [62] [63] Continuing to deny that 'doing gender' plays a role in the success of our female students is a mistake that will affect women creatives once they are in the industry. To move forward, we need further research to help us understand how to best address these issues, and answer the important questions posed by Windels and Lee back in 2012:
"What are the difficulties associated with developing creative solutions in a space designed, dominated, and interpreted by men based on an ethos of masculinity? What status inequities are we reproducing while "doing gender" in the masculine studio? How can we facilitate women's influence on the construction of creativity?"[64]

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# ONLINE TRANSITION TO TEAM BASED LEARNING IN LARGE CLASS TRANSNATIONAL ENGINEERING EDUCATION

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## INTRODUCTION

On the 31st of December 2019, China alerted the World Health Organisation to a new illness, later be termed COVID-19. Chinese Universities delayed the start of the second semester and travel restrictions prevented staff and students returning to campus after the lunar new year celebrations. With one weeks' notice the school prepared for remote delivery.

In more normal times Queen Mary University of London's Engineering School (QMES) staff fly from London and block teach. The authors module is double taught to two cohorts of 120 students. This paper focuses on moving from initial delivery in the first teaching block (weeks 1-3) to a fully online Team Based Learning (TBL) implementation in the second block (from week 7). The philosophy adopted was that any investments made should enhance teaching practice over the long term and be aligned with best practice. The research question this work addresses is: What is required to transition a face to face (F2F) TBL module to online delivery within a short timeframe.

## MATERIALS & METHODS

The paper is split into two parts; design & evaluation. The methodology used in the design section leverages on key references[1,2,3] which reviewed best practice, strategies & other quality metric required for successful online teaching and online delivery by TBL. This work merges the key points from these sources into a set of tables, structured in-line with the key components of the TBL framework: Prework, Readiness Assurance Test (RAT), Application Exercises and Peer Review.[4] The tables include analysis of the delivery in block 1, to identify gaps and actions required for a full online TBL implementation in the second teaching block. Gaps and actions were identified with the aid of the following:

- The literature, particularly references [5,6, 7,8,9]
- Students voice: The challenges faced by students in China during this unprecedented crisis may not be captured in the historical literature.
- A community in crisis: The works of the wider education community in developing best practice during the crisis provided a range of resources.
- Experience of colleagues: QMES established a task force to monitor quality and engagement during online teaching. The author was able to observe a wide range of online classes delivered by

colleagues, determine best practice and receive valuable feedback on the authors own delivery.
The tables acted as a focus for discussion and subsequent mapping out of the delivery approach, content updates and other supporting systems which were needed to support teaching an learning.

## DESIGN

This section presents analysis of the status, gaps and actions needed to move from block 1 delivery to a full online TBL delivery in block 2. The results are summarised in each of the following sections and tables below according to the phases of TBL.

### Orientation

The duration between the last F2F TBL class (between week 3 and week 7) represented a significant gap where students would have been busy working on other modules. In addition, the teaching approach in the second block was planned to be significantly different. This being the case it was considered important to provide several notes and updates, Table I as part of an extension to the normal orientation session given at the start of the semester. It was also necessary to introduce the new digital tools that would be used in block 2.
A sense of belonging and team cohesion are more challenging to establish in an online learning environment, Table I. Issues such as; the absence of social bonds, putting a face to a name, building trust with virtual strangers have been reported[9]. These challenges should not be as pronounced in QMES as the students have been together during F2F delivery for a semester prior to the crisis. However, live online sessions and synchronous groups work should be scheduled to support these issues rather than running group work asynchronously as is common for some online delivery approaches.
In TBL, students are strategically organized into permanent teams of 5-7 people. In online TBL, the literature indicates smaller teams, 3-4 people, are more effective.[6] It is also common practice to keep students in the same teams for an entire module when delivered by TBL. The philosophy being that it takes time for teams to develop the social and professional cohesion to become highly effective. Balancing these factors and the fact that students were exposed to considerable change and uncertainty the existing teams where maintained, Table 1. This supported team dynamics, mitigated issues of belonging and minimized change on a student population which was already under considerable stress. There was a danger of some members of the team not being able to participate effectively which will be addressed later in this work.

| **Online TBL element, issue, best practice** | **Gap analysis against block 1 status** | **Actions needed in block 2** |
|---|---|---|
| Provide student-specific information about the module. | Completed in Semester 1 for F2F delivery.<br><br>Introduction to SEM 2 included updates and changes in block 1.<br><br>Changes to teaching approach to be covered in block 2. | In the block 2, first session, present<br>-TBL reminder.<br>-iRAT vs tRAT scores for semester 1.<br>-Differences between online & F2D delivery.<br>-Introduce new tools and communication channels.<br>-Schedule and upcoming assignments reminder (outlined in block1).<br>-Outline links between learning outcomes and TBL activities.<br>-Link to schools "what to expect from online teaching" document. |
| Formulate teams & practice RAT and application processes. | Completed in Semester 1.<br>Teams formed in alignment to TBL & intuitional practice. | Discuss the importance of team roles & responsibilities in online teaching.<br>Consider reduction in group size to align with online best practice. |
| Belongingness, developing social presence with instructors / students are more of an issue with online delivery.<br>Fears of isolation & not being heard. | The students were familiar with the instructor and their group members after working together for a semester.<br>Teams larger than recommended for online delivery. | Student were encouraged to turn on cameras during group discussions.<br>Instructor to turn on camera during live session.<br>Consider reducing team size to 3-4 as per online TBL recommendations.<br>Encourage recording and submission of group sessions. |
| Balancing aggressive vs reticent students<br>Fostering engagement and peer learning | Students confident in English may dominate discussions.<br>No tRAT in block 1 limited engagement and peer learning. | Encourage a rotating team leader / responder role.<br>Encourage audio recordings of group discussions.<br>Identify digital tools which can support tRAT. |
| Creating desire to know more and think creatively. | Not supported. | Deploy professional practice system which rewards students who dive deeper into the subject. |
| Invest time early for team building & communication activities. | Students had worked with each for 1 semester 1. | None required. |

*Table1. Status, Gap Analysis & Actions Required For Best Practice Online Tbl Delivery:* ***Orientation Phase****.*

### Prework

A review across Coursera found that 80% of online students prefer to work from slides and transcripts rather than watching a video lectures.[10] The prework resources, were developed to support various learning styles. The resources in Table II were developed to support various learning styles. While a variety of formats were developed, a principle of "less is more" was adopted in regard to the content. This is in response the known characteristic that students tend to devote a fixed length of time to prework, no matter its length or complexity.

Feedback obtained from the school wide survey showed the most frequent negative comment was associated with accessing the videos on the schools VLE. On checking with a small group of students, the recordings were valued but speeds were prohibitively slow. From block 2 videos would also be distributed by "QQ" (a very widely used Chinese social media tool). All videos were short (<20min) and lively as it can be harder to focus on a video rather than a F2F lecture[11] and to reduce streaming issues.

| **Online TBL area** | **Gap analysis against block 1 status** | **Actions needed** |
|---|---|---|
| Lecture style Slides. | Minor updates were required to refresh the slides and partition for shorter videos. | Minor updates. |
| eBook. | Partially prepared. | Complete relevant chapters. |
| Video Lectures. | Unprepared.<br>Some students had difficulty accessing videos on VLE. | Complete set of mini-lecture videos.<br>Also post videos to QQ group. |
| Slides for live session, including RAP and Application exercises. | Unprepared. | Complete, delay upload to VLE to encourage attendance.<br>Record sessions, post to VLE and QQ group. |

*Table 2. status, gap analysis & actions required for best practice online TBL delivery:* ***Prework****.*

### Readiness Assurance Test (RAP)

In the authors F2F delivery of the Individual Readiness Assurance Test (iRAP) data is collected using an audience response system. Each student is assigned a "clicker" that allows them to respond live in class. Several studies have shown that "clickers" can enhance interaction, engagement and make classes more enjoyable.[12,13,14,15] This was not possible in block 1 as all the students were in their own homes. Rather, the RAP was run live in class using a common chat room. Questions were presented via video conference and students entered their answers into the chat.

During block 1 it was not possible to maintain accountability in the RAP, Table 3. No traceability of student's performance in the Individual Readiness Assurance Test (iRAT) was possible and Team Readiness Assurance Test (tRAT) could not be run with the tools and resources available. New digital tools were needed to replace the WeChat perpetual chat room used to deliver the RAP in block 1. Online it is common to run the RAP asynchronously using a VLE.[1] However, colleagues found that running large scale online quizzes, even asynchronously, resulted in slowing of the schools VLE. The system is hosted in the UK and does not perform as well as in China as it does in the UK in normal times. During block 1 the large demands placed on the Chinese internet services made this approach unworkable. Combined with the peer learning benefits of delivering the RAP synchronously this ruled out the VLE as a platform for the RAP at this point.

Based on Table 3 a new digital tool was needed with the following characteristics for online RAP delivery: Allow real-time access to: the number of responses (needed to support management of the pace of the class), synchronous delivery, information on individual student and group responses, extraction of data for analysis offline, controllable live display of responses to specific question and cumulative performance. The digital tool should also support student accountability, interaction and instructor flexibility. When sourcing for a suitable tool, criteria adapted from Shanks[8] and Barrett-Fox[16] along with the characteristics defined above were used to review the available tools.

Free access to a premium subscription of Turning Technology (as were a free access to a number of other systems reviewed) was available during the crisis. This reduced the purchasing barrier & improved the chance of getting the system in place before block 2. In addition, as Turning Point "clickers" were used in the normal F2F sessions, so the software was already installed on staffs managed computers. This removed the need to get approval from the Universities IT services team and the requirement to get it installed, a major advantage in a lockdown situation. Further, it allowed the use of the existing slide packs as the software is the same as for the hardware version of the clickers. Online polling from Turning Technologies was selected to run the iRAT, tRAT and post class evaluation.

| **Online TBL element, issue, best Practice** | **Gap analysis against block 1 status** | **Actions needed** |
|---|---|---|
| Use technology and infrastructure to support the RAP design, team interaction, feedback & academic integrity. | Questions delivered via PowerPoint & video conference. Responses captured in a perpetual chat room. | Source tool to collect RAP data, provide realtime feedback, gamification, improve identification of areas of difficulty. |
| Ensuring closed book iRAT.<br><br>Ensure test integrity. | Students could see each others answers this resulted in "follow the leader" behaviour. Quizes in chatroom were time consuming to setup and find. | Source a tool which supports fast paced iRAT, provide access to realtime responses, control of response visibility.<br>Include a question on integrity in iRAT. |
| In traditional online delivery, tRAT is commonly delivered over two days.<br>Ensure test integrity.<br>Ensure adequate team contribution in tRAT.<br>Ensure test integrity.<br>Lower response rate and less engagement in online delivery. | tRAT not possible in block 1.<br><br>No visibility of group discussions during block 1. | New tool to supports tRAT. Ask for explanations based on tRAT responses.<br>Recommend recording team meeting.<br>Synchronous tRAT should encourage participation.<br>Introduce competition / gamification. |
| Minilecture based on RAT are commonly added to next lecture.<br>Concern students donot review minilectures. | Mini-lectures were given based on tRAT questions in live sesssion.<br>tRAT results not available so more mini-lectures than needed were given. | Source digital tool for tRAT that enables identification of areas need for mini-lectures.<br>Synchronous delivery encourages viewing mini-lectures. |
| Maintain flexibility and accountability. | In block 1 this was not possible. | Source suitable digital tool. |
| Enhance collaboration and interaction design. | Limited collaboration due to unsuitable tools. | Source appropriate digital tools. |

*Table 3. status, gap analysis and the action required for best practice online TBL delivery: **RAP**.*

### Application Activities

During block 1 both synchronous and asynchronous application exercises were run. In the synchronous approach there was insufficient time to adequately discuss longer application activities suitable for summative assignments. Shorter exercises worked well as did asynchronous application activities. Running summative application exercises asynchronously eliminates the disadvantages some students with poor internet access or challenging home situations might have. The approach adopted was to deliver shorter formative application activities during live classes and longer asynchronous summative application activities between teaching blocks.

It is important to bring formal closure to conceptually difficult material, the asynchronous approach did not naturally allow for this. Peer evaluation was integrated into formative assessments in block 1, but students still felt they needed to "hear from the expert", a challenge with 240 students online.[17]

A method of ensuring students were engaging appropriately and that they were speaking English (a module learning outcome) during group work was desirable. Each group had been recording conversions for their English modules, no related complaints were received during the school wide survey so a new recommendation to record group discussions of formative activities and a requirement to do so during summative activities was initiated. Students were also encouraged to turn on their webcams during team discussions although they were not required to record video.

| **Online TBL element, issue, best practice** | **Gap analysis against block 1 status** | **Actions needed** |
|---|---|---|
| Grading of team application activities typically by instructor using rubric created by team.<br>Peer evaluation 30% | Formative application activities graded by instructor within VLE.<br>Peer evaluation of one summative application activity. | Link quality of peer evaluation to assignment grade (see Table VI). |
| Common to include end of semester reflective assignment. | No reflective application activity.<br>End of semester examination may not be possible. | Include reflective element into final two summative application activities (see Table VI). |
| Belongingness and team cohesion.<br><br>Ensure civil discussions.<br><br>Balancing aggressive vs reticent students. | Synchronous application activities supported feeling of belongingness.<br>No monitoring of team dynamics during application activities.<br>A few formative assignments showed evidence of poor collaboration i.e. students dividing up the work but not really discussing the content, writing in isolation. | New requirement to submit audio recordings of team discussions for application activities.<br><br>Rotating group leader role. |
| Consider the method of delivery (asynchronous or synchronous). | Formative application activities were both asynchronous and synchronous. These build up to summative asynchronous activities. | Summative application activities to be delivered asynchronously to ensure no student is disadvantaged.<br>Additional time to be given compared to F2F delivery. |
| Frequent communication is essential for effective teaching. This is even more important in online delivery. | WeChat work, the module forum and emails were used to keep in contact with students. | Maintain communication links.<br>Students have classes every week but not in every module. Structure summative asynchronous assignments to enable communication during non-teaching time. |
| Use analytics to support & measure collaboration, appropriate to stated application design incentives. | The only analytics available were from the VLE. Students were not able to be fully engaged with the VLE due to low speed. | Look for ways of measuring collaboration.<br>Look for ways to incentivise collaboration. |
| Requirement to bring closure to asynchronous application activities. | None other than marks and feedback. | Develop approach to provide closure on asynchronous activities. |

*Table 4. Status, Gap Analysis & Actions Required For Best Practice Online Tbl Delivery: Application Activities.*

### Peer Evaluation

During peer evaluation of formative application activities in block 1 students provided none-actionable, none-critical feedback to their peers, Table 5. Comments such as excellent, great and perfect were commonplace but generally did not reflect of the true level of attainment.

As a result, a new peer review process needed to be developed for online delivery. Peer evaluation in TBL is designed in part to motivate students to take responsibility. The notional "threat" of peer evaluation discourages students from relying on the work of their teammates[18] reducing the number of "free riders". The literature indicates peer review can:[19]

- Build accountability among peers
- Improves quantitative problem solving
- Improve knowledge retention
- Increases course satisfaction
- Increase student engagement

In TBL it is considered best practice that peer evaluation make a significant impact on the course grades[20]. The Michaelsen method forces students to discriminate between members. The approach forces students to thoroughly consider their peers' contributions to the team which translates to more thoughtful feedback.[21] These approaches were adopted for the peer evaluation of summative application activities. Each peer evaluation was split into three credit bearing parts for the remaining summative application exercises. An additional, zero credit element was added to support reflection on the group performance. The components of the new online peer evaluation system were:

- Peer assessment of own members using the Michaelsen method (10% within the group).
- Team peer assessment of 3 other teams works (10% assessment of other teams).
- The suitability of the team peer review (2 above) (10% for the group carrying out the peer evaluation).
- The team ranks the three assignments along with the groups own work (0% reflective exercise).

The third component above was designed to encourage students to provide valuable and actionable feedback to their peers and resulted in much more useable comments and appropriate scoring than in previous exercises.

| Online TBL element, issue, best practice | Gap analysis against block 1 status | Actions needed |
|---|---|---|
| Provide robust rationale for peer-evaluation to ensure student buy-in. | Sem 1 methodology did not easily map to online delivery.<br>In sem 2 peer evaluation carried out on asynchronous formative assignments.<br>Majority of peer review comments were not actionable. | Develop and incentivise rational for providing quality, actionable feedback.<br>Provide a guide to support students in providing effective feedback.<br>Provide incentive for students to provide valuable and actionable feedback. |
| Ensure process transparency so that students understand the effect on their grade of evaluating and being evaluated by others. | Guidance was given in live sessions. | Deliver a dedicated live session on peer evaluation with written guide. |
| Provide multiple formative and summative evaluation cycles to promote learning, with structured opportunities for team debrief and individual reflection. | Multiple formative assignments were run, building up to support summative assignments. No team debrief of individual reflection opportunity was provided. | Provide an incentivised opportunity for individual reflection on group assignments linked to marks. |

*Table 5: Status, Gap Analysis And The Action Required For Best Practice Online Tbl Delivery: Peer Review.*

## EVALUATION

Fully online TBL delivery was achieved in block 2. Prior to the first live session details were provided on how to create accounts with the new digital tools. Several small trials were run to allow practice using the tools and resolve any technical issues. This also provided additional touch points with students and gave valuable feedback on integrating the tools more effectively.

The mini-videos were distributed on the schools VLE and via the class “QQ” groups. This had the positive effect of eliminating all negative feedback relating to access. Unfortunately, “QQ” did not have the tracking capability of the VLE to support determination of which students were not engaging with the material. This reduced the academics ability to identify and follow up with students that had difficulties.

Feedback from block 1 suggested students valued the live sessions. The synchronous delivery helped engage students, maintain a sense of belonging, support a feeling of community and lessen feelings of isolation.[22]

Full iRAT and tRAT were run using TurningPoint software which enabled introduction of an element of competition/gamification. TurningPoint allowed calculation and displayed of the best performing individuals and teams during the live sessions. This improved engagement and built accountable as students did not want to let themselves or their teams down. The ability to see the number of responders during the iRAT allowed a high pace to be maintained which reduced the opportunity to lookup answers. Performance in the iRAT (45%) was lower than in F2F classes (~60%). It is likely to be associated with the students not adjusting to the higher expectations of semester 2 and the fact that

until block 2, students had not been held to account. Evidence for this was seen in improved scores in later classes.

tRAT performance was encouraging with an average score of 80% which compares well with the iRAT performance (45%), while lower than the typical F2F tRAT performance recorded in semester 1 (typically ~90%), again this score improved in later sessions. The improved score between iRAT and tRAT was aligned with student's perceptions where 95% of students felt that they achieved a better score in the tRAT. These observations suggest group communications was effective. However, analysis of data relating to the mode of group discussions indicated that some groups held discussions via text chat. While seeming as effective as voice or video discussion, 97% of students felt they could fully contribute, one of learning outcome for the module is associated with group communication in English. In future, classes students were required to submit audio files of their group conversions to the VLE even if they also used text-messaging to communicate as well.

The work of Ficapal-Cusia et. al.[5] developed a methodology for evaluating the practical team-based learning experience in an e-learning context. Their evaluation of the effectiveness of the functioning of the team used a questionnaire which itself was based on the evaluation rubric from.[23] A similar set of questions was developed to evaluate the level of teamwork. The results were encouraging with no flags raised on the effectiveness of TBL or the tools.

Overall, from the instructor's perspective the RAP delivery improved, interaction and the quality of discussion were significantly improved. From the student's perspective, the survey question associated with the RAP indicated that ~75% of students felt that they were well prepared for the iRAT with only 5% strongly disagreeing. The tool allowed these students to be identified and bespoke support offered.

The application activities and associated peer evaluation worked well. Students scored higher marks than they did in earlier activities. The new peer evaluation method eliminated (with the exception of one group) the cultural norm of providing nice comments and an overly generous score. More importantly was a profound change in the quality of feedback given.

Less than 1 % of students failed the module compared to 10% in previous years before TBL was introduced.

## CONCLUSION

During this study several lessons have been learned:

- Focusing on what needs to be done immediately[8] is very valuable. The approach allowed teaching to continue using what was immediately available, resolve issues with technology and cover of the learning outcomes until a more refined approach could be developed.
- Stress on both students and faculty during a crisis is considerable. Relaxing expectations and focusing on learning outcomes is the appropriate approach.
- TBL is well suited to online teaching, selecting and embedding suitable digital tools into the delivery was a major challenge. However, now it's done moving back to F2F teaching will be relatively easy and the lessons learned will improve the authors normal practice.
- Online learning can be an effective platform for TBL and many of the practices developed may have application in a future, blended teaching mode.
- In addressing the research question, to rapidly transition a F2F TBL module to online delivery the following elements need to be in place. Together with the tables these form a framework for delivery:

- Pre-class materials–Consideration needs to be given to isolation, bandwidth issues, different learning styles and stressful home situations. A less is more approach and a variety materials types supports different learning styles.
- Appropriate technologies-Efforts to maintain technologies that students have familiarity with and that are well tested is very beneficial as is selecting the correct tool.
- Approach for assuring integrity–The absence of F2F supervision and use of inappropriate technologies leads to an erosion of RAP integrity. These can be resolved in the online environment though appropriate digital tools.
- Summative application activities–Need to be asynchronous to provide time for discussion and not to disadvantage students with technology or home issues.
- Peer assessment – Methods from F2F teaching may not be directly transferable to online delivery. Methods of linking peer assessment to group discussion are critical in ensuring adequate delivery of learning outcomes.
- Overall, the work contributed experience learned through transferring a F2F TBL module to online delivery under crisis conditions. Many of the lessons learned have wider applicability in the new blended learning environment that academics will face in the future. The work was completed before many colleagues made their own transition, and during a full semester of online delivery compared to most British institutions which only faced a few weeks of online teaching. It is anticipated that this work will serve as a general reference for other academics moving to a blended learning environment and a comprehensive guide for those teaching via TBL.

## NOTES

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# ARCHIVES AS PEDAGOGICAL TOOLS

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## INTRODUCTION

Engaging with archives has long been identified as an area in higher education within which new skills can be developed for students to enhance their learning. The role of archives is usually positioned as supporting roles within higher education - mediated through the interactions of students within a physical space in the library. This paper reveals how this relationship can be bridged using the example of Soviet archival material on the revolutionary school of architecture teaching—VKhUTEMAS (1923-1926) to reveal new forms of architectural learning. It brings the archive out of the library to the classroom revealing the relationship of formalizing, and more explicitly reconceptualizing research methods through sourced archival photographs and documents and the role archives can contribute within architecture teaching. This was first attempted during a one-day workshop delivered in 2020 at the Birmingham School of Architecture to 2nd year students. It focused on a method of teaching called ‘Space’ through new avant-garde teaching methodologies and drawing upon my doctoral research completed in 2018 at the Liverpool School of Architecture. During this research I collected 1000 images in archives and in print from institutions, public and private collections. This paper discusses for the first time the role in contemporizing ‘archives as pedagogical tools. It will reveal how both realms can inform new design studio initiatives to enhance student learning. It will reveal how the role of research methods can be used to uncover new meaning through problem-based learning that feeds into student engagement through an overarching pedagogical strand of reflective learning - each providing a small, but important contribution to how we can improve the teaching of architecture. The lack of clarity over the effectiveness of architectural teaching today reflects its complexity as a teaching/learning setting requiring new approaches to stimulate new thinking. Unsustainable ad-hoc initiatives pedagogically informed or otherwise have created a sense of 'initiative fatigue' inhibiting the traction necessary for new teaching approaches to flourish rather than delivering just 'another course or project’.[1]

This situation raises fundamental questions about design education that continue to resonate today: Is there an alternative to the academic method of architecture teaching through the use of the archive? How do you teach students with no previous training in archive skills? Is it even possible? The questions in this study are not, ‘What is the correct way to teach architecture?’ but more specifically, ‘Can new methods be introduced through the use of archives to deliver better teaching?’ Clearly there is the possibility of adding similar value to a much wider audience and development opportunities for these techniques and others across architectural teaching.

## ARCHIVAL MATERIAL

The chosen archival material on Russian avant-garde architectural teaching in the revolutionary era in Moscow stands as a unique and influential chapter in the history of modern architectural teaching. Its methods has not previously been fully understood nor is it potential in improving architectural teaching. The Moscow VKhUTEMAS (Higher State Artistic and Technical Workshops), established by a state decree was a specialised educational institution for advanced artistic and technical training.[2] 'Space,' (*Prostranstvo*) a course founded within VKhUTEMAS, offered one of the first alternatives to the classical academic atelier and apprenticeship models of architectural training developed by architect Nikolaii Ladovskii (1881-1941) through model education.[3] Archival material pertaining to this extraordinary period of Soviet teaching exists in archives in the Russian Federation, America, Canada, Germany, and the UK but not previously brought together.[4]

## METHODOLOGY

Using this sourced archival material, the intention was to teach students also about the history of Soviet architectural teaching through the lens of archival research using reproductions of photographs and documents to be pieced together, challenging students to portray a narrative of 'Space' teaching. A lecture was delivered providing an understanding of this period of Soviet architectural teaching history, the role of archives, different research methods relating to archive research and their use. Students were taught three methods helping them to analyse and uncover clues to inform decision making at different stages of the workshop. These methods consisted of: (i) photograph analysis, (ii) document analysis, and (iii) comparative analysis. The first method would help students understand how to read the photograph.[5] To use photography either as data or as data generators students needed to have some notion of how viewers treat and understand photographic images through coding. These codes would be established by each student/group during the workshop.[6] This choice of method would provide the means to unlocking what students could see within the photographs provided. Document analysis would have to be used in order to elicit meaning, gain understanding and develop empirical knowledge of documents provided.[7] Further to this, the role of historical comparisons would serve a strong sense of purpose for students/groups when piecing together material especially in the latter stages of the workshop.[8] This method was expected to be used after the analysis of photographs and documents revealed findings of historical understandings so each group could reach a conclusion through triangulation.

## THE WORKSHOP

The workshop commenced based on the assumption students had returned from archival research abroad from Moscow and now have to analyse and piece together their archival findings to uncover new research and findings. The following sections now describe each stage of the process revealing how students navigated the workshop task - working in 9 groups containing 5-9 students each. Selected photographs and documents from the collection of the 1000 pieces of material sourced formed the core material for the workshop was delivered to each group in boxes each containing 150 re-produced photographs and documents of a variety of sizes and images depicting models, teaching, and assignment drawings (Fig. 1). The material chosen allowed for the correct sequence of 'Space' to be portrayed but the full amount of material included in each box was not all needed to portray the correct sequence requiring the groups to collectively discuss and agree their selections. This encouraged students to be selective making 'key' choices throughout the workshop. This was a pedagogical choice by the teacher as students would have to be 'reactive' and creative as opposed to providing a smaller amount of material which would have simplified student's decision making.

Furthermore, no descriptions were included on either photographs or documents forcing students to analyse what they see as part of the learning process

*Figure 1. Top, re-productions of photographs and documents stored in an archive box. Bottom, arranging materials (Photographs by Matthew Armitt).*

Students began separating material into categories of photographs and documents (Fig. 2) such as photograph type, model types, and document types revealing what material was important through each group choice where each student selected a handful of potentially key material to be taken forward for analysis.

*Figure 2. A group of students sifting through the provided photographs and documents searching for 'key' material to be analysed (Photograph by Jemma Brown).*

Individual groups then began analysing their chosen material to extract a sufficient level of detail through a multi-analysis approach of photograph and document analysis. To achieve new interpretations of architectural history, specific photographs portrayed different meanings, depending upon the content of the image, justifying the requirement for different forms of coding targeting specific pedagogical functions within each of their chosen photographs. These codes consisted of location, model characteristics, materiality and the number of models targeting pedagogical activity in which the "Space" teaching was taught helping to begin compiling material as a timeline to help better understand their findings. After the analysis of photograph, students moved onto document analysis. The documents – classified as assignment drawings were handwritten in Russian making it challenging for students to analyse the wording. In one group, a student had experience of Russian and translated one of the document texts. This revealed key pedagogical wording such as model, clay and other instructions helping to reveal the working function of the assignment. Other students/groups did not possess the ability to translate Russian. They instead chose to analyse the drawings found in the assignments as the form of analysis. Students found relationships between model photographs through line drawings helping to establish deeper connections of pedagogical understandings (Fig. 3). The assignments revealed a clear pedagogy function of instruction where students would construct tridimensional models starting from a two-dimensional drawing. They decided which assignment drawings came before the modelling and that the model was the primary medium used to teach 'Space'. These observations began to form a sequence portraying a narrative of history.

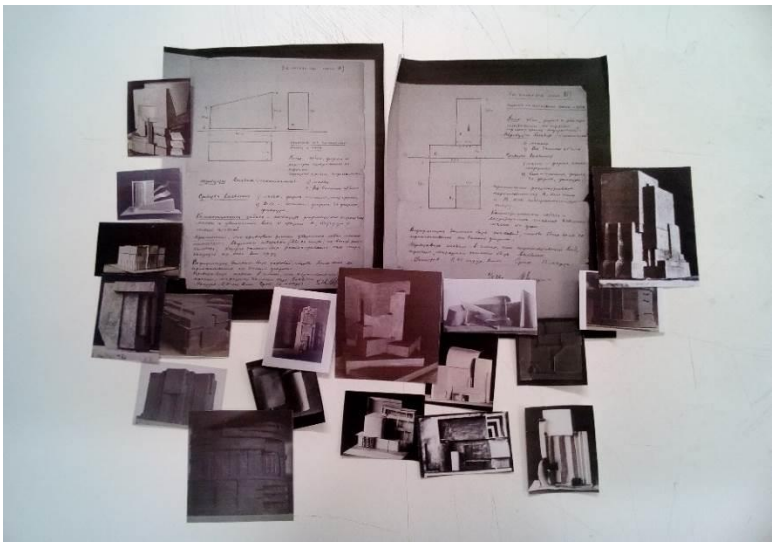

*Figure 3. A group of students searching for visual connections between model photographs and assignment drawings through relationships of geometry, line drawings. (Photographs by Matthew Armitt).*

Each group went on to introduce the comparative study after the photographs and document analysis had been completed enabling each group to understand the material more broadly with other photographs and documents. Analytically, the comparative approach was indispensable for each group causing them to ask and answer questions about the relationship beyond individual material analysis (Fig. 4) allowing for a more comprehensive sequence to be formed.

*Figure 4. An early attempt of a sequence of "Space" teaching (Photographs by Matthew Armitt).*

During the workshop, and using one of the re-produced archival photographs delivered a discussion between teachers and students at VKhUTEMAS was revealed.[9] One group chose to mimic its pedagogical meaning by recreating the moment in past history revealing a playful approach to the

days learning (Fig. 5). It was enjoyable to see this level of engagement take place where students become part of the workshop as opposed to participants

*Figure 5. Top, students recreating a scene from the 1920s (photograph by Jemma Brown). Bottom, teachers and students discussing assignments (1923-1926). (Gelatin Silver Print). Source: currently housed at the Archive of A. V. Shchusev State Museum of Architecture (MUAR), Moscow, VKhUTEMAS Collection. (Photograph by Matthew Armitt).*

After their analysis and comparisons to achieve reflective learning the 9 groups presented a variety of different variations as part of the concluding stage of the workshop. For the purpose of this section, only three out of the nine group's sequences will be discussed.

Group 4 started with a photograph depicting teachers in an office followed by choosing assignments that revealed a 'dual' pedagogical method to construct from two dimensions (paper drawings) into three dimensions models (Fig 6 top). Next positioned where three photographs showing students working in a workshop with a variety of models constructed with different materials such as clay and

card. The next photograph portrayed a discussion between students and teacher in a classroom revealing students presenting multiple photographs of an ‘exhibition’ which appeared as the final stage. Their sequence consisted of six stages.
Group 7 began with a photograph revealing teacher and student interaction. (Fig. 6 middle). This was then followed by four assignment drawings seen to be used to construct three dimensional models. They choose one photograph showing students working in the workshops with a variety of models with different materials such as clay and card and concluding by portraying ‘exhibition’ photographs as the final stage. Their sequence consisted of five stages.
Group 9 used all three methods and also started with the small classroom photograph similar to group 7, followed by assignments which revealed complex wording used to construct from two dimensions into three dimensions models (Fig. 6 bottom). The inclusion of historical references as precedents after the assignments revealed a wider teaching context showing representations of architectural landscapes and paintings as an additional stage not seen through the other two groups. Models of different materials and designs were found, this was followed by a photograph of students taking part in a discussions in a classroom with fellow students and teachers where again the concluding stage included photographs of exhibitions, this time two examples. Their final sequence consisted of seven stages.

## DISCUSSION

Each group revealed similarities and differences at key moments providing a rich setting of collective learning with students witnessing a number of different interpretations which allowed for reflective observations and assimilation as a year. What Group 4 revealed turned out to be a short-sighted sequence using photographs in the wrong order with key teaching stages missing. Group 7 revealed a deeper understandings from the previous group but again through a shorter sequence. However, Group 9 portrayed the correct sequence revealing the correct number of stages in the correct order revealing the experimental form of ‘Space’ teaching. The choice and timing of methods used revealed how some groups more than others had greater success through analysis. All 9 groups in the end compared and contrasted between each other as a year where they ended up learning what was the best approach and what was possible. The model was found to be a device encouraging students to perceive space in three dimensions, revealing the shift from the two–dimensional assignment drawings.

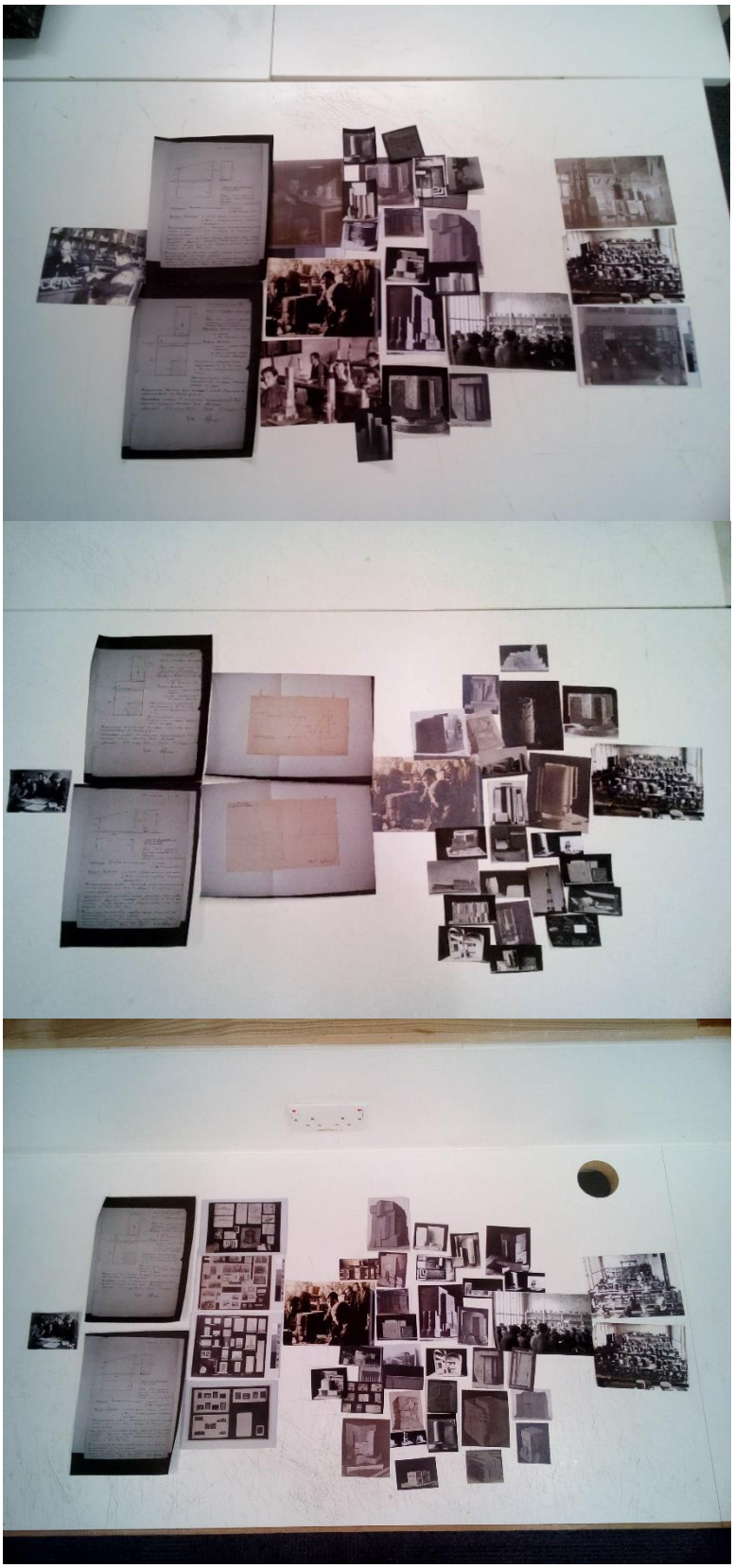

*Figure 6. Top, Group 4 sequence. Middle, Group 7 sequence. Bottom, Group 9 sequence, bottom. (Photograph by Matthew Armitt).*

## REFLECTION

The role of archives taught within architectural learning can be seen to facilitate new learning through participation, problem-based learning and student engagement which remained the workshop intention from the outset. Using the role of 'archives as pedagogical tools' reveals it is possible to bring the archive into the architectural studio to teach students with no previous training in archives. The workshop revealed the role of archives, research methods, and collaborative working helping students to uncover new historical meaning as an important form of learning. Throughout the day each group were forced to make choices through their own analysis enhancing their decision-making skills. It also provided an understanding of a period of architectural history not taught within the architecture curriculum. Engaging with archives has now been identified as an area in higher education where new skills are being developed revealing an opportunity to exemplify the role that archives play in the wider context of architectural education in the future. As an educator, this revealed strong teaching practice and it is hoped that the role of the archive and the importance of architectural methods can play a more central role in an architectural curriculum.

## NOTES

[1] See Paul, Flynn. “Towards a pedagogy of archival engagement.” *Archives and Records,* vol. 41, no 2 (2020): 105-108.

[2] VKhUTEMAS taught pioneering methods of modernist Space design teaching through radical educational experimentation. Teaching methods combined physical cognitive learning with modelling as tools of learning. The changes were accompanied by development of a well-structured curriculum but, more importantly, marked a return to a more conservative academic tradition, increasingly reminiscent of the École des Beaux-Arts model, which it was originally created to oppose. The aim of the VKhUTEMAS, according to the resolution that had established the school, was ‘to train artists of high quality for the benefit of the national economy. See Stephanie Barron and Murice Tuchman. *The Avant-garde in Russia, 1910-1930: New Perspectives*. Los Angeles County Museum of Art. 1980.

[3] Ladovskii was a Russian avant-garde architect, educator and leader of the Soviet rationalist movement who became the creator of teaching architectural ‘Space’ as a form of architectural education.

[4] From the archival visits by the author the material collected was more than 1000 documents, mainly photographs. For further clarification of sourced archival material see Armitt, Matthew. “Teaching Discipline Space: Experimental Architectural Pedagogy at VKhUTEMAS (1923–1926)–Moscow,” vol. 1, and “A Repository of Assignment Drawings, Models, System of Visual Materials, Workshop and Exhibition Photographs (1923–1926)” vol. 2 (Ph.D. Thesis, University of Liverpool).

[5] The use of still photography as a research method has been fruitfully addressed by a number of academics. See in particular Bateson & Mead, 1942; Becker, 1974; Byers, 1964; Caldarola, 1985; Collier, 1967; and Wagner, 1979.

[6] Byer describes photography similarly: “the photograph is not a “message" in the usual sense. It is, instead, the raw material for an infinite number of messages which each viewer can construct for himself.” See Schwartz, Dona. “Visual ethnography: Using photography in qualitative research.” *Qualitative Sociology*, vol 12, no 2 (1989): pp. 120.

[7] See Juliet Corbin and Anselm Strauss. *Basics of qualitative research: Techniques and procedures for developing grounded theory* (3rd ed.). Thousand Oaks, California: Sage Publications. 2008. See Tim Rapley. *Doing conversation, discourse and document analysis.* London: Sage. 2007.

[8] According to one prominent contributor, Jürgen Kocka, heuristically, the comparative approach allows one to identify questions and problems that one might miss, neglect, or not invent otherwise. Pragmatically, comparisons help to distance oneself from the case one knows best. Because of this, comparisons can have a de-provincializing, an eye-opening impact on the analysis. See Jürgen Kocka. “Comparison and Beyond.” *History and Theory*, vol. 42. no. 1 (2003): 39-44.

[9] The photograph description is as follows: Vladimir Krinskii (centre), Mikhail Korzhev (left, in checked shirt) with Mikhail Turkus (right wearing a tie) discussing assignments with students during the 'Space' course at VKhUTEMAS. (Gelatin Silver Print). Source: currently housed at the Archive of A. V. Shchusev State Museum of Architecture (MUAR), Moscow, VKhUTEMAS Collection.

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# CARDBOARD ARCHITECTURE: A MULTIDISCIPLINARY RESPONSE TO COVID-19

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## INTRODUCTION

The COVID 19 school closures have had a significant impact on students' well-being, sense of safety and educational progress. As many students have been without formal schooling for several months, it is imperative to ensure that effective transition methods are in place to support a successful re-entry to the classroom setting. Here we seek to leverage the research evidence on the ways in which the built environment could be used to support the transition back to the classroom post COVID 19 lockdown.

The resulting project is called *Unboxy* - a set of low cost, durable, geometric cardboard shapes that are to be used by primary and lower secondary school students to build temporary objects or structures. Unboxy was a spatial product, imagined as a counter to the social isolation, fear of an unseen but invasive virus, and the breakdown of routine and society norms. Our central question is how does the Unboxy project draw on multidisciplinary design and educational concepts to promote and develop student agency and wellbeing.

The development of the Unboxy project involved the following processes: problem identification and design ideation; research and design; prototyping; commercialisation. The focus of this paper is on the research and design component. This included the following steps: identification of relevant education and design concepts; unpacking existing design and education research with potential application to enactment in post-pandemic school contexts; and enabling research and design teams to share knowledge and engage in the dynamics of the design process.

The original impetus for the project came from the leadership teams at Australian firms Y2 Architecture and Innovation equals Design and Education (IDE). All staff time was provided pro-bono. The architects at Y2 were themselves dealing with working from home, with a sense of dislocation from colleagues and their work culture. The original idea was for cardboard shapes that could be used for social construction of objects or shelters within the classroom. This was based on the idea that building activities would be inherently fun, satisfying and non-discriminatory. The developers wanted a product that would not require students to read or follow instructions, but that anyone could use as a safe space. The concept of wellbeing was the central idea. A product development process was set up in May 2020, including Research, Design, End-User, Logistics and Marketing teams.

The research team was assembled during the first week of the process, in order to respond to the original problem and design ideation phase. The purpose was to identify and summarise existing research literature about the ideas being generated – essentially to frame the thinking of the team. From the first meeting a rich learning environment was created, with open and participatory workflows. The shared purpose was to create a competitive, marketable, solution to be adopted by schools initially and then be the basis for broader application.[1]

The researchers were made up of colleagues who had worked together previously, but not all as one team. The guiding principle was to find researchers who had expertise in either classroom design and use; learning and wellbeing; responding to students experiencing trauma; and early childhood education. The research team had to contribute through: dynamic engagement in theoretical discussions, actively participate in the design processes, provide analysis of contextualised pedagogy and practice, and critically reflect on enactment of design prototypes.

Another key requirement for the research team membership was a capacity to work across disciplines and be product focused. This was important as there were regular problem-solving interactions between the design and research teams, providing the unpacking of concepts as they emerged, from research to practice, trying to introduce a critical practitioner perspective, and applying concepts to 'real-world' practice.[2] This was an example of a distributed collaborative product development, using the interactive capacities of technology.[3]

## KEY PROJECT CONCEPTS: EDUCATION AND DESIGN PERSPECTIVES

In conceptualizing the optimal vehicle for classroom re-entry facilitation, the research team focused on three key areas related to wellbeing: student agency, security and space. These three ideas emerged as organising concepts during ongoing reflective discussions within the research team. These concepts are outlined in Table 1 and are further discussed below.

### Agency

Agency is defined as two distinct experiences: will and action and exists through interaction with the environment in which they are embedded. The multidisciplinary interests informing the Unboxy project, explored the agentic opportunities of the construction materials to support students return to school from forced lockdowns and isolation to relocation and social interaction. The designers focus on the potential of the materials and constructions was informed and reformed through dialogue with the educators´ interest and experiences. The research team, drawing from the literature, provided the conceptual framework for the discussions and articulated the emerging ideas strengthening the initial intent.

Educators, primarily concerned with student agency, are focused on the decision-making power in actions and interactions and view it as central to student engagement and wellbeing.[4] In the COVID-19 environment where students are disempowered and disconnected from their peers and teachers, educators emphasise the need to restore decision making powers and offer opportunities for social interaction and debate. The educators interest lay primarily in the need to provide opportunities to re-establish a sense of safety in classrooms through including students in decision making processes and providing opportunities for discussion about how they can be together again in the spaces they create.[5] These dual concerns of decision making, and interaction were interpreted by the design team in simple triangular shapes which could be formed and reformed through group negotiation in multiple ways. The cardboard material and simple joins offered an array of design choices and outcomes responsive to the decision's students made and required group collaboration to form large structures to inhabit.

The designers, while also concerned with designs that enable students to choose how they work with the materials and what they create, also saw the potential for observing how students chose to work within their classroom spaces. Through providing student agency, the architects recognised the potential of the Unboxy constructions to inform their work with educational environments through observation of the preferences and choices students made about inhabiting the spaces they created.[6] Designers were interested in students authoring their own spaces in order to explore and inform future classroom designs from the student perspective. This investigation was reflected in the survey instruments and research questions designed by the research team responding to the architects' inquiry, widening the scope and relevance for the research project.

The research team's interest in the connections between the Unboxy project and student wellbeing, took into consideration the intent of both educators and designers, making links with the literature to describe student agency and ownership. Articulating the opportunity for students to make a series of decisions around the construction, design, placement and function of Unboxy ensued a deeper experience of the materials and clarified their purpose to the schools who were engaging with the project. The sense of agency and ownership generated through Unboxy, raised teacher's awareness of its potential to reduce anxiety and reunite students within their classrooms. Furthermore, the research team communicated the opportunity for teachers to observe their students in the making and reflect on what the constructions and interactions might reveal about their feelings in their transition from home to school. In this way the research team drew together the concerns of the wider multidisciplinary Unboxy team ensuring a sharper focus on what might be gained and bringing a greater clarity of purpose to the constructions.

### Security

Another of the conceptual themes was the need to cultivate well-being through establishing a sense of security utilizing the physical environment. Ultimately, Unboxy provides students with a kinesthetic focal point for which to collaborate through constructing a physical space, object or architectural design of their own choosing. Drawing upon decades of research on the "stimulus shelter", the research team aimed to ensure that students could construct these shelters, should they so choose. While a stimulus shelter is just one potential design outcome of Unboxy collaboration, it is not uncommon for students to seek to create structures that they themselves can use for their own purposes and needs. In the post COVID 19 era, this is particularly salient as students seek to symbolically and concretely re-build the school experience that they were forcibly relocated from[6].

The re-building process is likely to involve different interactions with the environment, including bending, crawling, and climbing as part of developing spatial skills and translating ideas into physical entities. The hands-on nature creates an emotional reaction as students manipulate personal, spatial and relational space.[7]

The concept of the stimulus shelter refers to the enclosed or semi-enclosed areas within the classroom that afforded a sense of privacy and refuge. In the traditional classroom setting, a stimulus shelter can be created from a bookcase, tent, or other furniture. The main characteristic of a stimulus shelter is that it is somewhat separated from the main classroom, yet still a part of it. These spaces can be co-opted by students, for brief periods of time, in order to escape the activity of the classroom.[8] The benefits of the availability of such a space are many. The shelter offers students a place for rest and regrouping, both critical as stress levels are likely to be intensified as students transition back to the classroom environment. The stimulus shelter also provides an opportunity for individual or small group work. Given that it is expected that academic skill loss will vary significantly among students at the same grade level, differentiation of educational content through individualized and small

teamwork becomes increasingly critical to re-establishing needed educational benchmarks. Enclosed nooks within the larger classroom space are also conducive to becoming ideal areas for assisting students with sensory or other learning issues, given the manageability and smaller size of the enclosure.

The Unboxy design needed to be sympathetic to the need for the creation of shelter which carried with it some significant considerations for the design team. The materials and shapes were required to enable students to collaboratively create constructions that could be large enough to contain a group, and stable enough to be created without adult intervention. The idea of shelter implied roof structures and tunnels that students could build safely and successfully. The resolution of these design features required the teams to constantly negotiate competing interests.

| Concept | Educator interpretation | Designer interpretation |
|---|---|---|
| Agency | Thinking/will<br>Action/choice<br>Engagement<br>Decision making | Interaction with environment<br>Creating own spaces or objects |
| | Objects<br>Materials<br>Resources | Building materials |
| | What students make? | How and where students construct? |
| Security | Experience – perceptions, actions, reflection | Embodied activity – building and re-building |
| | Safety, boundaries | Spaces within spaces - shelter, nooks, niches |
| Creating spaces | Participation | Social interaction, teamwork |
| | Belonging, ownership, place, transition | Spatial awareness, creating |
| | Abstract thinking, problem solving | Generative spaces, open-ended making |
| | Communication | Representation<br>Authorable spaces |

*Table 1. Interplay between concepts*

## Creating spaces

The Unboxy project provides the opportunity to create space for education and sharing experiences, and it encourages appropriation of their education through the design process. The Unboxy project required the research team to become involved in new ways of synthesising evidence through the practical application of both architectural and education research to configure a resource for students in post-covid learning environments.

The Unboxy tool integrates education concepts with design features. This occurs as students use Unboxy as a vehicle for becoming involved in the creation of their own space. This agency helps them reimagine the classroom environment while becoming active participants in where they learn.

Drawing upon psychological frameworks for emotional regulation, it is understood that students use physical objects as a projection of their own emotional stage during troubled times. What is created can be viewed as an externalization of their wellbeing. In addition to serving as a physical cue or reminder of new rules for engagement within the created environment.

From an education perspective, we believe that Unboxy can exert an impact within the classroom environment through the introduction of generative spaces that has been created by students with the intention to best adapt to their needs. Design can work to disrupt what is normally taken-for-granted; both the normalised and the neutral elements of design. It is for this reason that the idea that students have the chance to create their own space is unique. It was therefore important for the Unboxy materials to emphasise the opportunity for students to explore their construction and the spaces they chose to work in, free from instruction or adult parameters. In this way teachers and students are co-creating spaces that will help them engage in a dialog about where and how learning occurs.[9] This is in keeping with a constructivist view of learning as a collaborative process between adults and students and between students and their peers.[10]

Finally, engagement with Unboxy can result in reimagining the space of the classroom. This sort of generative thinking can occur through various activities: creation of spaces or artefacts that can reclaim, make, or remake school spaces.[11]

*Figure 1. Example of Unboxy in action*

## PRODUCT REALISATION

The Unboxy product is a response to the above education and design concepts. Several product features were identified in response to these concepts: hands-on pieces that can be joined multiple times/ways; allowing creation of 3D structures that are stable; strength for reuse and active play; made up of geometric shapes to allow for science, mathematics, engineering and technology projects; pieces that are durable, textured, writable; enough pieces in one kit to support building a small shelter; supports individual and social building projects; while some basic design options were provided, the kit allows for open-ended, creative, building; and pieces that can be combined; small and large repetitive geometric shapes, and hard-wearing joiners. Figure 1 is an example of the Unboxy project in action. Student use of Unboxy draws on problem solving, critical and creative thinking and making skills. This example is of a free-standing shelter.

## CONCLUSION

Unboxy is a project to mediate the transition for students returning to school post-pandemic – a cardboard design and construction kit, consisting of geometric shapes and joiners. This paper reports how a multi-disciplinary research team worked the design and end-user teams as part of a research and design process. Through this, we identify the key concepts that are likely to promote and develop student agency and wellbeing.

The research and design process included the identification of relevant education and design concepts; utilised existing research with potential application to enactment in school contexts post-pandemic; and enabled research and design teams to share knowledge and engage in the dynamics of the design process. The end point was a commercial product with potential for multiple end-user groups. The role of the research team was to actively participate in the design processes, provide analysis of contextualised pedagogy and practice, and critically reflect on enactment of design prototypes.

Three concepts were identified that drew on both education and design research: agency, security, and creating spaces. As outlined in Table 1, we defined and applied these concepts to the product specifications of Unboxy. The final product provides students with an open and experimental canvas, providing a license for imaginative exploration, engagement and learning in the post-pandemic classroom.

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# EDUCATING FOR A DEMOCRATIC PRACTICE OF ARCHITECTURE

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## INTRODUCTION

Educating future architects for a democratic practice of their profession requires, on the one hand, theories that guide students in their efforts towards the promotion and preservation of democratic values in the environments they will affect with their work. On the other hand, it requires methods that incite them to contribute to architecture as independent thinkers, and that enable them to establish distinct architectural positions while engaging productively with others.[1] The first requirement deals with setting theoretical goals for architecture and the city (e.g., what would a democratic architecture be like?), the second deals with the role of architects in practice: how they do their work, position themselves and collaborate with others in the production of the built environment. In the academic year 2019 – 2020, two European graduation studios developed a shared pedagogical approach to foster democratic architectural practice, in a joint project for the city of Skopje, North Macedonia.

In the following pages we will lay out the general and specific considerations that led us, as researchers and educators, to orient both studios towards democratic practice using this approach.[2] We will describe how the context in which we chose to intervene, the city of Skopje and the many tensions that define it, offered fertile grounds for the exploration, examination and discovery of architecture as a democratic practice. Further, we will advance three theoretical goals for its development, in the belief that they constitute key democratic purposes for the city, addressing the potential urban environments should offer to citizens: the possibility to find meaning, the possibility to appropriate space as something for which they care, and finally, the potential for different individuals to integrate in this environment. An account of the pedagogic approach utilized by our collaboration will be followed by salient examples of the outcomes, which – as we hope to make clear in our closing remarks – suggest simple and clear strategies to promote open and productive relations among architects, as well as to develop open built environments that encourage fruitful cohabitation among citizens.

## SKOPJE AND THE CHALLENGES TO DEMOCRACY

Our collaboration focused on Skopje, a city conquered by the Ottoman Empire, inscribed within a kingdom after World War I, within a socialist republic after World War II, and currently tense between global economic interests and regional power struggles. Skopje exhibits the scars of a

massive earthquake, and continuously fluctuates between conflictive ethnic condition and unifying efforts in multiculturalism, both being influenced by the rise of divisive and dissociative political initiatives as well as fragile economic situation.[3] As elsewhere, the recent rise of these initiatives has quickly eroded fundamental democratic values among the inhabitants of this capital.[4] Individual freedom and collective solidarity, for example, have been threatened by dogmatism and animosity between identitary factions.[5] As a historical crossroads, Skopje is no stranger to attempts to segregate rather than unite society, and can therefore provide us with both testimony and warning of the challenges faced by intrinsically diverse societies.[6]

Simultaneously, the city's architecture has been shaped largely by historicist and utopian projects (i.e., idealized visions of past and future) that tried to impose a unitary model for the city. After the 1963 earthquake, for instance, a modernist utopia was envisioned as a new backbone for the city. Like other radical architectures of its time, the so-called "metabolist" project entailed a deterministic vision of progress that introduced an unfamiliar urban structure, as well as unprecedented configurations and scales on the existing urban fabric.[7] The more recent *Skopje 2014* initiative to redesign the city's center, on the other hand, tried to homogenize buildings and spaces under a unitary aesthetic.[8] While the modernist masterplan presumed that the city and its inhabitants shared the singular ideal of progress projected by a team of Japanese architects; the 2014 facelift pretends that North Macedonians agree on a simplistic reading of the past, expressible in faux neoclassic decoration, taken for local.

But to what extent can such attempts for uniformity respond to the real possibilities and needs of the many individuals that jointly use and produce this environment? Is it desirable or feasible to simplify the ambitions and perceptions of a society under a single, prevalent architecture? In the face of these questions, it would seem that rather than utopian masterplans or nostalgic renovations, piecemeal action and open negotiation among individuals are able to generate more resilient social artefacts – be they laws, institutions or cities; artefacts which are open to new and unforeseen possibilities, and consequently able to adapt and change.[9]

## AN EDUCATIONAL FRAMEWORK FOR DEMOCRATIC ARCHITECTURE

Based on this premise we invited our students to explore, evaluate and discover three concrete qualities that characterize built environments in which citizens have historically thrived, not despite but precisely because of their diversity.[10] We see these qualities as theoretical goals, in the sense that they not only define a notion but also strive for a conceptual envisioning of what a democratic city should be like.[11] Firstly, citizens should be able to establish *meaningful* relations with the spaces they use and inhabit. This means both being able to identify meaning in those spaces, but also being able to endow them with new and useful meanings. Secondly, citizens should be able to *appropriate* those spaces, by being able to project their hopes and feelings onto them, empathically. Finally, citizens should be able to *integrate* with each other through their use of built space, based on their ability to consensually imagine and execute joint visions of possible futures for the city in which they all live.[12]

These three qualities – meaningfulness, appropriation and integration – are essential to democracy, in the sense that they ensure genuine, productive participation from citizens in the construction of their everyday reality. Individuals who cannot identify any familiar message or any recognizable pattern in the spaces and buildings that surround them are by necessity excluded, not only from the use of their environment, but also from its development. Those who are unable to envision a future for themselves in a particular place, or feel unable to transform even minute aspects of their immediate surroundings, will hardly recognize themselves as citizens. In both cases, the inability to truly and actively participate – a sine qua non of any functional democracy – corrodes an integrated society, understood

as one that is coordinated and open to transformation in order to benefit its associates. As concrete goals for the built environment, the qualities of meaningfulness, appropriation and integration are intrinsic to the democratic practice of cities, because they entail citizens' right and duty to produce and claim their built environment according to their own interests, and in consensus with the interests of others.

While the above-mentioned goals for the built environment are essentially theoretical, their pursuit demands that architects adopt a distinct position within their discipline. It does not seem feasible, for instance, to work towards citizens' empowerment on the basis of dogma. Simply mimicking architectural trends, on the other hand, might not be the best response to complex societal issues either. Instead, the collaboration between our two studios encouraged students to position their work methodologically, in relation to the mentioned theoretical goals and to the given context, understood as the result of the interwoven natural and cultural aspects that define Skopje's reality, including the formal and technical features of local architectures.

This positioning was complemented with the methodical imagination of projects, understood as visions of possible futures for the built environment together with the instruments and methods required to achieve them.[13] With slight differences between the two courses, all students developed the analytical and projective phases of their studio around the framework described above, rather than on a predetermined brief or site. The freedom to define what specific aspects of this reality were worth interrogating and addressing, to define a situation or site where those aspects could be best developed, and to formulate projects based on those definitions, presented students with the need to act as independent thinkers.

Students from TU Delft engaged in a graduation studio, extended over a full year, while students from SS. Cyril and Methodius University developed their projects over the course of a single semester. Two joint moments happened: in Autumn 2019, the students and teachers from TU Delft visited Skopje for several weeks, living in apartments across the city and becoming part of urban and academic life in Skopje. With their Macedonian colleagues they visited a number of architectural landmarks and participated in an intensive workshop on 'Urban Narratives', addressing social-spatial practices in the city at several sites through the use of narratives. They observed human behavior in urban space and interviewed people about their experiences, memories and imaginations of their built environment. Early 2020, the students and tutors of both groups met again in Delft, where work from both studios was presented at an exhibition.

## Narratives: fragments and wholes

Adjusting to available time, the group of North Macedonian students focused with special attention on narratives, understood as the stories crafted by individuals and groups to register and communicate their experience of the city – a fundamental source of knowledge for the architect.[14] Defined in their plural form, narratives play a key role in the democratic practice of the built environment, as they acknowledge multiple and diverse experiences, as opposed to univocal, absolute and ubiquitous views or actions on the city. It was in this capacity that narratives were used as basis for the design of new spatial and programmatic performances for Skopje.

Concretely, the group studied and developed three existing narratives which have a strong conceptual and architectural presence in Skopje – brutalism, temporality and open-end-ness – and developed them into several new projects for a particular site in the city's center. Like their colleagues from Delft, they explored, evaluated and discovered the city as a complex system of values and information. In more practical terms, their research and design work was undertaken as a collective effort which developed, from the three initial narratives, five new urban proposals used to intervene in

the chosen site. As the students themselves could take position as actual citizens of Skopje, using both their individual and collective experience and analysis of the city as the basis to develop their visions, we could call these proposals new narratives – indeed stories to register and communicate their take on the city, as citizens and as architects. [Figure 1].

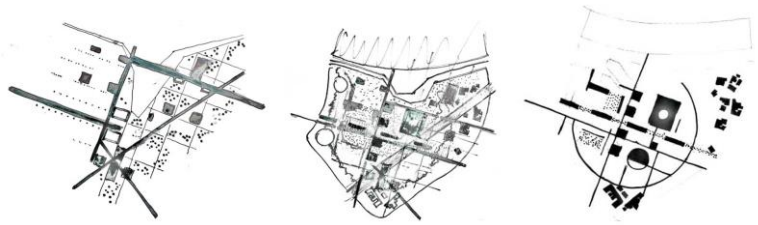

*Figure 1. Different narratives for a single site: conceptual drawings / sketches / models.*

Their collective effort did not aim to impose a single architecture on the city, but rather to develop several themes, reflecting different positions, simultaneously. Each of the five urban narratives developed by the group of North Macedonian students led to the conflation of different programs in a single final composition, given the limits imposed by operating on one site. Eventually, and through multiple iterations, connections, intersections, juxtapositions, and overlaps, the five new narratives converged in a complex project for this particular setting.

Let us examine these new narratives:

1) *Streets do not have to remain attached to the ground.* The narrative developed by Ivana Kocevska and Angela Kuzmanovska envisions the idea of free movement and flow of people, through different paths at different levels, replicating the richness of street life beyond the limits of a singular level. As architectural outcome, this is materialized as a network of bridges, or elevated streets, which are able to embrace different programmatic and spatial additions that prompt unforeseeable human actions. Among these elevated streets, a series of scattered outdoor programs can emerge, resonating with the open-ended configuration of the existing City Trade Center (GTC), a historic landmark of modernist Skopje.

2) *The massive presence of brutalist architecture can be broken.* The narrative by Mariana Gileva and Martina Velkova explores and evaluates so-called brutalist architecture,[15] suggesting its large masses or volumes can be ruptured. The resulting proposal which brings this narrative into architectural form offers increased connectivity between previously detached levels.

3) *New and more interconnected forms of dwelling are possible*. The increased connectivity observed in the above-mentioned challenge to brutalism was also taken as starting point to re-think the residential towers that dominate the site. Arrayed in a manner that continues and concludes the 1960's City Wall complex around the inner Skopje centre, this part of the project interrogated conventional housing prototypes visually, materially and functionally, by introducing common areas with activities that stimulate cooperation between residents.

4) *Open-ended public spaces foster appropriation or marginalized individuals*. The extension of the residential tissue just described in the abovementioned proposal (by Ljubica Bojadzieva, Jordan Lazorovski, Tijana Stankovska and Dimitar Stefanovski) opened space for the design of a floating square with modular pavilions and an open space underneath that can be appropriated by a multitude of individuals, via graffiti, music and sports activities.

5) *Together with multiplicity and complexity, there is also value for autonomous architectures.* Derived from their study of brutalism, students Angel Mladenoski and Tamara Stefanoska also recognized the distinctive and unique atmospheres offered by singular or monumental buildings. The

notion of atmosphere was taken as a generative point to defining a specific program for part of the project – a museum that houses different exhibitions, lectures and discussions. The formal appearance of this project – a circle – defines a complete and distinct entity, although programmatically it is capable to extend its content in the surrounding, and also invite the public-ness inside.
Jointly, these five new narratives for Skopje speak of architecture as a collective, cognitive practice [Figure 2], able to cater to the many narratives, individual socio-political desires and beliefs that constitute the experience of collective memory, as the city itself represents. Through extensive discussions and negotiations, these students were able to recognize values form their work in that of others, and vice versa, leading to a high level of coordination and integration among all team members, as well as in the final, joint result of their individual efforts. In semantic and compositional terms, this result is a complex project that is able to integrate urban fragments and performances in unprecedented ways.

*Figure 2. Collaborative working and learning*

## Providing possibilities for action in public urban space

While the students from TU Delft also undertook the analytical stages of their work in small groups, the synthetic project phase was individual. After having compiled an extensive research book as a group, each student launched a proposition, and based on it developed a full-fledged intervention for a chosen site in the city which resulted in projects ranging from conventional buildings, urban designs, and public spaces, to interiors, micro-interventions on building elements and renovations of existing buildings. The students benefitted from the diversity of their individual ambitions and inclinations, and eventually recognized their own projects as parts of a richer whole. For this contribution, we will highlight three projects as part of this diverse take on the city. Together, they show how the definition of theoretical goals and methodologies aimed towards democratic practice generates rigorous architectural propositions, which respond to existing conditions and offer new knowledge of the built environment, simultaneously.

Holly Dale's project stemmed from the proposition that urban life could benefit from the insertion of domestic qualities and activities in public space. The process was undertaken partly via an open competition. Questioning the role of the architect, she deliberately developed a mixed approach in which the architect developed part of the project, and opened the development of other parts by others. The proposed cooperative scheme challenged the conventional alignment of formalized education and practice around the figure of the architect as an individual form-giver. [Figure 3]

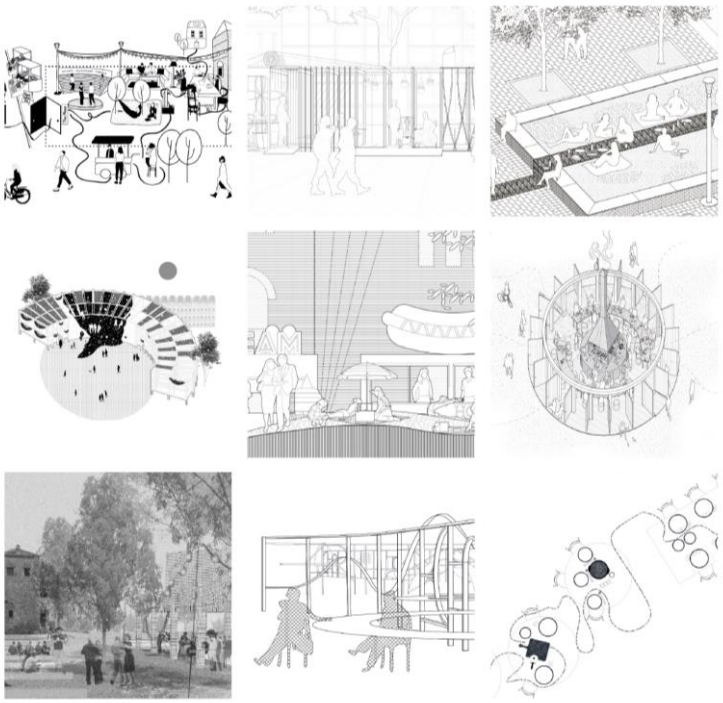

*Figure 3. Participating entries in the competition.*

Leonie Meisel proposed to refurbish the dilapidated post office, a remnant of the utopian, metabolist project for the city. Instead of assuming her work as a single, unitary project, her project was developed on the basis of micro-investigations into specific aspects of the existing architecture – a piecemeal approach to architecture. The project reused the situation, shape and material presence of the building, making it accessible, not only physically but also aesthetically to a diversity of citizens, as a playground that results from offering small solutions to specific problems, rather than defining a masterplan.

Also tapping into a latency, understood as unused potential left by deterministic projects for the city, Lucija Grofelnik chose to intervene in one of the most symbolically charged areas of Skopje's center. At the very point where historicist and utopian visions collide, a functional infrastructure – a parking lot under Mother Theresa square, circled by the incomplete modernist Cultural Center – was reinvigorated with a public use that refused to add to the chaos of the city, via the modest yet rigorous organization of space on the basis of modulation.

## CONCLUSION

As we have shown, the city of Skopje and the many tensions that define it are fertile grounds for the exploration, examination and discovery of architecture as a democratic practice. The outcomes of our collaboration also shows that, when allowed to operate on the basis of openness, independence and rationality, both architects and their work benefit from the rich environment generated by open discussion. The projects we have described are certainly nuanced and complex, yet rigorous. In all cases, they represent some degree of progress, understood as the growth and development of knowledge. This progress, we trust, is a fundamental justification for democracy.

Aside from tangible improvements (i.e., more meaningful, appropriable and integrative buildings and spaces, able to recognize the needs, possibilities and hopes of more citizens) in the built environment, the group of students engaged in this collaboration was able to question their education, by recognizing it as a formative process, rather than as the simple or passive reception of information. The result of their efforts suggests new and exciting ways of practicing architecture, based on robust and reliable personal and professional skills, but also in genuine openness to competition and collaboration. We can conclude confidently by stating that this group of students have been able to acquire reliable skills as professionals, while gaining awareness of their duties as architects in a democratic society.

## NOTES

[1] The value of understanding architecture as a conversation carried out by different individuals around a discernible topic, is suggested by: Sarah Williams Goldhagen, “Something To Talk About: Modernism, Discourse, Style,” Journal of the Society of Architectural Historians, Vol. 64, No. 2 (2005): 144 – 167

[2] This collaboration stems from and complements the efforts of EU funded COST Action 18126 “Writing Urban Places: New Narratives of the European City” in which all co-authors are involved. For more information on the action, see: writingurbanplaces.eu

[3] An overview on the diverse elements of urban design in Skopje, remnants of the past and current, is presented in “Skopje, a Modern City?”, Unpublished Report of the Research project #3 by group of authors (Elisabeth Deipenbrock, Mendy Heid, Charlotte Herbst, Charlotte Kaulen, Luise Koehler, Magdalena Pudimat, Maria Rohde and Kevin Vincent) led by Maren Harnack at the HafenCity Universitaet Hamburg in 2010
For further information on Skopje’s modernist history, in the period 1914-2014, see: J. Ivanovski et al., *Findings* (Skopje: Youth Cultural Center, 2014)

[4] A critical review followed by projective ideas for restitution of the basic resource of democratic space, as recognized in the notion of ‘freespace’ is presented in: Slodoban Velevski and MArija Mano Velevska, M., eds., *Freeingspace* (Skopje: Museum of Contemporary Art, 2018)

[5] The link between dogmatism and factionalism based on identities comes from Estanislao Zuleta, who defines dogma as any idea that is taken for inseparable from an identity, in Estanislao Zuleta. *Elogio de la Dificultad y Otros Ensayos* (Cali: Fundacion Estanislao Zuleta, 2001)

[6] To explore the potential of crossroads beyond divisiveness see: Benedicte Zimmermann, “Histoire Croisee: A relational, process-based approach,” Footprint 26 (2020), 7 – 14; and Mary Louise Pratt, “Arts of the Contact Zone,” Profession (1991), 33 – 40

[7] The process of rebuilding Skopje after 1963 earthquake, greatly marked by world solidarity, is documented in Town Planning Project, *Skopje Resurgent: The story of a United Nations Special Fund* (New York: Stationery Office Books, 1970). In the last ten years a series of publications documenting projects of that period have emerged in the attempt to value the ‘unfinished modernization’ of architecture in the Balkan region, including: . M. Mrduljash and V. Kulich, *Unfinished Modernizations: Between Utopia and Pragmatism* (Zagreb: Croatian Architects' Association, 2012), and V. Kulic et al., *Modernism In-Between: The Mediatory Architectures of Socialist Yugoslavia* (Berlin:Jovis Verlag GmbH, 2012). This last book evolved into a remarkable exhibition in 2018 at the New York MoMA, entitled “Toward a Concrete Utopia: Architecture in Yugoslavia 1948-1980.”

[8] The recent phenomena of transformations in Skopje have been subject of numerous articles, research and academic discussions, including: Ivo Buleski, Tearing apart a city: architecture as a tool for social manipulations at the example of Skopje, Macedonia. *(Torino:* Politecnico di Torino, 2017)

[9] Stanford Anderson, “Environment as Artifact: Methodological Considerations,” Casabella, 359 – 360 (1971). 71 – 77

[10] Stanford Anderson, “People in the Physical Environment: The Urban Ecology of Streets,” in *On Streets*, ed. Stanford Anderson (Cambridge, MA and London: MIT Press, 1986): 1 – 11

[11] According to definition of theory as the explanation of what architecture is, the definition of the principles that guide its practice, and the justification of a course of action for its development, in: Jorge Mejia Hernandez, Transactions; or Architecture as a System of Research Programs (PhD dissertation, Delft University of Technology, 2018) 15

[12] These are the goals for the built environment developed by the above-mentioned COST action, and recently developed in the online conference “Meaningfulness, Appropriation and Integration of/in City Narratives” (https://writingurbanplaces.eu/wup-news/successful-online-conference-meaningfulness-appropriation-and-integration-of-in-city-narratives/)

[13] These qualities of the project are based on: Marx Wartofsky, “Telos and Technique: Models as Modes of Action,” in *Planning for Diversity and Choice: Possible Futures and Their Relation to the Man Controlled Environment*, ed. Stanford Anderson (Cambridge, MA: MIT, 1968). 259 – 268

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[15] The definition of a “brutalist” style in architecture is usually ascribed to Reyner Banham, “The New Brutalism,” Architectural Review (December, 1955): 354 – 361. However, it is habitual that Banham’s definition is diluted and

expanded to classify buildings made mostly with reinforced concrete, used not only structurally but also in partitions and even minor elements, which therefore appear as massive and rough.

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# COMBINING METHODOLIGIES: TEACHING COMPLEXITY TO IMPROVE STUDENT DESIGN SOLUTIONS

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## INTRODUCTION

Sustainability is addressed to varying extents in the architecture academe. The more explorative studios include systems-based approaches. However, there remains a preference to keep traditional studio approaches, where sustainability is only an extra step added-on to existing pedagogy, usually in the form of energy simulations. What is required is a mindset shift to a robust systems thinking approach that expands beyond conventional architectural roles and skills. To design in response to visible, urgent events no longer suffice. Instead, design methods that accommodate solutions to current events and invisible, long term, "downstream" effects are required. The ideal built environment would adapt to existing and future threats rather than respond with overly specific solutions unable to adapt. Complex systems require greater respect since they include feedback loops that shift a system from one regime to another, suddenly accelerating issues that confront the architectural profession, such as climate change, housing shortages, and global pandemics.

If we conceive of such issues as lying within a bounded problem space, and current solutions as a small subset of that problem space, then much of the underlying issues are unknown, ignored, or disconnected. For innovative and sustainable solutions to evolve, awareness must expand (i.e., become holistic) to include more of the problem space (Figure 1). This requires transgressing traditional boundaries and borrowing tools from other disciplines, as the underlying problems arise from multiple causes that interact despite their classifications into discrete realms. The inability to operate across traditional conceptualizations and classifications perpetuates undesirable outcomes and prevents meaningful remedies. In response, educational studios can explore and adopt new insights and tools. Challenging students to think holistically, test rigorously, and design for adaptability enhances their comprehension of complex issues and helps provide robust design solutions. This paper reports on such approaches and the student work generated through them.

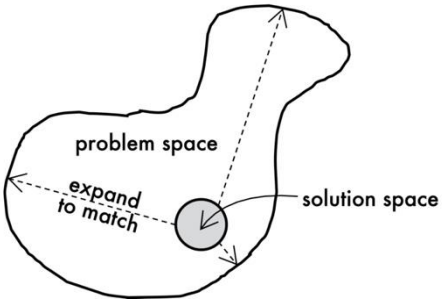


*Figure 1. Current design techniques need to expandto address the entire probem space*

## PROBLEMS

Academic architecture studios focus on specific themes and skill development that are multidimensional, but not holistic. It's common that sustainable studio projects focus on energy efficiency and the site; and socially conscious design studios focus on community and culture. The complex reality is that all must be considered in any design. It's impossible to have a sustainable building without taking into account the social/cultural dynamics; and it's impossible to have an equitable design without considering energy efficiency. From a holistic perspective, efficiency may not be the best choice if it reduces future options and adaptability; or the assumption that climate data will not change over time limits the ability to provide thermal comfort in the mid- to long-term; or to propose design solutions that unknowingly isolate communities from each other and the environment will diminish social cohesion and wellbeing. Such hyper-focus conceptually severs the connections between issues and may stem from a mindset developed over the past decades that assume perfect knowledge, a static environment, and a world without limits to growth. Without incorporating relationships connecting the different studio foci, complex problems cannot be solved. Ultimately this prevents students from developing essential and valuable skills needed in their future careers: how to integrate, analyze, and manage complex issues to propose effective solutions.

An inability to think across scales also constrains students' awareness of their design impacts on other scales. The consequences of a design on neighbors' views or access to daylight; stormwater runoff as a result of building footprint size, or ground surface materials; the impact on the community's real estate market and potential for gentrification are results. What is needed is a rigorous tool to look across scales of the built environment, since limited perspectives lead to limited understanding.

Another contributing factor is students' tendency to ignore how their designs may effect outcomes over time. Without adequate tools, students may not wrestle with notions of formal expressions in tandem with ethical questions, such as erosion, biodiversity, or rates of material extraction and transportation to provide the materials of their buildings. These issues are central to design investigations and proposals, and will play a larger role than it has for professionals in the past.

Without tools to help expand students' field of focus, they may contribute to the very outcomes they are attempting to change. This perverse result is seen across industries. Unrestrained lumber harvesting can lead to deforestation thus diminishing the availability of lumber in the future. Urban, civil, and cultural meaning derived from the built environment can be undermined by the demolition of historic buildings. There are predictable pitfalls, known as "system traps", to which students may fall prey, such as the Fishery Dilemma Trap or the Success to the Successful Trap[1]. Without tools to warn of these potential traps, they will persist as a result of failed action from limited understanding.

In a world of complex systems, knowledge is opaque. However, it's possible to be more certain if ideas are tested rigorously, early, and frequently. If tests are not conducted early during schematics, it

can lead to poor fundamental choices that then force unfortunate design decisions later (if addressed at all), and ultimately lead to diminished designs. Without forming and testing hypotheses early and often, meaningful and new knowledge is impossible.

Buildings designed with a high level of optimization make it difficult, or impossible, to change over time; including their form, building orientation, and even the building location, as sea levels rise and forests burn. What once seemed like a smart safety and building performance decision, inoperable windows are now a liability during the spread of SARS-CoV-2[2,3,4,5] and a lack of natural ventilation increases GHG emissions. However, studios rarely consider accommodating multiple owners and changing programs over time, let alone global pandemics and other infrequent, impactful events. An inability to adapt to fluid circumstances can be dangerous as buildings are routinely demolished at the end of their limited usefulness, contributing to climate change.

Adaptability is a central characteristic of resilience. Walker and Salt argue sustainability in social-ecological systems requires resilient systems[6], and Wu and Wu write that, "sustainability should focus on the system's capacity to create and test opportunities and maintain adaptive capabilities" rather than "maintaining a system at its equilibrium state by reducing the variability in system dynamics or optimizing a system's performance"[7]. The preference for adaptability over stability is counterintuitive to the belief that sustainability means equilibrium. Instead, resilience and sustainability require states of change in cycles known as "panarchies" that move through periods of birth, development, degradation, and destruction[8]. As such, polarities such as birth and destruction are more usefully conceived as stages of a singular process that are ascendant at appropriate times. The key to maintaining functionality across the stages is the ability to self-organize, that is, the ability to accommodate these changes rather than to resist and eliminate them[9]. And because systems are complex, the adaptive capacity spans scales. A fundamental example is thermal comfort, where an individual may seek comfort through clothing (individual scale); opening a window (building scale); choosing to sit in the shade of trees (site scale), or in the sunlight available as a result of the surrounding buildings as defined by the city's zoning regulations (urban scale); experience air temperature impacted by climate (global scale). The adaptive opportunities available (or not) at each of these scales are the result of design decisions, with downstream effects on an individual, building, systems, and culture. The insight from a systems-based perspective is profound, and requires a mind-shift to protect opportunities for self-organization at every scale and in perpetuity. However, designing with this in mind is alien to most studios, designers, and architects.

## SOLUTIONS

To design sustainable and resilient built environments requires a different approach for a world prone to volatility. This approach imagines a different mindset where design always permits future changes; accepts volatility and sees it as a source of solutions; where designs and concepts are modularly tested, taking time to learn between iterations with the option to change course toward different goals; where second- and third-order effects of decisions are considered across scales and time; and where equity and wellbeing are achieved, and ecosystems are supported.

To operate from this mindset requires tools that span traditional boundaries to unearth causes and understand their interrelationships. This leads to knowledge through synthesis, enabling the identification of critical intervention points to reach more desirable outcomes. However, tools that may help solve a problem in one domain are often found in another. This paper reports on the ability of specific techniques, some which break disciplinary boundaries, to enhance how students think of complex issues. For discussion purposes, these are arranged in three topics: think holistically and dynamically, test rigorously, and adapt transformatively.

### Think holistically and dynamically

To comprehend the built environment as a complex system requires two things: 1) to identify a system and its elements, and 2) to understand the dynamic relationships among those elements.

The Integral Framework (IF), created by Ken Wilber[10], is a tool that can help identify elements. IF is originally from psychology, but was translated into architecture by Mark Dekay[11]. It seeks to understand and develop an individual holistically by using a set of four perspectives arranged as a matrix of objective/subjective and individual/collective "lenses". This matrix is composed of four quadrants: Experience (individual and subjective), Culture (collective and subjective), Performance (individual and objective), and Systems (collective and objective).

Students use IF to capture "snapshots" of conditions/problems via site inventories and analyses. Figure 2 shows its application and highlights findings from each quadrant. Students identify key site parameters from more perspectives than a conventional studio, and piece together a collage of items to identify ethical, performative, personal experiential, and systemic issues. It also helps to identify decision-makers and stakeholders. By using this tool, students are more likely to comprehensively understand the site and community. However, by itself, IF does not provide insight into the dynamics of the elements it identifies.

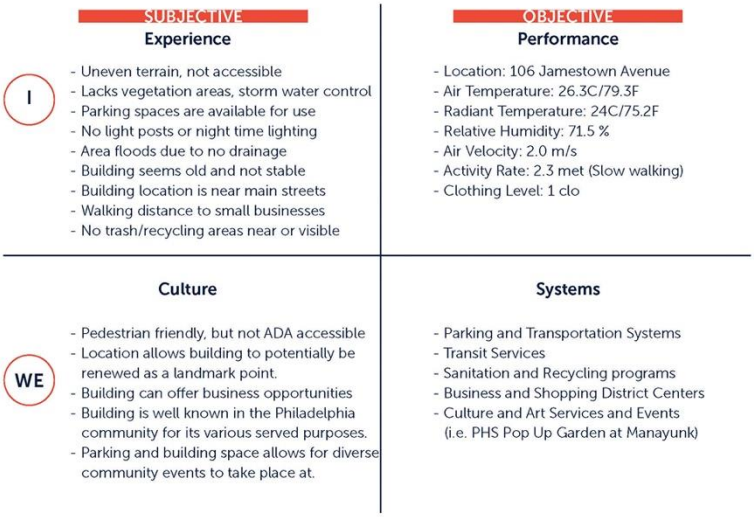


*Figure 2. A holistic site inventory*

To understand dynamics between elements, students use a Systems Thinking (ST) process derived from Meadows' research[12], a tool first created in economics. ST works well with IF to move from "snapshots" of data to the "movies" of dynamic system behavior, providing a story of the relationships between elements. These tools are a powerful combination, able to change undesirable system behaviors by using leverage points, making connections across scales, and mapping behavior over time. Data collected using IF are organized into ST diagrams. The data either literally become elements in the diagram, or concepts that require further research. These elements are then linked to show how a change in one effects the other in reinforcing and balancing loops. Through multiple iterations, patterns emerge. Applying system typologies from the literature, behavior over time can be graphed and examined alongside known system traps to identify dynamics and if they are generating desirable outcomes. This leads to a leverage point analysis, which uncovers key locations to intervene in a system with design solutions. Figure 3 shows the use of a ST diagram to comprehend the built-environment-system that produces flooding on a site. This generated multiple proposals, and the

students chose to develop a rain garden and to eliminate parking to apply a balancing force to the unrestrained growth of development and pollution. Although this solution could be identified without ST, the students' understanding and justification for their design is more robust as a result. They now know how to apply ST to more complex issues later in the semester. Furthermore, students learned to wrestle with dynamic complex systems, which is needed to provide truly sustainable solutions.

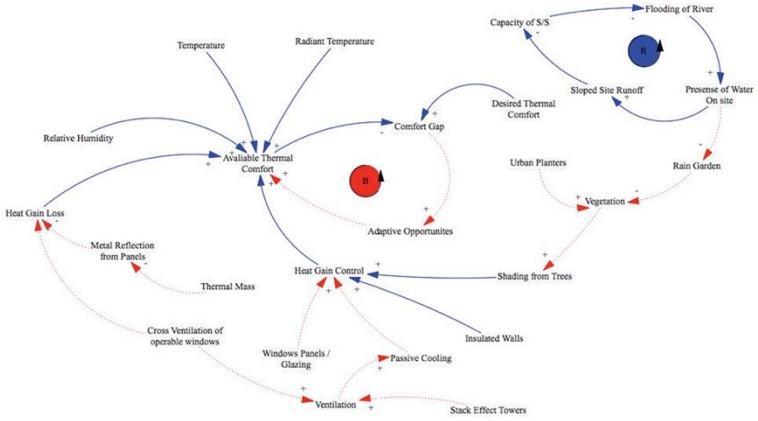


*Figure 3. Uncovering relationships with systems thinking*

## Test Rigorously

Once proposals are made, it's essential to test and develop them iteratively. This process must start early and be used as a generative decision-making tool. Building placement, orientation, and form are among the earliest decisions in the design process, and directly determine the experience of the building; the energy performance of the envelope; the optimization of passive systems to coordinate with site forces; and include culturally significant programs, forms, and circulation. Multiple proposals should be evaluated and tested before deciding. Testing should continue throughout the schematic and development phases to further refine decisions. Figure 4 shows early testing during schematic design, starting with building form and the location of windows.

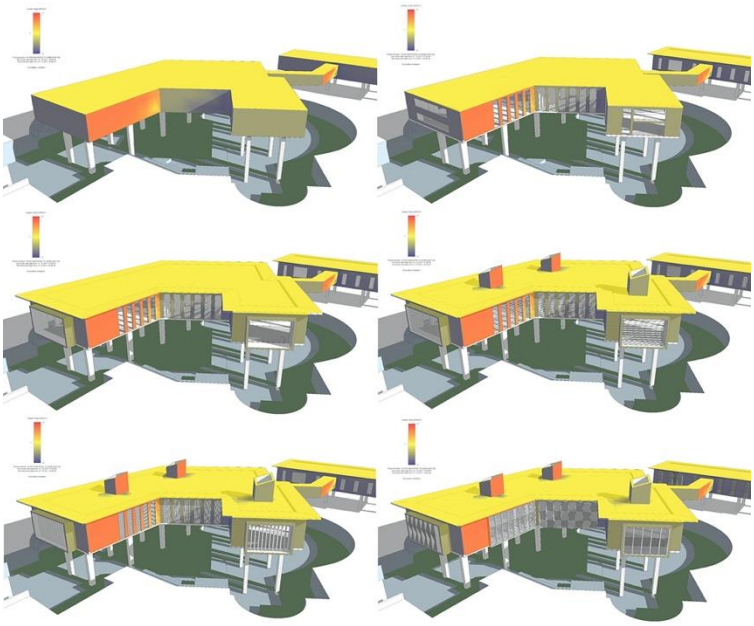

*Figure 4. Testing early and often*

**Adapt Transformatively**

Designs must seek to maximize opportunities for change rather than over-specify a design to fit one use. Adaptive opportunities apply the Adaptive Principle[13], and generate designs that enable future changes. Such opportunities find different expression according to the scale it's applied. In Figure 5, a student bus stop proposal analyzes the site using the IF and ST for individual-scale exploration. The process helps to identify multiple adaptive opportunities to provide thermal comfort, such as temperature control via thermal mass, shading, evapotranspiration; air flow control and blocking wind during cooler periods; and to alter metabolic rates via places of rest or exercise.

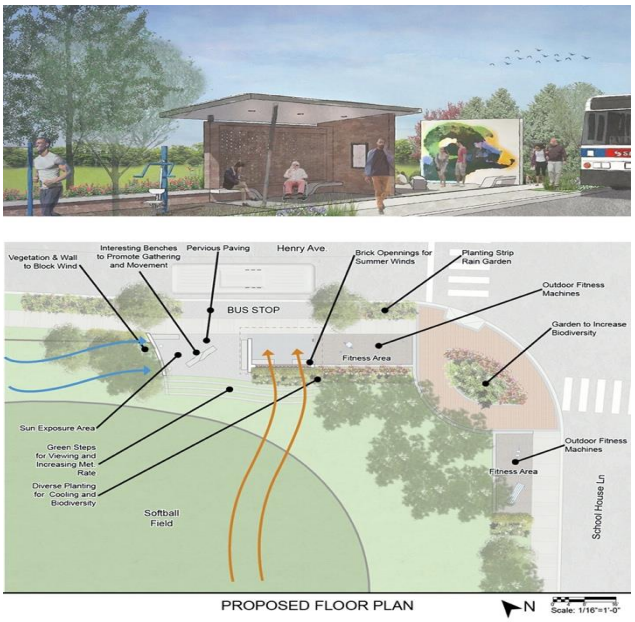


*Figure 5. Bus stop with adaptive opportunities*

At the site/building scale, adaptive opportunities inform the building program, site, building form, and the ability to replace layers of the envelope over time. Students are asked to reuse or demolish an existing structure, and to justify their decision. The project shown is one where students decided to reuse the old coal storage structure as an ethical statement of re-envisioning the future of energy, overlaying solar panels onto the skin of the coal shed. To "future-proof" the building, students used Scenario Planning (Figure 6), a tool originally created by Khan for military planning[14], to make informed predictions of the future of the neighborhood and city. Scenario Planning is a process to make educated guesses about the future by imagining future worlds based on divergent outcomes of key drivers and a strategy to deal with them[15]. As a result, students proposed a mixed-use program to support the neighborhood and its local economy, yet designed the building to be easily adapted to another program should their predictions be wrong. Additionally, students designed the building with adaptive opportunities so users could provide their own thermal comfort, making it more energy efficient, and designed it for passive heating and cooling. Furthermore, the design included rain gardens to counteract the effect of flooding and local water pollution (Figure 7).

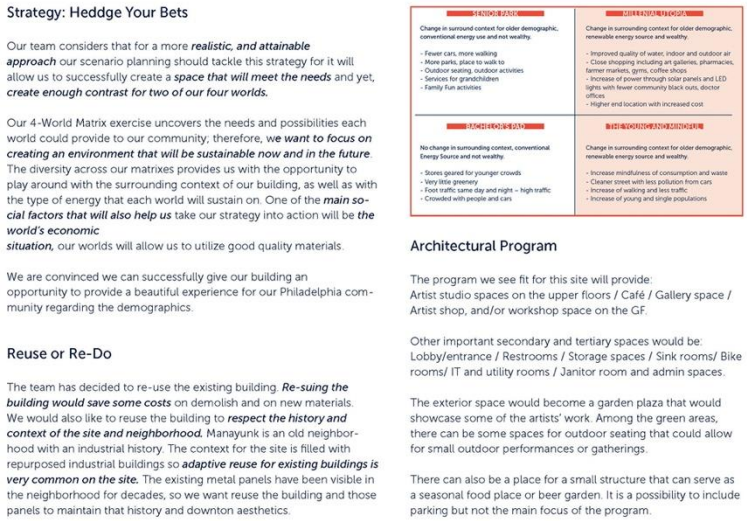


*Figure 6. Future-proofing buildings with Scenario Planning*

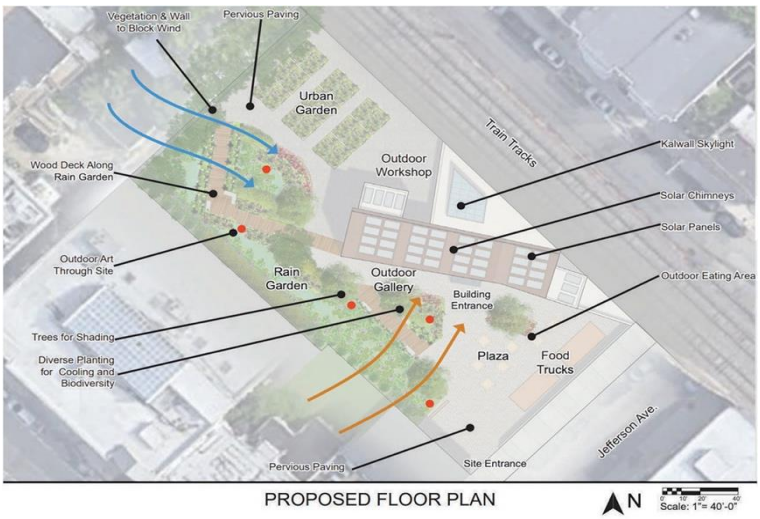


*Figure 7. Site with adaptive opportunities*

At the city scale, adaptability considers urban metabolism and its supporting systems, and seeks to keep them functioning despite sudden shocks. For example, multiple means of commuter transportation (ex. virtual), or multiple ways to access fresh, nutritious food. Figure 8 shows a student proposal providing resilient energy networks in Culebra, Puerto Rico. Students identified multiple leverage points using ST, and chose to develop a solar microgrid. The students navigated complex and competing issues to create a strong rationale for their proposal: that decentralized, small-scale solutions avoid systemic collapse. These are the skills professionals will need to prosper in an uncertain world.

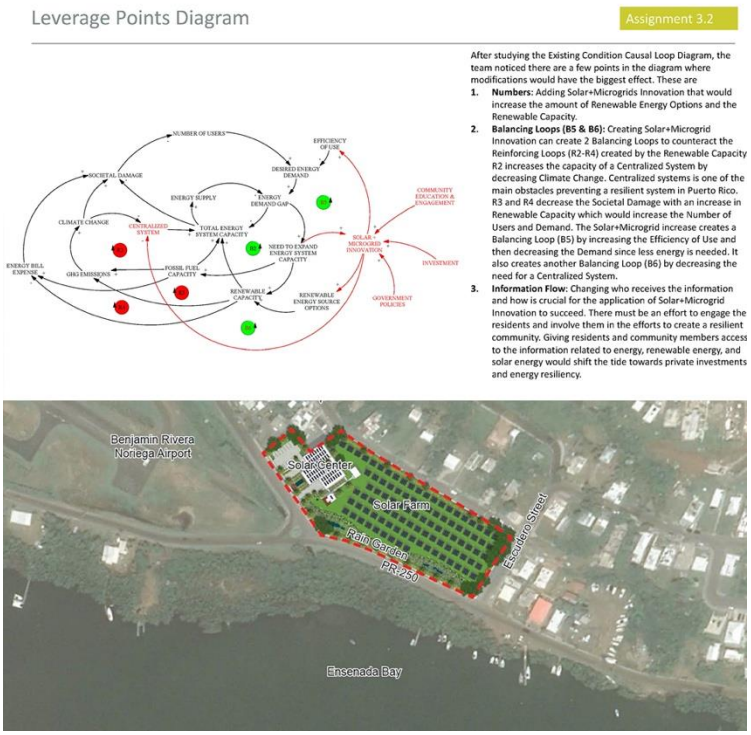


*Figure 8. Resilient community energy network*

Another student proposal addressed pollution and flooding in urban lakes in Bangalore caused by rapid growth, cultural habits of waste disposal, and religious rituals. She chose to address religious rituals because adapting cultural norms connected to nature sustains communities and individuals. As a result, a series of "nodes" were identified to provide alternatives via submersion pools to accommodate this important cultural activity without pollution (Figure 9). This investigation also led to solutions she would not have identified otherwise, including a tax triggered when water quality reaches unsafe levels, using the proceeds to reduce water treatment costs.

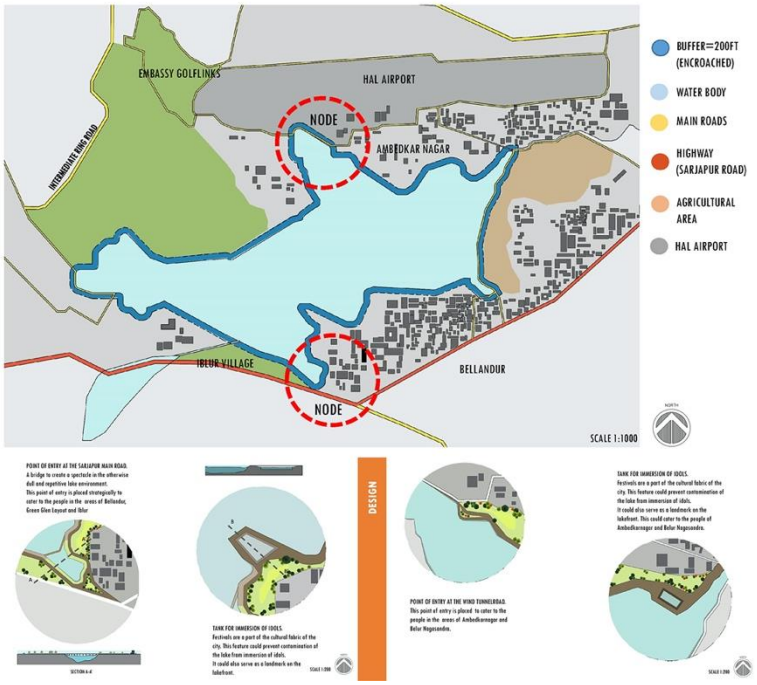


*Figure 9. Cultural activity without pollution*

## CONCLUSION

Architects and designers need unique skills and tools rooted in a new mindset for a volatile and uncertain world. This paper argues the mindset would recognize the built environment as a complex system and sustainability as a systems-based phenomenon requiring dynamic equilibrium; it respects the power of complex systems, as the outcome of changing systems is opaque, uncertain, and should be made cautiously; life depends on finite resources and growth is limited; resources must thus be used efficiently to satisfy society's needs and provide equitable wellbeing. This new mindset is breaking through, but is not fully formed nor consistent across the academe.

This mindset seeks design solutions that enable future changes; sees volatility as a source of solutions; tests designs modularly and iteratively, taking time to learn with the option to change course; considers second- and third-order effects across scales and time; includes stakeholders in decisions; and supports ecosystems as the foundation of life.

The skills needed to respond to major social, technological, economic, environmental, and political fluctuations such as climate change, pandemics, cultural shifts, and economic cycles are crossdisciplinary skills that 1) view situations holistically to collect valuable data and input, 2) understand dynamics between elements, 3) test ideas early and often, and 4) propose solutions with future optionality via adaptive opportunities across scales.

These tools exist in different disciplines and can be translated for use in the built environment. IF (psychology) allows us to see issues from multiple perspectives. To understand the dynamics, ST (economics) provides insights to propose design interventions across scales, sometimes outside of traditional architectural solutions. Iterative simulations enable informed choices early and throughout the design phases. And scenario planning (military) can future-proof proposals.

This approach has value because it can improve students' ability to see holistically and make sense of data. This enables their designs to work in a complex world that requires resilience, and is essential in responding to urgent issues confronting society.

Educators may see the potential of this approach in how the pandemic abruptly changed how they teach. There are insights from applying this approach to education itself. The switch to virtual classes was bumpy, but the capacity of university systems to adapt ensured continuity despite a sudden shock. Instructors experienced the value of multiple means to conduct class, exploring new pedagogical techniques across time and space. Innovations should be cautious not to discard proven techniques nor see new technologies as a panacea, and should be tested iteratively at small scales before college-wide implementation. Furthermore, digital studios offer education to those who may not have pursued it because of location, employment, or family situations, and engaging virtually may diminish social isolation when physical engagement is impossible. The opportunity to capitalize on the upside of virtual instruction has enormous potential, and may help academe switch to this new mindset.

## NOTES

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# MIXED REALITY DESIGN-PRODUCTION RESEARCH THROUGH COOPERATIVE LAB AND STUDIO

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## INTRODUCTION

As mixed reality (MR) continues to permeate the Architecture Engineering and Construction industry (AEC), MR technologies are becoming increasingly accessible to researchers, students, and professionals. Current research within the field directly couples MR technologies with low-tech material fabrication, thus introducing new notions of and potentials for immersive modes of cooperative spatial design and production. This paper delineates the confluence of several key interrelated courses and Spatial Futures Lab research tracks, from which Spatial Futures Studio was conceived and launched.

Spatial Futures Lab (SFL) was established in 2019 as an interdisciplinary research initiative geared towards projective forms of practice that interweave rapidly proliferating design technologies into intuitively operable design-production environments and fluidly cooperative workflows. Spatial Futures Studio (SFS) is a recent SFL initiative that leverages these and other facets of MR towards the exploration of collaborative design and production dynamics within an experimental Master of Architecture studio setting. All SFS participants entered the studio as MR novices and set out to collectively utilize MR for the design, review, fabrication, assembly, and communication of large- and full-scale architectural constructs.

## MIXED REALITY

Milgram and Kishino define mixed reality (MR) as a spectrum of interactive display technologies across a "virtuality continuum", with augmented reality (AR) located towards one end, the "real environment", and virtual reality (VR) establishing the opposite end (Figure 1).[1]

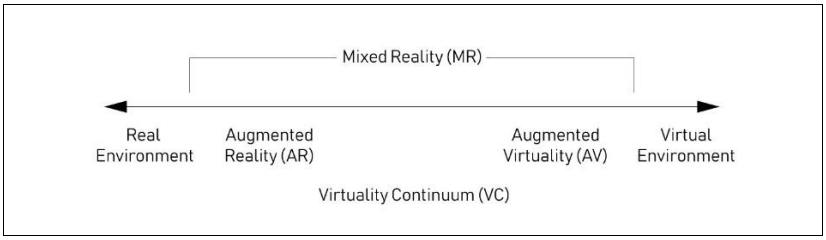


*Figure 1. Virtuality Continuum and Mixed Reality as defined by Milgram and Kishino in 1994.*

Expanding upon this foundational definition, Azuma defines AR as applications that operate in accordance with three essential features: they are performed in real-time; they combine real and virtual objects; and they are registered in 3d space.[2] Additionally, MR applications utilize location-specific information to spatially register virtual objects in physical space.[3]

Wide access to MR was primarily limited to military and manufacturing sectors prior to 2014; advancements in processing, tracking and display technologies at that time converged towards the production and expanded availability of enhanced MR software and devices.[4] Since then, MR has proliferated throughout a wide array of fields ranging in diversity, for example, from cultural heritage[5] and higher education[6] to entertainment[7] and medicine[8]. Although the use of MR continues to proliferate throughout AEC at an accelerated pace[9], a recent analysis of emerging concepts and technologies in Construction 4.0 delineates its relatively nascent state within the industry at large[10].

## MR DESIGN AND FABRICATION

Since 2018, there has been a notable emergence of published literature that focuses on research in the utilization of AR applications to create direct links between MR and architectural production. A brief survey of the state of the art in this strain of MR research reveals a rich set of working AR applications and associated collaborative benefits. Research in MR fabrication spans a range of approaches incorporating various degrees of computational integration that define levels of interactivity between human operators and devices within given production scenarios.

For example, MR has been integrated into a cyber-physical system configured for human-robotic fabrication of timber components, in which operators utilize AR through a head mounted display for live interaction with virtual and physical components registered to and produced through a customized robotic system[11]. A contrasting example is one within which MR masonry construction has been enabled through an AR application that provides holographic instructions registered in space allowing experienced masons who are MR novices to rapidly construct complex walls without the assistance of printed drawings[12]. MR has also been utilized for complex production in an approach that allows for live closed-loop design adjustment during assembly and installation through AR interactivity[13]. Additionally, MR workflows have been developed for handcraft-based fabrication of large steam-bent timber structures in a process that integrates live interactive component design in real space[14].

Of particular importance to the work presented in this paper, MR has been used for augmented hand-bending of complex steel components by coupling MR with low-tech manual fabrication techniques[15]. Additionally, the unique capacity that MR holds to rapidly equip novices with new skill sets for complex fabrication has been demonstrated[16]. Four of the examples delineated in this section utilize Fologram, a commercially available MR platform released in 2018 that connects the commonly utilized modeling platforms Rhino and Grasshopper to the Microsoft HoloLens, phones, and tablets for live AR interactivity[17].

## RESEARCH + TEACHING CONFLUENCE

A new Master of Science in Architecture (MS Arch) concentration in *Advanced Production* was established at Georgia Tech (GT) in 2017. Expanding upon topics related to and replacing the MS Arch concentration *Digital Design and Fabrication*, *Advanced Production* set out to incorporate a wider array of design technologies and approaches in relation to emergent and future modes of architectural production and practice.

Two key required seminars were established for this concentration, both of which are taught by the author of this paper: Robotic Operations, which places focus on both core competencies and projective human-robotic workflows; and Advanced Productions, which is geared towards the

exploration of AR applications in relation to digitally produced physical and spatial constructs. Notably, both seminars are open to undergraduate, Master of Science, Master of Architecture and PhD students. Cumulative insights attained through a productive interdependence between these seminars and simultaneously launched research trajectories into MR, unmanned aerial systems (UAS), robotics and cyber-physical systems led to the 2019 launch of Spatial Futures Lab (Figure 2).

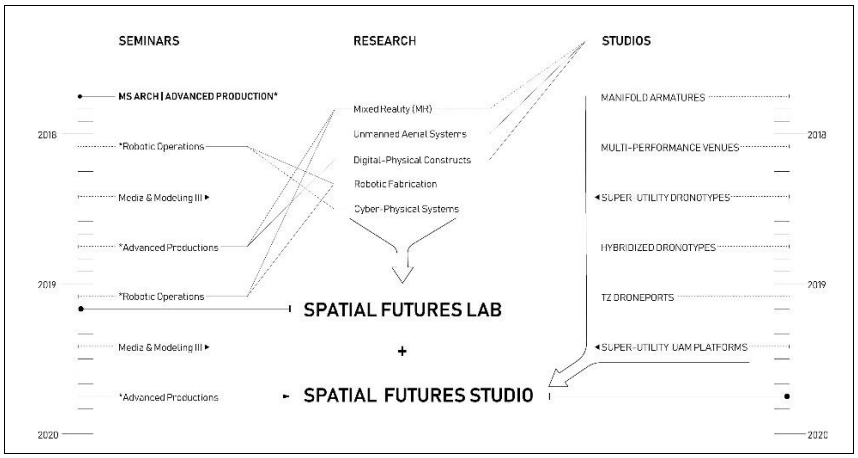


*Figure 2. Intertwined research and teaching continuum establishing Spatial Futures Lab and Spatial Futures Studio.*

Additionally, a thematically accumulative series of Master of Architecture and Bachelor of Science in Architecture design studios was carried out by the author in parallel with the seminars and research efforts outlined above. While many running topics placed ambient focus on some of the design technologies covered in the above seminars, each studio was staged as a freestanding exploration of projective architectural typologies and spatial permutations. Spatial configurations, design sensibilities and potential operational attitudes were experimented upon and cultivated throughout this overall sequence and directly informed the confluence of the Spatial Futures Studio with the Spatial Futures Lab.

## SPATIAL FUTURES LAB

Spatial Futures Lab is an interdisciplinary research group, facility and initiative that leverages emergent design technologies towards future modes of architectural practice and production. SFL is nested within the GT Digital Fabrication Lab, an industrial-scale material production facility configured for both research and teaching. Operating with research assistants from GT School of Architecture and GT School of Electrical and Computer Engineering, its core mission is to develop, demonstrate and deploy operable collaborative spatial design systems and production approaches enabled through interactive design environments.

Customized orchestrations of established and internally developed protocols fuel this endeavor. For example, a key system developed by Spatial Futures Lab interweaves UAS, MR, computer vision and parametric modeling into an immersive live-action environment within which both manual and automated procedures enable collaborative interactions with computational models and physical objects through user-friendly controllers and inputs[18] (Figure 3). This cyber-physical system comprises an interwoven set of devices, platforms, and dataflows, including optical motion capture, head-mounted displays, dynamic modeling, and aerial robotics all coordinated through Robotic Operating System[19].

*Figure 3. Live cyber-physical activity at Spatial Futures Lab, as seen through MR on a mobile device.*

## SPATIAL FUTURES STUDIO

Performed through the "Design and Research" option studio sequence for Master of Architecture students in their final year of studies, Spatial Futures Studio was conceived and configured as a cooperative design-production practice fueled by MR. Infused by an ambient design agenda aimed towards the development of multipurpose typologies and platforms for near-term futures, the objective was to cooperatively design and produce a full-scale occupiable construct plus large-scale architectural "mega-models" of several separate projects. Serving as the premiere trial at Georgia Tech for full commitment to utilizing MR as the prime instigative conduit for all facets of architectural production - from questions and ideas to production and communication - the collaborative set-up itself formed the basis of the studio experiment.

Several key operational points were clearly established at the outset. As a fundamentally collective endeavor there would be no standard desk-crits; criteria including collaborative fluidity, digital-physical agility, and proactive troubleshooting defined benchmarks for successful participation. None of the eleven students had any substantial prior exposure to AR-based fabrication – they were all novices. Additionally, material production skillsets varied widely amongst the students, ranging from two who had substantiated expertise in CNC fabrication and traditional shop-work to those who had minimal to no such experience whatsoever. Incoming computational skills were considerably varied, as well. Lastly, both collaborative and executive decision protocols were generally established thus delineating the vibrancy of attitudes and rigor that would drive the overall mode of operation.

Spatial Futures Studio was the first studio directly tied to Spatial Futures Lab. As such, students were provided with key SFL resources including gear, software licenses, materials, and open access to the lab's workspace. Primary equipment provided at the outset included a hand-operated steel rod-bender, a 3m tall prefabricated deer-hunting platform with a pre-stiffened 275kg load capacity, an ample supply of 25mm diameter steel rod, and the Microsoft HoloLens equipped with Fologram. Additionally, extra-studio support was provided by the lab's primary architecture research assistant, who was also embedded within SFS as a student.

The primary MR fabrication technique adopted for SFS enabled low-tech production of complex steel framework components. This was facilitated through modifiable computational definitions provided by Fologram that enable an operator wearing the HoloLens to navigate and perform an automatically generated sequence of holographic rod bending instructions through an AR interface[20] (Figure 4). An essential advantage embedded within this approach is the direct and intuitive digital-to-physical link that is established: no drawings were created for fabrication or assembly of any steel framework components produced in this studio.

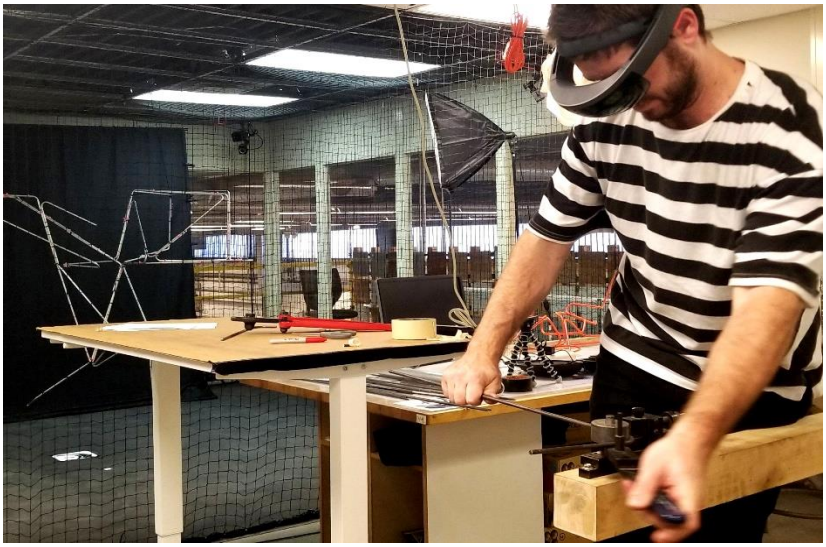

*Figure 4. MR assisted fabrication utilizing holographic instruction sequences for manual fabrication of complex spatial components, enabled via Fologram.*

MR training initiated on day one, with students rotating through an introduction to the Microsoft HoloLens, hands-on AR rod bending, and collaborative AR assisted assembly of a pre-modeled framework (Figure 5). Fologram was subsequently introduced within Grasshopper, and over the following two weeks students rotated through a regimen that simultaneously spanned several tracks during each studio session.

*Figure 5. Training in MR fabrication and assembly commenced on day one.*

In anticipation of logistical complexities that may ensue given the fact that the studio initially only had access to one Microsoft HoloLens, small teams were formed to separately explore potential workflows that might facilitate AR bending and assembly by only utilizing Fologram on phones. Individually modeled frameworks fueled each team's effort to develop and exercise customized approaches to construct small scale frameworks with thin steel rods, pliers, and zip-ties, utilizing AR on multiple phones in different fixed positions. While an array of small frameworks was ultimately produced through this exploration, each team independently proved that no such approach would be effective for the large-scale production ambitions at hand.

However, this track proved to be constructive both in stoking a vibrant collaborative atmosphere at the outset, and in practical terms with respect to the physical frameworks produced. Participants were

tasked to individually extract portions of these frameworks and refine components and geometry for MR production of large spatial constructs utilizing the full-scale steel rods, Microsoft HoloLens and the hand-bender. Also, during these initial weeks, teams of two were required to log both training and practice hours at the welding station through pre-scheduled time slots during this phase, whether they were experts or novices at the outset. By the third week, students were modeling, bending, assembling, and welding large spatial components.

Each participant was tasked to design and produce one large finished spatial construct by week five, thus ensuring collective command of the MR production approaches at hand. From that point forward and equipped with insights into participants' strengths and interests with respect to the collaborative mission, studio focus shifted towards full scale design and production with the total arsenal.

### Beacon Armature

Beacon Armature is a full-scale construct that served as the prime design initiative that centered all studio efforts. Utilizing the prefabricated deer-hunting platform as a structural armature for large MR fabricated steel framework components, Beacon Armature was designed, developed, and executed through a complex orchestration of exceptionally fluid collaborative dynamics.

To begin with, a rapid-fire collaborative exchange between the students and instructor established the overall design agenda and geometric parameters which ultimately drove all subsequent iterations and development. Upon discussing general spatial, occupiable, and functional goals as a group, students were then given two days to model configurations associated with these ideas and present virtual geometries registered to the prefabricated platform through MR. All versions and iterations were then compiled into a single model and provided to the instructor, who then had one day to synthesize spatial tendencies, feature highlights and geometric nuances into a consolidated, tightly modeled low-resolution control envelope. This control model was provided to the students, who then formed new teams. Each team was responsible for developing geometric and fabrication strategies for key portions of the control model, thus initiating a concentrated chapter of iterative design development, refinement, and MR production.

Coincidental to this shift in operational focus, SFL acquired access to an additional HoloLens and Fologram license. This addition to the arsenal substantially amplified the collaborative dynamics and production efficiencies as numerous operational clusters emerged throughout the arc of work performed. In addition to the many advantages embedded within a new capacity to perform separate operations with the HoloLens simultaneously, a range of nuanced collaborative MR workflows emerged.

In some cases, a solo HoloLens operator would utilize AR to loosely rig steel components together, and when the construct became too large or complex to continue without assistance that operator would direct another operator through sequenced welding connections. In other cases, a HoloLens operator would direct a team of two or three workers in setting up the assembly such that final welding could be carried out without any AR assistance. Meanwhile, for example, MR bending could be performed by others while other such operations were executed. Ultimately, multiple MR devices were in play at any given time through all phases. Many high-level decisions were facilitated through the simultaneous use of two HoloLens operators, often in group design and tactical review sessions with multiple phones and tablets also in play during such impromptu meetings. As work progressed through these types of production dynamics, Beacon Armature palpably evolved into a digital-physical construct (Figure 6), with all participants fluidly navigating between various states of physical and MR engagement.

*Figure 6. Design-production progress as seen through AR on a mobile device - magenta and yellow lines are virtual models registered to physically installed components.*

A critical collaborative workflow cluster emerged as the large cantilever required additional stiffening in place upon its initial installation. This scenario involved four operators and two HoloLenses (Figure 7): using a graphic marker wand, Operator I locates vertices for new stiffening components in relation to the existing structure; Operator II registers each vertex by clicking on the marker wand with hand gestures recognized by the HoloLens; Operator 3 verifies the alignment and capture of the new component, then pushes the geometry through a different Fologram definition for Operator 4 to bend into a new component. New components are installed in place and the cycle continued until the cantilever was effectively stiffened. Once this specialized team dialed their dynamics into an efficient workflow, this whole process took a matter of just a few hours to complete.

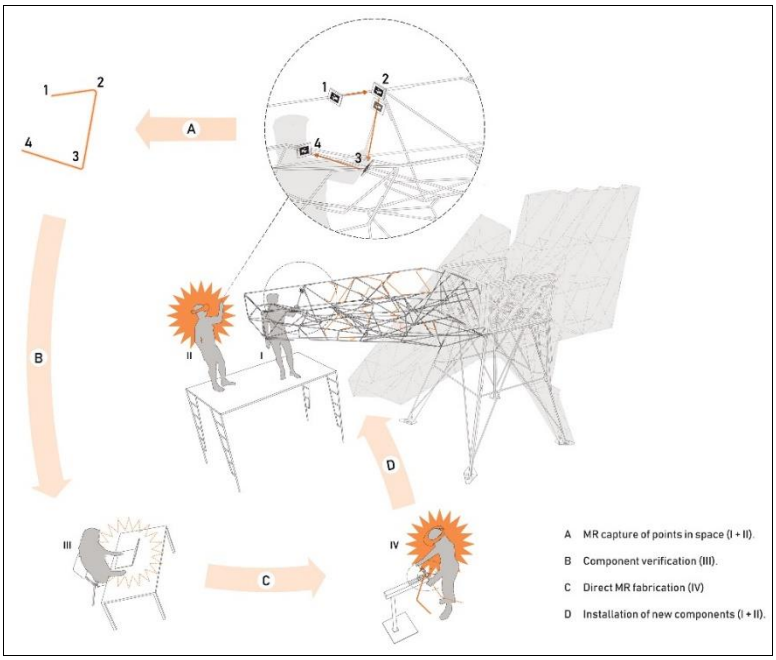


*Figure 7. Specialized cooperative MR design-production team and workflow.*

Conceived as a flexible, deployable multipurpose platform, Beacon Armature is an occupiable composite construct that combines a cantilevered drone launch and landing pad, elevated operator deck, billboard frame and other features into a variably articulated voluminous spatial framework. In

its final state, Beacon Armature exists both as a freestanding architectural installation in its own material, spatial and experiential terms (Figure 8), and as a composite digital-physical MR experience through AR applications designed to communicate projective situational scenarios and other layers of spatial information (Figure 9).

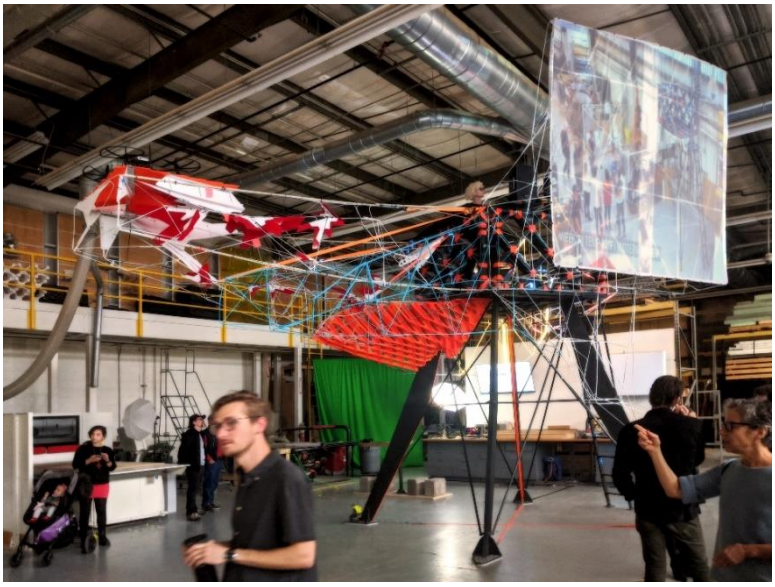

*Figure 8. Finished installation of Beacon Armature.*

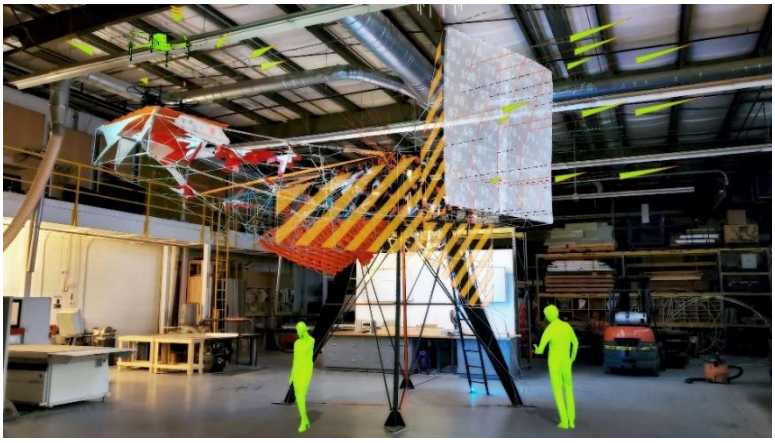

*Figure 9. Composite view of Beacon Armature overlaid with MR spatial information.*

**Mega-models**

With cooperative agility and production efficiency at peak levels throughout SFS, an additional phase of work was launched and executed during the final three weeks of the semester amidst the vigorous final push to complete production of Beacon Armature. Prompted to expand the core architectural ambitions held by Beacon Armature into larger civic armatures in their own terms, a semi-orchestrated rapid design brainstorm produced a catalog of low-resolution potential project seeds. Three of these spatial strategies were identified for design refinement and MR production of 1:10 scale architectural “mega-models”, large physical section models upon which extended geometry, situational scenarios, and other spatial information registers through AR applications (Figure 10). While initial teams were formed to refine and execute each mega-model, the collaborative fluidity

already in play extended into these efforts; all participants were simultaneously involved with many facets of work throughout the overall studio continuum.

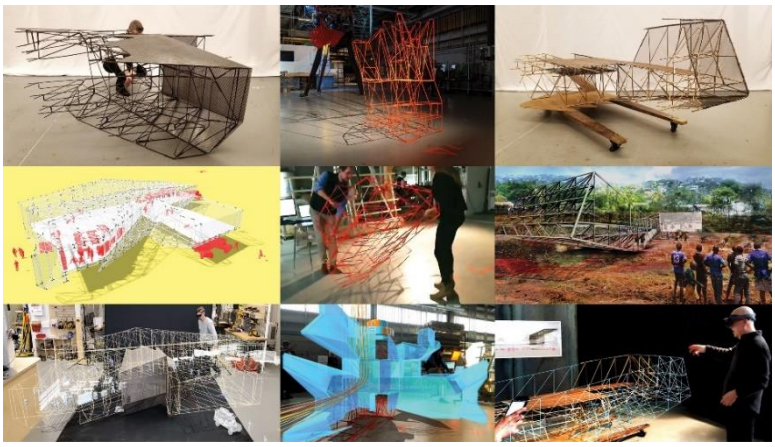

*Figure 10. Three "mega-models" were conceived, cooperatively produced, and communicated utilizing MR during the final three weeks of the semester.*

## MR MIXER

For the final review, Spatial Futures Studio work was exhibited and experienced in a vibrant format, transforming the Digital Fabrication Lab into a public exchange venue centered around MR in architecture with SFS members as docents. With the Beacon Armature situated towards the center of the main volume, mega-models were set up as freestanding exhibitions located throughout the space. A hands-on MR bending station was set up with the hand operated rod-bender, a batch of raw steel rods, a HoloLens, and its live view displayed on a large monitor for visitors to experience the process firsthand. With Beacon Armature activated as a DJ booth, a large drone on its pad and video projection on the billboard screen, guests were invited to engage with the work through AR applications on phones, tablets, and the HoloLens in an extended participatory browsing session. A final SFS roundtable discussion with invited guests followed this immersive mixer.

## CONCLUSION

The robust nature of the work presented here was made achievable through the accumulative interweaving of several channels of research and teaching. The interrelation between recently formulated design-technology seminars, a parallel series of freestanding architecture studios, advancements in MR research, expanded accessibility of MR technologies, and Spatial Futures Lab led to the initiation of Spatial Futures Studio. Inherently experimental and cooperative in its dynamic operational setup, Spatial Futures Studio serves as a demonstration to bolster the argument that MR holds a unique charge to foster new modes of collaborative thinking, immersive design, and architectural production. The rapidity with which MR novices attained working command of the AR fabrication techniques at hand and directed these protocols towards the production of large-scale architectural constructs is noteworthy in and of itself. Nuanced workflows emerged based on both potentials and limitations of the approaches utilized with respect to the various goals in play, thus providing Spatial Futures Lab with critical insights for future calibrations of similarly cooperative MR endeavors and engagements.

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# MAKING IT WORK: HOW ARCHITECTURAL ATTRIBUTES IMPACT THE PRODUCTIVITY OF DESIGN STUDENTS

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## INTRODUCTION

Most designers strive to produce solutions that stand out as imaginative or unique. However, it is a misconception that such production is limited to people who are artistic[1] [2] or eminently creative.[3] However, we know that creative production is much more achievable than commonly believed. Creative outcomes exist in all shapes and sizes, ranging from solutions to everyday problems to legendarily innovations.[4] Inspired solutions can come from anyone; one need not be a famous architect to produce remarkable or creative design work. Creative production is influenced by factors well beyond individual talent and skills; it is well-understood that other factors impact a person's motivation and engagement with their work. The environment is one such factor, imposing physical, social, and organizational elements that shape ideas and perceptions, and thus one's ability to effectively complete and perform tasks.

Research concerning the relationship of the environment to workplace productivity has been well documented for nearly four decades, shaping our understanding of how cognitive abilities, personality, and social factors influence a creative process.[5] In a ground-breaking study in 1996, Amabile et al.[6] validated that the environment absolutely meddles with creative acts and inspirations. They summarized that there are five environment factors that are particularly influential: autonomy, access to resources, encouragement, imposed pressures, and aspects associated with the organization itself. Today we know the ways a work environment can 'kill' creativity,[7] the ways it can motivate and foster creative production,[8] [9] [10] that it can create stresses that impact performance and efficacy,[11] and that it can simply change one's behavior.[12] But, it is not certain how this knowledge is to applicable various types of work environments.

The environment is shown to be a "key support for creativity" (p. 46),[13] yet contemporary research does wholly define the elements of an environment that impact productivity. Environment is generally categorized as social, organizational, and physical. However, much of the related research on this topic uses the term 'environment' as a broadly defined concept and struggles to make each of the three categories exhaustive. This alone demonstrates why the topic is complex and in need of further investigation.[14] While isolated architectural attributes have been identified as important to production, research suggests that spatial and social aspects are hard to isolate from one another.[15] Some suggest that this stems from the "intricate interrelationship between the physical structure of the room, the arrangement and distribution of space, and the individuals" who share a space (p. 15).[16]

Related literature about the environment is also limited by the number of studies focused on the creative class. The creative class is defined by those in industries such as design, the arts, technology, music, entertainment, or those whose main professional function is to drive the production of new ideas and to generate 'creative' content.[17] Subsequently, workplace research has advanced how we design offices for creative industries, giving legitimacy to exciting office environments seen at Google and production management structures seen at 3M (i.e., 15% rule). While design students are the emergent creative class, they have not been part of this research trend. We do not really know how the environment endorses creative production in *university* environments or how it limits their ability to develop imaginative, unique design solutions.

University workspaces are a cross-over between a professional office and educational setting. For design, this is especially true. The studio is the crux workspace for design programs, typically mimicking an industry office for their respective field. However, design students utilize spaces beyond the studio such as fabrication shops, classrooms, and libraries. The workplace of a design student is difficult to summarize into one type of space, which may explain why they are under-studied among workplace and environment research. Also, this explains why researchers who investigate this topic must look to office and educational studies that concern the environment and productivity for precedent.

Office productivity research suggests that creative production is influenced by views to nature, spaces that encourage social interactions, adaptable furnishings, mechanisms to display in-process work, the quality of light, proximity to resources, spatial arrangements, circulation patterns, proportions and sizes of room, and aspects of privacy. These are all are associated with the creative 'potential' of a workplace.[18] [19] [20] [21] Marten[22] suggests that a workplace that is physically designed to support interactions between people is among the most important attribute of a creative workplace culture. Other researchers suggest that physical elements impact the creative process because they influence one's mood.[23] However, it is important to note that recent studies have challenged these findings and suggest that there might be a limit to the influence of the physical environment. For instance, recent studies suggest that organizational and social dimensions mediate production and creativity in the workplace *more* than interior and architectural elements.[24] [25] [26] This is important information for any researcher to consider when asking how architecture relates to productivity.

Educational research also makes several suggestions concerning the supportive attributes of the environment and creative production of students. Contemporary design trends for educational facilities are driven by goals that include enhancing the creative production of learners and effectively responding to the basic physiological needs of the users. Effectively, the "planning, designing, and utilization" (p. 27)[27] of learning spaces have drastically changed, resulting in modern facilities that resemble creative offices and campuses. The new facilities emphasize adequate "climate control, air quality, appropriate lighting, and cleanliness" (p. 25)[28] and commonly feature interactive technology, adaptable spaces, learning commons, gardens, fewer walls, mobile furnishings, double-sized classrooms, project rooms, and extensive use of interior glass.[29]

Both office and educational research do not include design students as a focus of study. The review of related literature demonstrates a gap in knowledge. However, studies presented inspire questions about the transferability of knowledge to the creative production of design students and will no doubt be instrumental in analyzing the outcomes of this research.

This investigation asks how the physical environment impacts the productivity of a niche subject group—university design students. The goals are two-fold. First, to define the spaces that support their productivity. Second, to identify specific architectural attributes that are perceived as conducive or detrimental to their ability to effectively develop comprehensive and inspired design work.

## RESEARCH DESIGN

### Participants and Site

The Theory of Creative Affordances (Glăveanu, 2012)[30] suggests that we cannot assume that all people see the possibilities of their physical environment. The environment is not simply a stimulus that causes behavior. Rather, creative outcomes are at the whim of the person perceiving the possibilities of the environment and realized when a person is able to engage with seeing beyond what should be, would be, and could be done. For this reason, this research makes design students the unit of study. How do they perceive and experience the possibilities of their work environments as it relates to their design production?

The participants are students enrolled in one of five undergraduate programs at the School of Design at Syracuse University. The programs include Environmental and Interior Design (EDI), Communications Design (CMD), Fashion Design (FAS), Design Studies (BS), and Industrial and Interaction Design (IID). Each occupy a single floor in the Nancy Cantor Warehouse (see image 1). The shared facility is a crucial to this investigation because each floor has roughly the same floor plan. The floors differ by minor interior adaptations to support each program. Students also have equal access to fabrication shops, classrooms, lecture spaces, meeting rooms dispersed throughout, a common lounge area, and a café.


*Figure 1. Floor assignments per design program at the School of Design, Syracuse University.*[31]

### Research Design

This study utilizes a mixed approach to collect a diverse sample of data that details the experiences and perceptions of design students. Two methods were used after obtaining IRB approval: online surveying and remote interviewing via video conferencing.

The survey was distributed through the student listserv, reaching the email inboxes of all students enrolled in a design program at the research site. The online survey was anonymous, asking participants to share their experiences of working in the building and inquiring how they believed various environmental factors related to what they shared. Mostly qualitative, the survey used open-ended questions to gather personal experiences and points of view. Prompts encouraged consideration for architectural attributes including air quality, odors, lighting, acoustics, comfort, spatial arrangements, and furnishings. Participants were also asked to rate how attributes support or hinder the development of their design work. To solicit further participation in part two of the study, the survey provided a link to contact the research team for interviews.

The interviews asked the design students questions about workplace preferences and their productivity. Responsive interviewing techniques stimulated rich, descriptive accounts of their

experiences. Prompts evoked identifying particular architectural attributes that support or hinder their creative production. They were also asked to describe what they *avoid* when looking for a place to immerse in their work and how preferences differed for work related to *non*-design course.

### Description of Sample

The interview phase is currently in progress. For this reason, the findings presented below are based on the survey sample (n=25). Most of the respondents are first, third, and final (IID only) year undergraduate students, comprising 86.6% of the sample. Second year students comprise 10% of the sample, and only 1 participant (3.3%) contributed as a graduate student. The sample varies among design programs. 83.4% of the respondents are pursuing degrees in environmental and interior design, communications design, and fashion design (equally distributed), and 13.3% of the participants are enrolled in industrial and interaction design.

## FINDINGS

The descriptive data from the survey were analyzed to identify themes among the shared experiences. The researchers applied technical knowledge concerning the design of the built environment to formulate informed conclusions. Though the study is still in-progress, the results suggest that distinct archetypes of space as well as specific spatial attributes relate to the productivity of design students. These discoveries are described in depth in the following sections and are expected to evolve.

### Discovery 1: Types of Space Matter to Design Student Productivity

For design students, not all types of spaces prove to be equally productive and inspiring. When asked to share their thoughts about their choice work environments, the students shared stories and experiences that suggested that the types of space they work matters to their productivity. They are particularly drawn to working at the design studio. As an alternative, they also perceive they are productive working at home and at their campus library.

Studio is the most highly preferred type of space to work for a design student. 68% of the respondents from this study prefer working in studio over alternative spaces such as home, classrooms, the library, the lounge, and cafe. The data suggests that this preference is most pronounced among students who are in their fourth year of study and also those majoring in communications design. The data also suggests that this preference is less for third-year students and also those who are majoring in fashion design. However, the regard for developing design work in the studio environment is generally high across the sample. Students described why when they shared that the design studio:

*[Is] quiet, hidden, and only has studio equipment. For me with a low attention span it's easier to get distracted. It's hard to get distracted at a studio.*

*... has a collective energy and limited distractions that helps you find a groove with your work.*

*... [is]a place where I can think through options by physically mocking them up and making all the mind maps my heart desires.*

Design students find the studio appealing when it supports social interactions and collaboration. They described it as a place for “collective energy” that helps you “find a groove,” and a place where you can “go to people and talk through problems” and get feedback. But they also shared that the social aspects of a studio should not interfere with their need to independently focus, and that the studio should be dedicated to design (and not socializing). When the studio space is interrupted by non-design-related activities, it has a negative effect on the student’s productivity.

Design students also perceive libraries as suitable for developing their design work. They feel inspired by the activities of other people in the library, a social element similar to studio. They also view it as a

place for production because it provides the 'things' they might need. However, several participants expressed that the library is better for developing independent work, especially assignments and projects perceived as less 'creative.'

Design students also see value in developing their work in spaces *beyond* studio and the library. 16% identified their home as suitable, and most expressed dislike for working in classrooms, cafes, and lounges. The home was described as productive for supporting privacy, comfort, and a desired sense of autonomy. One student described the "comfortability, seclusion, and personalized" aspects of home as key to their productivity. Personalization is key; the power to manipulate their work area gives them a sense of freedom and autonomy which they say positively influences their productivity. Students also praised home as a low stress work environment that lifts the burden of traveling to studio and allows them to work at their own pace and time. In an extreme example, one wrote that working anywhere but home was simply "not necessary."

### Discovery 2: Spatial Attributes Matter to Design Student Productivity

The physical attributes and spatial qualities of a workspace are just as critical to design students as the *types* of spaces they work in. This study suggests that noise, light, furnishings, distancing, and comfort all play key roles in their productivity. However, their experiences suggest that some elements are more influential on production than others, and that aspects of control of such elements are extremely important.

Design students agree (across all years of study and design majors) that background noise is problematic for design production. Listening to nearby conversations is frustrating, and noise from conversations in large lecture halls are the worst due to poor acoustics. Fashion design and industrial and interaction design students are the most expressive in describing these issues. One emphasized that nearby conversations are distracting because they solicit their "direct attention," which is especially frustrating when they are trying to focus on their work. Others commented on the disruptions caused by background noise that is "sporadic and unexpected." Conversely, the productivity of design students is not disrupted by noises that the students feel they can manipulate; controllable acoustics are a spatial attribute that reportedly enhances their productivity.

Design students feel strongly about lighting, and generally prefer working under natural light that is both adequate and allows them a level of control. Design students express that lighting temperature, the intensity of light, and lighting types all play a role in their production. This is particularly true for artificial lighting. Many students dislike working under overhead fluorescent fixtures; they prefer to see their work illuminated by softer, warmer light. Communications design and industrial and interaction design students show a higher preference for warm, soft lighting in their workspace than other design majors. However, some design students believe that lighting that with warm tones effect the accuracy of the colors that they are designing with. Interestingly, the data suggests that the preference for warm lighting becomes less pronounced as a design student progress through their degree program.

The relationship of lighting to physical and mental wellness is not overlooked by design students. One student described that poor lighting feels like it is "hurting their brain" and that it impedes their work because it strains their eyes. Another student illustrated the importance of lighting to their productivity when they wrote:

*I think that lighting is most important to how I work. Warm lighting is most relaxing to me and I have a more pleasant time doing my work. I think harsh lighting or working in a dark environment under a lamp evokes more stress.*

Comfort matters to the productivity of design students for more reasons than one. They cite comfort and ergonomic qualities of furniture as key factors that impact their work. However, they also identify the thermal comfort of their environment as very important. With few personal controls of the air distribution and quality in the design studio, it is no surprise that the students in this study expressed that the surrounding temperature in their workplace was an issue. One student illustrated this when they shared that they have to keep a blanket at their desk in studio to eliminate that factor, and that being cold makes it near impossible to focus on their work.

Flexibility and mobility of furniture are generally regarded in related literature as key for supporting workplace production. However, this study suggests that design students are more bothered by furnishings that lack appropriate surfaces for tasks (i.e., cutting, drawing, building), and that they perceive the *comfort* of their furnishings as the most important related issue. The ergonomics of furnishings are extremely interruptive to their production of design students. One student wrote that if the design studio furniture was more comfortable that they would need fewer breaks. Another student blamed the furniture for promoting "bad posture." Another attributed studio furniture to chronic joint pain. However, design students believe that furniture that is too comfortable (such as those meant to aid in relaxation) can also be detrimental to their ability to work. They perceive an 'ideal' comfort range for furniture that supports the physical demands that relate to design work. One student described how comfort negotiates productivity when they wrote:

*I've tried working on lounge chairs and couches before, but I get too comfortable, and I don't feel like I have space to put anything… I use a chair sometimes that is too low for the table I'm working at, and my posture worsens over the course of the hours I spend [in studio]…*

Finally, design students feel productive in spaces that are arranged in ways that support social and collaborative interactions. They correlate these qualities to a studio culture that boosts production through the exchange of ideas. Design students thrive in spaces that encourage and enliven social learning and do not necessarily want to develop their work in isolation from others. However, the data suggests that design students want a balance between shared and individually assigned spaces; they desire developing work with others but also desire spaces that will accommodate them if they feel the need to work alone. This study suggests that the need for this balance is expressed the most among the students majoring in fashion design and industrial and interaction design.

## DISCUSSION

This study aims to understand how the productivity of university design students are impacted by their work environments, particularly as they relate to architectural elements. The results of this study suggest two findings. First, types of spaces matter to design student productivity. They are particularly drawn to working at the design studio. As an alternative, they also perceive they are productive working at home and at their campus library. Second, the physical attributes and spatial qualities of those spaces matter. Above all else, this work suggests that the most important factors that promote a creative work environment for design students are controllable noise, the quality of light, and aspects of comfort, including air temperature and ergonomics of furnishings.

Limitations of this study concern data collection as well as the size and diversity of the sample. Most of these are pandemic related. COVID-19 delayed the approval of the study and thus the distribution of the survey. Distributing the survey mid-semester means that the students were asked to participate at a time when they were likely oversaturated by online activities from their studies which may have dissuaded participation. The delay also impacted the timely completion of phase two. Since interviews are still in-progress, the findings of this work are emergent. Completing phase two is expected to enhance and modify the discoveries presented.

The methodology of this research was also limited by the pandemic due to social distancing mandates. The research design was originally envisioned as on site, in-person interviews with design students so they can physically point out the attributes of the environment that relate to cultivating their work. This method hoped to evoke their memories of working in various spaces and also conjure strong emotional responses to elements of the building. Revisiting this method of data collection is opportunistic for furthering this work.

Finally, the pandemic has no-doubt changed the perceptions of working from home. Generally speaking, people are more accepting and tolerant of working from home. Since the data for this study was collected months into the pandemic, it is possible that this study captures design student experiences of productivity that are conditionally dependent on this, and perhaps less reflective of pre-pandemic preferences.

## CONCLUSION

This study is just the beginning of an important and exciting investigation that aims to know what design students need from their work environment to be productive. This is important work because design students are the emerging creative class, and because contemporary literature concerning creative production in both offices and educational settings does not target them as a unit of study. Considering that design students work in environments that reflect aspects of both offices and educational spaces, we should not assume that the productivity influencers are the same as those for design practitioners working in industry.

This work presents early yet bourgeoning evidence that design students prefer (and perhaps require) specific physical and spatial attributes to be productive. Future work on this study includes expanding the sample size, completing the in-progress interview phase, and realizing the original methodology of data collection: walking site while interviewing participants. This study should also be conducted at other institutions to discern if preferences are agreeable among design students attending different programs and if there are commonalities among different design majors. All of these modifications and continued efforts will enhance the reliability of the findings.

The long-term goal of this work is to produce generalizable knowledge that universities can use to evaluate the adequacy of existing spaces, and to discern how they can be improved to support students who are pursuing a professional design degree. Once completed, the knowledge that emerges from this research will serve as an important resource that creative education and design programs can use to design new and inspiring facilities.

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# CONCEPTS OF SPACE, LANDSCAPE AND PLACE IN METHODOLOGY OF ARCHITECTURAL DESIGN STUDIO

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## INTRODUCTION

Architectural and urban design education is a challenging and long-term process which is usually initiated at the faculties of architecture and carried out in an intimate and personal way during a lifetime of an architect. Teaching architectural and urban design is therefore challenging and demanding and it needs to provide a methodology which is sufficiently structured to guide students yet flexible enough not to restrict their personal, creative impulse.

The paper presents how the concepts of space, landscape and place are applied to the methodology of an architectural design studio and used as an analytical and a design tool for supporting development of students' projects on both urban and architectural scales. The paper shows the application of the 'space, landscape and place triad' at different stages of design such as context comprehension, problem definition, solution development and the projects' presentation. They are interpreted as epistemological stances which complement each other allowing for a multileveled approach towards the design reality. The notion of 'space' is seen as an underlying grid that carries global tendencies, architectural constants and top-down strategies for architectural creation. It establishes broader spatial and temporal relations looking at the continuity as an important quality of architectural acts. Furthermore, the methodology addresses the concept of 'landscape' and introduces the ideas of the visual and cognitive spatial comprehension. Working with landscape directs the students towards the integration of architectural design into its natural, social and cultural contexts. The question of landscape addresses the idea of topology as relational interplay that an architectural act establishes with the system it is inscribed in. Finally, the methodology approaches 'place' as a person-related realm which exists as long as it is bodily dependent and phenomenologically apprehended.

The work aims at presenting the theoretical background and the practical outputs of the methodology based on the space, landscape and place triad produced in the design studio of the second year of the Integrated Masters in Architecture at the Faculty of Architecture University of Lisbon.

## SPACE-LANDSCAPE-PLACE TRIAD

In our methodology, the notions of space, place and landscape are used as the basis of architectural and urban design. They are the conceptual backgrounds for emergence of architectural actions, the poetical containers for echoing their significance and the phenomenological perspectives for apprehending architectural and urban pieces. Through interpretation of the variety of meanings that

are attached to the notions of space, landscape and place we tackle their conceptual profoundness and interpretational diversity and apply them to urban-architectural discipline. Apart from their explanatory importance we give these phenomena a significant structural and methodological role in supporting creation, development and representation of students' projects in architectural education.

In human geography, the notions of place, landscape and space differ regarding their levels of concreteness being the space on the most abstract and the place on the most concrete side. Space is deemed to be broad, vague, anonymous, less defined and less concrete, while place is known, recognizable, and familiar. In his introduction into theory of place, Cresshwell discusses the commonly made distinctions between place and space: "(S)space, (then), has been seen in distinction to place as a realm without meaning, as 'fact of life' which, like time, produces the basic coordinates for human life"[1]. Tuan claims that the definition of boundaries between space and place is necessary for their differentiation and conceptual structuring. "'Space' is more abstract than a 'place'… The ideas 'space' and 'place' require each other for definition…From the security and stability of place we are aware of openness, freedom, and threat of space, and vice versa"[2]. In between these two concepts, we place the notion of landscape which can be deemed a space perceived through a filter of human needs as something potentially purposeful and meaningful. The landscape is a passage from the abstract space towards the concrete place – it is a cultivated space on its way to become a place. Or said differently, it is a place before we immerse into it.

This space-landscape-place abstract-to-concrete approximation is the main structuring grid upon which our methodology is built. In the following sections we will interpret space, landscape and place concepts separately and present how they are being applied on different aspects of architectural design. Finally we will show how the use of these notions, which are united as triad in their ontological intrinsicality, support creation of architectural projects of considerable integrity.

### Exercise 1 - SPACE

As described in Plato's Dialog Timeous, space (χώρα) is considered to belong between 1) the absolute one - that is not a subject of change, and 2) the relative one - the sensible world in which generation occurs. It is an intermediate that participates in the immutability and simultaneously receives the mutability of sensitive world: "…a third Kind is ever-existing Place, [52b] which admits not of destruction, and provides room for all things that have birth…" [3] Based on Plato's tradition this notion of what is known as absolute space remains present in different temporal and disciplinary perspectives as the foundation of diverse accounts such as mathematical, physical, psychological, philosophical, etc.

Newton's absolute space as he describes in a "Scholium" at the beginning of the Principia, is a true and mathematical space which remains similar and immovable without relation to anything external [4]. This mathematical space, Harman calls "ideal" and according to him, it does not deal with reality as such but lies within the higher strata of reality: "Many mathematical structures are far from being exemplified in reality and some will never be"[5].

Differently from Newton and Hartman, who are accept the existence of absolute space as independent from human beings that one can reach by mental processes and like that conceive it, Kant denies it. His resolution of the space problem: "reached in the Dissertation of 1770 (cf. Handyside 1928) and the Critique of pure reason (1787) was that space was indeed absolute, but that it was not a property of the physical world. Rather, it was an innate organizing principle of the mind, by which the sensations derived from the physical world were constructed into a conscious manifold. Space was a way of perceiving, not a thing to be perceived"[6]. The continuous space of Modern Movement is an abstract space which as a natural phenomenon, a found condition, an a priori continuum, has scientific

connotations similar to the field theories of light and energy - it is ever present, untouchable, and abstract[7].

Another interesting spatial conceptualisation is Deleuze's smooth and striated notions: "(T)the sea is a smooth space par excellence: open water always moved by the wind, the sun and the stars, nomadically traversable by noise, colour and celestial bearings. Increased navigation of the open water resulted in demands for its striation"[8]. Similarly to the abstract space, the smooth one is permanent, repetitive and extends beyond representational limits. It is as an infinitely stretched fabric before it gets cut, folded or bended. It is an everlasting metronome behind any rhythm or music.

Using the Plato's tradition in the SPACE exercise we aim at applying the notion of space as a supporting grid system to enable creative tendencies, architectural foundational premises, and top-down strategies towards creation. Space serves herein to establish broader and ideal relationships (both spatial and temporal), through a continuity framework, which uses geometry within architectural activities and its former solutions. This strategy is framed in the stability of the constants, the clarity of rules, patterns and repetition. It is an underlying grid (geometrical and ethical) to support an eclectic educational path, in order to facilitate creative learning in the development of spatial solutions. It is architectural heart beating.

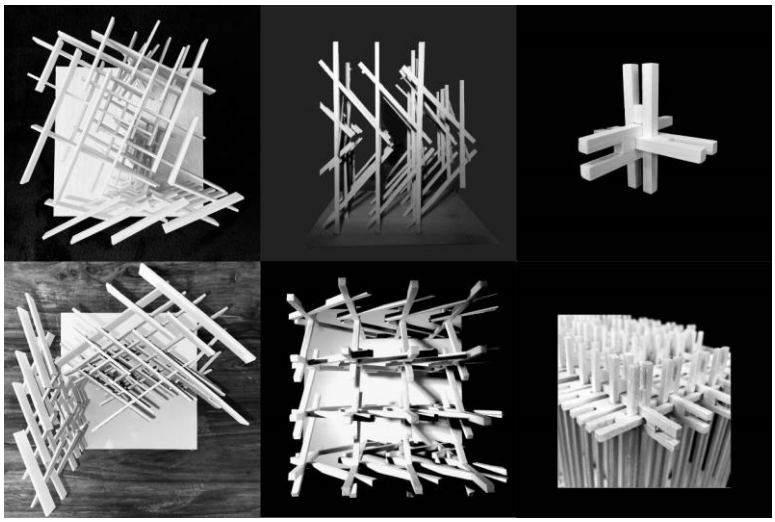

*Figure 1. Exercise SPACE, Para-architecture, students Iris Reis, Maria Jorge, scholar year 2020/2021, tutor Nuno Montenegro*

In this exercise, the students are presented the abstract notions of spaces and asked to explore them and based on them create an abstract para-architectural piece[9]. They are able to choose an existing or develop a new notion of space and translate it into geometrical and structural rules, tectonic patterns, metric frameworks, modular systems. Students are asked to, by manipulating the concept of space, develop different abstract languages (with architectural and urban affinities) without their contextualisation or site application.

In practical terms, they are encouraged to use different techniques such as writing, drawing, modelling, and to explore abstract notions of space in general and architectural space in particular. They conceptualize, idealize, geometrize; create patterns, define metrics and rhythms. In short, they manipulate spatial notions through their personal ethical and poetical stance and based on it create their para-architectural pieces. These pieces further serve as creational 'dough' for development of site and function-specific projects.

Regarding the architectural and urban representations, the SPACE exercise focuses on the abstractness and therefore the possibility to establish an infinite distance between the observer and the observed through development of 'objective' non-perspective drawings and tri-dimensional models.
The exercise SPACE enables an approach at three main levels:

- Concept (Geometry, Idealisation and Conceptualisation)
- Language (Language and Pattern + Metric and Rhythm)
- Poetics (Ethical Assumptions and Poetical Works)

In general produces some of the following outputs:

- Writing (Theoretical and Poetical Writings)
- Automatic Sketches (Oblique and Diagrammatic Drawings – near to an subconscious level)
- Free models (Abstract Models)
- Final models (Para-architectures)

### Exercise 2 - LANDSCAPE

The next exercise is structured around the concept of Landscape. The Landscape usually refers to the shape of material topography as a part of the Earth that can be seen from a place. It is an out-there world. "Landscape is an intensely visual idea. In most definitions of landscape the viewer is outside of it"[10].
Landscape is more than merely an objective physical environment – it is a way of looking at that environment. As argued by Seddon, this notion is more ambiguous in English speaking world than in Italian or French. While the English landscape is sometimes mistakenly confused with a notion of undetermined vast territory still to be appropriated, the Italian idea of 'paesaggio' as used by Norberg-Shultz by definition incorporates the human point of view and his needs[11]. Landscape and topography can be approached as an environment seen through the framework of human needs, culture and values as pointed out by Christophe Girot in his theory on topology of landscape. "Topology is meant to weave meaningful symbolism back into a particular place by understanding its terrain and surface condition, and by modifying the inherent significance of natural features as they interact with the purpose of man, his daily life and destiny." From "Topology - a new measure of quality in landscape architecture"[12].
Apart from its importance in structuring a visible and meaningful environment, the landscape is crucial in shaping our cognitive apparatus. In his cognitive linguistics, Toyota explains how the upbringing environments influence our use of spatial prepositions, and ways we conceptualise reality. When asked if we should rather say that a lake is 'on' or 'in' a mountain, people brought up in hilly and flat regions have different designations. Those from mountains tend to use 'on' preposition while people brought up in flat areas use 'in'[13]. This example elucidates how the relationship between humans and the context is a reciprocal one – while shaping the environment, humans are also being shaped.
Landscape is in the very core of the architectural and urban discipline. For Norberg-Schulz (1979) the structure of a place is built upon the relationship between the landscape and the urban settlement, generating what he calls a place's atmosphere or character. The same built assembly would have another character if it was made in different landscape. Similarly, Humphry Repton claims that architecture should be created upon the Landscape: "...the plan must be made not only to fit the spot, it ought actually to be made upon the spot, that every door and window may be adapted to the aspects and prospects of the situation"[14].
In our teaching methodology we use this multileveled concept of landscape as something that precedes and embraces the architecture in both spatial and temporal sense – extending its boundaries.

Landscape is a wider architectural and urban setting which is the foundation for creations but also permits creations' understanding and generating their meaning. It is the surrounding which brings into the field of architecture the world of others.

The aim of the exercise LANDSCAPE is to understand the order and qualities inherent to a Hegelian situation as the set of accidents of specific location and time and their latent possibilities that can become evident through the architectural-urban action. As suggested by Wilson[15], instead of the desire to impose a new idealized order on top of an imperfect reality, students are asked to search for an architectural and urban gesture that allows the generation of a synergy between the existing situation and the new object. This gesture is an expression of an idea or meanings and a symbiosis between the pre-existing and what is about to happen as an ethical responsibility of the architect as the effective agent before an affected collective being. Architectural and urban gesture is not only a material action it is a moral gesture.

The representation at the LANDSCAPE level is proposed for capturing, modelling and explicit pre-existing natural and built environment that precede, inspire and grasp a variety of architectural interventions. Such representations (apart from the landscape as contextual reality) include strategic planning actions and gestures, which reveal the quality of the dialog established between architecture and (its) landscape.

The exercise LANDSCAPE enables an approach at three levels:

- Topography (Geography, Site implantation)
- Heritage and Context (Location and Impact)
- Perceptive Topology (Balance, Interplay and Arrhythmia)

In short, it produces some of the following outputs:

- Site Analysis
- Site and Gesture Drawings
- Site and Gesture Models

*Figure 2. Exercise LANDSCAPE, Site and Gesture Models, (from left to right) Class F, Iris Reis, Class F, scholar year 2020/2021, tutors: Nuno Montenegro, Ljiljana Cavic*

### Exercise 3 - PLACE

The third level we use in our methodology is based on the notion of Place as something that presupposes in-situ interaction, apprehension and appropriation. Place carries ‘sense of place‘[16] and represents ‘meaningful location‘[17], a ‘secure one’[18]. It is a way humans make the world meaningful by chunking it into recognizable units that he knows and is attached to. For Aristotle place is a precondition for being to occur. In his Physic he describes: “The physicist must have a knowledge of Place, too, as well as of the infinite — namely, whether there is such a thing or not, and the manner of its existence and what it is — both because all suppose that things which exist are somewhere (the non-existent is nowhere — where is the goat-stag or the sphinx?)”[19].

Another important account about the Place is the notion of dwelling from the Heidegger's phenomenology. He argues the necessity for presence and incorporation of certain locations as a precondition for existence. "To say that mortals are is to say that in dwelling they persist through spaces by virtue of their stay among things and locations"[20]. According to Heidegger this tight relationship between living and a site is what turns the abstract space into an inhabited place by means of adaptation to the landscape.

Moreover, this phenomenological account addresses the inseparability between body and place but also the act of building which as a consequence of dwelling occurs between body, place and location (location being the very quality of nature). To build for Heidegger is to be able to dwell the specificities of a certain location: "Only if we are capable of dwelling, only then can we build"[21].

Apart from the body-place and place-location relationships, we would stress the Bachelard's[22] phenomenological account about poetic image and personal memories that can strongly echo and reverberate in others.

The ontological inseparability between body, place, experience and the presence as condition of being is the third generative force of our teaching methodology. Architectural and urban disciplines are thus tackled as not enclosed in the traditional conceptual sphere of project and design. They emerge as material artefacts intended to be experienced and only like that fully exist.

In the PLACE exercise students are asked to dive into the intervention site where 'learning through' begins. Students make records of a place which include their bodies as the integral and explanatory part of it. The idea is to use their own real and imaginary presence, to explain and explore the site, in order to internalize the place in a more intense and personal way. Students are then challenged to immerse themselves into the site, in order to be able for them to recognize and document the tense friction that occurs between their bodies and the place, but also between their mind values and judgments, and the newfound situation. This experiential and corporal 'dive' aims to unify the two proposed didactic approaches - 'learning about' the place is aided by 'learning through', being in place and with place. This subjectification and apprehension of the context aim to create the ontological dependence between a student and the place of intervention in order to allow the decisions on site to be the decisions of the student itself.

Apart from the body-place relationship the PLACE exercise also addresses phenomenological aspects such as experience, atmosphere and materiality, which are possible to be grasped only due to the existence of the body, and the body self-involvement. At this stage, students are challenged to explore materials and their textures, to examine how they tremble in light and shadows. They manipulate different materialisations and sense their nature, the way they vibrate, change and age.

Regarding the architectural representation, the PLACE level implies the idea of drawing from a first-person perspective, which enables the capture of the impermanent qualities of a place. It also includes the hands-in modelling and material manipulation that takes the architectural process out of the paper and drawing realm, back to sensitive reality experience involving smell, sound and texture.

The exercise PLACE allows an approach at four main levels:

- Place Dive (Phenomenology)
- Materials (Physical and visual manipulation)
- Atmospheres (Sensitive qualities and Sensations)
- Persona (Memories and the idiosyncratic personal context)

PLACE exercise facilitates the production of the following outputs:

- Phenomenological Diaries
- Atmospheric Drawings

- Body-material Interventions
- Photography, Videos and Collages

*Figure 3. Exercise PLACE, Body-material students' interventions, (from left to right) Iris Reis; Lorena Biazin, Margarida Alexandre, Mariana Vieira da Silva, Marta Dias, Zé Neves, Maria Martins; Iris Reis, scholar years 2019/2020, 2020/2021, tutors: Ljiljana Cavic, Nuno Montenegro*

## CONCLUSION

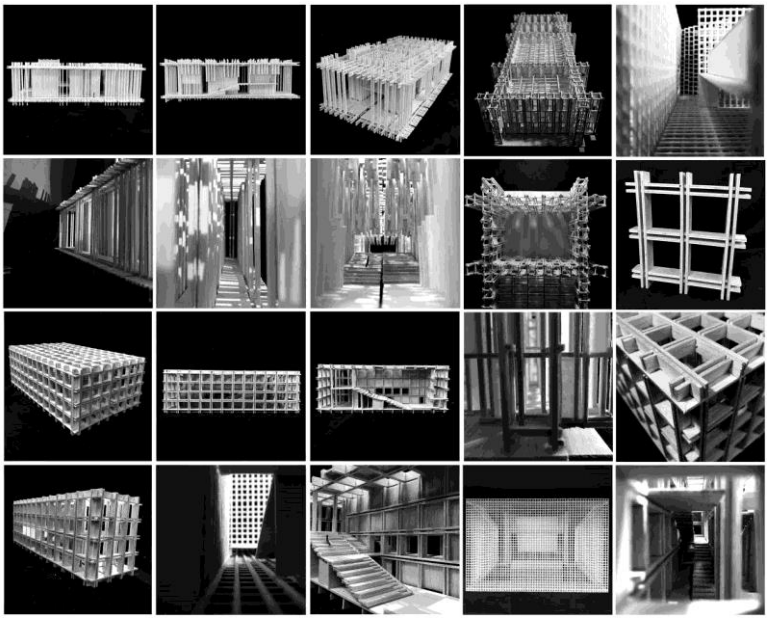

*Figure 4. Exercise PLACE+LANDSCAPE+SPACE, Floating Theatre students' projects, class E, scholar year 2018/2019, tutors: Pedro Cabrito, Ljiljana Cavic*

The presented teaching methodological grid based on Space-Landscape-Place triad is intended for architectural design studio of the second year of the Integrated Masters in Architecture at the Faculty of Architecture University of Lisbon. It covers both theoretical foundations and practical applications necessary for development of architectural and urban design works (Table 1). When applied, our methodology has shown its purposefulness regarding the following criteria among others:

- At early stage of architectural education, students are given broad yet stable structuring grid that is adaptable to their interpretation and sensibility.

- The methodological grid is flexible and can incorporate new spatial, landscape and place concepts.
- The methodology covers different scales and approximations, from global, to local and personal which support architectural design as a complex, transversal and multi-approximation process.
- The grid offers, apart from design, an extensive theoretical background necessary for informed and intensive architectural and urban practice.

| | Space | Landscape | Place |
|---|---|---|---|
| Theoretical Foundations | **Concept** Geometry, Idealisation and Conceptualisation | **Topography** Geography, Site implantation | **Place Dive** Phenomenology |
| | **Language** Language and Pattern + Metric and Rhythm | **Heritage and Context** Location and Impact | **Materials** Physical and visual manipulation |
| | **Poetics** Ethical Assumptions and Poetical Works | **Perceptive Topology** Balance, Interplay and Arrhythmia | **Atmospheres** Sensitive qualities and Sensations |
| | | | **Persona** Memories and the idiosyncratic personal context |
| | Space | Landscape | Place |
| Practical Applications | **Writing** Theoretical and Poetical Writings | **Site Analysis** | **Phenomenological Diaries** |
| | **Automatic Sketches** Oblique and Diagrammatic Drawings – near to an subconscious level | **Site and Gesture Drawings** | **Atmospheric Drawings** |
| | **Free models** Abstract Models | **Site and Gesture Models** | **Body-material Interventions** |
| | **Final models** Para-architectures | | **Photography, Videos and Collages** |

*Table 1. Methodological grid based on Space-Landscape-Place Triad*

## NOTES

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# VIRTUAL REALITY IN DESIGN, A NEW STUDIO ENVIRONMENT

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## INTRODUCTION

Technology and design share a mutual relationship, designers create devices, user interfaces and experiences that connect users to technology. While advancing technologies change the way design is being practiced, impacting design education and curricula development. [1] Digital renderings have replaced analog marker renderings and rapid prototyping such as 3D printing is reconceptualizing the design workshop. In this new decade, immersive technologies such as virtual reality (VR) are going to be a major part of society, impacting lifestyles, work cultures and education.[2] Design educators however may not be familiar with or possess the right knowledge in understanding VR, both in its implications to design and how it can be integrated into their curricula. VR as a technology is not new but its increased accessibility in the last five years has created a growing segment of users in the area of creative work, including an emergence of design-useful VR applications.[3] This growth is reflected in the professional design world with product, interior and architecture design firms already utilizing VR in their process and business.[4] Design educators need to be aware of this trend and be better informed so that curricula can not only keep up but also set new standards and precedents in design's role in the sphere of VR.

## VIRTUAL REALITY

The term virtual reality has existed for more than fifty years and has taken on various contexts in history. [5] VR has presented stereoscopic images through a stereoscope, large fixed head-mounted displays with stereo screens, digital 3D environments on computer screens, and as virtual environments (VE) or virtual worlds (VW) and cave automatic virtual environment (CAVE) a room filled with digital projections on the wall that are generated by a computer. (see Figure 1)

*Figure 1. Top-left, A stereoscope viewing stereoscopic images, https://en.wikipedia.org/wiki/Stereoscope. Top-right, The Sword of Damocles VR head-mounted display, image from http://etsanggarp.blogspot.com/. Bottom-left, Virtual environment with three participants connected, image from https://www.ercim.eu/publication/Ercim_News. Bottom-left, CAVE projection environment, http://www.visbox.com/*

VR technology has started to become smaller, more comfortable than its predecessors and easier to set up and use, making it more suitable for a variety of activities from gaming and entertainment to simulation training and education.[6] (see Figure 2) A newer generation of head-mounted displays (HMD) paired with tracked controllers on each hands introduced VR systems that allow the user freedom of unrestricted movement in the 3D VR environment; a technical term known as six degrees of freedom (6dof).[7] Since 2013, these VR systems have started to become more affordable and available to the mass consumer market.[8] Design and design education which have utilized previous forms of VR are now presented with a new opportunity to integrate these VR systems as part of their work, curricula, or research.[9] This opportunity means that current VR applications, that are usually not design-centric need to be adapted for design education or new VR spaces for design need to be created and explored.

*Figure 2. The current generation of VR systems, including wired and wireless head-mounted displays and controllers with full six degrees of freedom tracking. Image from https://pale.blue/ news blog.*

## DESIGN EDUCATION AND PEDAGOGY

Design in academia strives to integrate knowledge and skills as part of the curricula that will prepare students for real-world situations and professional practice.[10] This is a complex task as knowledge in design is not only explicit but exists in implicit and tacit forms.[11] The design studio started to morph in light of these complexities and in contrast to the lack of societal and human connection presented by traditional models such as the Beaux-Arts system and Bauhaus.[12] Design studio pedagogy evolved with new approaches to help facilitate design knowledge building through experiential learning, collaboration, dialogue and critique, allowing for real-world problem solving and integration of concepts and skills into the curricula.[13] Constructivist pedagogy became intertwined within the design studio aligning with design education goals, emphasizing the learning environment and experiences as a vital part of knowledge building for students.[14] VE and VW design spaces which incorporated constructivist learning approaches, revealed an ideal match for design, encouraging experimentation, critical thinking and innovation. [15] This gives us an implication of what possibilities current VR can have in this area.

## RESEARCH METHOD AND DATA

The data collected from this research are a result of literature reviews, qualitative research interviews, user observations and collaborative academic projects, both from within design and outside design. Many of the design use cases are relatively new with few publications. Participants who are primarily educators were engaged through VR academic groups through various platforms such as discord, and through events and conferences organized by *Educators in VR* and the *Immersive Learning Research Network*.[16] The analysis is framed through activities in the design process, design studio pedagogy and constructivist pedagogy.[17] The next following sections of the paper presents the important perspectives and considerations design educators need when integrating VR into their own curricula development.

## VIRUTAL REALITY APPROACHES IN DESIGN EDUCATION

This section highlights the various approaches identified from educators currently utilizing VR for teaching. They have been categorized into three main approaches. The first approach has been named *adapt,* these are design educators which have substituted VR as a meeting place or a communication platform for remote learning. Many of the design educators in this group are still in the exploratory stage of finding out what benefit VR can have for them. This is the largest group with many gaining an interest in VR due to the Covid-19 pandemic restrictions. It is likely due to the rushed nature of shifting into a remote setup during the pandemic that led many within this group to choose popular VR applications that were convenient. [18] The characteristic of this approach is that studio activities are adapted in VR, with educators mainly utilizing a whiteboard in VR, sharing media such as images and video clips and using the VR space for discussions.(see Figure 3) Educators interviewed wanted to try VR to make classes more engaging compared to video conferencing setups, however this group mostly did not utilize unique VR affordances.

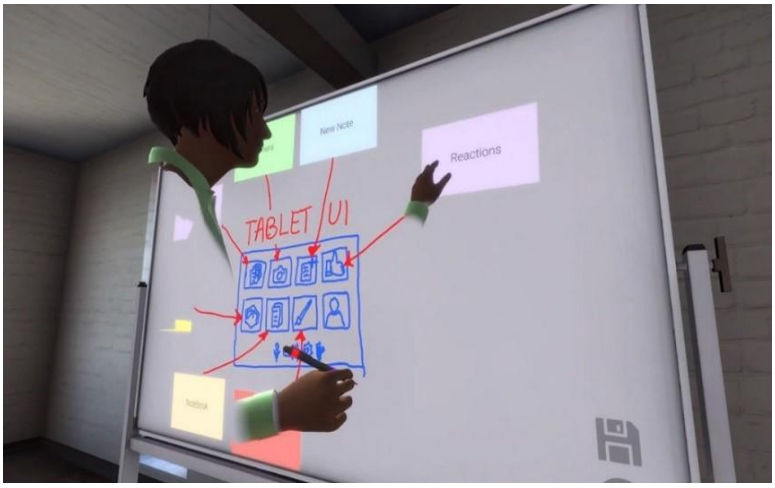


*Figure 3. A UI/UX design discussion utilizing a VR whiteboard. Image from MeetinVR*

The next approach, *enhance*, are the educators that have utilized unique affordances in VR such as 3D spatial sketching, full-scale model making and manipulation in immersive environments, and leveraging various 3D perspectives for viewing CAD models in space. [19] Many of the design educators in this group have begun to discover how VR is enhancing their own design process and have explored the technology enough to incorporate it within their curricula. Design educators in this group are mostly from product, interior and architecture design as the tools and features in some of the VR applications make it ideal for their design process[20] way they can teach design through their own explorations of integrating VR in the design process. In this group, VR is utilized as one of the tools within the design curricula.

The last approach is *shift*, this is when curricula is centered around VR, such as in inborn experience design which focuses on interfaces and interactions in VR. [21] While it can also be in the form of designing for VR, in the example of VR experience and game design classes.[22] *Shift* also represents novel approaches where VR becomes the enabling factor of design. An example here is NASA which utilizes VR to design in microgravity simulated environments. [23] VR here becomes vital as it allows designers to be immersed in environments that would be otherwise almost impossible to replicate.[24] Curricula within this approach is also interesting as it blurs the lines of traditional design disciplines and instead embraces hybridity of approaches from architecture, interior, product and interaction design.[25]

## CURRENT VIRTUAL REALITY APPLICATIONS

Multiple literature sources in the area of design studio and constructivist pedagogy have identified that the ideal learning environment for design education should facilitate active participation, hands-on doing and the practice of skills, encouraging dialogue, collaboration, critical thinking, innovation and experimentation.[26] Tacit and implicit design knowledge is best demonstrated, transferred and practiced through activities that align with these pedagogical requirements. However, the majority of readily available VR applications are not intended for design education and do not meet the requirements for such design studio activities. An analysis was done on these VR applications, identifying the types of possible design studio activities that can be implemented. This resulted in three groups that were categorized by the similar features they had that matched design studio activities of visualizing, making and connecting., (see Figure 4)

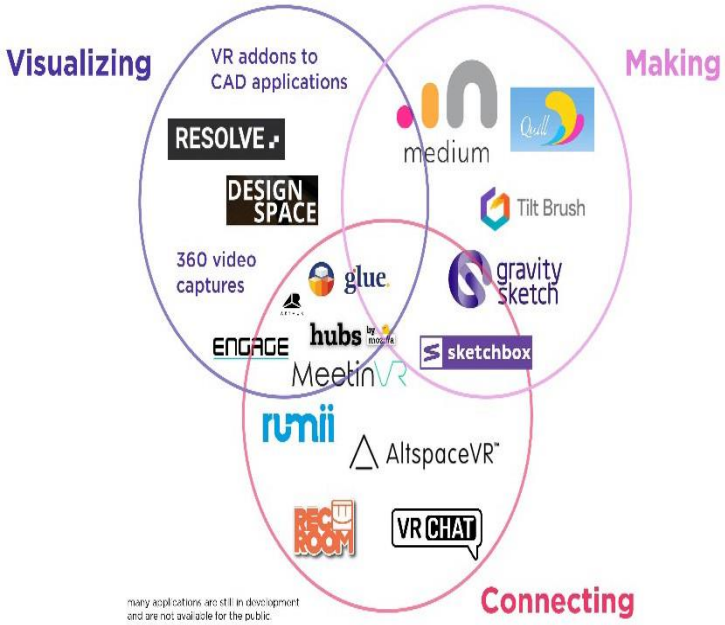


*Figure 4. Venn diagram of VR applications grouped into design studio related activities.*

One of the main challenges is finding an all-round suitable application, many of them are stronger in one area but had significant limitations in others. Applications in the *visualizing* category, present immersive ways of viewing 3D models and spaces. Designers can utilize scale, lighting, color and movement around their designs that gave them unique perspectives that aided the design making and development process. However, the applications in this category are limited in features such as realtime editing, being able to create and modify designs while in VR. This plus the lack of synchronous features for collaborative work makes them less ideal for teaching and more suited for individual evaluation of design work.

The *making* category has the most design-friendly VR applications which include tools and features that facilitate creative work. Designers are able to model from scratch and edit forms in real-time while in VR which is an important part of the idea generation and prototyping process in design. Features and tools similar to CAD applications but with the addition of 3D spatial sketching introduce a new approach within design that would be almost impossible without VR. The reason why such applications have not become more prevalent in the design classroom is due to the limited collaborative features which are crucial in a design studio for activities such as discussions and critiques. Applications here also focus on particular areas of design such as form development and may not fit every step of the whole design process.[27] This is not ideal given that design studios encompass various stages of the design process and sometimes include cross-design disciplinary work. The *connecting* category are VR applications that focus on meeting spaces. Numerous features identified in these applications are important for the ideal VR design studio. These include the ability to host larger groups of VR users in a synchronous environment and have administration and security features that would allow an instructor additional controls useful for teaching. For example, a feature controlling when and where content can be shared or controlling the speech volume of students, giving a presenter a louder amplification in the VR environment.

There are a few VR applications that continue to add features placing them in overlapping areas between the categories. This is however still limited as the additional features are not as well designed as the main intended features of the apps. The VR applications reviewed also share similar limitations

across the categories such as interfacing and compatibility issues with the various types of file formats they allow. Conversations with some of the app developers reveal that this is done intentionally as part of their business strategy or for proprietary reasons. Research of the VR application reveal that numerous apps are not available to the public which make it difficult for design educators to explore or learn about them. One other significant challenge is the learning curve in many of these applications that can be a barrier and dissuade adoption.

## A VIRTUAL REALITY DESIGN STUDIO

The current gap for design education in available VR applications led the author to create a VR design studio from the ground up. This option allowed the integration of design studio and constructivist pedagogy requirements while taking into consideration the limitations of other VR applications and the facilitation of the various routes of teaching design in VR such as *adapt, enhance* and *shift.* The creation of the VR design studio (VRDS) also gave the flexibility of integrating design considerations into the VRDS such as the environment, the interactions and the types of VR design tools. Though in its infancy and still going through iteration and development, the VRDS has been implemented in multiple actual use cases in academia.[28] Videos of the use cases presented in this section can be seen in the conference presentation by the author. [29]

The effective integration and implementation of VRDS in the various use cases is due to its core structure of a *collaborative VR design sandbox.* This is essential to the VR development process that allowed the VRDS to be tweaked to each of the use cases and their intended goals. This makes it suitable for design educators with various teaching approaches and discipline-specific content to adjust the VRDS to their needs. The key principles of the *collaborative VR design sandbox* have been identified and developed by the author and sets a guiding framework of important considerations for an ideal VR design studio setup. The next section will present these key principles and provide empirical evidence from the use cases that demonstrate the affordance of each principle. It should be noted that the key principles were integrated in the VRDS for every use case, but the evidence presented have been chosen from particular use cases that best highlight an example.

1. Principle: Ensuring synchronous environments and tools for real-time design, facilitating collaboration, iteration, dialogue, presentation and critique.

Evidence: In this use case the VRDS was integrated as part of a participatory design research session. The goal of the session was to improve on the design of Intensive Care Unit (ICU) rooms in a hospital to help reduce sleep deprivation and delirium. (see Figure 5)

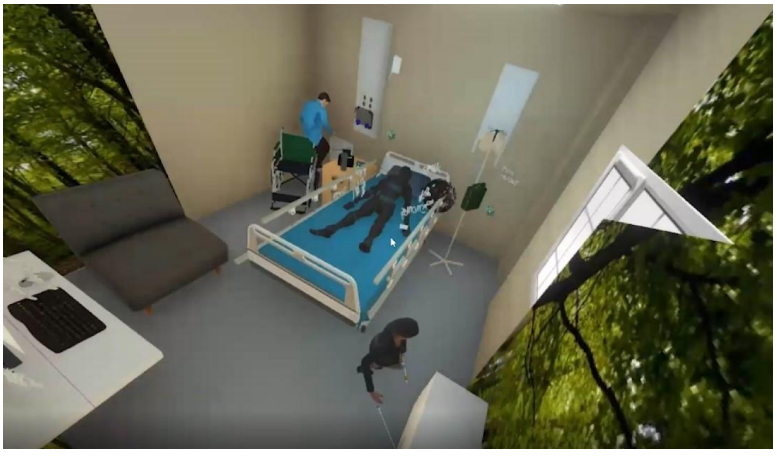

*Figure 5. The VRDS being used in a participatory design research session for an ICU hospital room.*

The synchronous environment allowed for multiple participants to be in the VRDS at the same time, generating prototypes and making changes to them in real-time. These allowed participants of the research session to collaborate and see their ideas materialize in space while they continued to have dialogue and critique of their decisions. This does not only fulfill the requirements of design studio pedagogy but also allows for the *enhance* approach to be adopted, changing the way idea generation, concept development and critiques happen in design curricula.

2. Principle: Flexibility and diversity from file format integration to customization of interactivity and permissions in the VRDS. Facilitating interfacing of current workflows from design work and education into VR.

Evidence: The VRDS was integrated into a semester long design studio with the end goal of designing an art exhibition. (see Figure 6)

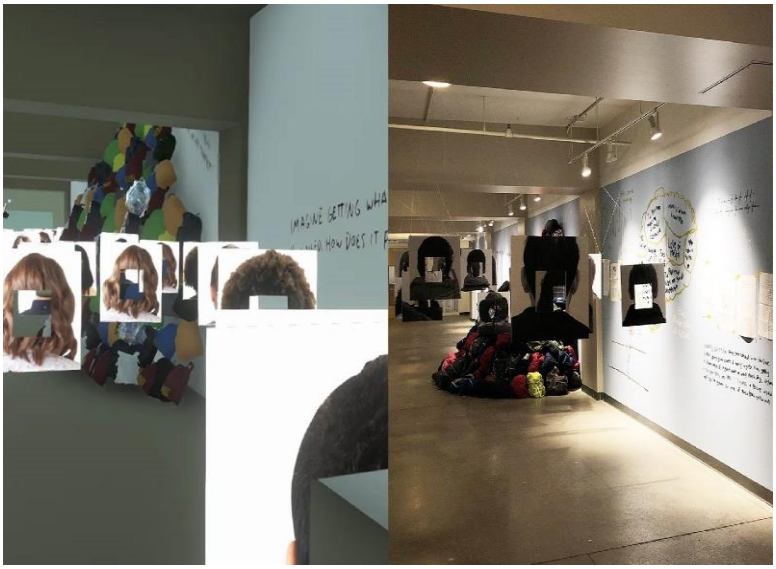

*Figure 6. An art exhibition planned and prototyped utilizing the VRDS next to a photo of the actual exhibition.*

The art exhibition wanted to integrate multiple sensory elements; the flexibility of file formats allowed for students to import CAD models of objects and interior spaces built-in programs they are familiar with into the VRDS. The students were able to integrate video clips and spatialize audio clips in the VR prototype that created interesting new ways of prototyping concepts for the exhibition. The interactions and permissions in the VR exhibition prototype were customized between the students and the faculty that participated in the critique, this ensured that the faculty did not accidentally change the prototypes.

3. Principle: An emphasis on the usability of tools and features catered not only for design studio activities but for teaching, learning and research.

Evidence: The VRDS was tested in a remote collaborative session with students and design instructors, this happen during the Covid-19 pandemic and an extensive orientation session was not possible. Instead, particular tools that were easy to use were created for the session, features such as movement was also set so participants could adjust their own comfort level. This facilitated a shallow learning curve where participants mastered interactions, created prototype spaces and were able to present them to the group. (see Figure 7)


*Figure 7. A teaching instructor presenting a prototype interior space for teaching and research.*

The use cases and evidence demonstrate the importance of these key principles and when they are integrated into the VRDS then can new VR design curricula be explored.

## CONCLUSION

This paper has presented a brief overview of the emerging intersection of design education and VR. It frames the exploration of this novel area through design studio and constructivist pedagogy and highlights an ongoing trend of VR that presents an opportunity for design educators. The research presented in this paper provides design educators with an awareness of the current approaches of VR integration in design education. It further goes into an analysis of existing VR applications, addressing the strengths and limitations of utilizing them for the design studio. The use cases and key principles of the VRDS presented can be used as a framework and guide by educators interested in the integration of VR into their curricula development. There are also areas of the research that have not been presented in this paper due to its infancy and a need for further development and studies. These include the technical details concerning the implementation of the VRDS and specific analysis based on individual use cases that will be reserved for future papers. The author acknowledges several concerns regarding the implementation and setup of VR in academia that had surfaced from interviews. The author suggests connecting to researchers and design educators in this area, including the groups VR groups presented in this paper. Applying for grants and reaching out to the campus tech services is a good starting point to explore this technology but any more details is beyond the scope of this paper. The VRDS continues to be used in present studies and has expanded to areas of academia beyond design. The author is open to opportunities for collaboration and discussions with fellow academics interested in moving this research forward.

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# THE EXPANDING MULTIVERSE OF LEARNING SPACES: ADAPTING TO A NEW LEARNING CULTURE.

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## INTRODUCTION

The ongoing pandemic has heightened our awareness of how we teach, expanded the meaning of where we teach, and raised important questions about the relationship between onsite and online learning. This experience provides new insights, and tools to work with, which are influencing and challenging teaching and learning. Culturally and socially, our students have already been living in a multiverse, and education has been undergoing a shift from an "instruction paradigm" to a "learning paradigm."[1] Some say the experience of the 2020 COVID-19 pandemic is similar in impact to that of the industrial revolution and that the confluence of these circumstances presents an opportunity for the transformation of schools.[2] Accordingly, this is a historic moment to think creatively about shaping the future of learning spaces.

Acknowledging that the current situation is calling for systemic changes in education, touching on everything from "mission and purposes, criteria for success, teaching/learning structures, learning theory, productivity/funding, and nature of roles,"[3] the aim of this paper is to reinforce best pedagogical practices like active learning and collaboration which support individual, social and environmental well-being while looking for ways to adapt to a dynamic and uncertain future. As the world of learning expands and unfolds, it will be essential for instructors to adopt an agile mindset centered on learning, be learners themselves, own multiple learning domains or platforms, collaborate with one another, and be alert to new opportunities and advantages. This paper offers a new perspective on the changing culture of learning based on a holistic vision of technology and space and a new paradigm for thinking about "where" learning occurs in schools.

## THE MULTIVERSE

Although the relationship between learning spaces and student learning outcomes is not linear, learning spaces are a recognized factor in learning outcomes.[4,5] Today "learning spaces" implies multiple learning platforms (each a world in itself), with specific advantages and limitations. The concept of the multiverse is used in this paper to suggest how the idea of the learning environment will need to expand beyond the physical and virtual dichotomy and account for multiple platforms in order to take advantage of new opportunities. Onsite, online, and hybrid platforms each represent a different dimension of the new multi-platform learning environment.

### Onsite

An onsite platform is a physical space with face-to-face communication, including the traditional classroom, lecture hall, or lab. Onsite teaching and learning can also take place in outdoor areas, whether formal or informal, in creative maker spaces like studios, shops, or innovative incubator spaces, or "in the field." Onsite instruction usually takes place synchronously but may be recorded to create asynchronous learning opportunities.

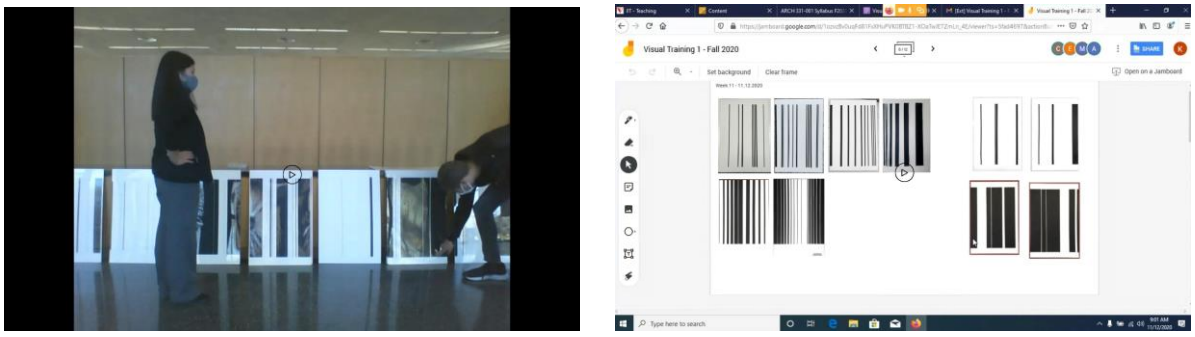
### Online

An online platform is a digital space that can be accessed from anywhere and occupied by teachers and learners either synchronously (at the same moment in time) or asynchronously (on demand). The digital space is usually created by the use of meeting software, which is shared by all participants and accessed remotely and individually. To enhance collaboration, software borrows "analog" concepts from onsite platforms, like whiteboards and break-out groups. Participants have similar points of view unless the instructor chooses to control the level of participants' ability to share. In this platform, device and connection quality are known to impact the quality of communication and instruction, making access to devices and the internet central factors in online platforms for learning. Additionally, privacy issues and variations in the home setting can influence the learning experience.

### Hybrid

A hybrid platform is a learning space in which some learners are physically present in a physical space at the same time that other learners are digitally accessing the physical space from a remote location. The synchronous hybrid learning space is considered a distinct platform with characteristics that differ from the purely onsite or purely online environments. Some research "suggests cautious optimism [that] synchronous hybrid learning … creates a more flexible, engaging learning environment compared to fully online or fully onsite instruction."[6] The term "Hyflex"[7] was introduced to describe that kind of hybrid space in which participants are also allowed choice in how to attend (i.e., onsite or online).

Hybrid platforms share characteristics with both onsite and online platforms. The main distinction of the hybrid platform is that it needs to be viewed from multiple points of view at the same time. For example, three points of view are implied in Figure 1, in a studio-format course where work is being presented by some learners onsite and others online. The onsite classroom in Figure 1a is experienced differently by the onsite and online participants, representing two perspectives. The presentation of work by online participants represents a third experience, which is similar for both the onsite and the online participants (Figure 1b).




*(a)* *(b)*

*Figure 1. Presenting work in a synchronous hybrid platform. Images from one class session recording: (a) onsite learners' work, and (b) online learners' work.*

Adapting to the new multiverse culture of learning requires advancing knowledge of each platform to form a more integrated and nuanced perspective. In order to build on our past and current experience and transform learning culture, "the question is less about rejecting earlier methods in education than it is understanding how different methods impact learning, that we might draw on them more adeptly in our own instruction." [8]

## A HOLISTIC VISION OF SPACE AND TECHNOLOGY

This paper offers a particular lens through which to view the new multi-platform learning environment within the evolving culture of learning, one based on a holistic vision of technology and space. This lens integrates research showing that habitat enhances culture,[9] that physical and virtual spaces can both empower learners and learning,[10] and that spatial affordances influence both feelings and behaviors.[11] Focusing on learning and teaching behaviors and emotions while designing course curriculum, inspires new pedagogical approaches, encourages a particular learning experience, and enhances all users' well-being.[12]

Given that "learning spaces can produce conditions and mediate relationships that can improve student learning along a range of indicators (physical and mental well-being as well as cognitive)"[13] and that "relationships [are] made more complex by the blurring of real and virtual space,"[14] understanding the mechanisms between space, technology, behaviors, and emotions becomes crucial. By focusing on the affordances of each platform, and softening the dichotomy between onsite and online learning spaces, it is possible to leverage this new stage in the learning culture which has accelerated during this pandemic.

### The influence of affordances

Architectural affordances refer to the qualities, tools, and elements of space that create cues for certain behaviors, activities, and emotions, which are correlated with user perception. Learning culture is influenced by space affordances.[15] Therefore, understanding these affordances will aid in addressing current dilemmas such as how to maintain dynamic and inspiring in-person and remote learning experiences through onsite, online, and hybrid platforms. Using a variety of platforms with different physical and digital affordances enriches the range of learning behaviors and emotions, supports diverse learners' needs, and creates a more holistic learning culture (see Figure 2). Working holistically with the appropriate behavioral and emotional affordances offered by each platform can better support active, fulfilled, self-actualized, and motivated learners and teachers.

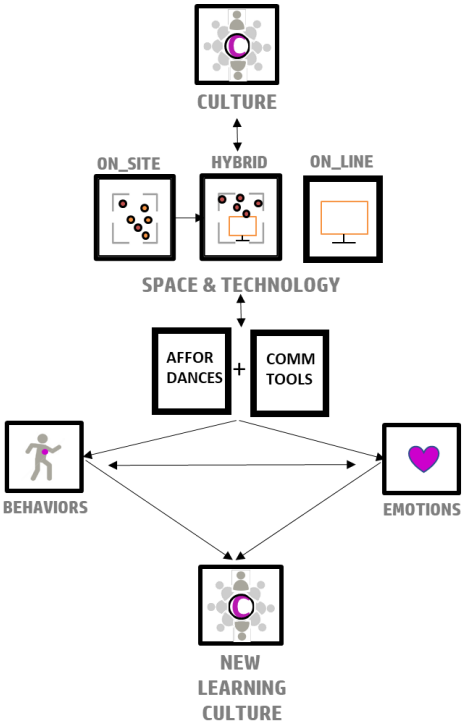



*Figure 2. Affordances influence on behaviors and emotions toward a new learning culture*

## Physical and digital affordances

As suggested above, space design matters, when supporting learning behaviors.[16] Space cues encourage certain behaviors and activities, discourage others and influence the user experience of both students and instructors.[17] For example, the design element of fixed furniture encourages a more passive culture and passive learning, whereas, movable furniture opens a variety of options to configure the space as needed for each class and for specific activities, supporting more active learning.

Contemporary design of innovative learning spaces often accommodates multiple experiences through mobility, visibility, and intensive technology.[18] When learning moves from onsite to online, however, communication and collaboration tools move from analog to all-digital, which eliminates these spontaneous behaviors but also opens other options for learning.

Whether analog or digital, it is clear that communication and collaboration tools affect the learning culture and create both behavioral and emotional affordances. Table 1 is intended to shed light on the differences between the physical and the communication affordances (tools) offered in each learning platform.

| | **Onsite Platform** | **Online Platform** | **Hybrid Platform** |
|---|---|---|---|
| **Physical Affordances** | • Strong/ Low cues setting<br>• Fixed/Movable furniture<br>• Hard/Soft finishes<br>• Hard/Soft barriers<br>• Visual/No visual connection<br>• Auditory/Nonauditory connection<br>• Personal /Team spaces | • Personal space (home, office, phone etc.) | • Fixed/Movable screens<br>• Fixed/Movable furniture<br>• Hard/Soft finishing<br>• Hard/soft berries<br>• Visual/No-visual connection (by tech)<br>• Private/Team spaces (combination of physical and virtual) |
| **Communication Tools** | • Analog tools-whiteboards/writing walls<br>• Multi-colored markers<br>• Drawing equipment<br>• Lab equipment<br>• Model-building supplies<br>• Pin-up space<br>• Digital tools-screens and smart boards | • Personal computers<br>• Digital whiteboards<br>• Break-out sessions<br>• Virtual rooms<br>• Polling<br>• Screen sharing<br>• Session recording<br>• Digital collaboration tools (Jamboard, Miro, Google docs) | • Digital tools-screens and smart boards<br>• Distributed microphones (large seminar)<br>• Multiple monitors<br>• Digital collaboration tools (Jamboard, Miro, Google docs)<br>• Analog tools-whiteboards/writing walls<br>• Drawing equipment (actual & virtual)<br>• Lab equipment<br>• Model-building (actual & virtual)<br>• Pin-up space (actual & virtual) |

*Table 1. Platforms' physical Affordances and communication Tools*

## Cultural, behavioral and emotional affordances

Figure 3 provides an illustrative way of looking at the cultural, behavioral, and emotional affordances associated with each of the three previously-identified learning platforms, as well as distinguishing the synchronous from the asynchronous online learning experiences. Note that since learning is complex and involves different types of learners, some of the qualities and affordances of a particular platform can arguably spark different perceptions in different users. For example, whether online is more or less formal than onsite or whether synchronous online learning supports more passive

collaboration than onsite collaboration, can be debated. It is less controversial, however, that the onsite experience does not translate perfectly to the online experience and vice versa. Thus, a diagram such as this is highly useful for beginning the conversation about the pedagogical practices best supported by each platform's affordances.

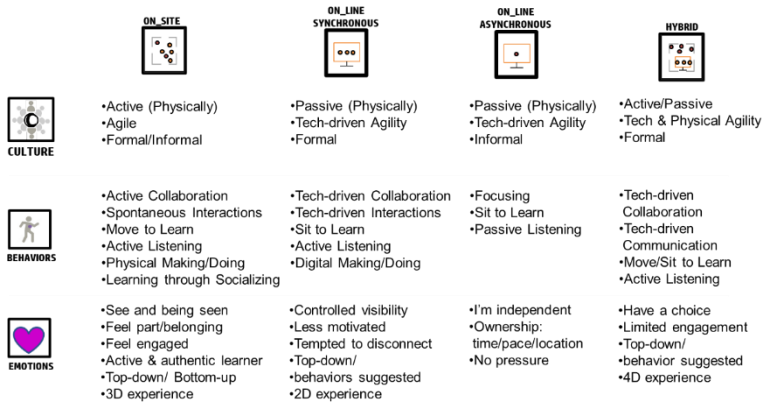



*Figure 3. The effect of each platform on cultures, behaviors, and emotions*

Figure 3 also illustrates how the learning platform affects learning behaviors and emotions. Looking at the cultural, behavioral, and emotional affordances horizontally (i.e., across platforms) reveals that certain behaviors and their related emotions are dramatically influenced by the type of platform. After two semesters of learning mostly online, during which the affordance of "move to learn" has been replaced by "sit-to learn," there has been a dramatic effect on learners' motivation, which merits consideration in the post-pandemic multi-platform culture. The affordances associated with the expanding multiverse of learning platforms, and their effect on teaching and learning, suggests a new paradigm for selecting "where" to conduct a class session when designing the "what," "how," and "when" of the class experience. A methodology for choosing the "where" is described in the next section.

## A NEW PARADIGM - SELECTING THE "WHERE"

This paper offers a methodology for moving beyond the "assigned" classroom model to a new paradigm for selecting the "where" for our courses. Specifically, it is proposed that instructors think about the selection of learning platforms differently than in the past, when, for example, the Registrar's Office may have assigned courses to classrooms with little to no consideration given to the type of learning activities used in the course, or input from the instructor. This new paradigm asks instructors to form a holistic appreciation of the affordances offered by each different platform when planning where to conduct a class session and to use those platforms whose affordances best support the planned learning behaviors. This means that over the course of a semester, an instructor may flexibly use a variety of learning platforms within the same course in order to achieve the best learning outcomes for students. For example, some learning activities may be done online, others onsite, and still others in hybrid mode. In selecting the "where" for each class session, instructors would choose the platform or platforms that provide the best combination of affordances to support the types of learning experiences to be engaged in that class session. The options range from using several of the platforms in the same class or session (see Figure 4) to using a variety of different platforms and experiences throughout the semester (see Figure 5).

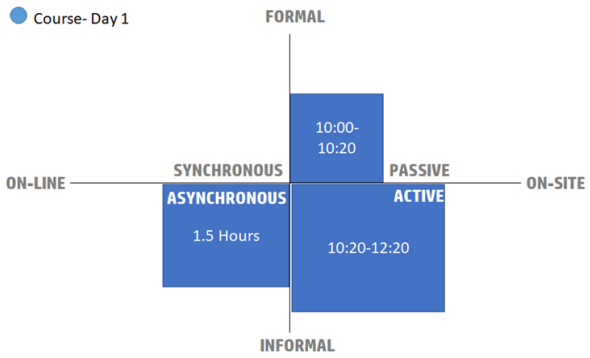



*Figure 4. "Choose your Space" by a class session*

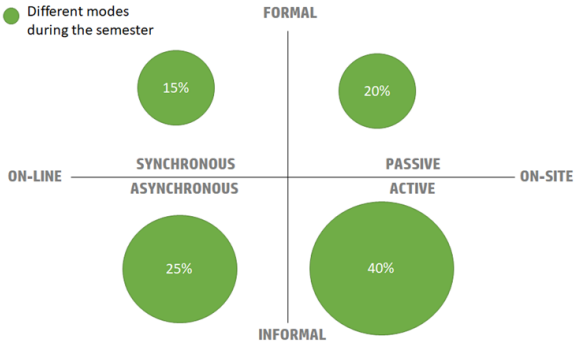



*Figure 5. "Choose your Space" by class session over the semester*

The key element of the proposed methodology is a multi-platform knowledge base that both stores information about the affordances of each platform, and is dynamic and interactive. Adopting the analogy of the campus as an ecosystem,[19] this database is meant to capture not only the multiverse of learning "platforms," but also the affordances of each, toward supporting healthy learning behaviors and emotions that each supports. The characteristics of this knowledge base are described in the next section.

## A dynamic multi-platform knowledge base

To support instructors making informed decisions about the "where" to conduct a class session, we're proposing a dynamic, multi-platform knowledge base with the characteristics listed below.

*Breadth.* The knowledge base should encompass all potential learning spaces on campus, both physical and digital, even those that have not been routinely used as learning spaces in the past.

*Detail.* The knowledge base should include descriptions of all the behavioral, emotional, cultural, and spatial affordances offered by each learning space.

*Relational.* The knowledge base should connect data about learning platforms with affordances and learning behaviors so that algorithms can be compiled to suggest optimal spaces to support planned learning activities.

*Accessible.* The knowledge base should be intuitive and easy to use. This might be accomplished by guiding the user through a series of questions.

*Dynamic.* Finally, to keep up with changes to the platforms, as well as evolving pedagogical strategies, the database should be updatable directly by users.

### Inventory of learning "spaces"

The first step in creating the proposed database would be to identify all possible learning spaces on campus, both physical and digital, and to collect the data about the affordances provided by each. The resulting inventory would include parameters related to the physical and technical qualities of the platform and the kinds of pedagogical activities it could support. Figure 6 illustrates how one might inventory characteristics of a space according to cultural, physical, and behavioral affordances. As Harris and Cullen noted, the value of the inventory is that the process provides concrete data to inform the more abstract notion that "classrooms facilitate performance" and could reveal unexpected results.[20]

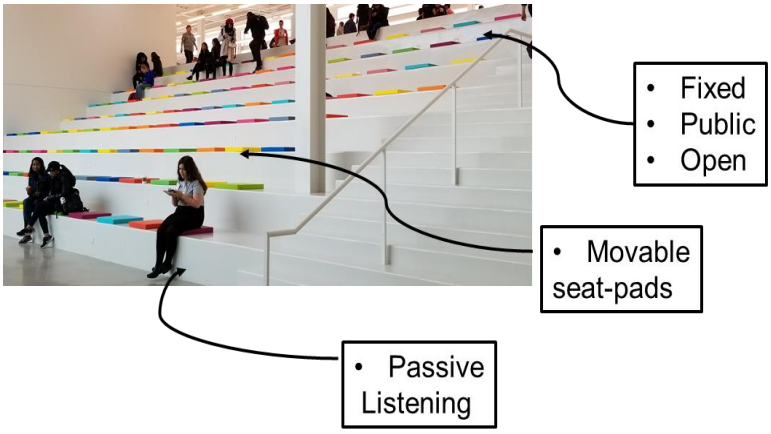



*Figure 6. Example of space affordances. "The "Pitch"- Kaplan Institute at IIT (photo by the author)*

Once collected, the data could be organized in tables, according to the various categories of learning spaces and affordances, making it accessible to the various stakeholders. Learning spaces could be categorized as physical or virtual. Affordances could be categorized as cultural (e.g., formal/informal, public/private), emotional (e.g., passive learner vs. active learner), and spatial (e.g., open/closed, fixed/flexible), including the available digital communications tools. The database could also indicate the location and proximity to other spaces in the campus ecosystem.

### Dynamically shape through active user engagement

After creating the data tables, a user interface would be needed to transform the data into usable information. A series of algorithms could be developed relating spaces and their affordances to the pedagogical strategies and learning behaviors that they support. A good user interface would be intuitive and easy to use and include the following three tools:

*Query*. For instructors to receive guidance on the platform with the best combination of affordances for the learning activity.

*Feedback*. For users to provide feedback on the spaces (i.e., stars or likes), as well as on the tool itself.

*Update*. For users to add, correct, and enhance information in the knowledge base (like a "Wiki").

This user interface would function to dynamically shape the database through active engagement of stakeholders, including students, teachers, facilities staff, technical services, and registrar.[21, 22]

## CONCLUSION

In an effort to empower faculty and students to embrace the new multiverse, this paper presented two main ideas on adapting to the new learning culture. The first was an expanded view of the learning environment, which encompasses the new multi-platform reality, and the second, a methodology for curating the layers and insights related to each platform to empower a more dynamic learning culture.

The benefits of adapting to the new learning culture in these ways are both organizational and pedagogical. By embracing multiple platforms, benefits could include expanding the potential student pool, creating a more equitable learning culture favoring multiple learning styles, enhancing teacher support through increased transparency and collaboration, and broader reach with expertise and collaboration opportunities accessed around the globe. A framework for the education experience which reflects current social and cultural norms and thought could also enhance student engagement.

With any paradigmatic change will also come challenges. Teachers and students were challenged to adapt quickly to new learning modalities, and institutions were challenged to implement new protocols and adapt infrastructure. The dynamic knowledge base will need committed advocates to cultivate it. Teaching in the multiverse also takes more time and requires new skills and knowledge for which some will need support. The ability to effectively and seamlessly navigate across multiple learning platforms in real-time and the agility to adapt to new developments is a new “normal” that will continue to be challenging. Motivation, as mentioned earlier, will be a challenge touching on issues of equity and quality of life.

With this paper, we have chosen to cast the challenges of adapting to a new learning environment as opportunities to revisit some of the fundamentals, a time to reflect on and reimagine our schools. Our holistic vision of technology and space, described as an expanding multiverse of learning, along with the proposed dynamic knowledge base, are intended to raise awareness of teaching and learning behaviors, users’ emotions, and spatial affordances in relation to the design and implementation of courses at a time when the cognitive, social, emotional and physical well-being of learners and teachers is especially critical. The proposal is intended less as a roadmap than as a catalyst to begin discussing these important dimensions of the future learning environment.

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[21] Harris and Cullen noted that “changing the physical space is a necessary but not sufficient condition for creating a learner-centered environment. Changing a culture requires buy-in, engagement, and intellectual investment, which we gained through ongoing assessment. Assessment empowered our community, involved everyone in the process, and, most important, sparked a campus wide discussion.”
[22] As Barr and Tagg noted, shifting from a perspective of teaching to a perspective of learning, (from the “instruction paradigm” to the “learning paradigm”), implies changes in a college’s mission and purposes, criteria for success, teaching/learning structures, learning theory, productivity/funding, and nature of roles as well as the very structures of our institutions. “Structures reflecting an old paradigm can frustrate the best ideas and innovations of new-paradigm thinkers. As the governing paradigm changes, so likewise must the organization’s

structures." Hence, this proposal for adaptation to the multiverse of learning is a structural or paradigmatic change.

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# MSA *CATALYSTS*: ADVANCED PEER LEARNING THROUGH VERTICAL GROUP PROJECTS

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## INTRODUCTION

The Manchester School of Architecture has advanced peer-to-peer learning by linking multi-level group projects with outreach work. This pedagogic approach has become an essential vehicle to progress the School's ambition to connect academia, the architectural profession and societal networks whilst offering a rich learning experience for the student. Embedded into the curriculum, the School adopts this approach at key points during the academic year, requiring students to collaborate through intense 'vertical' projects. Students from different levels of study across undergraduate and postgraduate programmes unite to explore an architectural proposal or contemporary agenda in relation to a live project as group work. The addition of external collaborators, who may act as client or participate as an active team member, enhances student learning, experience and debate.

This paper will introduce and analyse this model's pedagogy and good teaching practice through two examples of the School's established peer-learning projects, *MSA Events* (2008 to date) and the *All School Project* (2015 to date). An associated pedagogic research project, named MSA *CATALSTS* initiated by this paper's authors, Jolley and Sanderson, will also been outlined. Reflecting on the School's vertical project's inception, evolution and ongoing legacy, this paper will demonstrate the effectiveness and value of the resulting educational ecosystem and note impact on skills and knowledge acquisition. This will be mapped through specific case studies to illustrate built legacy, legislative legacy, and research legacy in the city of Manchester and beyond. This will provide an insight into the thinking, strategy, advantages, outcomes and possibilities of this alternative approach.

### Academic Context

Increasing numbers of Higher Education Institutions are creating alternative and often vibrant opportunities for students to collaborate outside campus. Often supported by business strategies to align Universities with current markets, these offer students real-world experiences within education. Specific to architectural studies, this presents the opportunity for educators and practitioners to redefine the role of the Architecture School in society by changing where and how students learn. Students abandon the traditional studio and instead negotiate workspace within a new context, often alongside practitioners, collaborating on live projects. [1] Once removed from an academic setting, project timescales slow down; extend; make room for critical thought and projects can be annually revisited. [2]

The Manchester School of Architecture has a long history in running vertical projects, which it defines as those characterised by multi-level peer learning. Often short and intense these are positioned at regular intervals through the academic year for all levels and modes of study on the BA (Hons) and Masters programmes. As examples of mixed-level learning, studio-based vertical projects can provide an effective vehicle for peer-to-peer learning through design-based learning. As a perpetual knowledge cycle this mode of knowledge acquisition can be aligned with 'Legitimate Peripheral Participation', advocated by Lave and Wenger (1991) because it 'provides a way to speak about the relationships between newcomers and old-timers, and about activities, identities, artifacts, and communities of knowledge and practice.' [3] This is enhanced further by the School incorporating collaboration with outside agencies, organisations and practices, to create an experimental learning environment that sits between academia and practice to simulate professional activities. Scheduled either end of the academic year and driven by live agendas, these vertical projects include:

**The All School Project**: an integral part of the School's induction programme uniting every student in MSA in teams to respond to a single brief created in collaboration with a local external partner to rapidly produce 50 solutions to a single design or research question.

**MSA Events:** a year-long project concluding around Easter as a collection of 20 collaborative projects. Working with a live client, the brief for each 'Event' is prepared by groups of three or four students in the postgraduate MArch course and delivered to groups of approximately 16 undergraduate students from the BA (Hons) course in Architecture Years 01 and 02. Activities during Events are researched, designed, planned and taught by MArch students who are then assessed on their project management and delivery.

Over the last seven years Jolley and Sanderson have consecutively and independently co-ordinated Events and the All School Project, and at certain points in their careers, collaborated to share and evaluate findings. In doing so, they conceived MSA *CATALYSTS*, a pedagogic research project to determine vertical projects' value and monitor how they can enhance curriculum delivery, graduate outcomes and research activity.

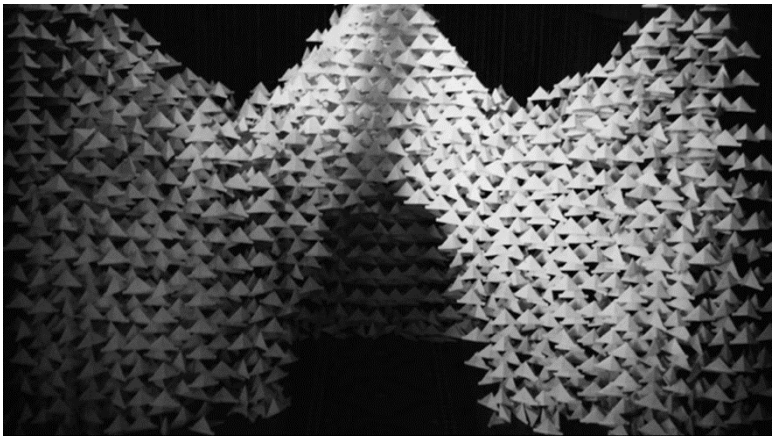

*Figure 10. You Can Leave Your Hat, Installation, MSA Events, 2014.*
*http://analogies.msa.ac.uk/group/23/*

## MSA *CATALYSTS*

MSA *CATALYSTS* asks: Can the pedagogic framework of vertical projects in architectural education enrich learning by supporting peer learning and simulating professional architectural practice whilst simultaneously supporting research informed teaching?

*Figure 2. Become an Architectural Great, Students working in the B.15 workshop, MSA Events, 2017. https://events.msa.ac.uk/2017/group/10/*

The research project is concerned with the effectiveness of vertical teaching; assessing the value of the resulting educational ecosystem; the impact on student skills and knowledge acquisition as well as the benefit to communities and culture. Based on *MSA Events* and the *All School Project*, its initial methodology is centred on self-reflection and the critical appraisal of our own experiences of running these projects. Our observations were then cross-referenced with the analysis of collaborator and student reflective feedback through social media and dedicated student blogs. We noted that the pedagogic theories and methods that characterize vertical projects play a key role in achieving the School's exceptional graduate outcomes; student experience and progression metrics across both its undergraduate and postgraduate programmes and this defined key themes for our research:

- **Theme 1: Learning Community and Student Experience**

How does vertical teaching enhance learning?

- **Theme 2: Graduate Skills Acquisition**

Can we design a unique pedagogic framework to deliver live projects in academia and simulate architectural practice?

- **Theme 3: Research-led Education**

How do we create a pedagogic framework to support live research projects for staff to facilitate research-led education?

- **Theme 4: Incubator**

How can collaboration beyond the university deliver community-focused architectural projects with long-term social value or offer life-long education opportunities?

## EXPANDING THE THEMES

The following section of this paper expands on each of the four themes, contextualized in vertical projects at Manchester School of Architecture from 2012 – 2020 which were part of either MSA Events or the All School Project.

### Theme 1: Learning Community and Student Experience

The first theme asks: How does vertical teaching enhance learning? By observing and analysing the MSA Events' blog content to compare students' experiences in different years, Jolley and Sanderson concluded that the combination of peer learning and vertical teaching mirrors team dynamics in an architectural firm or a construction design team and in doing so parallels an architectural assistant's training in practice.[4] Specifically, we highlighted the importance of learning communities, the development of graduate skills and techniques to encourage reflection. We actively encouraged collaboration with international transdisciplinary students and practitioners and, as projects evolved over several years, allowed design team members (students, academics, industry experts and practitioners) to change. Through experimental partnerships, projects advanced in directions not initially imagined at concept development and concluded as unexpected opportunities further explored in later years.

### Case Study 1: Atelier Zero, MSA Events 2012

*Figure 3. Atelier Zero, Final Installation, MSA Events, 2012. https://ateliermcr.wordpress.com/*

Atelier Zero[5] was an Arts Council funded collaboration in celebration of the Cultural Olympiad, delivered as part of MSA Events 2012 in collaboration with another school of architecture, ESA (Paris), the Office for Subversive Architecture and curator Jane Anderson. The initial brief asked for a city pavilion to mark the Cultural Olympiad, whist creating an awareness of roles and team work when translating design proposals to building. The project united students on programmes across the school to envision, construct and install a boating pavilion. On completion the pavilion spent 77 days in situ. The students' first-hand and practical involvement in the design, construction, installation and occupation of a structure offers a unique learning experience not routinely encountered during architectural education. Architectural educator John Bishop (1997) notes the advantage of shifting studio projects to the community, stating that 'much design education is very remote and esoteric and even where design work has a 'real life' context there is a tendency to 'tailor' the design brief, often for valid educational reasons, in order that the creativity of the student is not limited by the reality of the context of the design problem.' [6] Subsequently Sanderson co-authored a paper with Helen Aston (MSA) which included transcribed interviews with the students, land owner, curator, collaborator and agent. This captured the various voices connected to the project (see Figure 4) and also the long-term impacts of temporary installations in the city as catalysts for the longer-term occupation of the site[7].

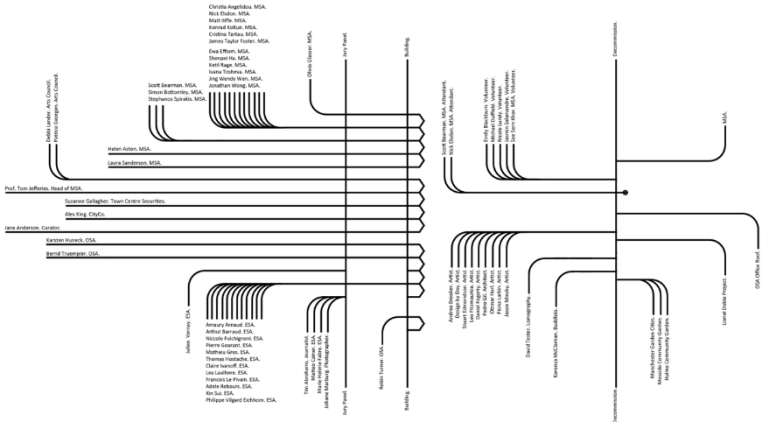

*Figure 4. Atelier Zero, Project Diagram, MSA Events, 2012.*
*https://ateliermcr.wordpress.com/*

### Theme 2: Graduate Skills Acquisition

The second theme asks: Can we design a unique pedagogic framework to deliver live projects in academia and simulate architectural practice? Because these events are live projects we are able to encourage student autonomy; career confidence and readiness whilst developing a pedagogic model to enhance professionalism and complement the UK's PSRB requirements. Specifically, we widen the School's reach by facilitating and supporting international collaborations and travel or online parallel events. This creates a learning environment that sits between academia and practice by allowing Masters architectural students to run their own live project for a real client whilst sharing knowledge and skills with undergraduate students. This allows students to transform their declarative knowledge into a physical output, mirroring practice and demonstrating in depth practical understanding. Our work can support life-long learning in the community and initiate conversations concerning the value of architecture. Vyas et al (2012) discuss the '(1) use of artefacts, (2) use of space and (3) designerly practices' [8] uncovered in their ethnographic fieldwork in design studio – making sense of the specific tools that designers use to collaborate and communicate, which are essential in creative problem solving.

*MSA Events* planning for (postgraduate) MArch students commences in January and to highlight how this process parallels practice we introduced design stages to structure the project's delivery, such as risk assessments, schedules of work and cost plans. This was cross-referenced with teaching session plans to ensure the MArch students managed the project's introduction to undergraduate students; its development, resolution and collective and individual reflection whilst meeting the learning outcomes for the purpose of assessment.

### Case Study 2: Temp Fest, MSA Events 2017

Temp Fest[9] involved the delivery of two temporary pavilions for public events during MSA Events 2017: the globally acclaimed Manchester International Festival (MIF) and the seventh year of Threshold, an independent arts and music festival in Liverpool. For each, the students prepared full working drawings and costings and in doing so the MArch students passed on their practice experience to undergraduate students. The effectiveness of the simulated practice experience is captured by one undergraduate student who reflected: *'I gained considerable experience working to a real budget and client, something that is often lost in regular studio work. Seeing the final project built was also incredibly rewarding.'*

*Figure 5. Threshold Music Festival, Liverpool, MSA Events 2017. https://events.msa.ac.uk/2017/group/11/*

### Theme 3: Research-led Education

The third theme asks: How do we create a pedagogic framework to support live research projects for staff to facilitate research-led education? By being able to work 'off campus' during the vertical projects, staff routinely gain the opportunity to pursue global research opportunities. The *MSA Events* programme enables staff to integrate research and teaching whilst achieving social or scholarly impact. In doing so the programme, becomes an interface between Manchester School of Architecture, communities, practice, professional bodies and architectural education committees with students acting as agents. They take ownership of a research question and respond by learning through doing. Publications by staff then transfer these creative acts into scholarly activity and this enables others, inside and outside of the School, to evaluate and build upon the results.[10]

### Case Study 3: Manchester Society of Architects Exhibition, MSA Events 2016

This case study progressed a privately funded piece of research, outside academia, and then through working with the local Architects Society, became an *MSA Events* project concluding with the findings being exhibited in the City of Manchester. In 2003, prior to working in academia, Jolley had secured funding to undertake a feasibility study on behalf of the Manchester Society of Architects who wanted to put together an exhibition of architectural drawings of historic Manchester buildings. This complemented research focusing on Lee House in Manchester, which is a part-realised tall building designed during the 1920s. The building is attributed to Harry S. Fairhurst but its design was influenced by Edgar Wood; both were Manchester architects who were proactively involved in the Society. The building was only completed to the eighth-storey, but a perspective by Edgar Wood in MMU's Special Collections shows one option for the modelling of the upper storeys. In 2015, over a decade after the original research, the Manchester Society of Architects launched their drawings exhibition. Running alongside this, an *MSA Events 2016* group built a model of Edgar Wood's full scheme.[11] This process combined archival research and professional model making skills. The final model was later handed to the building owner and exhibited in the city.

*Figure 6. Completed model of Lee House, MSA Events 2016.*
*https://events.msa.ac.uk/2016/group/15/*

### Theme 4: Incubator

The final theme asks: How can collaboration beyond the university deliver community-focused architectural projects with long-term social value or offer life-long education opportunities? Using vertical projects, the Manchester School of Architecture pursues opportunities capable of accommodating 'slow scholarship' to make space for critical thought and the School's reiteration and repetition of these projects further advances them. This is achieved by the addition of new collaborators joining a project to offer a new perspective or set of ideas. Over time this created research 'sandboxes' through collaborative trans-disciplinary networks.[12] A new pedagogic model has been established at the School to nurture supportive outward-facing networks between students, academic staff, external organisations, specialists and potential employers.[13] This generates a perpetuating education 'ecosystem' where students formulate further research questions, often explored through independent study once the vertical projects conclude, and this in turn influences career pathways and networks.

### Case Study 4: High Streets + Town Centres 2030 and Beyond, All School Project 2019.

*Figure 7. Proposal for Withington High Street, All School Project 2019.*
*https://www.msa.ac.uk/allschoolproject/*

In 2019, Sanderson collaborated with colleague Luca Csepely-Knorr (MSA) and the Institute of Place Management to discuss the future of UK High Streets and Town Centres. This research was a response to two notable reports in December 2018, the 'High Street Report' and 'High Street 2030: Achieving Change' as well as major funding opportunities including the Ministry of Housing, Communities and Government's 2019 'Future High Streets Fund' and Historic England's announcement of Historic High Streets as Heritage Action Zones. There was also considerable architectural interest, demonstrated in the launch of the RIBA Journal 'Future Town Centres Competition' with ACO Technologies.

The *All School Project 2019* enabled Csepely-Knorr and Sanderson to re-contextualise their research within a broader context, taking students to produce solutions for one of five Failing Mancunian High Streets by applying earlier research by the Institute of Place Management and their "25 Factors for Vitality and Viability" [14]. In one week the project produced bold visuals for 50 proposals which were exhibited at the ESRC Festival of Social Science and documented on a student blog[15] shared with local stakeholders. This work was embedded into the wider research project, organized by Csepely-Knorr and Sanderson, which included an 'IPM+MSA Research Special on the High Street' to draw together expertise from inside MMU, and a symposium as part of the ESRC Festival of Social Science which included practitioners. These two events allowed the pair to bring together voices from Architecture, Sculpture, Planning, Urbanism, Landscape, Film and Fashion. The presentation boards created as part of the *All School Project 2019,* although produced within a single week and perhaps rather utopian, aligned incredibly well thematically with the research content of the symposium, including ideas of typology, place specificity, pedestrianization, transportation and seasonality. The visual quality of the work, made possible by the *All School Project 2019* and the online interface of the blog, engaged new and diverse audiences and allowed the research more impact than would have been otherwise possible using tradition studio-based delivery and timescales.

The research proved to be even more timely than originally anticipated, and within a year, the Covid 19 pandemic had brought even more considerable challenges for High Streets and Town Centers locally, nationally and internationally.

## CONCLUSION

"The situated nature of learning, remembering, and understanding is a central fact. It may appear obvious that human minds develop in social situations, and that they use tools and representation media that culture provides to support, extend, and reorganize mental functioning. But cognitive theories of knowledge representation and educational practice, in school and the workplace, have not been sufficiently responsive to questions about these relationships." [16]

This culture of vertical projects at the Manchester School of Architecture has advanced significantly since the first *MSA Events* in 2008. 300 projects have been completed over 13 years of *MSA Events* and 50 solutions have been proposed each year over the five years of the *All School Project*. Through the MSA *CATALYSTS* research project, Jolley and Sanderson have refined and related the pedagogic framework behind vertical projects across MSA, defining the embedded research-informed teaching.

*Figure 8. Transgrestival Pangaea Festival DJ Booth, Design + Build, MSA Events 2015. https://events.msa.ac.uk/2015/group/18/*

Through a series of case studies, this paper has highlighted the role of these vertical projects in (1) enhancing learning communities and student experience, (2) simulating architectural practice, (3) engendering research-led education, and (4) acting as incubators for community-focused architectural projects with long-term social value

## ONGOING TRAJECTORIES

*MSA Events* and the *All School Project* have continued since Jolley and Sanderson moved to other roles in the School, and are now under the direction of Senior Lecturer, Becky Sobell. In the 2020-2021 academic year, and as the Covid-19 pandemic continues, vertical projects at MSA have moved to online formats, made necessary by social distancing. The *All School Project 2020* saw students work in mixed year, mixed programme (BA, MArch, MLA) groups on a series of themes (1) Viewpoint : how can we connect when we are apart?, (2) Black Lives Matter, in collaboration with BLM_Arch@MSA, and (3) Wellbeing in Architecture, in collaboration with MSA&U. Each project used Instagram hashtags to report to a common thread. *MSA Events 2021* builds once again on the format of the programme by exploring new possibilities made possible by online learning platforms.

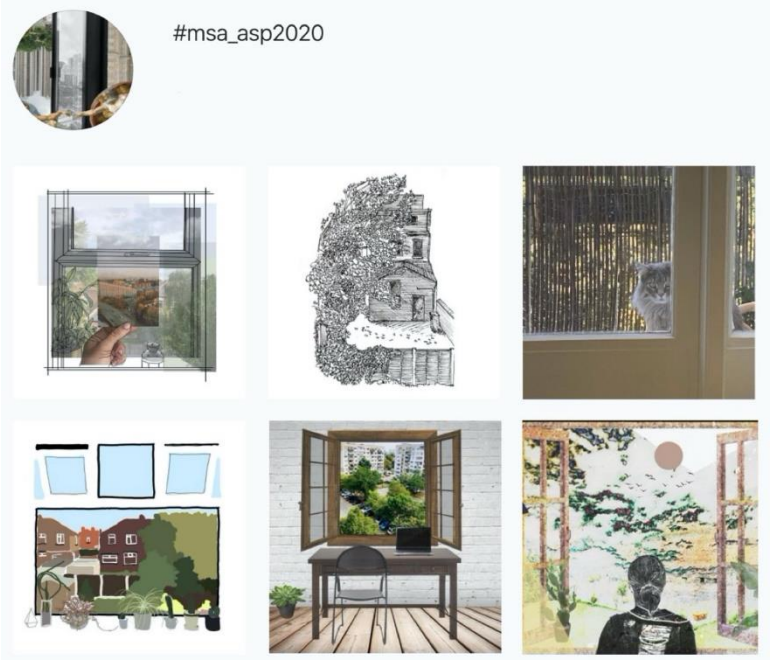


*Figure 9. Viewpoint Instagram, Sobell, B., All School Project, 2020.*

Although no longer coordinating these specific vertical projects, Jolley and Sanderson continue to pursue their own research and interests, connected to projects which were catalyzed by *MSA Events* and the *All School Project*. Jolley is currently developing a sketching festival with the Manchester Society of Architects. *The 2021 Sketching Festival*, will build on previous activity in 2015 and 2017 to engage two international architectural communities through a collaboration between KL SketchNation (Kuala Lumpur, Malaysia), Manchester Student Society of Architecture, Manchester Urban Sketchers and Manchester Society of Architecture, where outputs included sketching walking tours and exhibitions. Sanderson is the Atelier Leader for *Continuity in Architecture*, a vertical (BA3, MArch1, MArch 2) studio for teaching and research who have been working with local community groups for a number of years. Taking an interest in how the 'Design Thinking' of the atelier can be applied to the 'Wicked Problems'[17] of Local Planning, *Continuity in Architecture* have produced papers, chapters and exhibitions in Bollington (2016), Bakewell (2017), Rochdale (2019), Shrewsbury (2019). The atelier is currently working in collaboration in Bradford Civic Society and Bradford Townscape Heritage Scheme on a project funded by the Architectural Heritage Fund on the future of the Historic High Street in the Top of Town area in Bradford.

## NOTES

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# TALKING, DRAWING AND REALIZING TOGETHER: IDENTIFYING ELEMENTS OF DESK TUTORIALS IN ARCHITECTURAL DESIGN STUDIOS

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## INTRODUCTION

Traditionally, teaching in architecture is anchored in situations of tutoring within a studio, where students are developing individual projects at their desks. At the Schools of Architecture in Denmark, this is especially relevant since project-related work covers most of the ECTS points required in the education.[1] In this unique educational tradition students receive regular feedback on design development from tutors. However, since we, as tutors, often unfold our desk tutorials in one-to-one situations, we rarely question and discuss what a tutoring session actually consists of, how it unfolds and why it works?[2] Instead this is often a tacit knowledge having been developed from years of experience, thus essential parts of this unique and also intimate situation remain less described.[3]

This paper presents a development project at the Aarhus School of Architecture, Denmark (AAA) 2019-20, to study desk tutorials with the aim of identifying and uncovering elements of these and to discuss the impact and potential of this format of teaching. The study has happened from monitoring tutoring sessions conducted by three teachers with students at both undergraduate and master level. Three of these tutoring sessions have been analyzed and compared by the use of a script-model, developed through the process.

American philosopher Donald Schön describes how "Reflection in action" is taking place in design studios in schools of architecture: "…its characteristic pattern of learning by doing and coaching, exemplifies the predicaments inherent in any reflective practicum and the conditions and processes essential to its success."[4] Following the thoughts of Schön then becoming an architect involves an aspect of practicing that you cannot learn *about* but need to *do* and to *exercise* in order to possibly master.[5] By developing projects aspiring architects become acquainted with challenges and also problem-solving aspects of such a practice.[6]

Developing projects in a studio-based environment is a primary element in the education of architects at AAA. Although these are complemented with secondary elements as lecture series and courses, the project-based education happening in the studios does account for most of the 30 ECTS required in fulfilling a regular semester in the education.[7] With the project development being pivotal it makes tutoring of the projects an essential part of educating students in architecture.[8]

From studying a limited range of sources describing historic practices of teaching architecture in Denmark and abroad it is revealed how tutoring has traditionally been an integrated element. An

example is from the history of AAA by former dean: Mogens Brandt Poulsen where tutoring is mentioned as *the* teaching format that, together with crits, is practiced at AAA.[9] From Poulsen one also learns that practices of teaching at AAA, inaugurated in 1965, were inherited from the Royal Academy, Architecture in Copenhagen, Denmark (KADK) as a majority of the original teachers at AAA were from KADK.[10] From the pedagogy practiced by Professor Steen Eiler Rasmussen at KADK one also learns about tutoring being an integrated part of teaching, both after and before a larger reform happened there in 1924 to modernize the education.[11]

Tutoring, as a teaching format, can be detected back to the "Ecole des Beaux-Arts" in Paris. In 1941 American architect Paul Cret, described teaching practices at this school: "…he receives friendly wise counsel and advice, which he may or may not follow".[12] In possible contrast to this American architect F. L. Wright was practicing a more explicit authority in his teaching at the school Taliesen, Wisconsin that he established in 1932.[13] The tutoring practiced by Wright might be identified as a master-apprentice relation that one finds within the education of craftsmen, where apprentices are trained by masters towards eventually becoming masters themselves.[14]

Through this historic background, it is possible to identify how the specific practice of having desk tutorials as part of the education as AAA is part of a tradition at schools of architecture in general.

## METHODS

In our study, covered by this paper, we have sought to reveal and identify elements of desk tutorials, where we have been focusing on a traditional format of tutoring where one student is being tutored by one teacher at the students' desk in a design studio.[15]

Our study was based on fieldwork monitoring different desk tutorials. We selected three tutors with numerous years of experience, also from different schools of architecture, and observed them in their practice of tutoring. Monitoring happened from both of us being present at the tutoring sessions. We monitored several tutoring sessions for each, and selected one that we identified as the most elaborate and extensive for each to end up with three tutoring sessions to be analyzed and compared. We recorded the discussions between the tutor and the student; we took pictures of the session and interviewed the students after tutoring about their experiences of the tutoring session. This fieldwork happened in the autumn of 2019 and winter of 2020 and for that reason it was not affected by corona.

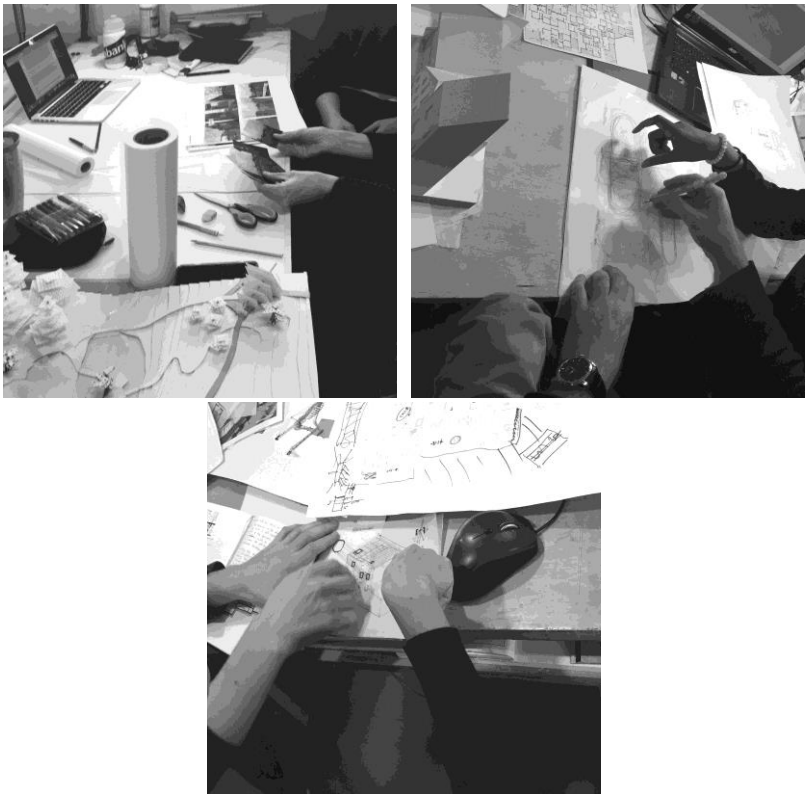

*Figure 1., figure 2. and figure 3. Images from tutoring sessions that were monitored as part of this study.*

As a method for analyzing the tutoring sessions we developed a script model. This model was developed through a combination of *hypotheses* from our own experiences as tutors in relation to what we *registered* and *observed* from monitoring the different tutoring sessions. This script model we used as a method for investigating the tutoring sessions as a dramaturgy. Here the idea of scripting is related to ideas of organizing art forms in time as e.g. cinema, music and dance.[16] The script model had four staff lines: *structure, media, levels* and *communication.*

- *Structure:* how the tutoring session was structured into three parts in time: "taking off" with an **Introduction** leading to a **discussion** and finally a "landing" with a **conclusion** to revolve around what was going to happen next.
- *Media:* What was being both talked about and used in the tutoring? **Drawings, models** etc.
- *Levels:* the oscillation between the tutoring focusing on a specific **project** or being on a **meta**-level as general teaching into architecture and the development of it.
- *Communication:* the oscillation between the tutor either ***instructing*** the student in a distinctively asymmetrical relation or ***improvising*** with the student to make the relation appear more symmetrical.

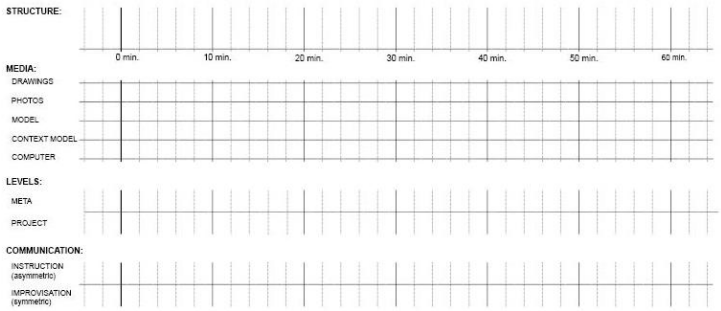


*Figure 4. The four staff lines of the script is presented here as an empty version*

We will continue by presenting findings from the three tutoring sessions using the script model.

## THREE CASE STUDIES

### *Tutoring session 1*

Teacher 1 (T1), where she was tutoring student 1 (S1), an undergraduate on her first semester (fig. 5). This tutoring session took place at the beginning of a new assignment and was to be followed by another desk tutorial shortly after this one.

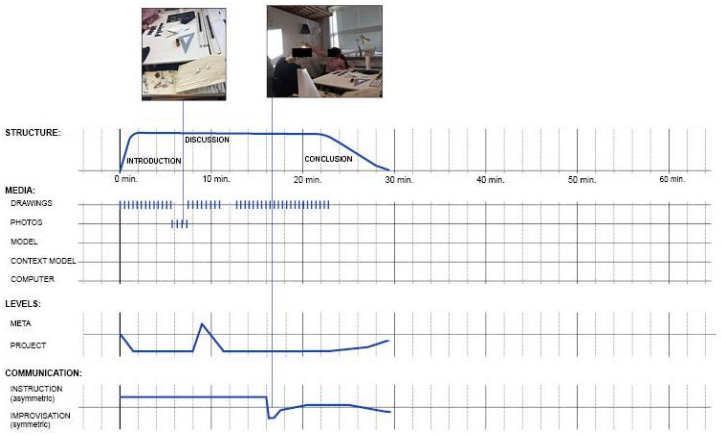


*Figure 5.. Script of tutoring session 1*

- *Structure:* After just one minute of the student (S1) introducing her project, the teacher (T1) asked: *"Does anything occur to you?"* as a way shifting into a qualitative discussion about the work of the project by S1. At 22:00 T1 asked what were to happen next, which lead to a concluding discussion about how S1 were to continue working after the tutoring.
- *Media:* The discussion happened around few specific representations – mostly drawings. At first this was drawings already prepared by S1, but at 7:00 she started drawing new ones based of the old ones as T1 asked her to draw her thoughts. Photos were also included as a media for exploration.
- *Levels:* T1 was tutoring mainly on a project level. However, at 9:00 she explained about the use of drawing as an analytical tool, which could be identified as being on a meta-level.
- *Communication:* The communication in this tutoring session was mostly asymmetric with e.g. T1 instructing S1 on how to use drawing for analyzing and developing her work. There were however more symmetrical moments with T1 involving S1 in reflecting about her own material.

In this tutoring session T1 was inviting and encouraging S1 to explain her thoughts by the use of drawing. This could be identified as a method that T1 was providing for S1 on a meta-level. T1: *"And how to figure it out?"* S1: *"by trying?"*, T1: *"exactly!"*

### *Tutoring session 2*

- Teacher 2 (T2), where he was tutoring student 2 (S2), an undergraduate on her fifth semester (fig. 6). This tutoring session happened in the middle of a longer project, and T2 had tutored S2 several times before.

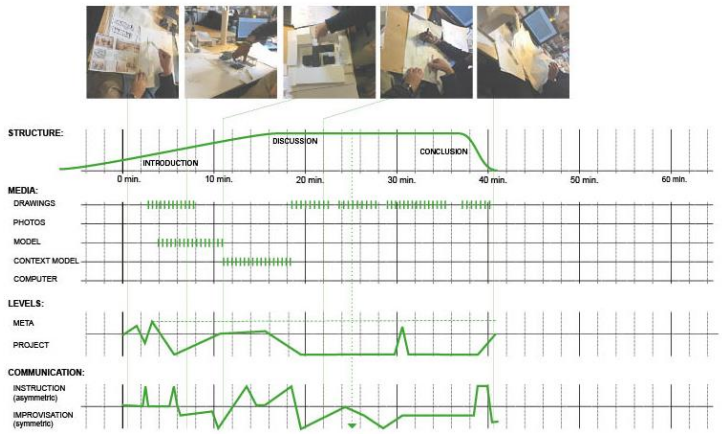


*Figure 6. Script of tutoring session 2*

- *Structure:* student 2 (S2) used 17:30 minutes for introducing her project to teacher 2 (T2). One reason for why this took so long was because of T2 asking many questions to S2 about her project development. After this point in time the tutoring continued in to a discussion where T2 still had many questions for S2's project, but then as something he was also involved in answering. At 25:00 S2 concluded: *"I think I need to make a model",* as a way of addressing the many questions from T2 indicating that the spatial layout of the project was difficult to understand, which T2 confirmed.
- *Media:* models were used in the beginning as means to understand, while drawing was used more dynamically later for actively discussing how to develop the project. An interesting shift happened at 11:00 when T2 instructed S2 to get a context model, representing the site of the assignment, and to position a model of her most recent project into it.
- *Levels:* T2 was mostly tutoring about S2's project; however some of his instructions could also be identified as being on a meta-level. They were given implicitly, and could be identified as a background for his tutoring (the dashed line in the script).
- *Communication:* T2 was involved in improvising with S2, but he also provided instructions, however these were mostly integrated with his improvisation in a complex mixture.

T2 created a "secure setting" in this tutoring allowing for a doubtful and questioning strategy when discussing S2's project; which, could also be identified as a general introduction to a critical approach in developing architecture. The conversation happened as much verbally about the project as through drawing. When interviewing S2 after the tutoring session she expressed this as: *"What he says he draws"* about T2's position and continued: *"I always know what to do afterwards as so much is happening up in my head"*.

### *Tutoring session 3*

- Teacher 3 (T3), where she was tutoring student 3 (S3), a master student on his seventh semester (fig. 7). This tutorial happened early in an assignment. Also, the semester was the first one for S3 at the master unit, which meant that S3 and T3 were not well acquainted at this point.

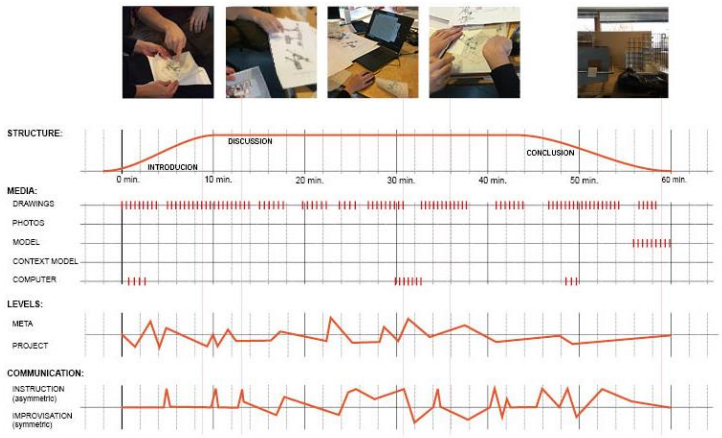


*Figure 7. Script of tutoring session 3*

- *Structure:* The introduction to his project made by student 3 (S3) ended at 10:30 when teacher 3 (T3) asked for his assessment of his own work. This was followed by a discussion of 30 minutes to end when T3 asked about which new drawings S3 should make as a way managing ending her tutoring.
- *Media:* S3 introduced smaller sketches mostly from his notebook and T3 recognized a potential in them; but she also requested larger representations in an accurate scale. From this acknowledgement she proposed to scan and double the smaller sketches in size, as a way of staying committed to S3s sketching, but also proposing a development for them to mean for a development of S3's project.
- *Levels:* T3 led the conversation towards both challenges and potentials of the project to address a development of it; however, she also included advice that was both specific (e.g. do larger drawings in scale), but also more general (e.g. include references).
- *Communication:* Verbally there was a conversation with an exchange of ideas, possibilities and expectations that was managed and complemented with T3's instructions. The conversation was about drawings that S3 had made prior to the tutoring, and S3 and T3 did not draw together as part of the conversation.

In this tutoring session T3 used storytelling and humor to create a safe environment for creative imagination. T3's friendly approach was however possibly misinterpreted by S3 as being "too" relaxed, when he asked her about the material he should develop for an up-coming mid-crit: *"…and that is good enough for presenting the process?"* to which T3 replied: *"No, it is never good enough, as you make a drawing with a bigger scale, this makes you want to zoom in and do one of a smaller scale"*. This presents how T3 at this point found it necessary to instruct S3 at a meta-level.

### *Comparing the three tutoring sessions*

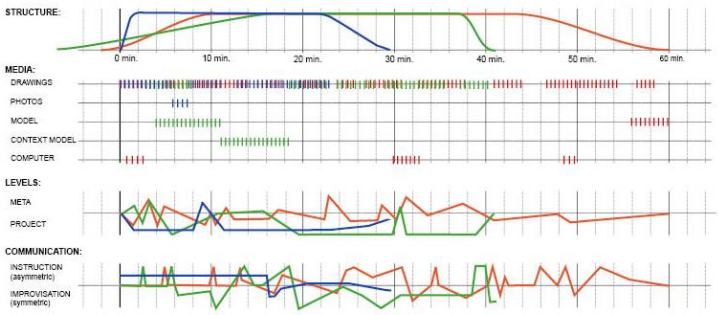


*Figure 8. Collapsed scripts of tutoring session 1, 2 and 3*

- *Structure:* The length of the three tutoring sessions varied and so did the distribution of time between introduction, discussion and conclusion. This was related to the context of the projects that the tutoring was about, but it also revealed different approaches of how these tutors managed their tutoring. A distinct shift from introduction to discussion could be identified in tutoring session 1 and 2 from the tutors asking more demanding questions. This indicated that they understood enough of the project at this point to continue into a discussion about it. In tutoring session 3 this transition happened more fluent. A shift from discussion to conclusion could be identified from a point in time, where the tutors started focusing on how the students should continue developing their projects after the tutoring. This shift from discussion to conclusion was also less distinct and happening more fluent in tutoring session 3 in comparison to tutoring session 1 and 2.
- *Media:* The tutoring sessions all included several different types of representations; however, drawings were being used in all three sessions in the discussions to develop the projects, but in different ways. T1 instructed S1 to draw during tutoring session 1, T2 and S2 drew together during tutoring session 2, T3 and S3 talked about the drawings of S3.
- *Levels:* All three tutors oscillated back and forth between addressing questions about the specific project to also provide general advices in the education. T1 related most of her tutoring to the project of the younger S1, whereas T3 gave more general advice to the older S3.
- *Communication:* Also concerning how the tutors communicated with the students, we identified an oscillation for all three. T1 were instructive to the younger S1, whereas T2 were improvising with S2 for a longer part of the tutoring session. T3 chose to stay more neutral in longer parts of the tutoring session without directly instructing or improvising with S3.

## CONCLUSION

From analyzing and comparing the three tutoring sessions we identified how these three experienced tutors lead their desk tutorials through a basic structure of introduction, discussion and conclusion. However, despite following this basic structure, they were also sensitive and open to specific developments happening when tutoring the students and to adjust in relation to this. In all three tutoring sessions we were able to document a variety of different types of communication in relation to different types of media. Drawing however, were predominantly used in comparison to other forms of representation, to demonstrate how this is an especially important and powerful form of representation in tutoring to complement talking. All three tutors shifted between tutoring about the specific project to then provide more general advice. Also, in their tutoring all three tutors were able

to make qualitative shifts between giving the students instructions to then also improvise with them about how their projects were to be developed. This indicates how maintaining these different approaches are important to a rewarding and dynamic tutoring. Maintaining a proper balance between both managing the situation and also to be sensitive to what is actually happening in the specific dialog with the student about her or his project seems crucial to a successful tutoring.

Although the format of tutoring in itself is characterized by being asymmetric, then the tutoring happening at AAA today will possibly not involve as pronounced a master-apprentice relation as the one e.g. practiced by Wright at Taliesen?[17] The teachers that we monitored at AAA do not necessarily consider themselves as masters in a more traditional sense, with a professional agenda to be provided where the students should follow them as apprentices. Tutoring would possibly in itself involve a decline in the authority of the teacher as this is not "just" a master training a student into the architect profession, but tutoring the student through recognition of knowledge that she needs to develop the project herself, where the teacher will be a guide on this passage of developing knowledge.

For further studies we would recommend to test the script-model in other tutoring sessions for further research on the elements of tutoring. The script-model could possibly also be used by tutors as a qualitative check list for either planning ones tutoring or retrospectively reflecting about the completion of specific tutoring sessions.

One should be critical about our findings when monitoring the tutoring sessions, because of the possible effect that we had on the tutoring session through our presence? Despite that we sought to avoid attracting any attention, we were still reducing the intimacy of the conversations taking place between teacher and student.

## NOTES

[1] See “Academic regulations for the Bachelor’s Degree Programme” AAA, 2019, accessed January 29, 2021. https://s3-eu-central-1.amazonaws.com/aarchdk/wp-content/uploads/2019/09/05101136/2019-Studieordning-BA_05092019.pdf. “Academic regulations for Master of Arts in Architecture” AAA, 2019, accessed January 29, 2021. https://s3-eu-central-1.amazonaws.com/aarchdk/wp-content/uploads/2019/09/05120823/Studieordning-2019_KA_05092019_2.pdf. “Studieordning for bacheloruddannelsen i arkitektur” KADK per 1. september 2019, accessed January 29, 2021.
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https://kglakademi.dk/sites/default/files/downloads/article/studieordning_for_kandidatuddannelsen_i_arkitektur_pr._1._september_2017_0.pdf.

[2] John Biggs, “What the student does: teaching for enhanced learning, Higher Education Research & Development” *Higher Education Research & Development 31:1* (UK: Routledge, 2012): 39-55.

[3] Per Lauvås and Gunnar Handel, *Vejledning og Praksisteori* (Aarhus: Klim, [2006]2015) address methods and ideas of tutoring, however not directly related to education of architects.

[4] Donald Schön: *Educating the Reflective practitioner* (San Francisco, Jossey-Bass, 1987), 18.

[5] Ibid., 93.

[6] Ibid. 44-45. Often projects in the education of architects will simulate the development of a design as professional architects practicing their profession; however, some projects can also be focusing on more academic questions, but still be structured as a project. For a general introduction to relations between project development and problem solving see: Lotte Rienecker; Peter Stray Jørgensen, Peter Dolin and Gitte Holten Ingerslev, *Universitetspædagogik* (Frederiksberg, Samfundslitteratur, 2013) 215.

[7] See Academic regulations for the Bachelor’s Degree Programme of 2019 at AAA: https://s3-eu-central-1.amazonaws.com/aarchdk/wp-content/uploads/2018/10/04104003/ACADEMIC-REGULATIONS-2019-BA_04092019.pdf and Academic regulations for Master of Arts in Architecture of 2019 at AAA: https://s3-eu-central-1.amazonaws.com/aarchdk/wp-content/uploads/2019/09/05121511/Academic-Regulations-2019-MA.pdf (accessed January 29, 2021).

[8] Teaching in relation to the project development also happens at the end through crits where the students get a response to the result of their project and also at the beginning when introducing the field and context of the project to be developed.

[9] Mogens Brandt Poulsen: *Den gode skole, og arkitektmiljøet i Aarhus* (Aarhus, Arkitektskolens Forlag, 2015) 81, 114 and 173.

[10] Ibid., 88.

[11] Olaf Lind: *Arkitekten Steen Eiler Rasmussen* (København, Gyldendal, 2008), 290.

[12] Poul Cret, “The Ecole des Beaux-Arts and Architectural Education” *Journal of the American Society of Architectural Historians,* Vol. 1, No. 2. (1941): 11. As a student in architecture at the University of Pennsylvania, Louis Kahn studied under Paul Cret.

[13] This is being presented in: Lene Tanggaard and Svend Brinkman “Til forsvar for en uren pædagogik” in: *Uren Pædagogik* by Thomas Aastrup Rømer, Lene Tanggaard and Svend Brinkman (Aarhus, Klim, 2011),18-35.

[14] Per Lauvås and Gunnar Handel, *Vejledning og Praksisteori* (Aarhus, Klim, [2006]2015), 123-133.

[15] Traditional tutoring happens in a studio, where a teacher comes and sits by the desk of the student. There are of course other possibilities where the student instead comes to the teachers’ desk or to a more neutral setting elsewhere. Also tutoring can include more than one student and it can include more than one teacher. Although this does not involve other students, it is possible for students around the desk of the student being tutored to listen to the discussions and possibly learn from this as the issues and the questions being discussed for this one particular student would also be relevant to the neighboring student working with a similar project as it is initiated from the same assignment.

[16] Stan Allen, “Notations and Diagrams” in *Practice: Architecture Technique + Representation* by Stan Allen (London, Architectural Associations, [2000]2009), 40-69. Sergei Eisensten, “The Structure of the Film” in *Film Form* by ed. Sergei Eisenstein and Jay Layda (New York and London, A Harvest/HBJ Books, 1977), 150-178.

[17] Presented in: Lene Tanggaard and Svend Brinkman “Til forsvar for en uren pædagogik” in: *Uren Pædagogik* by Thomas Aastrup Rømer, Lene Tanggaard and Svend Brinkman (Aarhus, Klim, 2011),18-35.

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# DISEMBODIMENT IN DIGITAL ARCHITECTURAL EDUCATION: LESSONS FROM BAUHAUS

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## INTRODUCTION

Architecture has long been about an attempt to create a balance between theory and the technical means of production in practice. This concept has roots in the ideas that emerged in post-war Germany at Bauhaus, which was eventually interwoven into modern North American architectural education.[1] The Bauhaus was one of the first schools that attempted to rectify past imbalances through its curriculum, educating students in both the theoretical nature of design and the technical practical nature of craft.[2] The question is, does this Bauhaus mentality remain relevant in today's education? Architectural education today is faced with change; traditional skills of architecture are becoming digitally automated, and the balance between theory and practise is becoming more relevant. For example, today there is a large focus on students to be technically inclined to work within a digitally reliant architectural workforce.[3] Yet, there is a price for this; students are becoming disembodied from the work they create, a particularly relevant topic in today's pandemic situation. This paper will examine the lessons of Bauhaus to determine if it may offer us any solutions to our present dilemma of disembodiment in architectural education.

## HISTORY OF BAUHAUS

Bauhaus was uniquely a school connected with the cultural, political, and economic progressions in the early 20th century more than any other school in Germany of its time. Some influences stem back to the Industrial Revolution, where there was a separation of artists from the craft because of the shift to machine labour.[4] To Bauhaus, machines were not considered unwelcome, rather they envisioned them as an instrument to aid people rather than replace people in skilled trades. However, they did recognize that design was narrowing in on the technical rather than focusing on the broader range of knowledge in design. This idea was challenged by various architects, artists and craftsmen who would soon form Bauhaus. This led to the synthesis of architectural design into unified schools, with a shift in artistic training to include construction and manual trades. Bauhaus revolved around a similar concept; unities were created between artistic and technical production.

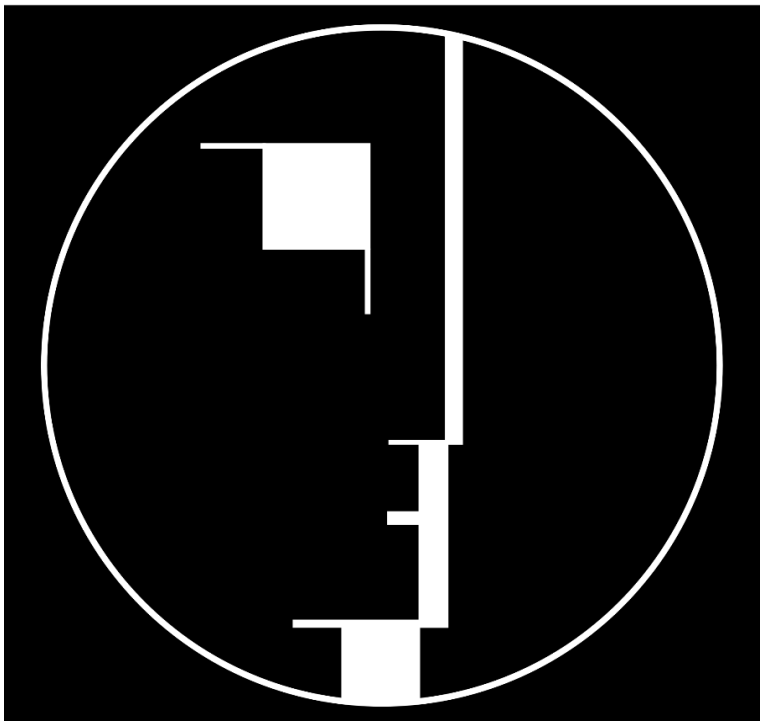

*Figure 11. Signet of the Staatliche Bauhaus*[5]

Soon there was a meeting of architects and artists including Lyonel Feininger, Wassily Kandinsky, Walter Gropius and Ludwig Mies van der Rohe who wanted to redevelop the creative German Republic. They looked at how to reform the traditional view of art academies to include workshops and manual trades. Connections can be made with this idea of balance and the first Bauhaus signet, the "matchstick star man", an abstract line drawing of Leonardo Da Vinci's Vitruvian Man, also reminiscent of the Chinese Yin and Yang.[6] This was symbolic of the educational reform the Bauhaus was seeking; the arts and craft movements had been rising in various parts of Europe and began to infiltrate and compose the Bauhaus curriculum.

The curriculum for Bauhaus had a goal of "creating a new guild of craftsmen without the class-distinctions that raise an arrogant barrier between craftsmen and artists."[7] The curriculum started with a foundation year and eventually led to 'mastery'; throughout these years theoretical and material studies were integrated such as wood, metal, weaving and colour.[8] The workshop courses that followed allowed students the opportunity to both design and physically manifest their ideas. The architecture courses were instructed alongside the Weimar Building Trades School; commissions were granted to the Bauhaus school that allowed for students to finance their projects. It also allowed students the opportunity to participate in project design builds by Bauhaus professors.[9] In these courses, the students could begin to feel a sense of embodiment in the work they were creating. This concept is explored in greater detail as something digital education is struggling to achieve in the present. First, it is important to look at how these early Bauhaus teaching methods were brought to North America.

## BAUHAUS IN AMERICA

Bauhaus was eventually closed in 1933, however, its core ideas were carried over to schools in North America, modernizing their curriculums. I will examine three case studies of where this effect was particularly profound: Black Mountain College in North Carolina, Harvard in Cambridge and the Illinois Institute of Technology in Chicago.

### Black Mountain College

Black Mountain College was among the first American schools to emulate modern Bauhaus ideas in curriculum. Josef and Anni Albers, former students and masters at Bauhaus, were among the first to begin changing the architectural program at Black Mountain College in 1933.[10] Their work at Black Mountain College was not exactly a continuum of what was established at Bauhaus; rather it began to weave Bauhaus ideals into its curriculum from a more pragmatic and life-oriented standpoint.[11] The founding of Black Mountain College took a democratic approach and their programs were focused on the "education of a whole man."[12] Albers took a new approach to the design of workshops of blended theory and craft. "Albers was a real teacher. He made his students actually look at things. He showed them how to see. They would go out into the woods and pick up stones, leaves and branches and bring these natural found objects back to the studio."[13] This emulates a move away from the previous disembodiment of classical architectural education. A more well rounded "education of a whole man" ties back to the idea of Bauhaus shaping its students into masters in a range of fields rather than just individual specializations. This concept is difficult to implement in digital online education as we struggle with more limited mediums of teaching and design.

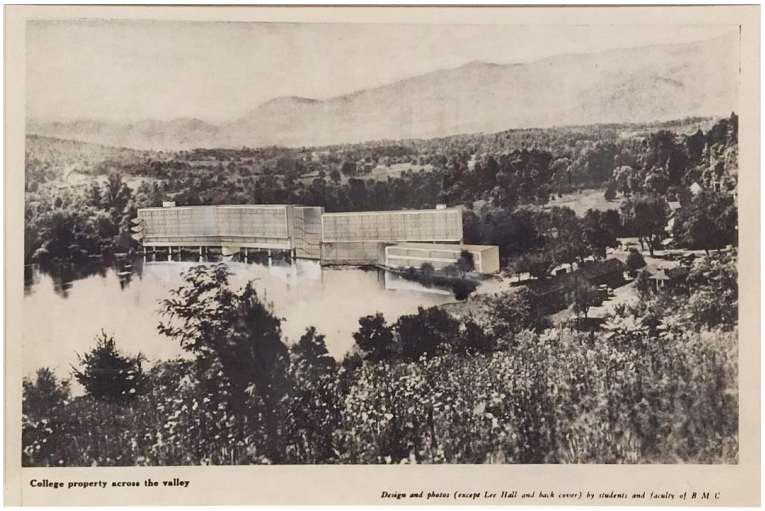


*Figure 2. Drawing of planned campus building overlooking Eden Lake at Black Mountain College in Asheville, North Carolina (1938) Architectural design by Marcel Breuer and Walter Gropius[14]*

### Harvard

At Harvard, Bauhaus founder Walter Gropius was appointed chair of the department at the Graduate School of Design in 1937.[15] A group called The Architects Collaborative which emerged at this time promoted Harvard GSD's new modern mentality throughout the United States.[16] Contrary to some beliefs, this was not done solely through Gropius' vision to create a continuum of what was created at Bauhaus. Harvard was rather a school whose architectural curriculum was infused with Bauhaus ideas that moved it away from its traditional Beaux-Arts education into something new.[17] This move away from what has been previously described as "historically imitative" architecture, allowed students a

greater deal of creative freedom. This new modernism is not to be confused with the style; Modernism as a style did quickly fall to the same issues as the "historically imitative" architecture of the past. It similarly became a rigid set of design parameters that architects, and architectural students began to design within. In the present, students have arguably the most freedom with not only freedom to design but also with the variety of technologies they can use to convey their design. The issue to consider is that when students only design through digital means, they may become disembodied from their work. Thus, this design freedom can start to become convoluted and meaningless.

### Illinois Institute of Technology

Arguably the most successful integration of modern Bauhaus ideals into North American education was done by Mies van der Rohe at the Illinois Institute of Technology or IIT. Before van der Rohe arrived in 1938, former Bauhaus master, László Moholy-Nagy, had taken over the department and influenced the existing curriculum to adhere more closely to Bauhaus ideals than the previous schools.[18] IIT implemented a 'learning by doing' approach to education.[19] Mies "organized the curriculum so a student might feel pleased with a careful drawing, model or analysis, in which all the factors were understood and incorporated into the solution."[20] This view stems back to the Bauhaus curricula aimed at shaping students to be educated in a range of fields related to design, such that every factor relating to the building design can be taken into account. Mies was also known to push his idea of architecture being "an expression of its time," evidently straying away from traditional architectural education at the time towards a new kind of American modernism.[21] These concepts are very similar to the concepts implemented at both Black Mountain College and Harvard, which are all relevant in the current situation of architectural design education in the present.

*Figure 3. SR Crown Hall, Illinois Institute of Technology*[22]

## ARCHITECTURAL EDUCATION IN THE PRESENT

The use of technology in architectural education has become even more pronounced in today's pandemic situation as education begins to switch to fully online modes of instruction and production. Although there are problems associated with this, it is recognized that architecture should not reject the digital, but perhaps revisit how it is used. This concept has roots in Bauhaus, where the idea of machines replacing age-old trades was rejected, however, the use of technology by their students was not. The interesting reality that is occurring in the present has been described as "precarity and total lack of power of architects in late capitalism."[23] New concepts have emerged about digital

architecture and how it can be much more effective in architecture when it is used for the basic building blocks or elements, or abstract fragments, rather than the whole building.[24] When architects use technology as a means of optimizing the elements that comprise the whole building, much more focus can be placed on the design of the building itself with inhabitation in mind. This concept can be derived from Bauhaus, where the designer does not reject the use of technology but also has strong foundations in the physicality of design.

The concept of online learning being a lower quality of education when compared with conventional means of in-person learning is a problem that stems from an apparent loss of engagement. There are however some solutions that have been explored by researchers to combat this loss of engagement. First, there is a need for faculty to be more than just an expert on the subject, and to go beyond to facilitate engagement with students and amongst other students online.[25] This can be done through regular feedback sessions or critiques in which students receive timely feedback on their work from both faculty and their peers. American educational theorist, David Kolb introduced four components in his research that builds on experimental learning cycles. Kolb states we should address concrete experience, reflective observation, abstract conceptualization, and active experimentation.[26] Based on a student's experience they should make observations that allow them to conceptualize a future building that they can then experiment with through iterative design.

Critique is perhaps the strongest way design students and educators can engage, making it a worthwhile topic to discuss on its own. Critique in architectural design education has been described as the "cycle of action and reflection."[27] Design students rely on this constant feedback loop to bring their designs from initial concepts to a fully imagined building. The preferred method of critique has been through in-person discussions and hands-on feedback; however, it is imperative critique can adapt to this new method of education for design students to progress. Educational researchers have concluded that the "key to successful implementation of online collaboration in design depends on high student participation rates and quick instructor feedback."[28] It is equally as important for the faculty to engage in critique as it is for the students. Through this, students can provide feedback to one another, and reflect on their work, also a concept known as meta-learning explored in the next section.

## Meta-Learning

Meta-learning has been defined as, "developing greater self-awareness as a learner and becoming more independent in one's learning."[29] In other words, the success of a student is largely dependent on self-reflection and self-understanding. If a student is not a meta-learner, they may have trouble with the iterative aspects of the design process, as they cannot see where the improvements may lie. When it comes to the disembodiment of students from the buildings they create, this is a primary issue. When a student has only ever envisioned their design and all the components that make it up from a 3D model or 2D computer-generated drawings, it becomes increasingly difficult to put themselves in that space. New technologies that are emerging in the architectural field may offer some aid to students and help build the concept of meta-learning, such as virtual reality. In this sense, meta-learners can use it as a tool to reflect on how they feel in a space and where they see the flaws. Meta-learning will continue to be an important trait for students in the design field as it embodies ideas of self-regulation, self-motivation, self-reflection and independence as a learner.[30]

## Embodiment

Physically inhabiting buildings renders them completely differently from the way they appear when drawn or modelled through technical means. Architects have the unique ability to translate buildings from their visions to physical reality using technology; however, this can sometimes inhibit an architect's ability to envision buildings in their true physical form. Geographers have long studied how architectural forms have affected people's perceptions of inhabiting a space.[31] The physical inhabitation is both geographical and sensorial [32] Embodiment is a critical concept to understand in design as architecture is both a "physical and volumetric body that incorporates other bodies."[33] The dilemma of removing the physical from architectural education in a time of digital learning becomes ever more relevant. Some technologies that can provide a sense of embodiment and meaning in digital spaces include virtual reality and parametric design.

## Virtual Reality

Virtual reality is a process which through "interiorizing and embodiment allows the user to get a direct experience and feeling of the place he is visiting, sharing emotions, perceptions and skills with other virtual viewers and the surrounding architectural or urban context."[34] When this technology is used through the iterative design process, it allows the designer to envision the spaces they are creating much more accurately and can aid them in all the formal and material choices before the building is physically manifested. Although this paper is meant to be hermetic based rather than scientific, the value of virtual reality has clear connections to neurophysiological studies with architecture. These studies have examined the emotional responses to architectural visual properties such as contour and form through three-dimensional spatial geometries. It was concluded that architectural spaces are "governed by the dynamic sensorimotor activity of the human organism as a whole and is thereby influenced by the particular conditions of man's embodiment."[35] Virtual reality has afforded designers to respond arguably more effectively than other design mediums through selective reinterpretation and immediate evaluation.[36]

*Figure 4. Experiencing a digital space in 3D using virtual reality*[37]

## Parametric Design

Parametric design is another form of digital architectural technology that has proven to be a useful design method in recent years. There are also ways it can be merely visual, ignoring the associated algorithmic complexities that make it meaningful.[38] The concept of parametric design replacing

traditional design methods can be loosely tied to the rejection of the industrial revolution ideas that emerged before and during the formation of Bauhaus. When used improperly, parametric design can turn into, "a style disposing itself of the restraints of external parameters and promotes the autonomy of architectural forms, while it cannot advance beyond new ways of shaping matter to produce unexpected spaces."[39] Similar to the concept of machines replacing traditional trades, there is a disconnect created between production and reason. Technology can only produce something based on information or parameters we provide to it. It does not have the cognitive ability to reason why it is created or how it can be improved. This is where the dilemma of how parametric design is used becomes relevant. When a parametric space is unintentionally articulated, lacking a model of design thinking, it begins to steer the design process.[40] It can however be an extremely useful technology when the designer puts their input into its parameters based on their design knowledge and criteria. When it is merely used for aesthetics, it becomes a completely disembodied technology from the designer, and the architecture created with it loses its meaning.

## REFLECTION

As education moves online, architectural education becomes completely removed from the material in a way that will have a profound effect on design production and student work. Materiality and form are the basic elements that make a building physical. Many argue that the traditional design methods of hand drawing and physical modelling should still be at the foundational level of architectural education.[41] This does not create barriers between students with more technical ability than others but like Bauhaus, it tests pure design ability and design communication. As architectural education progresses later through workshops and studios, most design production and processes are done through digital means. Technology in architecture has evolved rapidly since the time of Bauhaus, however, the concepts remain relevant. Technology is a constantly evolving and complex system of processes; it is how it is used that makes it most beneficial. Although technology has changed, the concept of architecture as a formal body that is designed to inhabit our bodies remains unchanged. We must not lose sight of architecture as a physical manifestation as the education and practice of it continues to digitize in the future.

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# TEACHING-RESEARCH FRAMEWORK IN ARCHITECTURE AS A MEANS TOWARDS CINEMATIC DESIGN

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## INTRODUCTION

In this paper I will provide a theoretical insight into teaching-research framework in architecture, by analysing the research-based teaching from the 1980s onwards. The examination of various structures, methodologies, the production and transfer of knowledge in architecture, will be exposed as pedagogical samples which problematize a context for the designer to consciously experience design as an interdisciplinary category. To be able to do that, I will deal with the moving image and how it relates to designing space. As the main focus of my research, I will take a series of architectural workshops at European and US universities that perform cinematic design practice experiments. By interpreting the key aspects of their epistemologies for teaching foundations, the aim of this paper is two-fold: to discuss the possibility of introducing cinematic design in teaching architecture; and to contribute to grasping cinematic design in relation to a designer's response to complex architectural and urban phenomena governed by rules of unpredictability, indeterminacy and temporality.

Pedagogy is often referred to as the activities of educating, or instructing or teaching, the activities that impart knowledge or skill. Pedagogy is also defined as 'the profession, science or theory of teaching.'[1] Contemporary media-saturated urban conditions have significantly challenged the characteristics and matters that pertain to traditional pedagogy and its limitations. The rapid pace of these transformations has urgently asked to reidentify the prevailing links between education and research, where exploration fuses with reflection and research is an instrument of discovery. Yet the representatives of early twentieth century Avant-garde art demonstrated that research and teaching can create an epistemological dialogue for identifying the break of traditional values. In the spirit of Jean-Paul Sartre's claim, 'only the guy who isn't rowing has time to rock the boat,' it is vital that the traditional role of the educator is broadened towards developing students' capacity to create their own insights and understandings through the design process. If research is considered a foundational component of this process, equally then the established thought-models within the contemporary architectural pedagogy should be inevitably challenged. Accordingly, the paradigm of this approach is the research-based teaching that aims to provide new agendas for investigating current spatial realities, production processes and speculative futures. The hypothesis is that the research-based teaching transmits theoretical foundations, introduces new thought-models in architecture and employs operative representational techniques adopted from other media, to open up traditional design education. The aim of this article is to discuss the pedagogical and epistemological dialogues in teaching architecture, as a means towards cinematic design.

Firstly, research-based teaching will be discussed as anticipating the understanding of architecture based on students' personal experience of space: through movement, sensing the environment and their diverse perceptions and interactions in the context. A hermeneutic view of knowledge is applied here: 'the idea of knowledge as a kind of invariant artifact must be coupled with that of knowledge as dialogic with context.'[2] This may mean dialoguing with the individual as a means to gaining personal insight.[3] Therefore, instead of pointing students' attention to the quality and conceptions of spaces as represented on film, the focus is rather placed on developing personal repertoire of references from film. I will deal with diverse pedagogical modalities that neglect the traditional linear trajectory of research and establish a non-linear path from historical references towards imaginative futures.

## The beginnings and raise of cinematic design

Although a number of prominent architects contributed to professional film productions in the early 1920s, it is debatable whether any of the early film products actually informed the architectural practices of those architects involved.[4] From the historical perspective, it is worth drawing attention to the 1980s asking how the role of film as an instrument in design has changed to date. In this period, TU Delft designed a course 'Environment and Psychology' taking video for exploring, analysing, and critiquing an objective image of the environment instead of exposing a subjective one. The primary aim was to examine how video recordings of interaction in the environment may reveal diverse modes of behaviour in the urban space, in their spatial and temporal configurations. The challenge was to determine a set of principles for the development of the urban space that would respond to the needs of different groups of users. Underlying the significance of this research project, TU Delft – Faculty of Architecture has established a long-term research and educational programme to investigate whether and how videography could play an additional role in the exploration, registration and understanding of urban environments.[5] The programme started with a design studio called "Camera Eye", which is focused on exploring ways to apply moving images in the process of urban mapping. The method of collecting video footage was combined with a very specific artistic approach and a clear identification of the site-specific conditions. Videography was used to create an 'objective' depiction of these urban settings. Another example is the Masterclass Media & Architecture course at The Berlage Institute (1995-96), aimed at addressing architecture and media professionals. Nevertheless, the Berlage Institute also employed video as the final form of representation.

The 1990s examples include a series of workshops in creative digital media developed and run by Maureen Thomas.[6] She deemed her workshops a necessary part of cinematic design experiments and is moving more firmly beyond mere representation. Given Thomas's concern that this kind of cross-disciplinary and convergent activities carry a high risk of indiscriminate and sometimes unfortunate intellectual hybridization when cinema enters architectural processes, it is not surprising that her teaching approach is organised around the close relationship between epistemology and methodology. The uniqueness of this method is in creating basic conceptual structures to describe precisely the kind of knowledge production and transfer in architecture, as well the ways of extending means and methods of teaching. For this purpose, her classes are focused on investigating how wandering through the filmmaker's arrangements of images, narratives and spaces, can help students comprehend more deeply the dramatic changes in how they normally see the basic architectural elements of our everyday urban environment. Thomas understood that students need to examine how a 'realistic attitude to reality, the dynamism of perception and the narrativity of experience'[7] change to improve their capacities of knowledge for diverse interpretations of the urban environments. On the other hand, the question of language communicated between these media was exemplified to embrace a grammar of space. Architectural movie clips were used to exemplify the 'screen language', and the

concepts of Plot Grammar (the structure of the story) and Shot Grammar (the action staged by the director) were introduced.[8] Moving to the 'screen language' required the analysis of the script and the captured material. It gave an opportunity to develop a discussion of both theoretical issues and the practical matters of material collection and interpretation. For example, architectural theorist Kevin Lynch's parsing of the legible city was systematically combined with traditional screen grammars. Using this practice-based and practice-led approach, new design knowledge is discovered in developing ways of observing, analysing, theorising, contextualising and presenting both the objects of study and the outcomes of the research.

This said, it seems almost impossible to explore architecture without film. What the historical overview also demonstrates is that in the process of education, film has been used predominantly as an instrument of narration and representation. In other words, significant were the quality, conceptions, experiential, socio-cultural and political dimension of spaces represented on film or video. This was reflected in a direct implementation of the moving image on top of the techniques and methods used in these research projects. For the film not only to be the final form of representation, it is necessary to design a more open research framework for dealing with previously collected materials. Otherwise, the results are linked only to specific site analysis. This also means that the knowledge produced in such process is not, in turn, related to its material and conceptual base in architecture. Therefore, the challenge was to find a method to transfer knowledge between architecture and film. In that regard, the discussion is open to examine how might the history, theory and practice– which have long viewed architecture as a subject of rigid categories– provide opportunities for enhancing epistemological and pedagogical dialogues. I argue that the research-based teaching dissects the intertwined histories of film and architecture to put them together in the framework of design principles and methodologies.

## Research as a process and paradigm in constructing architectural knowledge

According to the results of the Research in Design Thinking workshop, Jill Franz (1994) concludes that 'the 1980s experiments allowed educators to confine disciplinary boundaries in the framework of different research models.'[9] Moreover, given that a way of communicating knowledge is crucially controlled through either theoretical or practical models, in addition it is necessary to differentiate 'ways of thinking' (theory) and 'ways of making' (practice). For example, Donald Schön's theory of design as reflective practice (1983) was among the first experiments to deal with the interpretative and contextual nature of knowledge, based on the interaction in the environment. His theory seeks to establish the relationship between problem-solving project and reflective practice and creative production. Driven by desire to learn from experience, reflective practice evolves around deliberate activities that engage the architect in a critical manner with the relationship between conceptual, theoretical and practical concerns.[10] The epistemic value of these investigations is secondary to human experience, because knowledge can, in certain types of projects,[11] come out as a by-product of the process rather than its primary objective. Nonetheless, evaluating experience in the light of existing knowledge, according to Boud, Koegh and Walker, involves the integration of this new knowledge into one's conceptual framework.[12]

## Teaching cinematic design in architecture: the 1990s onwards

It seems that the use of film and cinematic principles came more naturally at particular American universities to facilitate engagement with architectural spaces. Most notably, Bernard Tschumi's (the former Dean of GSAPP, 1987-2003) Columbia University teaching curricula of the 1990s was

inspired by film to introduce new conceptual devices into architectural education. Tschumi focused on the criticality of an organizing structure of architectural programme that could exist independent of use. He proposed an 'abstract mediation' device reinforced by recent developments in philosophy, art and literature.[13] In teaching design, the question of cinematic architecture was open by showing an attachment to poststructuralist and deconstructivist theories, and to the philosophies of Derrida, Deleuze, Barthes and Bataille. According to Richard Koeck, 'Regardless of how much Tschumi sees his argument rooted in the decomposition of linguistic formalism, he demonstrates a deep fascination for the fragmented, composite quality of contemporary urban spaces, and the expressive nature of architectural form and function.' Koeck continues to indicate the consequence of this approach: '[…] the theories related to film, film editing and cinema have permeated the process and articulation of architectural and urban design.'[14] In the next decade, the official Visual Studies Curriculum at GSAPP has continued to change architectural education in the like spirit, grounded on what Tschumi started with paperless studios around 2004. Furthermore, for the past eight years Wiel Arets, the new Dean of the Illinois Institute of Technology (Chicago), has been exploring "Re-thinking the Metropolis": the vision for a new era of the school. The college's new educational and urban-centric approach thematically spans from Fritz Lang to Rem Koolhaas[15], recognizing the altered circumstances of the human condition. It has become commonplace to consider cities as profoundly mediated environments, where media crucially change the way we perceive space, behave, interact in our environment, and consequently the way we understand and configure future urban settings. This epistemological shift has led to opening the prospect of a reinvigorated IIT and Columbia GSAPP's "Studio-X" pedagogical typologies as schools for the 21st century.

Media and Architecture (2012) Graduate Seminar in Media Studies, taught by Shannon Mattern at The New School in New York, introduces the narrative dimension of cinema. Mattern believes that teaching architecture must be considered as a diachronic exercise, because without time, narrative will not be generated. She deals with creating a vision of space through time, but also with detecting the ways in which past and present interact. Premising that both film and architecture explore spatiality and temporality as fundamental categories of human experience, Mattern's teaching approach answered the questions such as: how to operate film in the design. In fact, in her design pedagogy she employs architectural programme structured by cinematic means, which is then exercised in the tripartite mode: 'as a function of the past (programme becomes the lessons of history), as a function of the present (programme is the act of design), and as a function of the future (programme is the beauty of infinite combination of events that can occur within a space).'16 On the other hand, using mental maps of the city as the multi-faced representations of what the city contains and layout according to the individual, has brought human condition even more firmly into the discussion. This method uses the notion of temporal sequences and their relation to the visual appearance of architecture. This pedagogical shift provided students with a personal approach to studying urban environment and helped them reconnect with the reality of urban condition of the everyday space. In this way, the consumer of architecture becomes what Giuliana Bruno refers to as the 'prototype of the film spectator.'17 Ultimately, the spatial relationships and physical dimensions of objects change with each viewpoint. What comes along is introducing the order of experience, the order of time – movements, intervals, sequence (fig. 1) – for all inevitably intervene in the reading of the city, which was made possible by applying the tripartite mode of notation- events, movements, spaces.18

*Figure 1. Space sequencing. Project by the author, performed in Bilbao, Spain 2012 © Courtesy of the author.*

In the twentieth-first century, film challenges the architectural discussion to increasingly extend into various other cinematic formats such as fiction, comic books and video games, but still tend to keep the film as the primary tool of projecting architecture through its content. Recently, curricula of architecture schools have been decolonized to investigate more deeply the agency that cinema offers in providing a lens through which students can interpret the current condition of the recession and the subsequent employment crisis. This strategy is especially significant as an opportunity to engage students in autoethnographic research, and by implication, that they become co-producers in cinematic content that can enact disciplinary and canonic disruption through diversification of *content authorship* and *content production*. Thus, students begin making their own films by situating their video practice and architectural practice, which guides and activates new understandings to emerge in theoretical and practical approach. Architecture has always been well positioned to play a significant role in addressing these queries but it seems that current demands on the profession to deal with proliferating social, economic, and environmental challenges while keeping up various software programs and emerging fabrication technologies, for instance, have left us often thin on existential and ethical enquiry.[19]

## Cinema as a research tool in architecture: critical evaluation

Going beyond mere representation, cinema as a research tool requires challenging the traditional disciplinary boundaries. The aforementioned studies have also shown that the basic prerequisite for engaging in cinematic research is the study of the visual qualities of urban environment and the setting of a subjective and empirical counter-perspective to rationalist doctrine and the study of spatial paradigms.[20] Crucially, the introduction of cinematic design in teaching requires more than an alternative to the existing curricula. Being still unburdened with the conventions and traditions of design thinking, and using only their own senses and camera to experience their immediate environment, students have an opportunity to comprehend the age of mediated space they currently live in and begin placing architecture in that world. This is possible because film has an enormous capacity to exit the dark room and pave the way to exploring the street, equally entering the social milieu and the gallery, transcribing historical messages or "walking" the political discussions, Apollo adventures and the Sci-fi imaginations of future societies. Its diverse means of addressing varying aesthetics, cultures and environments, make film compatible with the means of production and representation of architecture. Equally then, basing this argument on the concept of mediation works well with François Penz and Andong Lu's suggestion that 'the film has a potential to become architecture, insofar as it transforms the immediate presence into mediated or mediatised urban experience.'[21] We can either learn this lesson from the practicing and research architect Daniel Libeskind who understands a possibility of mapping human relations in reading Hamlet, or we can take an advice from Wiel Arets who advocates for understanding Godard's reading of architecture regarding the ways in which casa Malaparte's interior and exterior are prominently featured in his 1963 film Contempt (Le Mépris, fig. 2). On the other hand, artist Darko Fritz detects the problematic

relationship between the two disciplines concluding that architecture students feel uncomfortable while experimenting with a video because they are not trained as conceptual artists. Yet Rem Koolhaas' installation for the Venice Biennial Fundamentals (2014) proposes a view on architecture from the lens of the Italian neorealist film production (such as Antonioni and Pasolini). Recently, video artists' scripting system is considered important by Bill Viola. More recently, the experience of new generations has demonstrated that 'thinking through images,' which was initiated by the modern authors, has the capacity to promptly transfigure two-dimensional to three-dimensional spatial elements, so that architecture remains at the conceptual level. Mobile applications may function today as a prosthesis. New media like Facebook work to abolish differences and establish the control of the world, while the algorithmic scripting has become a new instrument for designing, already tested in Vedran Mimica's book The Berlage Affair (2018, fig. 3). Applying the system of tagging moves us away from the film scripting towards establishing relationships between data. The result of the algorithmic reading of text and images is the collage. Expressing the beginning of faith in the algorithm, we are moving towards the posthuman society.

*Figure 2. Jean-Luc Godard, Contempt [Le Mépris], 1963 © Film still.*

*Figure 3. Vedran Mimica, Algorithmic scripting for the book The Berlage Affair, 2018. D*izajn: Damir Gamulin Gamba © *Courtesy of Vedran Mimica.*

## CONCLUSION

The analysis of the pedagogical modalities from the 1980s onwards is indicative of how diverse knowledge is communicated and interpreted through the educational framework for cinematic design in architecture. It is also indicative of how architectural pedagogies provided transfer of knowledge between diverse disciplines in a close connection to research and practice. Featuring key points of the art of architecture debate, such a profound change has grown to be established in our visual literacy, as part of what we need to learn, or in words of Walter Murch: 'You need to know how to write, you need to know mathematics, you need to make a film even if you don't become a filmmaker. You need to know what goes into making a film because films will manipulate you through the media if you don't know what's happening.'[22] More importantly, a constant appropriation of new knowledge for designing space is well aligned with Murch's ideas about the democratization of media: 'with writing we had to develop literacy, motion picture is no different.'[23] Then, it is debatable how to use film for educating architects today when contemporary media abolish differences and *establish control* of the world?

## NOTES

[1] The Oxford English Dictionary, 2002 update (Oxford University Press, 2002).
[2] Stephen Awoniyi, 'Premises for a question about memory', in Working papers in ART & DESIGN, Volume 2: the concept of knowledge in art & design (2002): n. p.
[3] Ibid, ART & DESIGN, Volume 2 (2002): n. p.
[4] Richard Koeck, CINE-SCAPES: Cinematic Spaces in Architecture and Cities (New York and London: Routledge, 2013), 9.
[5] François Penz and Andong Lu, eds, Urban Cinematics: understanding urban phenomena through the moving image (Bristol, UK: Intellect, 2011), 241.
[6] Maureen Thomas has been developing and running cross-border workshops at University of Cambridge (Architecture and Screen Media and Cultures), London (Goldsmiths Digital Studios), Ulster (Visual Arts/Design, Architecture), Bath (Architecture/Engineering), National Film and Television School in UK, Aalto Media Lab in Helsinki, Malmo (Interactive Narrativity Studio) Sweden and Norwegian Film School/Arts Fellowship Programme Norway.
[7] François Penz emphasises the importance of introducing 'a realistic attitude to reality, the dynamism of perception and the narrativity of experience' to explain how cinema challenges the traditional disciplinary boundary of urban design, in his introduction to: cinematic urban design practice.
[8] Read more about the workshop in: Maureen Thomas, 'The Moving Image of the City: Expressive Space/Inhabitation/Narrativity: Intensive studio workshop on 'Continuity of Action in space', in Urban Cinematics, François Penz and Andong Lu, eds. (Bristol, UK: Intellect, 2011), 281-309.
[9] Jill Franz, 'An Interpretative Framework for Practice-Based Research. Research in Architectural Design', Working papers in ART & DESIGN, Volume 1: the foundations of practice-based research (2000): n. p.
[10] Stephen AR Scrivener, 'Reflection in and on Action and Practice in Creative-Production Doctoral Projects in Art and Design. The Foundation of Practice-Based Research: introduction', in Working papers in ART & DESIGN, Volume 1: the foundations of practice-based research (2000): n. p.
[11] According to Stephen AR Scrivener, in reflective practice it is crucial to distinguish between problem-solving research projects and creative-production projects.
[12] D. Boud, R. Koegh and D. Walker. "Promoting Reflection in Learning: a Model," in *Reflection. Turning experience into learning*, eds. David Boud, Rosemary Koegh and David Walker (London: Kogan Page, 1985), 26-31.
[13] Bernard Tschumi, Cinégramme Folie, Le Parc de la Villette (Princeton Architectural Press, 1987), IV.
[14] Richard Koeck, CINE-SCAPES: Cinematic Spaces in Architecture and Cities (New York and London: Routledge, 2013), 13.
[15] Since the time of his Delirious New York, Rem Koolhaas continues to pursue an interest in the relationship between architecture and cinema.
[16] Shannon Mattern, 'Polite resistance and the Dimensions of Narrative – Week Six Response', Media and Architecture 2012, A Graduate Seminar in Media Studies at The New School. Taught by Shannon Mattern, February 27, 2012: http://www.wordsinspace.net/media-architecture/2012-spring/?p=482.
[17] Giuliana Bruno, Atlas of Emotion: Journeys in Art, Architecture, and Film (New York: Verso, 2002).
[18] Bernard Tschumi, The Manhattan Transcripts (London: Academy Editions, 1994).
[19] David T. Fortin, *Architecture and Science-Fiction Film. Philip K. Dick and the Spectacle of Home* (London and New York: Routledge, 2011), IX.
[20] D. Walters and L. L. Brown, Design First: Design-based Planning for Communities (Oxford: Architectural Press, 2004).
[21] François Penz and Andong Lu, Urban Cinematics, 16.
[22] Cit. Walter Murch in: John P. Hess, 'In the Near Future Every Student Will Be Required to Make a Film', Filmmaking 360, July 18, 2017: https://filmmakeriq.com/2017/07/in-the-near-future-every-student-will-be-required-to-make-a-film/.
[23] Ibid.

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# MIES'S UNIVERSAL SPACE: IIT AS A LABORATORY OF IDEAS

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## INTRODUCTION

The Neue Nationalgalerie in Berlin is the last of Mies van der Rohe's built *universal spaces*, unique spaces that allow maximum flexibility of use. It is a space whose main floor is completely free of interior structural supports. The square plan and cruciform columns express "isotropy" in architectural form and structure; a clear separation between primary structure and enclosure; truth in construction is now fully visible. The building represents the culminating expression in an ongoing search process that started many years before. However, this search process was not limited only to the office but Mies explored the possibilities of the structure with his students within the graduate program in architecture at the Illinois Institute of Technology (IIT). This paper aims to highlight the contribution that the work developed by Mies's graduate students at IIT had on the development of his concept of "universal space" and demonstrate structure as an architectural factor, showing the potential influence of architectural research on practice and on the development of ideas for the built environment.

## A NEW CONCEPT

Mies began working on the development of open plan concepts as early as 1945, if we consider the date of his unbuilt proposal for the Cantor Drive-in restaurant in Indiana.[1] In this project, Joseph Cantor asked Mies to be in charge of the construction of a building for entertainment, with an open program, and a summer house. Mies's proposal for the first of the buildings consisted of an open space, rectangular in plan, spanned by two external truss-girders oriented in the longitudinal direction from which the roof joists were suspended. Although it was never built, the project for the Cantor Drive-in Restaurant marks the beginning of the journey in terms of the experiment of diaphanous and flexible space, free of interior supports that occupied a large part of Mies's career from the mid-1940s until the end of his days. However, the germ of the concept goes back a few years.

In 1942, Mies worked on two proposals that represented significant advances in his conception of universal space. The first was the Museum for a Small City.[2] In 1941, George Danforth was on the IIT faculty at the same time he was working in Mies's office. According to his Oral History, Danforth had chosen the museum theme as the focus of his thesis shortly before Mies received a request from the *Architectural Forum* magazine to develop a museum project for a small city.[3] Although Danforth never delivered his thesis, the Museum for a Small City project was published in the magazine in 1943. The magazine article begins with Mies questioning what a museum should be, like framing a

research question, to which the response is: a space for the enjoyment of art. The museum was conceived as a single large space in which the pieces of art could be protagonists. The building was conceived as *"only three basic elements - a floor slab, columns and a roof plate,"*[4] that is, three structural elements. It is the metal structure and grid of cruciform supports that makes the desired flexibility possible, and it is attention to structure that allows the sculpture and paintings to be the elements which define the space. The building also included a seating area and an auditorium, the clear spans of which were resolved with a pair of exterior-facing trusses. Although it is not yet an open space, the museum can be considered the starting point.

The other significant advance begins with Paul Campagna, who caught Mies's attention with a photograph of the Martin bomber factory by Albert Kahn Associates.[5] Using the collage technique, Mies encouraged the student and, in addition, he himself proposed a series of arrangements of horizontal and vertical planes to define a room for musical performances therein. Although this project is not properly the first universal space proposed by Mies, being an existing building, this idea of a large-scale open and flexible space remained latent to be used in future proposals.

Neither George Danforth nor Paul Campagna completed the projects they were working on in the early 1940s. However, the idea of a flexible and open plan, continued to be explored within the graduate program, at the same time that Mies was rehearsing it in his office. In this research forty-eight master's theses supervised by Mies were counted between 1938, the year Mies arrived at the school, and 1959, the year of his retirement from teaching at IIT. Sixteen of these theses explored the concept of universal space, compared to the seventeen proposals by Mies, some of which were never built. Many different structural alternatives to solve the space were explored: from unidirectional or one-way structures, using girders and trusses, to bidirectional, or two-way structures.

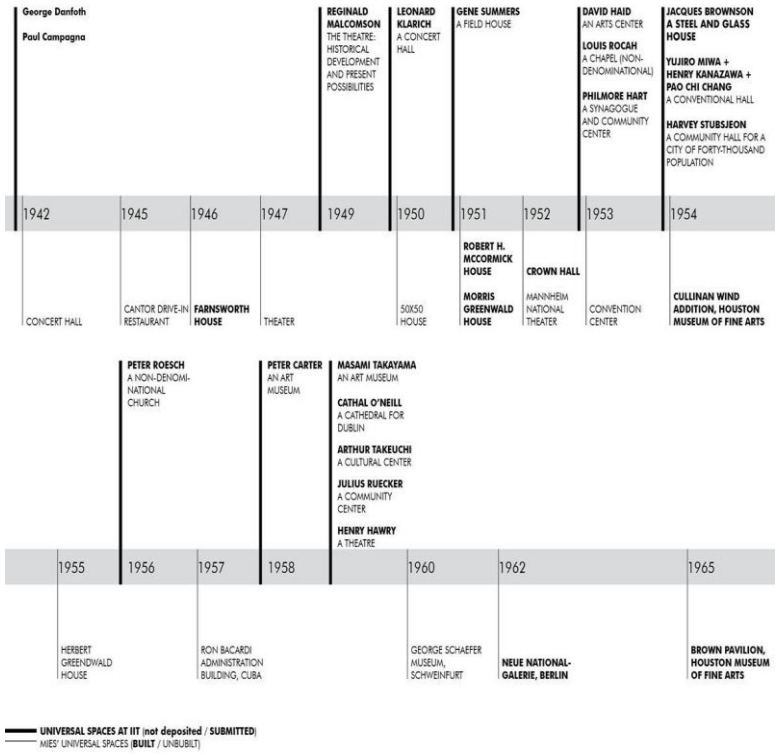


*Figure 1. Master's degree theses developed under Mies that explored the typology of universal space. Timeline by the authors.*

## DEVELOPMENT OF ARCHITECTURAL EXPRESSION

The first of Mies's built universal spaces was the single-family house for Dr. Edith Farnsworth in Plano, Illinois which began in 1945 and was completed in 1951. The Farnsworth house is a single-family house with one bedroom resolved in a continuous space around a central core that houses the fireplace, kitchen and bathrooms. The main volume is a one-way structure supported by 8 external columns. The project has three horizontal planes - the roof, the main floor and a lower terrace. After this example, a continuous space with a central core to solve the functions of a house continued to be explored into the fifties.

*Figure 2. Farnsworth House by Ludwig Mies van der Rohe, completed in 1951. Photos by the authors.*

Starting in 1950, Mies developed a series of studies for a square-plan house, in order to find a solution to the problem of mass housing. Proposals were made testing dimensions of 40 feet, 50 feet and 60 feet, as well as different numbers of bedrooms and layouts. As in the Farnsworth House, the only fixed element within the plan was a central service core, as the columns supporting the roof were similarly moved to the exterior. One of the most well-known structural solutions consists of a grid of beams arranged orthogonally, supported by 4 columns, one located at the midpoint of each side of the square plan.

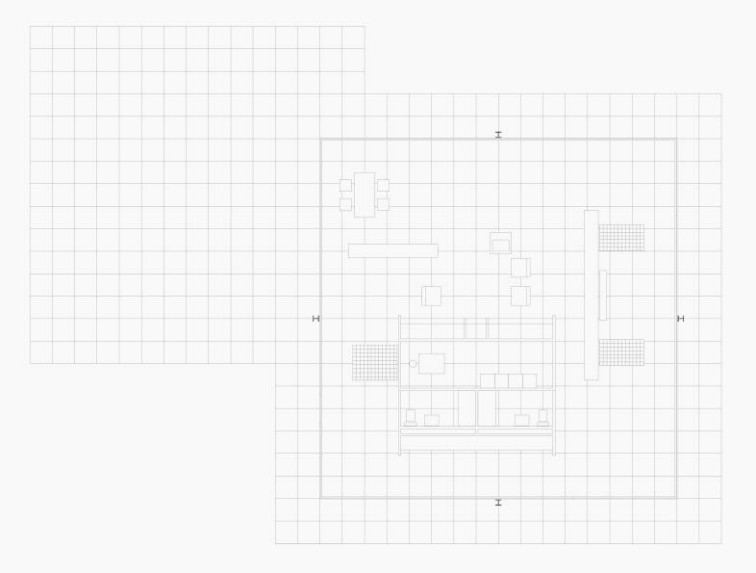

*Figure 3. 50x50 House by Ludwig Mies van der Rohe, 1950, unbuilt. Drawing by the authors.*

In parallel to Mies's office work, one of his students and collaborators, Jacques Brownson, began to work on the project of his own house, which he would deliver in 1954 as a master's thesis.[6] Of the projects developed within the graduate program under Mies, this project was the only one built. Here, Brownson applied the concept of universal space, already tested by Mies in the Farnsworth house, proposing a three-bedroom house resolved in a space free of intermediate structural supports. In this case, the central core divides the living space but the night area does have partitions. Construction was completed in 1952 the same year that Mies defined the iconic proposal for Crown Hall. It is possible to establish some connections between Brownson's and Mies's structural proposals: the external structure, four main girders from which the roof is suspended, and a central service core. However, the two buildings are of different scales, with the maximum span of the house being 34 feet and the school building 120 feet.

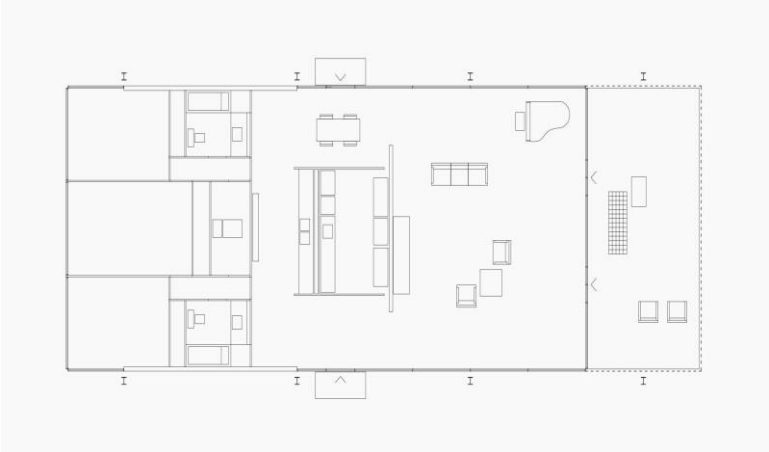

*Figure 4. House in Geneva by Jacques Brownson, completed in 1952. Drawing by the authors.*

While Mies kept working on schemes for the 50x50 House at IIT and in his office, Louis Rocah presented his master's thesis entitled "A Chapel (Non-Denominational)" in 1953.[7] Rocah stated in the preface that the work underlying his thesis was based on the architectural principles created and applied by Mies van der Rohe. This is the first published thesis that can be considered as a link in the search for isotropic universal space. Like Mies, Rocah firmly believed that the work of the architect cannot achieve its objective or any significance without comprehending the essential feature of the age: technology. Having expressed his belief that the structure, clearly conceived, developed and expressed, can directly transcend into architecture, Rocah argued the steel frame as the system that allows for freedom in the organization of space, while at the same time imposes a rigorous sense of rational order. Rocah proposed an open space, capable of holding a certain number of people who would be able to clearly hear the speaker – priest, pastor, rabbi, or lay person – at all times. The aim was to find an architectural solution that could express the principles of building in steel, applied to a building of a high cultural status.

The structure Rocah considered to be ideal for this purpose was a square grid of steel bars. In proposing this system, Rocah referenced Mies's experience with the 50x50 House, alleging that his aim was to continue investigating this type of structure. The solution using two supports per side in order to support the roof that was used in Rocah's design can also be seen in some of the working sketches included in the design for the 50x50 House, which helps to underline the idea that the work carried out as a part of the students' graduate program formed a part of this quest that was led by Mies.[8] Due to its isotropy, a characteristic that reinforces the feeling of unity and equity, the two-way

structural system was seen as a good choice for the non-denominational building. At the conclusion of his thesis, Rocah claimed that the discipline of an architecture based on the structure and technology was, at the time of his presentation, a valid framework within which it was possible to find a solution even for buildings of high standing in the hierarchy of values, like a building for worship.

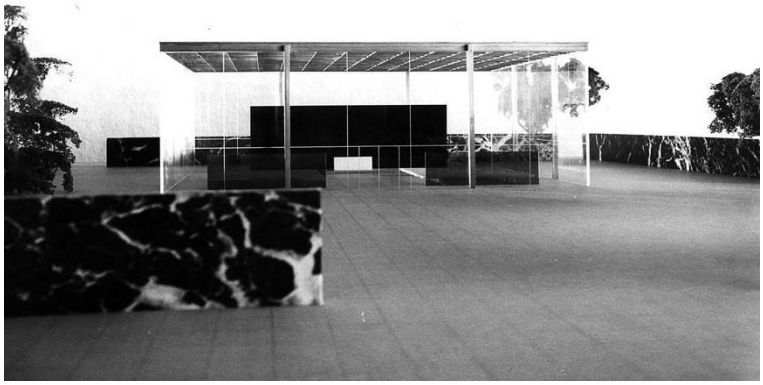

*Figure 5. A Chapel by Louis Rocah, master thesis submitted in 1953. Photo courtesy of Louis Rocah.*

The next stage in the development was into large-scale open plan buildings. At the same time Rocah was finishing his thesis, Mies began working on Crown Hall…. The Ron Bacardi company headquarters project was Mies's next opportunity. The company president, José M. Bosch had been impressed by Life magazine's 1957 feature on Mies under the title "Emergence of a Master Architect," which showed images of the Crown Hall project, inaugurated the previous year.[9] Bosch considered that the ideal office to be one without subdivisions, like Crown Hall, where everyone can see each other. After a visit to the project site in Cuba with Gene Summers, however, Mies reconsidered a scheme based on the Crown Hall project; to one that had a perimeter covered area to protect it from the sun, and materialized in concrete. For the first time, Mies proposed a square concrete slab to support eight cruciform columns, two per side, raised on a podium and with a glass enclosure that was set back with respect to the perimeter of the roof, providing external shade.

Shortly after Mies began working on the Bacardi proposal, in 1958, just a year before he retired from teaching, Peter Carter submitted his master's thesis entitled "An Art Museum". In this thesis is the second link from the graduate program advancing towards the achievement of isotropic space. Considering the museum as a "container" for art pieces that change periodically, Carter claimed that the building must allow each of the pieces to be arranged in harmony with the rest and with the architecture itself. After analyzing the evolution of the museum throughout history, Carter concluded that nowadays a museum is nothing more than a deposit in which the items show little evidence of discrimination in their selection, so that sometimes the viewer becomes overwhelmed by the number of pieces on display. Therefore, he proposed a museum that solves this problem by limiting the number of art pieces and allowing the viewer to contemplate them without any type of visual interruption. His museum project consists of a large room for sculpture, and a separate room for paintings, drawings and reproductions, located in the basement. The proposed roof structure is a two-way grid, made up of 'I' section profiles arranged orthogonally. Like Rocah's, it is supported by eight metal columns, two on each side of a square plan but with a span of 120 feet (Fig. 6). The enclosure of the square volume proposed by Carter is entirely made of glass and is coincident with the roof plate

(Fig. 8b). In this way, the system "*is comprehensible from both the interior and the exterior, and from side to side, giving the building a wholeness of expression.*"[10]

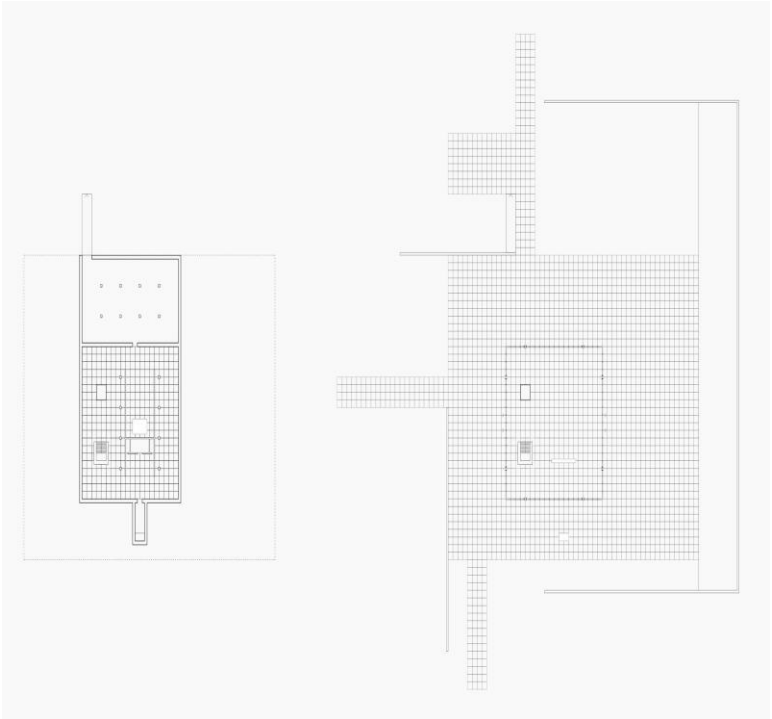

*Figure 6. An Art Museum by Peter Carter, master thesis submitted in 1958. Drawings by the authors.*

## THE *ULTIMATE* EXPRESSION

Shortly after Mies left IIT, in the summer of 1960, Mies received the commission for an art museum in the city of Schweinfurt by one of Germany's largest art owners, Georg Schaefer. The first proposal was a square plan of a single height space organized by a column grid. The building was enclosed in glass over a perimeter brick plinth with an opening at the entrance.[11] According to Schulze's critical biography, Summers successfully presented the proposal to Schaefer, only to find afterwards that Mies had another idea: of using the unbuilt scheme of the Bacardi building in Cuba which had been iced with the rise of Castro. This led to a second proposal, a version of the Bacardi building, in steel. Apparently, Schaefer was not satisfied with the modification proposed by Mies, so the process halted.[12]

Shortly afterward, in 1961, Mies was awarded the commission for the German Gallery of the 20th Century. The project was to be part of the city's Kulturforum, near the Tiergarten. Continuing with the scheme that he had proposed for the previous museum, Mies presented a building with a square plan and two floors, a main floor configured as a large open space and a basement. The main floor is elevated on a podium that provides a horizontal plane on which the metal structure appears to rest, and allows a sunken courtyard patio to be opened to the northwest providing natural light into the lower level.

*Figure 7. Neue Nationalgalerie by Ludwig Mies van der Rohe, completed in 1968. Photos by the authors.*

Phyllis Lambert drew the connection between Mies's last three attempts to achieve isotropic universal space thus: "The small-scale drawings of the concrete and steel structures for Cuba, Schweinfurt, and Berlin not only look alike, they are the same."[13] As this paper shows, it is possible to insert intermediate steps in the development of Mies' ultimate expression of "universal space" if one also attends to his work as a teacher.

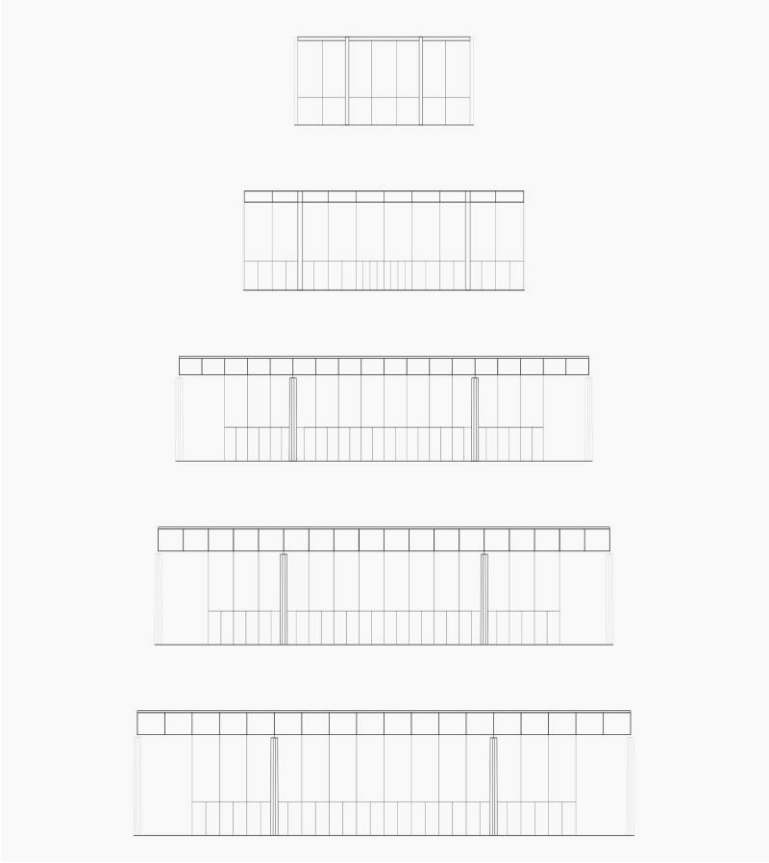

*Figure 8. Evolution of the span: (a) Louis Rocah's master thesis (1953); (b) Peter Carter (1958) master thesis; (c) Ron Bacardi Building (1957); (d) Schaefer Museum (1960) and (e) Neue Nationalgalerie (1962-68) by Ludwig Mies van der Rohe's. Drawings by the authors.*

These historical developments illustrate that the graduate program at IIT was a laboratory where Mies worked together with his students, exchanging ideas. Significant developments happened there which influenced Mies's thinking and architecture along the way. Studies were made of the external

structure concept with a lightweight exterior enclosure, directional continuous space versus isotropic continuous space, exterior walls coincident with the roof edge versus positioned independent of the roof edge, and structure not expressed versus fully exposed from the interior. It is difficult to say whether anyone influenced more than another, but there were some students who interiorized the philosophy and contributed to the process of research significantly, such as those highlighted in this paper.

## CONCLUSION

In practice, as well as through the research of his students, Mies advanced open plan and long-span structural systems in new functional domains like art exhibition, education and spirituality, not to mention domestic architecture, producing examples of designs and built works that bring to light their value.

In these pursuits, a space that could be considered not only open, but universal, was one that expressed flexibility, the most "future-proof" solution that could be imagined. Mies found that with a steel frame structure, having lighter profiles and longer spans, the interior space could be liberated from any permanent interventions that might limit future use. The square plan and symmetrical, isotropic layout provided the most flexibility and least predetermination of use. In time, the enclosing walls were also freed from the structure, to express that they too were independent and perhaps also less permanent. Each creative "jump" was made based on prior knowledge and experimentation, leading to Mies's last project, the Neue Nationalgalerie, the Gallery of the 20th century which is often thought of as the highest expression of Mies's "universal space" concept.

Nearly 80 years ago, Mies and his students at IIT began a quest to demonstrate that contemporary industrial materials, like steel, and related structural systems, could not only be used for buildings of any type, they could be developed into beautiful structures for buildings of high cultural standing. Today, we benefit from their work and their vision. In our rapidly changing world, long-span technology that enables large open spaces, free of internal structural supports, provides great functional adaptability and ease of renovation. Buildings with large open plans remain today essential elements of a city's cultural infrastructure and resilience strategy. Still now, as Rocah stated in the 1950s, an architecture based on structure and technology is a valid framework to find solutions for buildings of any standing.

## NOTES

[1] Phyllis Lambert, *Mies in America* (New York: Harry N. Abrams; London: Thames & Hudson, 2003), 430.
[2] Cammie McAtee, “Le musée pour une petite ville,” *Genesis* 14 (2000): 219-248.
[3] George Danforth, *Oral History of George Danforth, interviewed by Pauline Saliga* (Department of Architecture, the Art Institute of Chicago, 1993), 37.
[4] Ludwig Mies van der Rohe, “Museum for a Small City,” *Architectural Forum* 78 (May 1943), 69-85.
[5] Franz Schulze and Edward Windhorst, *Mies van der Rohe: a critical biography* (Chicago: University of Chicago Press, 2012), 217.
[6] Jacques C. Brownson, "A Steel and Glass House" (Degree of Master of Science in Architecture in the Graduate School of Illinois Institute of Technology, 1954).
[7] Israel Louis Rocah, "A Chapel (Non-denominational)" (Degree of Master of Science in Architecture in the Graduate School of Illinois Institute of Technology, 1953).
[8] Zaida Garcia-Requejo, "Learning with Mies. The universal Space of Louis Rocah," *EN BLANCO 24* (2018): 96-103. DOI: http://dx.doi.org/10.4995/eb.2018.9164
[9] Schulze and Windhorst, *Mies van der Rohe*, 348.
[10] Peter Carter, “An Art Museum” (Degree of Master of Science in Architecture in the Graduate School of Illinois Institute of Technology, 1958), 7.
[11] Andreas F. Beitin, Wolf Eiermann and Brigitte Franzen, *Mies van der Rohe: montage / collage* (London: Koenig Books, 2017).
[12] Schulze and Windhorst, *Mies van der Rohe*, 353.
[13] Lambert, *Mies in America*, 489.

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# THREE PATHS THROUGH THE FOREST- AN EXPLORATION OF THE TEACHING-RESEARCH NEXUS

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## INTRODUCTION

There are varied and sometimes conflicting views over the relationship between teaching and research in higher education. This frequently manifests in a complex and oftentimes contentious association between them, including whether it has a positive, neutral or detrimental impact on the quality of students' learning, and where academics' priorities should lie. There is evidence to suggest that national research audits can isolate research from teaching,[1] at both institutional and individual levels.[2] It has also been argued that there is no simple functional relationship between quality of research and quality of teaching at an institutional and departmental level, where teaching and research are often organised separately and with limited thought given to how they might be linked.[3]

This paper explores three different constructions of the teaching-research nexus: research "informed" teaching, research "through" teaching, and research "of" teaching. It questions how they can best affect positive contributions to students' and academics' higher education experience. A central argument lies in the conception that both research and teaching revolve around "learning," by both students and teachers, and the paper critically reflects on research projects within each interpretation. A key concept within the nexus as explored here is the direction of travel constructed between teaching and research.

## RESEARCH "INFORMED" TEACHING

In research "informed" teaching, discipline-specific research contributes to the content of the curriculum – even if conducted independently. This research may be undertaken by an academic, who then incorporates it within their teaching. One significant value associated with this approach is that students' learning embodies the most recent developments within the discipline, and is therefore progressive and at the forefront of knowledge. This is the most conventional conception of the teaching-research nexus; however, it is one of questionable significance. In their meta-study, Hattie and Marsh conclude that the correlation between teaching quality and research productivity is effectively zero.[4]

Writing in the context of built environment disciplines, Griffiths identified two ways in which research informed teaching might manifest: firstly, where the curriculum is structured around subject content, selected on the basis of specialist research interests of teaching staff; secondly, where the curriculum places emphasis as much on understanding the processes by which knowledge is produced

within the field as on learning the codified knowledge that results from such research.[5] His concern with the former is that it may reinforce traditional transmission-orientated approaches to teaching. Consequently, this can result in a one-way street between research and teaching, thereby limiting students' agency within the process. Furthermore, in the first scenario it could be argued that this approach reinforces the division between research and teaching and the conception of them as two independent activities, whereby teaching benefits only from the product of research, and not the process itself. Research tends to be practiced and redirected outside of the practice of teaching, potentially to the detriment of teaching quality.

The term itself, research informed teaching, implies that research comes before teaching, that research leads teaching, so as to inform the content of what students should be learning, as opposed to research and teaching being perceived as symbiotic processes that are of equal value. Another issue associated with Griffith's definition is that the teaching curriculum is structured around content based on the specialist, and potentially idiosyncratic, research interests of the teachers – which is not necessarily the most appropriate content.

However, as Hattie and Marsh highlight, research informed teaching does not necessitate that teachers are the author of the research that informs their teaching, and that they have to generate research in order to be effective teachers.[6] As such, teachers with an enthusiastic scholarship of their discipline, although not active researchers themselves, can inform their teaching with contemporary research, so that it remains at the forefront of knowledge in the discipline. Teaching can thereby reap the benefits of a research informed approach, but without manifesting some of the tensions of the teaching-research nexus.

Over the course of several years, architecture students studying for their undergraduate degree at Liverpool John Moores University (LJMU) have been offered a project option to design a library. The studio design teacher offering the project has conducted a number of research projects in the field of library design, which include studying how these civic institutions are changing in response to the digital revolution, the crisis of public sector funding following the global financial crisis, and changing patterns of occupancy and use. This research has been utilised to inform the studio design project. When preparing background reading material for the project the studio teacher's research outputs were deliberately not included, to minimise the extent to which their findings influenced the students' creative exploration. However, the understanding of issues facing this building type gleaned through the research informed writing the briefing documentation and compiling reference material, to encourage the students to reflect on and engage with the salient issues that face libraries. Similarly, relevant research by others and exemplary precedents have informed the teaching process in studio. One striking outcome of these projects, reinforced over several years, is that students always find a primary place for physical books within their libraries, although the symbolism behind their inclusion varies considerably.

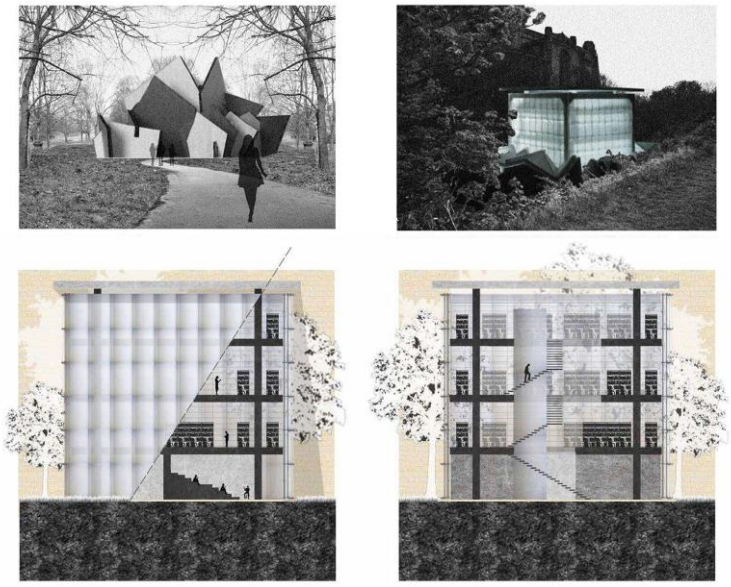

*Figure 1. "Thinking Inside the Box" library project, by Level 5 student Jarrod Towson*

Time is one of – if not the – most precious resources, as more of it cannot be created. Academics' time is increasingly being torn between different demands, including teaching, research and administration. This is one dimension through which tension within the teaching-research nexus manifests. Where teaching and research are conceived as two separate activities that are isolated from each other this tension will be exacerbated, as two independent priorities strive for attention. Arguably, there must be more fruitful and engaging means through which to conceptualise and practice the teaching-research nexus. One of these is students collaborating in research projects with their teachers.

## RESEARCH "THROUGH" TEACHING

Robinson describes research as the systematic enquiry for new knowledge, and questions why creativity – the process of having original ideas that have value – is often not considered to be research as a source of new knowledge in an academic sense, and producing original works often does not count as appropriate intellectual endeavour.[7] Research "through" teaching places students' creative project work at the core of discipline-specific research, so that teaching becomes the catalyst for co-producing work by students and teachers. Students' projects become embedded within wider contexts of real-world problems, grounding their work outside of the academy. Here, the conceptualisation of the design studio as a vehicle for research, through experimentation and critical discourse, can gain traction – not least as original thinking and innovation are fundamental elements of both studio design and research processes. Given that inquiry-based processes are inherent to creative exploration, research through teaching is especially suited to design disciplines.

In research through teaching, it is students' creative learning methods and the outcomes associated with them that lead research, and which drive the path that it follows. Student coursework, in the form of project-based learning, provides material for research. Their project work generates the medium for analysis and evaluation against wider concepts and issues, and it is here that the main research "through" teaching processes lie. Put another way, the students' projects are the research data. What is not being discussed here is the established practice of teachers and (doctoral) research students

collaborating; rather, the much less common practice of undergraduate and taught postgraduate students working in conjunction with their studio teachers on research projects.

This approach places students' project work at the core of discipline-specific research so teaching becomes the catalyst for co-producing work by students and teachers – working partnerships with students as researchers. Thomas identifies the value of and need for activities that encourage collaboration and engagement between students and members of staff in nurturing student engagement in a richer manner.[8] Research through teaching provides an opportunity to recast the student-teacher power dynamic, so that students and teachers become equal partners in the development of research projects.

A critical factor when designing coursework to explore research through teaching is that briefs for problem-based or enquiry-based projects should be developed around a theme that is pertinent in the context of contemporary issues outside of the university, to explore a problem that has relevance beyond the purely academic. Examples of this might include housing, which faces numerous challenges over a chronic shortfall of provision in the UK, or library design, where there are myriad issues over funding, the diversity of programmes, and the nature of public engagement.

In this sense, the research through teaching approach can be aligned with Neary and Winn's concept of "Student as Producer": "… undergraduate students working in collaboration with academics to create work of social importance that is full of academic content and value…" and which "… aims to radically democratize the process of knowledge production at the level of society."[9] It is an approach that can rebalance the student-teacher power dynamic, and facilitate collaborative research which addresses real issues within wider society.

An example of a research through teaching project involved students enrolled on the first year of the taught postgraduate architecture programme at LJMU. During the second semester students engage in a housing design project, which takes place over twelve weeks, choosing between one of three typical dwelling types: terraced, detached / semi-detached, or an urban block. A raft of challenges face new housing design in the UK, at the forefront of which is a triumvirate of interrelated needs: to make dwellings more spacious, more affordable, and more sustainable. Each of these is important in its own right, but are they reconcilable? The students were challenged to translate these three priorities into their design proposals. As theoretical projects they were inherently permitted a high degree of intellectual and creative freedom, and consequently their designs could push boundaries in exploring what housing could be. In the first instance their project work was presented as part of a presentation at an international conference on housing, after which the studio design teacher was invited to write a book chapter that utilised the students' projects to illustrate key trends and potential solutions to the challenges that currently face new-build housing.

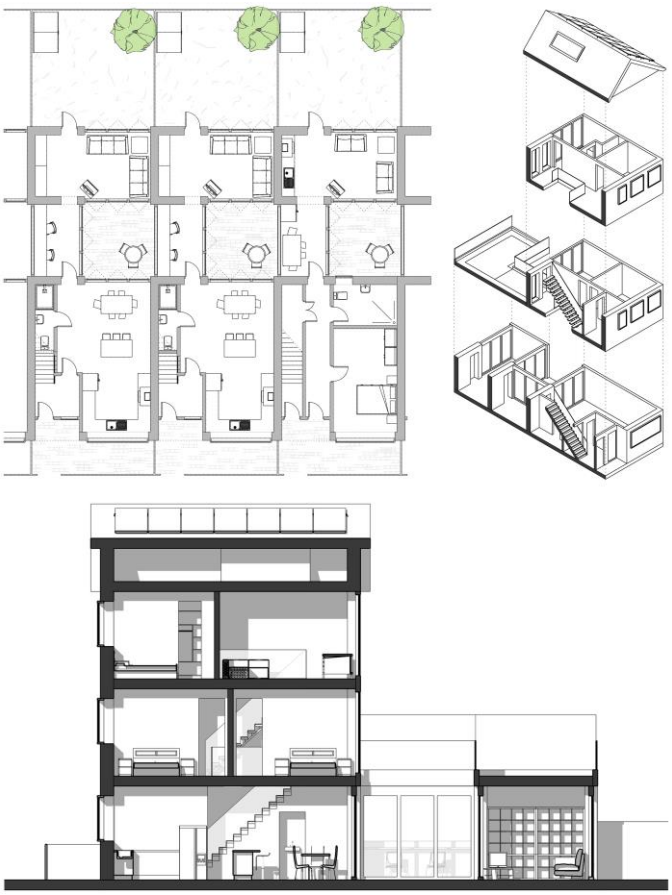

*Figure 2. "The Courtyard" housing project, by Level 7/1 student Omar Shariff*

One of the challenges in research through teaching, especially in creative disciplines, is that students' project work is inherently divergent. Their trajectory can be unpredictable, tangential and unexpected. Whilst potentially disconcerting for the teacher-researcher, this quality lies at the essence of what makes the process valuable as a research methodology, where the creative insight of numerous different minds exploring the same problem can reveal unanticipated outcomes and solutions.

Another potential issue inherent to this construction of the teaching-research nexus is that, like research informed teaching, the field of inquiry that establishes the topic of students' project briefs, is based on the specialist, and potentially idiosyncratic, research interest of the teacher. Should it be that students' coursework is directed in this way, and that students' coursework is utilised as the data for their teachers' research outputs? In a market-driven sector where discourses of students as consumers are rife, the notion of students as partners can represent a counter-narrative to the consumer model.[10] This might create a new tension in the teaching-research nexus; or it could provide an opportunity to rethink how students define the path of their own learning and higher education experience, and how their learning can positively impact society outside of the academy.

Nevertheless, students may question why they are contributors to their teacher's research, and how they benefit from it. Students' learning experiences may gain more advantage from research orientated toward enhancing pedagogic practices, to which we turn to next.

## RESEARCH "OF" TEACHING

Whilst pedagogic research has gained considerable traction over the recent past, it is argued here that research in the methods and practices of learning and teaching can be perceived as having less significance and value than disciple-specific research. This undermines its legitimacy and currency, to the detriment of enhancing the quality of students' leaning experiences, creating another dimension of tension within the teaching-research nexus.

Research "of" teaching as discussed here explores the means and value of students as participants in pedagogic research. However, the nature of participation differs from that within research through teaching. In the latter, students are partners within the research process, in that their project coursework forms part of the data and methodology of the research project. In research of teaching, students participate through sharing their experiences of learning, teaching and assessment methods. This may be to understand the cognitive process involved in learning – how students learn, or to understand the impact of different pedagogic approaches on their learning experience – identifying what they value and what they do not.

Whilst those within the upper echelons of university management often place significant credence on student evaluation surveys, those at an academic level can see less value in them – questioning the validity of quantitative and qualitative data where response rates are low, or being dismissive of respondents questioning established learning and teaching methods and subject content. Dissenting teachers might argue that students are not in a position to know whether or not particular teaching and assessment methods are appropriate and of value to their learning. Research of teaching is the process of holding up a mirror to our own teaching practices, one that can reveal harsh realities, which for some may prove uncomfortable viewing. However, the students' voice can be a powerful and insightful tool within pedagogic research to enhance their learning experience, without which teachers are blind to the consequences of their actions and cannot act to improve the quality of learning.[11]

Capturing the student voice effectively can prove challenging. Online surveys are often afflicted by low response rates.[12] Distributing paper copies of questionnaires in class may return higher response rates, however transcribing the resulting data can prove very time consuming. Here, though, lies an opportunity to recruit student interns to assist with transcription and data analysis – creating an additional dimension through which to engage students as collaborators in research projects.

An alternative method for capturing the student voice is focus groups. Here, small groups of students are brought together to discuss a topic. A significant benefit of focus groups is that discussion around the subject can open up dialogue and understanding, revealing hidden perceptions that may otherwise have gone unvoiced, and views can be questioned to understand their reasoning, and challenged or reinforced by others within the group. The groups are usually facilitated by a moderator, often following a semi-structured set of questions or prompts, to guide the discussion and encourage contributions from all participants.[13] However, in pedagogic research where the moderator is also a member of academic staff, participants may be reticent to voice their true feelings, for fear of subsequent retribution or bias. Here again lies the opportunity to recruit students as research assistants, who are more independent in their position. They can also transcribe the discussion, and assist with analysis.

Design pedagogy is often strongly associated with a socio-constructivist approach, where meaning is co-constructed through a social process of collaborative interaction in loops of dialogue.[14] Utilising focus groups and interviews with students as part of the research of teaching methodology thereby aligns research methods with teaching methods, creating a discourse-driven research environment that is very familiar to the students, through their experience of weekly studio tutorials and design reviews. This may explain why students have been so forthcoming with their views in pedagogic research

projects in the architecture programmes at LJMU that have utilised these methods, which has attributed significant value to the outcomes of these projects, as the following examples illustrate:

*"Those feedback sheets are the worst thing in the world. Half the time I can't read the person's handwriting, and then the rest of it they haven't put it in a clear way, they have just written odd words in."*

Undergraduate student, describing peer notes of design review feedback

*"I'd try and get rid of the whole feeling of your being in front of a firing squad… you think if you get the smallest thing wrong he or she starts barking at me. It just feels demoralising."*

Undergraduate student, describing design reviews

*"Read it. Act upon it. Lose it. Find it weeks later. Bin it."*

Postgraduate student, describing what they do with summative written feedback

*"Although they do provide some clarity I feel as though they mainly waste time that I could be using either getting feedback from the tutors or other students or working on my projects."*

Undergraduate student, describing group tutorials

Asking students to volunteer to participate in a research project can result in recruiting only those who are more engaged and forthcoming in sharing their views. This has the potential to skew the resulting data, by omitting the views of less engaged or more reticent students. Anonymous questionnaires may reach the more reticent students, but do not facilitate the two-way dialogue of other methods. The recruitment process and the resulting data therefore need careful consideration.

One strength in research of teaching is that methods of learning, teaching and assessment within and across programmes can be enhanced through the outcomes that emerge from research projects, and – through the same research project – teachers can produce research outputs through writing up their project for publication.

## CONCLUSION

A key concept explored through this paper is the direction of travel between teaching and research. Research "informed" teaching can lead to a one-way street, which in turn can foster a positivist model of teaching, where students are passive recipients of knowledge transmitted by teachers. A more proactive approach, where the direction of travel is largely reversed to go from teaching to research, is research "through" teaching; students become active participants in research projects with their teachers, increasing their agency within their higher education experience. In research "of" teaching there is a similarly constructive relationship within the nexus, but here research serves to evolve teaching and learning methods, to enhance students' higher education experience.

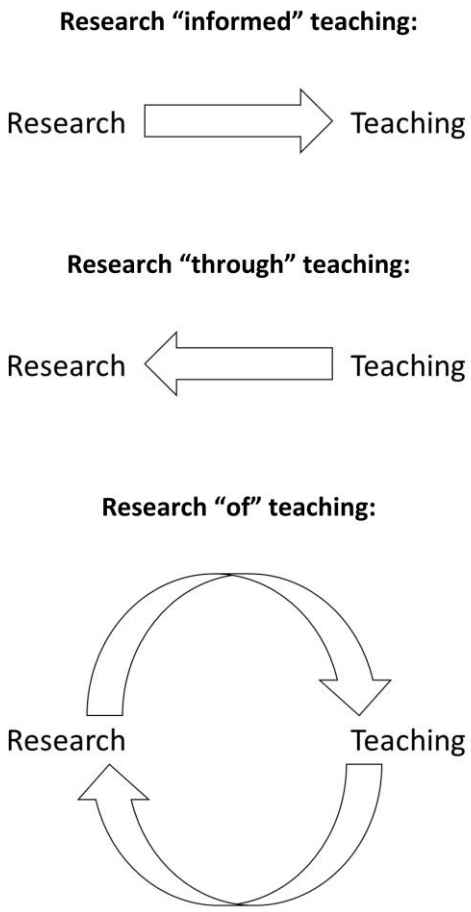


*Figure 3. Three directions of travel within the teaching-research nexus*

Hattie and Marsh contend that a central aim over the nexus between teaching and research, "is to increase the circumstances in which teaching and research have occasion to meet, and … for demonstrations of the integration of teaching and research."[15] That relationship can be significantly affected by the pedagogic methods of a programme,[16] as both research and learning are informed by the modes of inquiry characteristic to the discipline in which they take place.[17] As Griffiths highlights, teachers are bringing the processes of knowledge creation into their teaching, rather than the specific outcomes and methods associated with their research.[18] Arguably, studio teaching – with inquiry-centred and problem-based learning supported by one-to-one tutorials as the signature pedagogic method – is highly suited to fostering closer links between the two.

## NOTES

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# RESEARCHING AND DESIGNING THE COSMOPOLITAN HABITAT WITH URBAN NARRATIVES.

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## INTRODUCTION: QUESTIONS AND CHALLENGES IN URBAN DESIGN TEACHING

How can the investigation on theoretical concepts as for example the Cosmopolitan Habitat and challenges of real spatial situations both be integrated in the teaching of urban design? In which way can the theory and practice be brought together in order to create creative and critical proposals, new visions and future projections that contribute to the ongoing discussions about the transformation processes of our built and lived environment? And what kind of methodological approaches, different tools or methods can be integrated from other disciplines or researches to foster a change of perspective and different ways of communicating space and re-positioning it in a larger context?

Following these questions, a reflection on how we educate and prepare a future generation of architects and urban designers for dealing with urban conditions already existing within the cities and in the context of rural areas, is important. It departs from the necessary understanding and close reading of given situations and their lived experience as important resources, possibilities and connecting points to create new encounters.[1] Also, it calls for improvising actions that interpret the old materials anew; add on them or alterate them in a flexible and process-oriented way according to the contemporary ideas of society expressed in an architectural/urban design language.[2] "To design change, a discourse in the society as a whole and the integration of various parties and the public into a talk about the future of the city is necessary."[3]

A current example for addressing actual challenges, was the exhibition "Houston, we have a problem" at the Deutsches Architekturzentrum (DAZ) in Berlin in 2019, that with its title took reference to the incredible and nearly impossible way of finding a solution to keep the astronauts of Apollo 13 alive, while they were crossing the universe and lacking oxygen. The exhibition presented a collection of examples for dealing with architecture in climate change while showing its connection to a global scale. Of course, climate change in the discipline of architecture and urban design is an important topic and has to be tackled, but there are also other themes and questions to deal with. The Corona Pandemic, for example, in a very short time has revealed many inequalities of our society, also in the field of urban design: the borders between public and private life and the differences in the accessibility and proximity of health care, education but also basic human supply in food, water and shelter, just to name some. In improving our habitats and researching ways to do so, what has to be clear and what also the Houston -example points out, is that we need a shared commitment and innovations bound to the idea of circular design; "combining social and technological inventiveness

with artisan and vernacular knowledge and cultural outreach".[4] It is about addressing design as "active and experimental force in larger political, social and scientific changes."[5] Also in order to create future solutions, we need an open exchange about how we want to live and how to realize possible alternative solutions to what is pre-given by market demands or determining industries.
Of course, master students within an urban design course, even if connected to an ongoing research project or developments in a city or region, will not solve the problems of the planet. Nevertheless, by really engaging with a particular site, entering the process of analyzing and discovering its contextual relations through laying out concepts and transferring them into designed projects, a deeper understanding is gained as a common base that allows to discuss at a same level to later find various ways for creating designed solutions for the specific location. Learning in this sense is not understood as transmission of knowledge, but as embedded in an active process – Andreas Lang calls this a "situated learning".[6] Combining practice and theory at this point leads the students to question their own preconceptions and challenges them. It means to not only pose a topic and space, opening the design process on it, but to also carefully select theoretical concepts or positions in order to foster a reflection process and a link to actual discourses, shaping the design attitude and aim of practice of the students. "It requires a new theory of urbanization based on knowledge produced locally through critically evaluated design approaches, careful observation, critical thinking and the exploitation of lessons learned".[7] Building up on this and trying to make a place better, re-designing it and creating new, maybe even utopic ideas for living, working and leisure spaces connected to local networks, relevant institutions or important public spaces, the students start to discuss and work with the complexity and diversity of their urban surroundings, connected through circulatory dimensions.[8]
These ideas also influenced the conceptualization of the design-research project presented in the following part. It brings together three topics: The Cosmopolitan Habitat as a theoretical concept and the selected location (Halle/Saale) with themes around recycling and re-conceptualizing former cultural and industrial spaces, the methodology of the course in connection to the use of narratives within the steps of an urban design project; and the discussion of selected designed projects, questioning the use of narratives as possibilities to generate debates and outcomes of a theory- and practice-bound approach.

## WORKING WITH THE "COSMOPOLITAN HABITAT" AND APPROACHING HALLE/SAALE

The design-research project "Cosmopolitan Habitat. Urban Narratives"[9] here is presented as an exemplary case, for dealing with different sites of interest at the same time, merging them through a theoretical concept – the Cosmopolitan Habitat. The Master´s course was directed at the Leibniz Universität Hannover in Summer 2020 as part of the ongoing research project "Cosmopolitan Habitat"[10], realized in cooperation with the University of Palermo and funded as University exchange by the DAAD. It is a concept that inspires to think, design and transform the multidimensional city.[11]
Cosmopolitan from the greek "kosmos", which means world and "polis", which means city; plus the latin word "habitat" understood as living space; in combination "bring together international debates based on exchange among cultures and communities, places of civilisatory experience, processes supporting the culture of makers and the spatial dimension of migration".[12] It works as a possible future idea for new social and spatial connections, motilities and democratically lived spaces within the open and multidimensional city. The open city is a reference to Richard Sennett who names three aspects important for designing it: creating ambiguous edges, contriving incomplete forms in buildings and planning for unresolved narratives[13] and the multidimensionality seen in the heterogeneous and fragmented character, the multicultural city, which needs multidisciplinary

approaches. Taking some steps apart from the spatial connection "cosmopolitanism is understood as a "way of living based on an openness to all forms of otherness, associated with an appreciation of and interaction with people from other cultural backgrounds".[14]

In which ways these ideas could be visualised, connected to specific places, or shown through people's activities and social and spatial surroundings, was the first task for the students. They were encouraged to collect images, drawings, mind maps, quotations or metaphors, producing squared formats developed as travelling postcards (alias instagram posts), while approaching the design areas, doing a first analysis and talking to local experts or inhabitants that would provide them with additional information. The postcards would then serve as a collection of associations and individual perspectives on what can be brought into the discussion of the Cosmopolitan Habitat. In a first review the following questions were defined to work with during the urban design project: What are the conditions and uses for a heterogeneous and inclusive future city that capture its potentials from the in-between of the already existing? How can urban elements, energies, networks and initiatives of a collaborative city overcome spatial and social fragmentation? What role can boundaries, limits, borders, thresholds, and peripheries play for envisioning the "Cosmopolitan Habitat" and which are exemplary spaces and models for thinking the concept as an idea for the future city?


*Figure 1. Postcards as collective brainstorm by the course participants*

## Halle as project site

Halle as project- and research site in former East-Germany is a city, characterized by a very diverse social and spatial mix, a fragmentism that not only shows many open questions, but also detects qualities and positive challenges within the urban context. It is known as knowledge city with its connection to various universities, cultural city with its small galleries, the Burg-Hochschule with a well-known art- and design department and several active artists and initiatives within the city context as well as city of international inhabitants, relating especially to the neighbourhood of "Halle-Neustadt". Having been routed in international networks of trading, work migration, urban development and knowledge transfer since centuries it is an example easy to draw a relation with the cosmopolitan habitat. Founded in 806 is a traditional salt city that, being part of the "Hanse", through its economic activity was connected to whole Europe, which also characterized the city commerce for many centuries. Halle also has been an important site for Luthers reformation in the 16-17th century, when also the University has been founded. As the city was only partly destroyed during World War II, the urban development started quite late in 1959. The biggest building site was realized with the

"Chemiearbeiterstadt Halle West" (known as Halle Neustadt), designed for 70.000 people. In-between the years 1990 and 2005 around 80.000 people left the city, a development addressed in the exhibition "Shrinking cities" and the IBA Stadtumbau 2010.
Today, the city is part of the polycentric Leipzig-Halle conurbation at the heart of the larger Central German Metropolitan Region connected to many business sectors (logistics, chemical, refinery, engineering, renewable energy) in the region. Its close connection to Leipzig contributes to its growing. Considering the current urbanisation and demographic trends the Leipzig-Halle conurbation distinguishes itself as a performing business regional centre, mixed with the character of a university town. Nevertheless, since the German reunification, extensive transformation processes of the regional economy resulting in increasing unemployment rates significant abandonment of former productive areas, which demands new vocational programme of development.
The topics addressed with the students were related to two existing spatial situations, that needed ideas for a re-activation, drawing upon existing networks and actively engaged (cultural) institutions. One area, which is close to the city centre, would focus on re-imagining and proposing new uses for the empty voids as well as unused monuments like the "Volkspark Halle", searching conceptual ideas for its future programming, the other would be about future-oriented mixed uses and appropriate additions to a former slaughterhouse complex and its integration into the city's cultural framework as a new space for creative and social encounters.

## THE COURSE'S METHODOLOGY AND THE USE OF NARRATIVES IMAGINED

The course was designed in three phases that defined its methodology and the different ways of working with, implementing or using narratives on different levels. Narratives in general create interesting relations between fact and emotion, provide means to make sense of and understand social phenomena and individual experiences[15] reflecting the urban environment and its use.
They are used both for analysing and capturing space and as space-bound devices and projective tools within the design process they were thematized differently in each part of the course. It departed from a more conceptual part based on the theoretical study of literature about topics of contemporary urban design, narrative instruments and sociological or philosophical positions around "the Cosmopolitan" as well as the presentation of specifically for the project chosen international reference projects. Here the narrative elements were communicated thoughts and associations – the postcards explained in relation to the concept of cosmopolitan habitat. This phase was followed by an analytical part where an approach towards the design studies spatial context (Halle/Saale) lead to the production of creative mappings on the topics of the city of Halle (knowledge, culture and international inhabitants). They were thought as cartographic maps and diagrams that would collect found stories and bring together historical, social, political, economic, ecological and territorial phenomena through individual (virtual) urban explorations and data collections, previously prepared Google-picture maps, presentations of Halle and perspectives and inputs from local experts, met on a digital platform. Creative mappings are generally working on an analytical level, but also create individual experiences that lead to first conceptual interpretations. Here narratives were used as analytical tools, grasping the urban surrounding, interpreting facts and data and trying to communicate them in a new way, as through gifs that would make visible the aspect of time in relation to space.

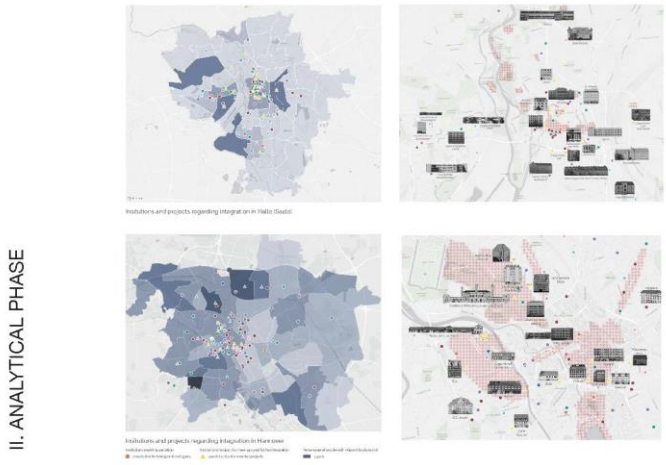


*Figure 2: International Inhabitants in Halle/Hannover*
*left: gifs, inhabitants city spaces, right: mapped institutions*
*by Anna Schlarb and Elisaveta Misyuryaeva*

Finally, during the Design Phase the students were encouraged to continue to research and test new ways of telling while presenting their ideas with tools from other disciplines. As external input "visual storytelling" was explained and presented during a digital visit by photographer Christian Dootz, who realized a small Workshop format with the students in order to concentrate their ideas and work on possible simplifications in order to tell the story they would tackle with their design-project. In this last phase storytelling was used to communicate new spatial concepts and build scenarios in a multiscalar design approach. Important for this was not only the design idea itself, but also its processual implementation and the bigger picture in connection to Halle.

## DESIGN PROJECTS AND THEIR RELEVANCE

In order to design new places of encounter, creative and productive living and working areas and new possibilities for cultural networks and thematic collaborations in the context of Halle and its already existing broad cultural scene, the two heritage spaces; the monument[16] "Volkspark Halle" and its surroundings and the for the industrial times very characteristic sloughterhouse complex in the Freiimfelde area both open up the question of how to deal with what is already there, how to read it as ressource and understand the re-cycling of the built material and its lived content as design practice that brings value to the places and opens a new perspective for their future use as well as a new role as a character of the city.

### Volkspark reloaded

In the case of the Volkspark the design proposal by the student Elisaveta Misyuryaeva showed an impulse intervention to overcome borders and connect the inhabitants of the increasingly diverse society, re-using the space as place for people, enacted by themselves. Through scaffolding a non-destructive division of the spacious area would enable smaller, interactive, easier to appropriate spaces that would foster a new experience of the building. This spatial idea was connected to the programmatic idea of an annual festival where collaborations and projects could be found and linked, which then would influence the change of the whole site through several "modi operandi". The repeatable intervention, was thought as an experimentation cycle in order to practically develop and

try out ideas how to deal with and use the space to create more connections among the people involved and their networks that would reach further into the city.

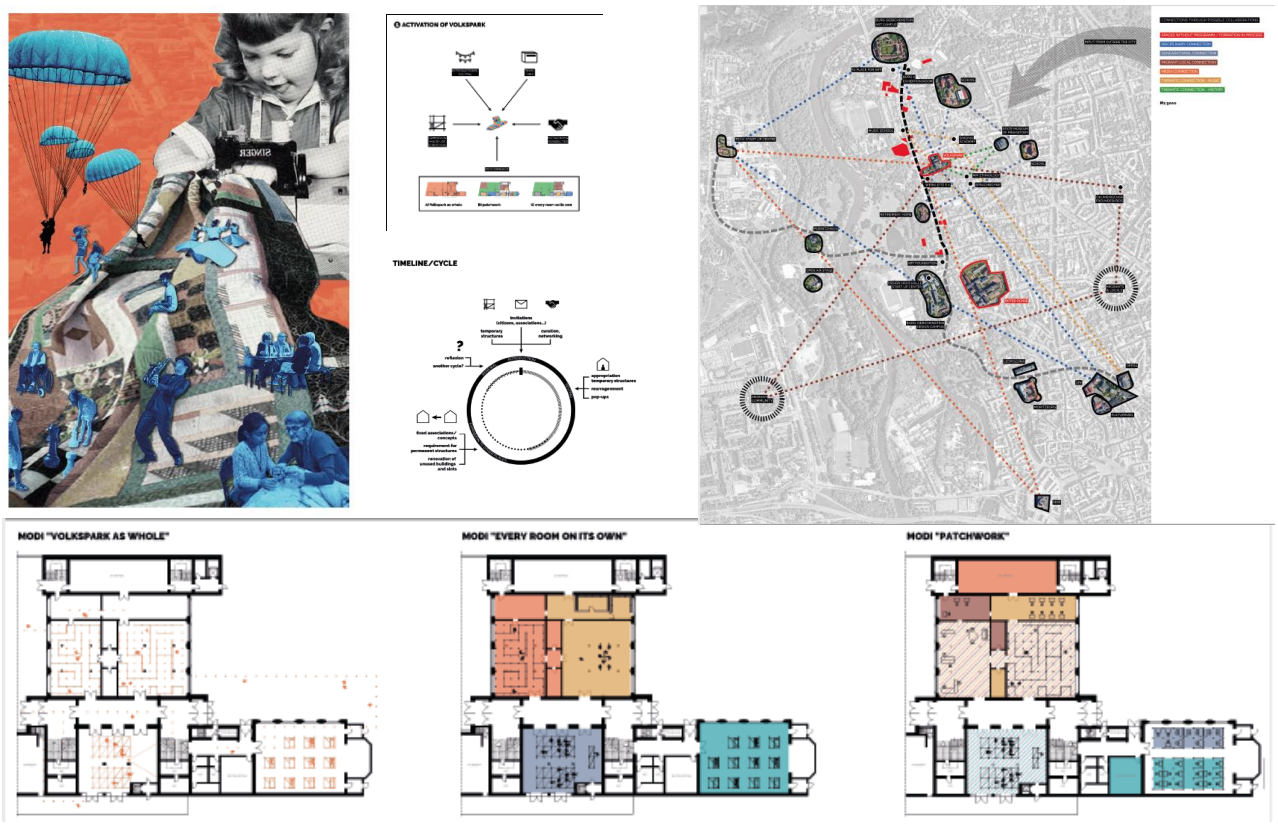


*Figure 3. Project "Volkspark reloaded" by Elisaveta Misyuryaeva*

### Communal Space Freiimfelde

For the slaughterhouse complex the design proposal by Anna Schlarb was to create a new connection for the area lying apart from the city centre but very close to the railways and with this to Leipzig. In this project the idea was more programmatically – linking it to the existing network of youth workshops for creative making and educative formats and create a mixed place of encounter, where creative, productive and social facilities would come together and be spatially connected through a fragmented roof structure, that could be used for creating additional spaces, happenings and connections. Also, a main design decision was to take the ruins of the former slaughterhouse as foundation for the new attraction point for the city, also including shared living spaces. It could be an interesting point of development, as there is no comparable mixed space and mentioning the plans for the re-activation of a former railway-area in the south, to which this place would be connected ad could work as an activator.


*Figure 4. Project "Communal Space Freiimfelde" by Anna Schlarb*

In both examples processes of how to implement the proposed ideas were developed. In the language of the drawings, they tried to not only address architects and urban designers, but also to create narrative elements (images) with which also the inhabitants could associate something.

## NOTES

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[7] Fabienne Hoelzel, in Undine Giseke et al *Urban Design Methods.Integrated Urban Research Tools.* (Berlin:Jovis 2021) 28
[8] Riccarda Cappeller "Urban Bricoleurs", in *Cosmopolitan Habitat*, ed. Jörg Schröder and Federica Scaffidi (Berlin: Jovis, forthcoming)
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[16] Monuments understood as creative parts of the city, following Sarah Hartmann – as repositories of history and memories, as places to spend time, as meeting points, and as points of orientation. (2019)

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# VISIONS OF THE PAST: THE GRAPHIC DESIGN STUDENT AS HISTORIAN

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## INTRODUCTION

From the commemorative monument to the digital archive, visual practitioners play a key role in the construction of public histories. Much scholarship has reflected on how images have the potential to enrich historical discourse and intervene in wider debates on the meaning of the past. Museums, publishers and other organisations work with artists and designers to develop new and accessible forms of history-telling. Indeed, this paper is rooted in the belief that art and design students of today can be visual historians of the future.

What follows is a reflection on our pedagogical approach to developing historical consciousness amongst graphic design students. The first section surveys the theoretical and philosophical ideas that provided a base from which this project grew. While much has been written on the potential of film, architecture, illustration and photography as innovative conduits for historical narratives, the ability of graphic design to offer serious engagement with the past remains under-theorised. The paper's second section responds to this gap, introducing "Vistoriography," a conceptual model explaining graphic design as a form of visual history, one with its own set of formal and stylistic traits. The final section considers our experiences implementing the model with students at Merz Akademie, Stuttgart, and the University of Portsmouth.

## HISTORY IN IMAGES

Our interest in visual histories began as a collaborative research project. To what extent could graphic design provide a complex response to historical events? Can the graphic designer mobilise particular tools and/or visual and textual strategies that enable the creation of historical narratives? These questions formed the basis of a graphic journal article, "Gettysburg Inc.: The Use and Abuse of an Historical Icon."[1] Building from the contention that Abraham Lincoln's famed Gettysburg Address of 1863 had become a commemorative palimpsest, shaped and reshaped in line with shifting ideological debates, we turned a critical eye on the ways in which arbiters throughout the 20th and 21st century had invoked the ghosts of Gettysburg.[2] The resulting article adopted the form of a "brochure" representing a fictitious corporate entity called Gettysburg Inc. Taking readers on a meandering and absurd journey through a suite of mysterious services and products, the brochure reframes historical references in relation to grand brand propositions and draws links between the "language" of public history-telling and that of commercial graphic design. The stock photograph becomes icon of a mass-produced past; the decontextualized quote emerges as stark commentary on the ethics of any historical

reconstruction. The central motif running throughout the brochure is a looming black-suited arm – a reference to visual depictions of Lincoln, but here appearing as a more sinister corporate presence. At its core, the article was an attempt to grapple with ideas related to what Hayden White has called the "practical past," a form of history-telling that is self-conscious of both its status as an imaginative reconstruction and of the past's enduring impact on the present.[3]

The writings of White, as well as Linda Hutcheon, Keith Jenkins and Alun Munslow (among others) have questioned traditional notions of objective history, emphasizing the creative and imaginative elements that comprise any historical account of the world. Their calls for self-conscious, ironic, playful, non-traditional histories – what Munslow calls "the-past-as-history-as-artwork" have resounded in academic circles for many years.[4] Central to our research and, subsequently, our teaching project, has been to reflect upon what such ideas offer to the visual historian and how these notions might be applied.

Certainly, there is a vast body of literature exploring the potential of visual media as engaging forms of historical discourse. Scholars have developed approaches to thinking about visual histories that go beyond mere distortion and consider the qualities that make the screen, the page and the urban space a venue for serious historical engagement.[5] In this context, the visual is as sophisticated a historical "language" as the written word. Images might offer particularly fruitful venues for imaginative explorations of personal histories and foster a vibrant "dialectic," to cite Hutcheon, "of past and present."[6] They might also enable us to self-consciously reflect on the very processes of historical reconstruction and enter into a discourse on the nature of historiography (or, as white terms it, with an eye on the visual, "historiophoty").[7]

When exploring the literature on graphic design, however, there appeared to be less that considered such issues. While books and articles have discussed how graphic designers might appropriate or "quote" historical images in their work, the emphasis on "retro" culture and nostalgia often leaves one wondering what potential there is for historical portrayals that go beyond "hip" self-consciousness and style-over-substance. As Rick Poynor notes, the term "jive modernism" was sometimes used to describe contemporary designers' revisiting of modernist styles "for gains in prestige, style, clients and awards."[8] Of course, there is potential in appropriation as a form of critical practice, but we wanted our students to reflect on how graphic designers can embark on other forms of historical engagement. In many ways, we are aligning ourselves, here, with calls to treat graphic designer as "author" or, in Teal Triggs' words, "to legitimize the designer's voice as equal to that of other forms of authorship… able to exert 'control' over what he or she is designing," able to shape traces of the past into meaningful narratives.[9] More recent publications, such as Fry, Dilnot and Stewart's *Design and the Question of History* and a symposium at New York's Museum of Modern Art, "It Wasn't Written: International Symposium on Designerly-ways of Historiography" (2018) have suggested a growing academic interest in design as a complex form of history-telling.[10] We wanted to embed the above ideas into our pedagogic practice and encourage our students to see themselves, potentially at least, as graphic historians.

## THEORY-PRACTICE-PEDAGOGY

For our purposes, it was important that the ideas of White, Munslow *et al* serve a double purpose. On the one hand, they provide tools with which to analyse the workings of historical narratives. On the other hand, they are a clarion call for historians to rethink their own practice. The philosophy of history was useful insofar as it demanded us to reflect on the process of history-making. What does a historian *do* ("What Is History?", to quote E.H. Carr).[11] To that we added, returning to a fundamental

and much asked question: what does a graphic designer *do*? And, have these seemingly distinct disciplines any common ground in terms of method and approach?

To begin, we conducted interviews with historians and teachers of history themselves, with the aim of identifying shared interests and themes. Dr Emma Wells, an ecclesiastical and architectural historian based at the University of York offered a representative definition: "an historian collates and evaluates information from many primary sources to answer questions about historical events." She also, however, provided self-reflexive commentary: "is that truly our job – should it merely end there?"[12] Wells is a champion of what she refers to as "Sensory History," where questions are asked, for example, about what particular smells meant to 15th century Parisians or how touch functioned in Europe of the Middle Ages. This focus on the senses – on feelings and experiences that may be harder to capture by way of documentary research – resonated with our interests, for it has been argued that visual histories might be particularly well-placed to represent and make tangible emotional and sensual pasts.[13] Cultural historian Dr Eilis Philips contended that a historian asks "big questions about the past in order to better understand what it means to be human, or to exist, now."[14] Again, it has been argued that graphic histories – through the juxtaposition of images, icons and ideas – may offer a particularly effective vehicle through which to uncover new connections and, indeed, discontinuities, between past and present.[15] These definitions emphasise the historian as more than just a recorder of "facts"; rather the historian serves as creator of meaning, someone who transforms primary sources into consequential narratives. As Keith Jenkins puts it, the historian "begins to transform the traces of the once concrete into the 'concrete in thought', that is, into historian's accounts."[16] We were struck by the idea of the historian as "transformer" for it was here that we began to note similarities between the work of historians and that of graphic designers.

The lack of theoretical writings on graphic-design-as-history may be explained, at least in part, by the manner in which the discipline is discussed. As Malcolm Barnard notes, graphic design is frequently associated with commerce and, often, set against the "purity" of other visual forms (e.g. fine art and illustration). With a client in charge, and a presumed "audience" (or consumer) clamouring for gratification, it is less common – than, with, say, film or painting – to attribute gravity and grandeur to graphic design. Nonetheless, and as noted above, recent scholarship has sought to invest graphic design with a clear sense of authorship and creativity. In a practice-based context, a graphic designer may be required to visually interpret and communicate a historical narrative to a contemporary audience through their work (much as many of the above-noted scholars would describe historians as both narrators and interpreters).

Importantly, we saw graphic design's historical potential residing in three key areas: firstly, the research conducted by the designer prior to and during the design process; secondly, the practice itself (techniques used, style adopted, actions undertaken by the designer while making); and finally, the content of the work. With regard to the first point, any textual research (archival, documentary etc.) undertaken may present certain historical ideas to the graphic designer. These might complement, or stand in opposition to, any visual research conducted. The potential to be informed by, or directly reference, historical imagery enables a secondary narrative. To provide a very basic example, were one to create a historical representation of the Vietnam War, one might juxtapose a quote from Lyndon Johnson announcing the US's aims to win "hearts and minds" of the Vietnamese with a Nick Ut or Eddie Adams photograph, thus situating two opposing ideas on the war's morality within the same frame. The second point – the practice itself – could refer to specific techniques associated with particular historical epochs (e.g. Letterpress, silk screen printing) or processes and acts that directly impact the designers themselves (see below for examples). Finally, reflecting on content would require the designer to consider the political/cultural/social message being communicated, the

"symbolic structures" and metaphoric meanings potentially derived from the image as well as issues such as tone (dramatic, humorous, satirical etc.) and register (to *whom* is the image communicating?).[17]

These three features are the basis for "Vistoriography." Existing in the interstices between theory and practice, Vistoriography is an active practice of investigating and visualising history. Developing this model enabled us to elucidate our approach to students in lectures and facilitate initial discussions on the various forms that "Vistoriographic" practice might take.

## TEACHING GRAPHIC-DESIGN-AS-HISTORY

An opportunity presented itself to us in 2019 by way of an invitation from Professor of Visual Communication, Joost Bottema, to deliver a weeklong workshop at Merz Akademie, supported by the Erasmus+ programme. Partnerships of various forms have existed between Portsmouth and Merz since the 1990s, with a particular focus on graphic design exchanges. From our perspective, we shared with lecturers at Merz a commitment to bringing theory and practice together in the taught studio environment and the workshop was viewed on both sides as exploring the potential of this.

Grounded in the above-referenced theoretical and historiographic ideas, we developed a creative brief intended to support the diverse range of undergraduate and postgraduate students registered for the workshop. Our aim was to encourage students to graphically communicate a unique and engaging story by visualising a personal history in relation to a chosen object, person, experience, or event. We saw the personal component of these students' histories as a spur to consider the impact of history on one's sense of identity, one's beliefs and values and one's creative practice (thus becoming, in White's terminology, a "practical past", which drags history out of the abstract realm and is utilized by people from different walks of life – politicians, writers, artists, creatives – as a means of reflecting on the present and as a call to bring about social, political and cultural change).[18] A childhood memory, family connection, remembered historical event or person could serve as a gateway into a larger collective history. It was important to us that the students would be afforded a considerable amount of latitude in making their response, and we therefore stipulated that work could take any visual form. We also, however, emphasised that, in order for their work to be considered a successful piece of visual communication, they would need to ensure that they deliver a clear narrative about their chosen subject to an appropriately identified audience.

In asking the students within our group to become designer-historians, we were encouraging them to actively engage with the past in order to identify ways of merging content, authorship and design. We understood that doing so would be a particularly effective strategy for ensuring that students would be "learning by doing."[19] Through applying sequential models of experiential learning to our planning and delivery, we aimed to create a learning environment that would promote and facilitate what Boydell calls "meaningful-discovery."[20]

Throughout the week we were present in the studio running one-to-one tutorials to discuss the student's progress. From a pedagogical perspective, we each focussed on tutoring our respective areas of expertise while ensuring that conversations were connected and formative feedback was "fed-forward."[21] We also held several group sessions in which students were encouraged to present their work in progress as a form of "reflection-in-action."[22] This gave all of us several opportunities to compare the extent to which they were "making sense" of the task and review how their peers were approaching it.[23] Students became invested in each other's personal historical stories and how they were being developed as a visual narrative.

Resolutions included a satirical children's book and classroom banner that explored the impact of the Chernobyl disaster on a young girl living in Germany, which began with individual childhood

memories but then expanded out to explore the politics and visual culture of nuclear disaster in the 1980s. Posters that sought to capture the personal and political impact of the 2013 Gezi Park protests in Istanbul, were expressed as a series of abstract visual reconstructions created by using the historical technique of marbling, combined with words that emphasised and contextualised the imagery. The culture of witches living and working in modern Croatia, based on childhood memory, was brought to life as an illustrated guide book. Another student created a broadside exploring historic medical visualizations and the role of "curiosities" and "vernacular" within Victorian culture (informed by an object they received from a grandparent). At the end of the week, we were tasked with exhibiting and presenting the work to the rest of the university. This gave us an opportunity to further embed experiential learning into the workshop by encouraging the students to take ownership of displaying their outputs and consider how presentation could help to position and amplify the narrative.

Where necessary, students were asked to provide context to the display of their work, ensuring that their stories could be situated and understood. For example, a student created a series of collaged artworks that collectively formed an interactive game – the "rules" presented next to the work offered parameters and direction, helping the audience to access the output and take a nostalgic walk through this personal visual history.

Reviewing work in the context of both a gallery exhibition and physical presentation, served to highlight the extent to which practice itself had been important in the shaping of historical narratives – ideation and iteration, experimentation, making, testing, reflection. Whether it was the student who created a multilayered historical map of Stuttgart – her hands marked by charcoal as she traced changes to the city's topography at several points in time – or a student new to the discipline, learning design software for the first time as a means of engaging the past, we began to think about these histories as somehow embodied. The very process of making, of designing, a form of historical discourse in its own right.

At the same time, the workshop made us revisit and reflect upon our conceptual aims. To what extent did our teaching methods encourage careful reflection on the visual as a form of historiography? Was there a danger of images simplifying or trivializing the past – a case of style over substance? Nonetheless, the project had at least yielded examples of what we saw as the potential of "Vistoriography."

## CONCLUSION

In different ways, the above ideas continue to inform our teaching. Undergraduate graphic design students at the University of Portsmouth also take Visual Culture modules, where they are encouraged to develop historical awareness through the analysis and creation of self-conscious visual histories. Similarly, we often find that students choose to tackle historical subjects as the research focus for their final year major project. In recent years, such projects have ranged from exploring the historical development and significance of sea shanties through a kinetic digital exhibition, to a designing an online platform which presents an interactive chronological typology and semiotic analysis of headwear. In all instances, the Vistoriography model is introduced in seminars, as a starting point for students to consider their approach to the past. In particular, and alongside the production of a striking range of personal and public histories, these discussions have helped students see beyond the idea of postmodern graphic design being simply an empty pastiche of historical styles.

This is, however, a work in progress. We believe that there remains a pressing need for more work that theorises graphic design as a historical language, to consider its potential contribution to historical and historiographic discourse. Many of our students are interested in history and we want to furnish them with the creative and critical tools to explore the past in all its richness and complexity.

## NOTES

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[3] Hayden White, *The Practical Past* (Evanston: Northwestern University Press, 2014, Kindle).
[4] Alun Munslow, *The Future of History* (Basingstoke, Palgrave Macmillan, 2010), 127. Linda Hutcheon, “The Politics of Postmodernism: Parody and History,” *Cultural Critique* 5 (Winter, 1986-87): 179-207; Keith Jenkins, *Rethinking History* (London: Routledge, 1991); Hayden White, *Metahistory: The Historical Imagination in Nineteenth Century Europe* (Baltimore: The Johns Hopkins University Press, 1973).
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[8] Rick Poynor, *No More Rules: Graphic Design and Postmodernism* (London: Laurence King, 2003), 80.
[9] Teal Triggs, “Designing Graphic Design History,” *Journal of Design History* 22 (2009): 326.
[10] Tony Fry, Clive Dilnot and Susan Stewart, *Design and the Question of History* (London: Bloomsbury, 2015); “It Wasn’t Written: International Symposium on Designerly-Ways of Historiography” (Symposium held at the Museum of Modern Art, New York City, 2018).
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[14] Eilis Philips. Interview with Daniel McCabe. Personal interview. Portsmouth, June 6, 2019.
[15] Cutter and Schlund-Vials, “Introduction,” in *Redrawing the Historical Past*, 7; Frey, “Historical Fiction,” 90-91; Louis Netter and Oliver Gruner, “Steal This History: Historiography, the Sixties and the Comic,” *Rethinking History* 21 (2017): 506-528.
[16] Jenkins, *Rethinking History*, 27.
[17] Hayden White, “The Historical Text as Literary Artefact,” in White, *Tropics of Discourse: Essays in Cultural Criticism* (Baltimore: The Johns Hopkins University Press, 1978), 91.
[18] White, *Practical Past*, loc. 403-417.
[19] Phil Race, *Making Learning Happen: A Guide to Post-Compulsory Education* (London: SAGE, 2010), 20.
[20] Jennifer Moon, *A Handbook of Reflective and Experiential Learning; Theory and Practice* (London: Routledge, 2004), 108, 114.
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# COMMONING DESIGN PEDAGOGY – THE FIRST-YEAR EXPERIENCE

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## INTRODUCTION

### The first weeks of first year: an introduction to university and spatial design

The first year of university is a period of significant transition. The student's early social and academic experience influences their likelihood to stay in university and become a connected member of the learning community.[1] It is now widely recognised that a sense of connection and situatedness within the university are essential for positive student experience and learning outcomes.[2]

Intensive, collaborative curricula activities held early in the course of study and located off-campus supply high levels of engagement and meaning and initiate ongoing connectedness and sustaining through prolonged periods of remote learning.[3] A result of the recent COVID19 pandemic and the shift onto online learning is that in the future much more teaching will occur remotely making a student community both harder to foster and more necessary for maintaining engagement. Without extended periods of organised and casual peer contact on campus, identifying effective strategies for building a connected cohort outside of the traditional context of the classroom and the lecture theatre will be essential.

Undertaking an intensive in the first two weeks of university means commencing Interior Design students immediately encounter and engage with RMIT's key values of 'learning through doing' in a collective learning environment focused on social, cultural and environmental awareness.[4] The Interior Design BA (Hons) at RMIT University has a large first-year undergraduate group (averaging 130 students) with a significant percentage of domestic students who meet the equity and diversity criteria (around 30%) and over 30% international students.[5] From the outset design students present and discuss their work in progress and so without actively establishing a learning environment predicated on trust and care, competitiveness, hierarchies, social segregation and attendant insecurities and social isolation can become entrenched. By making space in early in the course of study where relationships can mutual respect can develop and unfolding processes and active participation in their education is demonstrated and encouraged, students more willingly engage with peer to peer learning and unfamiliar or challenging approaches and concepts.[6] The principles of commoning provide a framework that facilitates a positive transition to university, and also develop meaningful personal, communal and societal values that shape their spatial design education and inform their future practice.

The events and projects discussed in this paper were iteratively developed over the last three years (2018-2020) and held in the first two weeks first year.

## Commoning pedagogy: background and context

Commoning, the verb of commons, was brought into use in 2008 by Peter Linebaugh to describe the psychological and social activities people go through to maintain spaces, activities and processes in common[7]. Commoning is intrinsically participatory and creative, requiring adaptive and innovative thinking and action. These characteristics make it easily understood by spatial designers.[8] Stavros Stavrides, an architect and activist for commoning, summarises commoning practices as "encouraging creative encounters and negotiations through which forms of sharing are organised and common life takes shape."[9] As commoning has the capacity to develop a subjective and objective approach for creating social relations that lend themselves to the production of new collective forms of living and working creatively, it can be applied to studio design pedagogy.

'Commoning pedagogy'[10] is a term developed by this author to describe how commoning processes and values can inform the course structure and delivery of design studio teaching and learning.[11] Like other commoning spaces, the design studio classroom is a location where shared creative, social and psychological processes unfold through a common interest. The teacher does not assume the role of the expert transmitting content but instead becomes part of the ecology, learning alongside and in response to the student group to establish a culture of emergence and sharing. The anthropologist and educator Tim Ingold believes that his is important because "It is not that you end with a piece of knowledge implanted in your mind that once had belonged only to me; rather we come into a concordance that is new to both of us. Education is transformative."[12] For Ingold, education occurs within variance, not commonality, and so requires an opening up and bi-directional responsiveness between the teacher and the student that plays out through the intermediary of the environment. Understanding classroom as a space of commoning makes central the shared aspects of study and design learning at university. Students begin to see each other not as competition but as a cohort with shared interests, meaning they can appreciate difference across the cohort and value opportunities to learn with and through each other.[13]

Incorporating the values of commoning in design teaching emphasises participation, investment in shared activities and respect for variance and plurality. These attributes bring about a sense of belonging and investment in their work and each other making commoning particularly useful for creating a meaningful learning and social culture in the first year.

## Day One: 'Continuously under Construction'

'Continuously Under Construction'[14] is a collaborative project with the RMIT University, the interdisciplinary collective 'These are the Projects We Do Together' and 'Melbourne Design Week' running over three consecutive years on the first day of the students four-year degree. All three builds were held at 'Testing Grounds'[15], a unique and multipurpose environment, itself created and organised by commoning principles, located on public land in the Melbourne Arts Precinct.

*Figure 1. 'The Pyramid' was made of 4317 bricks and constructed by students to be used as both a platform and a provocation to (re)consider design, construction, public art and public space.*

## Community

‘The Pyramid’ (2018) was the first in the 'Continuously Under Construction' series. It was a monumental collective construction that aimed to simultaneously built *community*. On their first morning the students gathered on site, most looking anxious, standing alone and staring at their devices. The social and physical environment changed very quickly as they started building.[16] Working together, outside and on an unusual activity facilitated social contact in a way that would be difficult to instigate in a classroom on the first day. When the students took a break from laying the cement bricks, they collected in groups in the shade, chatting and eating watermelon, forming a temporary audience for the unfolding event. Although it was a collective build, students gravitated to different roles; some preferred labouring, whereas others took on directing, documenting or detailing. It was astonishing to see what they had achieved working together on their first day, and when they placed last brick, a cheer broke out. All 130 students climbed on to the structure for a jubilant group photo. (figure 1)

## Inclusivity

In 2019 the approach was motivated by *inclusivity*. The day began with all four-year levels of the Bachelor program starting the semester together with a ‘Welcome to Country’, a ceremony performed by a local aboriginal elder who welcomes visitors onto their traditional land. Beginning with this ceremony foregrounds the necessity of making indigenous culture and knowledge foundational in Australian spatial design education. After the welcome, the students were introduced to the project; a collaboration with artist Bruno Booth[17] producing the timber framework for his forthcoming installation titled ‘Hostile Infrastructure’. (figure 2) Booth uses a wheelchair, and his creative work focuses on exposing the anxiety and exclusion caused by urban space for people with mobility challenges. Booth spent the whole day working alongside the students, describing his daily experiences and answering their questions. The rest of the year reinforced in various ways, insights into how spatial design can foster inclusivity and acknowledge diversity.[18]

*Figure 2. Students worked alongside artist Bruno Booth to construct the timber framework for his large-scale public installation, ‘Hostile Infrastructure’ 2019.*

## Sustainability

The focus the following year was on *sustainability*.[19] The students explored hay as a construction material and then used it to create a public amphitheatre. (figure 3) Queuing for lunch prepared by the tutors the students made friends quickly, gathering in the half-built amphitheatre to talk and eat, surrounded by the smell of warm hay. Once the amphitheatre was complete, we asked them to break into groups of four to design and weave seating mats for the amphitheatre out of reclaimed fabrics and string (figure 4)- a task that further extend the concept of inclusivity while providing the time and space for their new friendships to develop.

*Figure 3. The 'Hay Amphitheatre' became a space for gathering and part of the temporary infrastructure for Testing Grounds and then later recycled in community gardens for mulch.*

### Collectively, not competitively

Each of the three 'Continuously Under Construction' projects used a different construction method and material (bricks, timber, hay), and conceptual emphasis (community, inclusivity and sustainability). In each the students encountered the pedagogical approach variously through active and participatory learning that demonstrated the necessity and rewards of being engaged, socially and practically, with the community and industry they were entering.[20] *"It was not what I expected from my first day; it was better because it gave us a reason to interact. It also showed me that this course is not just about sitting back — you need to get involved and put in." (email from a local student after Testing Grounds in week 1 2018).*

As an initial introduction, the project provides an experience of working collectively and engaging in unfamiliar and challenging processes, with new materials and in public space. It is an introduction to each other and an opportunity to see firsthand the power of working collectively rather than competitively. The experience initiates a rapid transition in the new students from individuals holding preconceived ideas about design processes, design education, and interior design, to a community open to a more expanded view of what their future education may entail.

*Figure 4. Sewing Circles: In small groups students designed and wove seating mats for the hay amphitheatre from reclaimed fabric and string.*

### Week two: the three day Intensive

Interior design education is primarily concerned with the relations between people and their spaces, ranging from the built interior to virtual, social, digital, filmic and other experiential spaces. The three-day intensive in week two is an initial experience with unfamiliar modes of working and thinking that make up the soft and hard skills of spatial design practice. It is also an invitation to students to locate themselves in a shared world, to take a position on the existing social and spatial systems and conditions and to become active participants in their community and education.

In week two the students spend three full days together off-campus at 'Site Works'[21] in Brunswick sharing meals, creating, and learning through interaction and engaging with physical spaces and

materials. (figure 5) One of the aims of the initiative is to promote diversity and inclusion in the student community and their approach to their design studies. The series of short projects are designed instigate contact and exploratory, creative activity rather than delivering a set of instructions or resulting in prescribed outcome. (figure 6) The projects are sequenced to develop the students' skills, comfort, and willingness to offer up ideas, experiment, explore processes, and engage in activities and with ideas that they find challenging. Over the three days students learn to appreciate their processes, experimentation and growth rather than measure their creative practice against each other and in terms of successful or failed outcomes.


*Figure 5. Students working together and sharing meals prepared by their tutors during the three-day intensive at Siteworks. (www.saxonstreet.com)*

The intensive is an opportunity to build confidence, particularly in the international students and those who are working with English as another language, early in the year. These students often come into university more reluctant to ask questions of their tutors and the local cohort or express their views in group work.[22] "*Through group activities, communication and sharing mealtimes, we became closer to one another. I love how everyone is so caring, friendly, open minded and welcoming." (first year international student 2020)* The quick experimental and skill-building projects along with working in different groupings, encourage incremental developments in confidence and core competencies. By the third day, international and local students are visibly more integrated, and there is increased confidence in communication and participation by all students, including those from diverse backgrounds and cultures. International students are more confident approaching their tutors and questions when they need advice or input, qualities that are known to improve that group's outcomes and experience.[23] This observation is supported by feedback from many of the international students in their reflective texts and in a survey.[24]

*Figure 6. Examples of short experimental group projects performed by the students during the intensive. Left: Zichao Xu, Ji Feng Shi. Right: Mia Griffith, Baihui Luo, Marion Perera.*

The first intensive in 2018 included a spontaneous site-wide exhibition, itself an example of commoning pedagogy in action. The students were enthusiastic about the event and it has been included in the schedule each year since. The exhibition draws together 130 large scale photographs and 1500 drawing and images made between week 1 and 2 as well as the hundreds of models, installations, animations and performance artifacts made over the three days of the intensive. Many of the students have never presented their work publicly and for their first exhibition to occur so early in their education at such a large scale is empowering. *"During the exhibition we chat with each other, and I know many new friends. We talk and I learn the importance of teamwork and communication." (first year international student 2019)* It also provides an opportunity for students to share their experience with their friends and family and further enables them to see their work in the context of a diverse cohort who they can learn from. (figure7) Observations about the impact of the exhibition lead to initiating student-focused and student-led performances and exhibitions and over both semesters in first year as celebrations of achievement and as forums by which students develop confidence self-organising, sharing their work publicly and articulating their ideas to a broader community.

*Figure 7. Students installing the exhibition over the site on the last day.*

The strategy of 'commoning pedagogy' follows through to inform the design of the assessment.[25] Students review the creative work and documentation they produced over the intensive and curate and refine ten images that, along with a short reflective or creative text, describes their creative and experiential journey over the three-days. The assessment task also provides a dedicated moment to consider and articulate their aspirations for their future design studies. The social media app 'Instagram' is repurposed to become a collective exhibition space. Each student has the login details and uploads their collection of images and text so the same page so it becomes a shared platform or virtual gallery where they can explore each other's work and comment on aspects that interest or intrigue them.[26] Recognising that collective experience is made up a multitude of skills and approaches both shared and wildly individual is a critical aspect of 'commoning pedagogy'.

### Impact of the first two weeks

The value of starting with the intensive was tested in 2020 when the first two weeks of Semester one was the only time the students were in the same physical space the entire year. By the third week of Semester one, COVID-19 resulted in a sudden move online for all teaching and learning. The rapid and unplanned transition only two weeks into their first year of university education could have been rejected or made difficult by less effectively enculturated students. The existing communication and connections with their peers and also with their tutors made it easier to maintain and further establish a learning environment that was collective, willing, empathetic and open. The focus on social

cohesion and engaging with unfamiliar ideas and processes resulted in a positive attitude toward the rapid changes and teaching innovations required to transfer the course to a digital platform.[27]
Commoning supports and values variance and participation and develops depth and meaning through the investment of time, care and attentiveness, all qualities shared with a meaningful design education or creative project. For educators, commoning provides a way of moving away from expert transmitting knowledge and instead, they can engage in a more dynamic and dialogical model of teaching. Commoning acknowledges complexity and challenges but encourages agency as students actively participate in creating their learning environment and design processes and learn to recognise strengths across a group rather than work in competition. The practice of working cooperatively and collectively is carried through the entire first year. For some, the approaches and values will embed and endure, structuring their future spatial design practices and their contributions to the world we all share.

## NOTES

[1] R. Wilson, B. Clarke, D.Carlin, L. Morieson, & K. Lukas, '2012 Report: Focus on First Year.' Accessed August 2020 https://www.rmit.edu.au/about/schools-colleges/media-and-communication/research/projects/the-belonging-project

[2] In their study of the first-year experience '2012 Report: Focus on the First Year', *The RMIT Belonging Project* recognised the importance of orientation activities that introduce the students to the curriculum and build connection amongst the social cohort.

[3] R. Wilson, B. Clarke, D.Carlin, L. Morieson, & K. Lukas, '2012 Report: Focus on First Year.'

[4] Ibid

[5] RMIT Program BH115 Dashboard accessed Nov 25 2020

[6] N. Araújo, D. Carlin, B. Clarke, L. Morieson, K. Lukas, K., & R. Wilson, 'Belonging in the first year: a creative discipline cohort case study'. *International Journal of the First Year in Higher Education*, 2014 5(3). Accessed Jan 2021 from https://fyhejournal.com/article/view/240.

[7] Peter Linebaugh, *The Magna Carta Manifesto: Liberties and Commons for All*. (Berkeley: University of California Press, 2008).

[8] There are many examples of architecture and design collectives that produce commoning outcomes and are also organised by commoning values. 'Raumlabor' in Germany and 'Assemble UK' are two well-known examples.

[9] Stavros Stavrides, *Common Space: The City As Commons*. (Zed Books, eBook Collection, London 2016) p.6 (accessed Dec 18, 2020).

[10] Olivia Hamilton, 'A Commoning Creative Practice - Tending to Mutuality in Spaces of Engagement' PhD Thesis. RMIT Research Repository. (2018)

[11] The characteristics of commoning that inform pedagogy are discussed in more detail in Hamilton, Olivia. "A Commoning Creative Practice: Tending to Mutuality in Spaces of Engagement." 2018. Print. p128-141 https://www.rmit.edu.au/library/research/research-repository.

[12] Tim Ingold, *Anthropology and/as Education*, Taylor & Francis Group, 2017.

[13] The first iteration of *Collectively under Construction* and exploration into commoning pedagogy is documented in *Interiors*. Hamilton, Olivia. "Commoning Interior Design Pedagogy." Interiors: Design, Architecture, Culture 9.2 (2018): 122–139.

[14] The three *Continuously Under Construction* projects were conceived and run in collaboration with 'Testing Grounds' https://www.testing-grounds.com.au/ and 'These Are The Project We Do Together' https://www.theprojects.com.au/ and Melbourne Design Week and are documented on each of their websites: a case study of the Pyramid is available at http://www.testing-grounds.com.au/case-studies/the-pyramid/ and more information can be found at 'These are the Projects We Do Together' https://www.theprojects.com.au/ and Melbourne Design Week archive https://www.ngv.vic.gov.au/program/the-pyramid/

[15] Description of the site and mission is available here https://www.theprojects.com.au/what-is-testing-grounds.

[16] Films documenting *Continuously Under Construction 1, 2 and 3* are available in the archives here: http://www.theprojects.com.au

[17] Bruno Booth: www.brunobooth.com

[18] For example, later that year (2019), the students contextualise their site-specific work through attending an indigenous-led walking tour ('Walking Country, Walking Birrarung' with Dean Stewart) describing aboriginal histories and experiences underlying the built environment of Melbourne.

[19] In all three *Continuously Under Construction* projects the materials were sponsored by industry partners resulting in low cost to the program and students in line with the RMIT Belonging Project principles of making events economically and environmentally sustainable.

[20] The design of this event draws on *The Belonging Project*. Phase 2: Initiative 2 - A Cohort Day Out p.11.

[21] Siteworks https://www.saxonstreet.com/. Siteworks is a council asset run by the creative collective These Are The Projects We Do Together https://www.theprojects.com.au/ to provide inclusive, low cost facilities and is seen as a live research driven site.

[22] In class student segregation is widely recognised as a problem by teachers "Many students reported a persistent divide in the classroom between domestic and international cohorts, which reminds us that space is not just about interaction but also about belonging". B. Clarke, R. Wilson, R. & N. Araújo, 'Report: The Global at Home: At Home in the Global. Paper presented at Philosophy of Education Society of Australasia Conference, University of Waikato, New Zealand 2014.

[23] Overall retention in first year has risen since 2018 when the intensive was introduced.
[24] In 2020 the first years that attended the intensives and responded to a survey reported had made friends in the first two weeks (100%) and maintained the friendships over the first year (83%) and that these friendships made them more connected studying during lockdown (92%) and they planned to continue their friendships into the higher year levels (92%).
[25] *The RMIT Belonging Project*. Phase 2: Focus on the First Year Experience report recommends that orientation events are tied to assessment p.11. https://www.rmit.edu.au/about/schools-colleges/media-and-communication/research/projects/the-belonging-project.
[26] John Mueller. The Authentic Assessment Toolbox: Enhancing Student Learning through Online Faculty Development http://jfmueller.faculty.noctrl.edu/toolbox/whatisit.htm Accessed September 2020 The record of student work, images and reflective text is available at Instagram: rmitinteriordesign1styr
[27] The 2020 course experience survey had a strong response rate and 88% agreed they were satisfied with the course and the intensive received the *2020 Vice-Chancellor's Award for Strategic Contributions to Learning and Teaching: Initiatives that Exemplify RMIT's Commitment to Student Belonging.*

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Image Credits: Emma Byrnes

# SUSTAINABILITY AND RESILIENCE: THE IMPORTANCE OF EDUCATORS' RESILIENCY IN THE UNCHARTED TERRITORY OF THE ONLINE LEARNING ENVIRONMENT

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## INTRODUCTION

Although online education continues to grow as an option for K-12 school districts across the country, the Coronavirus pandemic recently forced many educators to shift to virtual teaching in just days due to state mandated school shutdowns during the spring of 2020. Many teachers were also expected to adjust to online teaching without any formal training. Even though approximately, 2.2 million students were enrolled in some sort of virtual learning in 2013 and the numbers continue to grow,[1] the Coronavirus pandemic caused havoc for many stakeholders of brick-and-mortar school districts. With little time and minimal to no experience, teachers prepared to not only take care of their own families whose daily schedules had been disrupted but also to find ways to facilitate learning in online formats. At the time of this submission, January 2021, districts in the United States continue to face uncertainty regarding whether or not brick-and-mortar buildings will be an option for all K-12 students during the upcoming school years. Many school districts are currently brainstorming ways in which they can better prepare to offer online education to students in the event of another COVID-19 outbreak or other crisis situation.

Whether online or face-to-face, K-12 teachers and students returning to school after the Coronavirus pandemic will continue to face new environments full of challenges and uncertainty. Many students will require additional support to close academic gaps and to address social and emotional distress and uncertainty caused by the Pandemic. Teachers must be prepared to address students' needs, and they must also be prepared to care for themselves as they learn to teach in what will be for many an unfamiliar environment.

Although online education continues to gain popularity as an option for students and families, most K-12 teachers have not been trained to offer instruction online or in a hybrid format in their preservice preparation. Many face stresses as they maneuver through this uncharted territory. By recognizing the benefits of resiliency, educators will be more equipped to positively address their own and their students' social and emotional needs while facilitating students' acquisition of 21st Century skills.

## CURRENT CONCERNS

According to a recent publishing by The Center for Disease Control (CDC) both children and adults react to stress caused by the COVID-19 Pandemic in a variety of different ways.[2] This stress may include: "excessive worry or sadness, unhealthy eating habits, unhealthy sleeping habits, and difficulty with attention and concentration.[3] The CDC also states that caring for one's mental health can help individuals successfully adapt to challenging situations.[4]

Educators around the globe will benefit from tapping into their own resiliency while they navigate the unfamiliar landscape of K-12 online or hybrid teaching and learning. Without strategies that address their own self-care, teachers will be less effective facilitating learning whether education is occurring within students' own home environments with online or hybrid education or in new versions of their brick-and-mortar schools altered with new features ranging from new courses to close academic, social, and emotional gaps to ongoing temperature checks.

Not all schools will have the time or financial capabilities to put new online curriculum in place immediately; however, all teachers can educate themselves on the benefits of resiliency in order to facilitate healthy relationships with students. The process of dealing with the crisis may be the catalyst that leads to enhanced academic achievement for students due to concentrated efforts to address social and emotional growth for educators and those they serve, regardless of the environment.

## MASLOW'S HIERARCHY OF NEEDS

During this unprecedented time in history where the Coronavirus has left many struggling financially and feeling vulnerable due to uncertainties, Maslow's Hierarchy of Needs theory can help educators begin to recognize how to approach self-care, relationship building, and instruction.[5] Maslow's hierarchy illustrates five levels of essentials for learning and thriving. Today's adult society members, including educators, must do everything possible to ensure needs are met at the bottom two levels of the hierarchy in order for teachers and students to address subsequent levels. Once physical health and safety are addressed, students and teachers can proceed upwards toward self-actualization. Addressing the three top levels of Maslow's hierarchy is not possible if individuals' physical health and safety are not first set right. Resiliency and positive relationships, whether online or face-to-face, can enable understanding of health and safety issues which must be addressed in order for the social and ego levels of Maslow's hierarchy to activate.[6] In assessing and addressing their own and students' needs, teachers will be better prepared to reach self-actualization and to help those they serve to do the same.

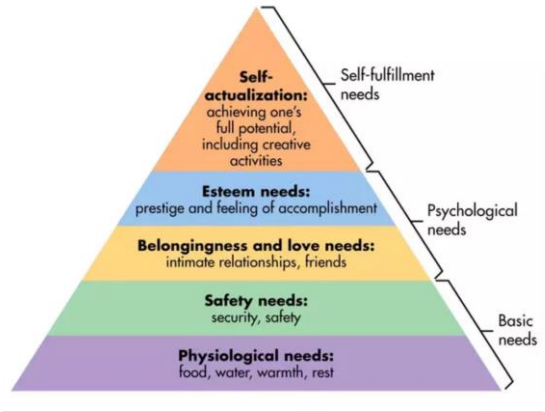


*Figure 1. Maslow's Hierarchy of Needs*[7]

## Social and Emotional Learning

Resilience, by definition, has the potential to enhance learning, and researchers are recognizing the importance of social and emotional learning (SEL) as a way to positively impact academic achievement.[8] The definition of SEL has connections with the definitions for non-cognitive variables and resiliency. SEL is defined as a system that enables individuals to utilize tools to "understand and manage their emotions, to feel and show empathy for others, to establish and achieve positive goals, to develop and maintain positive relationships, and to make responsible decisions."[9] Furthermore, Schonert-Reichl explains that academic achievement is enhanced by SEL in classrooms.[10] The author stresses the importance of teachers being cognizant of their own SEL in order to effectively help students acquire the skills they need to "achieve their full potential as productive adult citizens, parents, and volunteers in a pluralistic society…"[11] Schonert-Reichl's research illustrates a relationship between teachers' SEL and the SEL of their students: "...to successfully promote SEL, it's not enough to enhance teachers' knowledge of SEL alone. Teachers' own social and emotional competence and wellbeing play a crucial role."[12]

COVID-19 may be the motivation that propels school districts to implement equitable curriculum that addresses SEL. Educational leaders have concluded that social and emotional skills can be taught.[13] Recently, Schonert-Reichl found that academic achievement is enhanced by SEL in classrooms. Teachers need to be cognizant of their own SEL in order to effectively help students acquire the skills they need to "achieve their full potential as productive adult citizens, parents, and volunteers in a pluralistic society…"[14] Teachers not only need to be aware of SEL in the learning environments they oversee, but they must also be willing to address their own social and emotional wellbeing in order to positively impact the students they teach.[15] Well-being will not come for all with the snap of a finger, but teachers can start to enhance their own sense of safety and security by consciously acknowledging their own resiliency through relationships in and outside their classrooms.[16]

### Resilience

Researchers of psychiatry, psychology, human development, medicine, epidemiology, and social sciences have examined resilience and its impact on individuals and groups for decades.[17] However, definitions of resilience in the literature have not been consistent. In a study focused on promoting resilience, Meredith et al. found over 100 definitions of the term.[18] Britt et al. synthesized the findings of Meredith et al. into ten representative definitions that included an individual's internal capacity or ability to adapt or to exhibit growth in the face of adversity.[19] Graber et al. explain, "…a broad resilience framework focuses upon identification and promotion of strengths, social connections and capacities to enrich the story of human functioning across a wide range of fields."[20] Today's educators will benefit from thinking of resilience as "…a set of characteristics that facilitate positive adaptation."[21]

Important to note is that research includes the fact that resilience was once thought to be a fixed trait but is now believed to be a quality or characteristic that can be developed over time.[22] This shift in thinking enables today's researchers and practitioners to examine their own resiliency as a tool for addressing existing concerns.[23]

Multiple factors, including individual, relationship, community, cultural, and environmental have proven to be contributors to a person's resilience.[24] A person's ability to utilize characteristics that lead to resilient actions within their environments are identified as factors that enable individuals to succeed and thrive at work.[25]

### Psychological Resilience

Psychological resilience can help teachers persevere in new teaching and learning environments in order to successfully address their own and students' needs while building healthy relationships. Recently, researchers have begun studying and discussing the power of non-cognitive characteristics as predictors of academic and career success.[26] Non-cognitive characteristics have been defined differently throughout the literature, but similarities exist among empirical studies. Non-cognitive characteristics can be thought of as personal resources linked with performance.[27] Resilience is one non-cognitive characteristic and can be defined as a process where individuals faced with adverse and/or challenging situations utilize personal resources to positively adapt.[28]

### Grit

Grit is another non-cognitive characteristic, defined as "perseverance and passion for long-term goals."[29] Both resilience and grit are two personal resources identified as those that benefit teachers in avoiding burnout.

School reform efforts, including new ways to deliver content and facilitate critical thinking, will be unlikely in ever changing school environments without attention to non-cognitive characteristics that enable teachers to preserver through change and institutional innovation.[30] Goertzen and Whitaker credited resiliency as a malleable capacity essential for success in the 21st century workplace.[31] The authors explain that today's work environments constantly adjust, and these changes have the potential to cause anxiety for those they impact.[32] Anxiety may cause a negative chain reaction and impede enjoyment, and consequently progress.[33] Promoting healthy non-cognitive characteristics of current and future workforces may enhance employee and organizational outcomes.[34]

## RESILIENCE AND TEACHERS

Resilience is connected with educator satisfaction in empirical research,[35] and enhancing resilience amongst teachers has been proven possible. This link between educator satisfaction and resilience may prove to be an important factor for assisting today's teachers in adapting to the changes in K-12 education, including drastic changes due the COVID 19 pandemic.[36] Arnup and Bowles successfully connect resilience to teacher longevity and satisfaction in Australia. The authors conducted a quantitative study with 160 teachers who had a minimum of ten years of experience. Using a questionnaire concerned with job satisfaction and an adult resilience scale from 160 teachers, the authors examined connections between resilience, job satisfaction, and intention to leave teaching. Analysis of data found that lower resilience and poor job satisfaction were indicators of intention to leave teaching.[37]

In a similar quantitative study from educational researchers in the United States, Richards et al. utilized structural equation modeling to measure the impact of resilience on role stressor and burnout. The authors administered three surveys regarding role stressors, burnout, and resilience to 415 elementary and secondary teachers. Findings indicated that resilience positively influences teachers' abilities to work through occupational stressors, and the authors concluded by calling for qualitative research on resiliency that could help stakeholders understand teachers' lived experiences.[38]

In a qualitative study, Taylor studied retired teachers in the United States who stayed and continued teaching in classrooms for multiple years before, during, and after segregation to see if resilience amongst the study's participants was more important for their retention than other current factors including "quality teacher preparation programs, administrative support, sufficient salaries, adequate workplace conditions, mentors, and opportunities for professional development."[39] Taylor's findings

illustrated that resiliency was a factor for African American teachers' longevity before, during, and after desegregation.

In an effort to inform and improve the selection of candidates for teacher preparation programs in Australia, Sautelle et al. studied the value teachers and non-teachers put on six constructs identified in past research as indicators of teacher effectiveness. The constructs included extraversion, agreeableness, conscientiousness, resilience, self-regulation, and cognitive ability. The authors concluded that participants valued cognitive ability as the greatest indicator of teacher effectiveness, but that the other five attributes were also perceived as necessary for teachers entering preparatory programs.[40]

## Grit and Education

As mentioned earlier, grit is a non-cognitive trait defined as "perseverance and passion for long-term goals."[41] The term, coined through the research of Angela Duckworth and colleagues has recently gained the attention of educational researchers interested in enhancing performance indicators for teachers and students across the globe. Duckworth became interested in the idea of grit when she was teaching math to seventh grade students in New York City. The author started to wonder why some students made greater gains than others with equal or greater cognitive indicators. Intent on finding out the answer to her question, Duckworth left teaching to study psychology and is at the time of this research continuing her work at the University of Pennsylvania.[42]

Recently, researchers have identified grit as a predictor of resilience.[43] Duckworth et al. found grit and self-discipline to be stronger indicators of success than IQ amongst populations ranging from National Spelling Bee finalists to West Point cadets.[44]

Grit is found all around us; it is a factor in just about everyone's against-the-odds success. When you talk to people who've 'made it' (however that is defined), they invariable talk about how their accomplishments stem from their failure to give up and their ability to hang in – their tenacity, or grit.[45]

Robertson-Kraft and Duckworth conducted two longitudinal studies on entry-level teachers in inner city districts in order to see if a link existed between teacher effectiveness, retention, and other data available at the time of hire that indicated whether the candidates possessed grit.[46] The authors coded novice teacher resumes for evidence of grit and used independent-samples t-tests and binary logistic regression models to predict teacher effectiveness and retention. From the resume data collected and the examination of teacher candidate's SAT scores, interview ratings, college GPAs, and leadership potential, Robertson-Kraft and Duckworth found that students achieved more under the guidance of teachers whose resumes indicated that they were gritty. In addition, the authors concluded that grittier teachers were less likely to leave the profession.[47]

In her 2016 book, *Grit: The Power of Passion and Perseverance*, Duckworth explains how she created her original grit scale, which provides quantitative data on a person's grit level. She collected significant qualitative data on successful people and recognized that the individuals studied had a combination of passion and perseverance, but she wanted something quantitative that would measure the trait. She utilized her notes to write questions, "...sometimes verbatim, descriptions of what it means to have grit."[48] In 2004, she gave the scale to 1,218 West Point cadets and found grit to be a reliable predictor of which students would succeed in the school's initial induction program. Additional studies by Duckworth have found the scale predictive of who goes further on Scripps National Spelling Bee competition and which novice teachers will prove most effective while staying in the profession.[49]

In an interview, Duckworth described a partnership with researcher and psychologist, Carol Dweck.[50] Dweck popularized the terms fixed and growth mindsets. "...students who believed their intelligence could be developed (a growth mindset) out performed those who believed their intelligence was fixed (a fixed mindset)."[51] Duckworth and Dweck believe that both mindsets and grit levels can change with interventions and deliberate practice.[52] Both authors have collaborated with schools to infuse grit and mindset understandings into curricula. Duckworth believes that "in theory, this intervention can change students' grit levels by changing their beliefs."[53]

## CONCLUSION

Health experts agree that a second wave or new strands of the Coronavirus can happen.[54] In addition, if the COVID 19 pandemic taught citizens of the globe anything it is that individuals should be prepared to adapt to unexpected large-scale changes. Educators need to be prepared on how to best address students' academic needs while also addressing the social and emotional challenges caused by dramatic change and/or everyday life. Resiliency as well as other related non-cognitive characteristics have proven effective in helping individuals overcome challenges. Teachers who recognize the power of resiliency can work to enhance their own levels of the trait while modeling their own social and emotional competence for students. In doing so, teachers will have what it takes to build relationships with students and begin a journey of social and emotional teaching and learning that has the potential to change schools as we know them for the better.

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# SOCIAL PRESENCE, PSEUDO-PRESENCE, AND INTERACTIVITY IN ONLINE DESIGN STUDIOS

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## INTRODUCTION

The pandemic process compelled many educational institutions to apply online education during the quarantine. Therefore, design studios in practice-based disciplines such as architecture and industrial design have been adapted themselves in a limited time to become applicable for distance learning. However, current e-learning tools and applications provided an uninvited option for students: pseudo-presence during the online design studio classes. Students had the possibility to turn off their video-cameras and microphones to show their attendance and not to interact with the design studio at all. This study primarily investigates the pseudo-presence tendencies of the undergraduate architectural design students at Atilim University- Department of Architecture- in Turkey. Semi-structured interviews were carried out with 21 undergraduate design students and 5 design educators. The qualitative data was analyzed through students' pseudo-presence tendencies, social presence, and interaction levels due to a holistic perception of distance learning in the design studio.

### Online Design Studios during the Pandemic - Covid-19

In Turkey, it was the 16th of March that the educational institutions had been closed. Just in 2 weeks, Atilim University, like many other institutions, had to adapt their all-undergraduate programs into online distance education. Design studios are traditionally conducted through mixed methods based on the design educators' crits on students' projects during the weekly studio hours.[1] Therefore, design educators had to transform the physical and 3D studio environment into a digital- 2D environment to provide a new design studio environment as much as possible. In this order, the design educators learned and used several kinds of new tools and applications because of the emergency of the situation. "Zoom" platform has been one of the most preferred computer-mediated environments to create an online design studio.

The concept of an online design studio is not new. The first attempts of the remote collaboration were started in 1988- "the early virtual design studies"-.[2] An online design studio refers to a computer or web-based environment that provides a traditional design studio's requirements for the design process and the necessary communication level when its participants are not physically there.[3] Considering the mostly used studio design teaching method, which is formed by Donald Schön in 1983 – *reflection in action*-[4] the adaptation of traditional design studios into an online environment has become a challenge for design educators. The pandemic situation forced the design educators to focus on this

challenge in practice rather than just focusing on it, preferably as a research field. This process created chaos on so many levels, such as ensuring the students' presence during the online design studios.

### Social Presence and Pseudo-Presence in Online Design Studios

*Presence* can be defined as an individual's "experience of being" in an environment in terms of many different levels of perception, while the individual is not physically there.[5] On the other hand, *social presence* is developed for the first time to understand the impact of the media on people's communication.[6] There are several definitions and perspectives of social presence.[7] In the context of this study, *presence* can be described as "being there"[8], whereas *social presence* is defined as "being there together".[9] The reason for focusing on social presence in the online design studio is the significance of social presence in terms of its relation to interactivity between the students and the design educators. The interactivity in the design studio is essential to collaborate and communicate through the design crits.

Nevertheless, design students and educators may have experienced another level of presence during the zoom sessions – pseudo-presence-. The pseudo presence was used by Tanaka et al. in 2015 to describe users' feeling of interaction with an autonomous robot that fakes the presence of a remote operator.[10] Consideringly, "Zoom" and the similar platforms provide not only the possibility of being there together but also a possibility of faking our presence, which is also called as "pseudo-presence" in this study. Within the instant emergence of the online design studio since the beginning of the quarantine, students could turn off their video-cams and microphones, show their attendance, and not interact with the design studio at all. In this order, this study investigates the social presence, pseudo-presence tendencies, and interactivity of the undergraduate architectural design students simultaneously.

## METHOD

As a research method, semi-structured interviews were carried out with 21 undergraduate architectural design students and five design educators at Atilim University, Department of Architecture, in Turkey. The qualitative data was analyzed through students' social presence, pseudo-presence tendencies, and interaction levels during distance learning in the design studio. The students were mainly 3rd 4th-year students, and three educators were also in the 4th-year design studio. The other two design educators were in 1st year and 2nd-year design studios. Each interview lasted approximately 30 minutes, and they were all carried out through online Zoom sessions. Atilim University Research Ethics Committee had provided the necessary permissions, and all participants had been informed about the research process. The participants' approvals were taken by signing the form of consent. All the interview sessions were recorded and transcribed for analysis.

### Semi-Structured Interviews

The interviews were carried out with a total of 26 participants in four sets of questions according to their themes to understand the students' and educators' perspectives on online design studios during the pandemic. The first set of questions were prepared as a warming phase, and the following questions were asked to understand the participants' comparison of physical (face-to-face) and online design studio in general terms: "What did you miss most about the physical design studio?", "What are the best features of an online studio?" and "Do you have any memory that you could not forget about the online studio?" Next, the second set of open-ended questions were asked to reveal the behind the scenes when students turned off their cameras, and then it would be possible to understand the impact of pseudo-presence in the design studio. The students answered the following questions:

*"Why do you prefer to turn off your cam and microphone?"* and "If you ignored the studio while you were online, how did you spend this time?". In this phase, the design educators answered the different questions, which were *"How do you feel when your students turned off their cams?"* and *"How did this situation affect your performance?".* In the third phase, the questions were focused on the interaction by the e-learning tools; in this case, the tools were "Zoom platform" and "Moodle". Therefore, the first question was *"How was your first experience and adaptation process with Zoom and Moodle?"* that was explicitly asked to understand the user experience of the e-learning tools. All participants were then required to answer what they think about the interaction and critical environment during the online studio. In this phase, design educators answered an additional question about what strategies they followed to boost students' interactivity during the online design studio sessions. The final theme was the social presence, and the questions were asked on the communication between the students and the design educators during the online studio classes. The participants were asked to explain how their social interactions, dialogs, and self-expressions were changed in the online design studio compared to the physical design studio environment.

## RESULTS

The semi-structured interviews were transcribed and analyzed through the codes that hint at social presence, pseudo presence, and interactivity in the online design studio. The first phase of the interview questions provided a comprehensive perspective on the participants' perception about the distanced learning and teaching process from the beginning of the pandemic. Firstly, all students and educators emphasized that it was hard for the first time to adapt the online education. The reasons were mainly about the psychological impact of the pandemic. They were scared and lost their attention to the classes. Most of the students turned back their family houses and changed their lifestyles immediately. They had other responsibilities and many other things at home now to distract them. Also, educators mentioned that they had to care for their children and do housework, also work late at night because of the chaos that covid-19 leads. They had to adapt the whole program to online and focus on administrative works, too.

Another significant first impression on the online design studio was students' three dimensional (3D) thinking abilities. The students mostly stated that they couldn't have satisfactory 3D thinking because of a lack of modeling materials. However, they also noted that it was encouraging for them to learn and advance on programming skills. They were also glad that they didn't have to print their visuals and their cost-reducing impact. On the other hand, some emphasize that this situation may not be good if they were 2nd or 1st-year students.

### Pseudo-Presence

As the second part of the interview, the questions were focused on understanding students' pseudo presence tendencies, so the researcher asked them why they prefer turning off their cams during the classes. The answers were moderately similar. The first reaction to this question was that all students hated being obligated to keep their cameras turned on. But they said this situation happens in other theoretical classes, not in-studios. The most significant reason to prefer a turned off cam usage is the feel of being watched all the time. One of the students even referred to 1984, the dystopic novel of George Orwell, to make this point and said that *"I feel the big brother is with me all the time, and it's crazy!"*

Another reason for the turned off cameras is mostly related to female students. However, even male students mentioned this problem of their female friends: they worry about how they looked on the camera. They tend to watch themselves on the screen instead of focusing on the educators or their

friends. Hence, they feel more concentrated when they turned off their cameras. Not surprisingly, most of the students mentioned that they preferred turning off their cameras during the online studio because they live with their families now and do not want to open their private life to everyone. Sometimes other family members may visit their rooms suddenly or call them loudly, so they prefer cameras and microphones turned off. These findings show that the assumption of students' pseudo presence when they turned off their cameras is not correct. Students have several reasons to hide their presence even if they actively pay attention to the online design studios.

Another question asked them whether they have ever pretended to be online but not pay attention to the class and why? They have mainly three reasons for faking their presences, and they're all related to each other. The first one, they feel guilty if they do not attend an online class because everyone knows that they are at home and do not have anything else to do because of the quarantine. Therefore, even though they did not want to participate actively, they were online just in case. The second reason for pseudo presence was spending long hours in front of the computer and immobility. They sometimes turned off the cameras because they were eating something, having some coffee, or smoking. Some of them also mentioned that if they get bored sometimes, they preferred to watch something more interesting than a not engaging design performance of another student. Finally, the third reason was lack of sleep. They stated that they were working or trying to work all night for the next day's online design studio and present something to be appreciated by their professors. But then, they felt sleepy, and because they have an option like sleeping or resting in their bedroom, they surrendered the temptation of bed sometimes.

### Interactivity

The transcribed data analysis results in interactivity show that the online design studio environment is not as successful as the physical design studio environment. All students and also professors emphasized that they cannot sketch simultaneously and together. This situation decreases the interactivity during the design crits. Sketching on the Zoom platform has limits, and this kind of sketch does not have the designers' synergy and characteristics. Furthermore, the obligation to wait to speak up and miss the exciting moments to show self-expression was stated as a negative impact of an online design studio. The reason for this situation is that students and professors have to wait for their turns to talk to prevent noisy chaos during the video-conferencing process of the online design studio. To encourage interactivity in the online design studio, some professors try to motivate students by making jokes or longer greeting sessions at the beginning of the class. However, students may still feel passive and have trouble being connected with the online design studio environment. Most of the students also stated that they could not see their friends' working process like at the physical studio. According to the students' statements, this situation causes losing their motivation and ambition to study sometimes.

In the view of design educators, another significant factor that decreases the interactivity of online design studios is the difference between the size of the screen share area and the size of the speakers' images (*Figure 12*). Design studios are not only places to share design projects but also an environment to share their personalities and socialize with other students and professors. Sometimes students see the professors as their mentors, and professors also value the emotional bonds between them and students. However, the Zoom screen minimizes the personalities and spotlights the projects during the design crits.

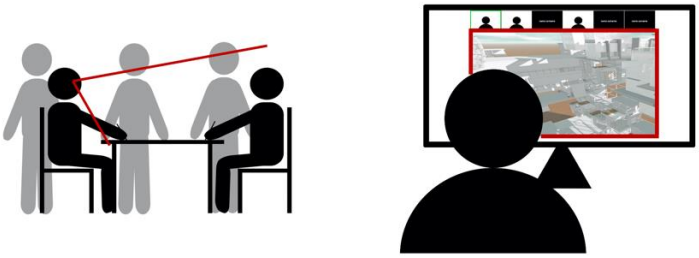

*Figure 12. Zoom minimizes the people and spotlights the projects during the online desk crits.*

### Social Presence

Decreasing in interactivity affects the social presence of the students, consequently. Students cannot express their characteristics during the zoom sessions by not having much chance to participate in discussions. The raising hand options increase the formality and seriousness, so they mostly save their feelings, jokes, and comments for themselves. Consideringly, students, also not able to criticize each other's projects neither. On the other hand, students stated that they could listen and watched the other projects by paying more attention than the physical design studio. Some of them emphasized that they had different WhatsApp groups, including only their close friends to talk and criticize each other's projects. Nevertheless, they also stated that it did not provide the similar satisfaction and synergy of being face-to-face comparing to a physical design studio. Besides, the online studio hours may get longer because design educators try to express themselves repetitively, and this situation may become exhaustive for everyone.

Most of the students stated that they missed studying together at the studio all night till the morning. Still, considering the current circumstances, they thought WhatsApp groups with the all-studio members, including the professors and Moodle classes- which they informed about the updates and resources- gave them a sense of belonging in a digital community and increase their bounding with the studio.

## CONCLUDING REMARKS

The results showed the current usage of "Zoom" as a computer-based medium has limitations to sustain an interactive and constructivist learning environment for architectural design education. The study emphasized that a low-level constructivist approach has a negative impact on students' commitment and social presence in the studio environment. Accordingly, the instructive learning environment decreased the interaction levels of the students and the design educators. Once again, it is approved that the dialog and the emotional connection between students and design educators are the most valuable feature of an effective online design studio similar to a traditional design studio.

In conclusion, this research stated that distance education for design studios requires more student-centered practice and e-learning tools. Thus, it would be possible to achieve interaction between the students and the design educators to encourage social presence. Architectural design educators should be looking for new ways of strengthening the relationship between them and students. Also, design educators should adapt the course requirements and communication approaches into the online design studio environment.

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# IMPROVING THE ENTREPRENEURIAL CAPACITY OF ART & DESIGN STUDENTS THROUGH PROBLEM-BASED CURRICULA AND MULTI-DISCIPLINARY PRACTICE. THE ARTS AND HUMANITIES ENTREPRENEURSHIP HUBS PROJECT PILOT AT THE UNIVERSITY OF WALES TRINITY SAINT DAVID (UWTSD)

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## INTRODUCTION

This paper unpicks the tensions and synergies that underpin the interplay of entrepreneurship education and Art & Design in HEI and demonstrates how these are addressed by the Arts and Humanities Entrepreneurship Hubs project (AHEH).

AHEH is a 3-year initiative co-funded by the Erasmus+ programme of the European Union. AHEH aims to improve the long-term prospects of Arts & Humanities graduates, equipping them with the tools and confidence they need to succeed as well as promoting the benefits of an educational entrepreneurial provision for undergraduates in Art & Design. AHEH is a pan-European project bringing together the worlds of Academia and Business to jointly research, design, test and disseminate a programme of entrepreneurial training for Arts and Humanities staff and students.

The paper reflects on a level 5 professional practice module at Swansea College of Art, UWTSD, which disseminated training content developed by the AHEH project at a national level.

Swansea College of Art's Art & Design provision has retained a strong emphasis on integrating practice-based and vocational skills with academic enquiry. At the time of the AHEH national pilot, the faculty of Art & Design consisted of three city-based campuses with subject areas that include Fine Art, Stained Glass, Film and Media, Games Design, Automotive Design, photography in the Arts and documentary photography

## THE CONTEXT OF ART & DESIGN AND ENTRENEURSHIP EDUCATION

The AHEH initiative was developed to address the underlying assumption that there is an identified need to extend the entrepreneurial and enterprise training for Arts & Humanities students in HEIs.[1] This is designed to help address inequality in graduate prospects where those from the creative industries are routinely disadvantaged in terms of employability and income, as indicated by employment and earnings research and statistics.[2] A recent report by the Institute for Fiscal Studies[3] reported that:

"…. lifetime returns for women are close to zero on average for creative arts and languages graduates, but more than £250k for law, economics or medicine. Men studying creative arts have negative financial returns, while men studying medicine or economics have average returns of more than half a million pounds"[4]

The Deus Report (2020) demonstrates that this trend is prevalent across Europe.[5]

Current HE priorities necessitate the development of autonomous artistic practice supported by teaching and learning provisions that explore the vocational and entrepreneurial potential of Art & Design education. The introduction of tuition fees by UK Universities in 1998 has resulted in a sharper and sustained interest in the student cohort in how their arts education will prepare them for their future careers, as reflected in media reports, and university league tables.[6] At a time when there is this emerging emphasis in Universities from the primacy of philosophical enquiry towards a more holistic education that develops and supports the employability of students, this research is timely. There is a growing recognition of the importance of creativity – a skill in which Arts and Humanities students specialize – to the labour market as a driver of future prosperity.[7] There is huge scope for creative graduates to develop skills specific to business start-ups and new enterprise. The creative industries federation reports that prior to the COVID -19 pandemic, the UK's creative sector was growing at five times the rate of the wider economy, employing over 2 million people and contributing £111.7 billion to the economy; a higher revenue than the automotive, aerospace, life sciences and oil and gas industries combined.[8] Despite this, salaries for graduates working in the creative and cultural industries are generally lower than in other sectors and many jobs are often neither full-time nor permanent.[9] The current consequences of the COVID-19 pandemic on employment and graduate prospects have been devastating and the creative arts sector has been especially hard hit.[10] This is reflected in a 2016 statement from the European Commission which is especially pertinent today: "Especially in times of financial crisis, entrepreneurship is one way to avoid unemployment or work-related frustration while supporting personal development and offering a means of self-fulfillment"[11]. The need to develop entrepreneurial competencies in undergraduates is understood by other educational sectors and entrepreneurship is reported to be one of the fastest growing fields of education across the globe.[12] The European Commission has published its own EntreComp framework for entrepreneurship to help address EU-wide skills shortages[13]. It lists 15 competencies, which can be used to structure learning curriculums and foster entrepreneurship. An understanding of, and grounding in, entrepreneurial competencies, as identified by the comprehensive EntreComp report[14] are necessary for Arts & Humanities graduates to gain employment as freelancers or to help them become self-employed if they aim to make a living from their practice. Despite this, there remains reluctance from the Arts and Humanities Education sector to fully engage with the fields of entrepreneurial education[15]with only 14% of current Arts and Humanities students who participated in a pan European sample group claimed they had had taken part in entrepreneurial workshops or training courses as a component of their studies. [16]

Questioning this lack of provision, the AHEH research report indicates that negative attitudes to entrepreneurialism in the educational framework of Arts &Humanities HEIs are linked to and fuelled by a disassociation from entrepreneurship in undergraduates, with arts and humanities students not considering entrepreneurship as relevant to their interests and fields of study.[17] Statistics show that while undergraduates typically underestimate the relevance of enterprise skills, the importance of this area is more valued once students have graduated.[18] Blackwall and Harvey, reviewing the careers of British artists and designers observed that 'the single biggest area that was regarded as absent from courses was the link to the 'business' or 'real' world', with calls to provide students with business

skills'. Where such education was provided, students did not welcome it during their studies, but upon graduation they wished they had embraced the offering.[19]

Without intervention, negative attitudes to entrepreneurship in students and institutional structures can be self-perpetuating, with one UK lecturer commenting; "The attitudes of some academics also presented barriers due to the belief that students did not want to set up their own businesses. Since then, their acceptance has increased."[20] A lack of knowledge from academics about aligning their subject expertise with wider industry and sector need, as well as a lack of recognition by businesses of the wider benefits and skill sets of CCI graduates[21] can be addressed by that delivering strategies to develop entrepreneurial skills can increase staff and student engagement, while collaborating with external partners can help potential employers recognise and value graduate capabilities.

The association of entrepreneurship as a field primarily concerned with the development of consumer culture is underpinned by the origin, development and embedding of entrepreneurship education in the business sector.[22] A perceived dichotomy between commerciality and art is compounded by the customary and continued practice of Art and Design gradates pursuing 'portfolio careers' where gaining employment unrelated to their art specialisms is viewed as a means to generate income to support independent and unrelated artistic development.[23]Students who view entrepreneurship as aligned to consumerism and/or divergent from their creativity are subsequently less likely to consider setting up their own business. Entrepreneurial training strategies designed to incentivized financial gain, sit uneasily with the philosophically and politically driven liberal arts.[24]

The AHEH project highlights that entrepreneurial training strategies developed by business schools cannot be viewed as one size fits all and need to be adapted and changed to be relevant and useful for arts and humanities students. The view that entrepreneurial competences simply need to be imported into arts education is a premise has been challenged by current research, which suggests that the development of an entrepreneurial curricula would benefit from a symbiotic relationship between art and business sectors with arts education providing insights and good practice of benefit to the business sector.[25] Moreover there are similarities that underpin entrepreneurship and arts education. Both are fundamentally concerned with creation and creativity and, abet for different purposes, both seek out that which is new and different.[26]

While negativity and lack of provision needs to be acknowledged and addressed, as the conclusion of the AHEH report summarizes it is also helpful to understand that perceived negative attitudes to business start-ups is somewhat contradicted by the number of University projects and initiatives that offer entrepreneurial support provided. Case studies collated by the AHEH project, demonstrate different ways that Further Education Colleges and HEIs have acknowledged and taken a proactive response to developing these skills in their students.[27]

The pilot at UWTSD focused specifically on delivery of entrepreneurial education to Art & Design undergraduates, where the field of Art & Design encompasses a wide range of subject specific departments. Students from each department and course develop particularized skillsets and may also have differentiated experiences of and attitudes to collaborative practice and entrepreneurship. Perceived dichotomies of art and business are disrupted by courses such as advertising, product design and surface pattern that are easily aligned with fields of business, commerce and consumerism and are experienced in integrating business partnerships, live briefs and industry mentoring into curriculum delivery. Other courses differentiate in the integration of entrepreneurial skills, delivering these skills through subject related professional practice modules. The RIES department at UWTSD offers centralized academic and student support for enterprise skills and start up offering a wide range of extra curricular and personalized entrepreneurial provision including the well attended activities for Global Entrepreneurship Week with activities tailored for art & design students.

## PLANNING AND DELIVERING AN ARTS AND HUMANITIES ENTREPRENEURIAL TRAINING PROGRAMME

The AHEH project has developed a body of resources that directly and specifically address the needs and interest of arts and humanities students. Student voices, including feedback from current students and graduates from across the European regions who identified and articulated their training needs was crucial in the development of this initiative. Student feedback gathered in questionnaires and during face to face cultural exchanges and pilot testing, highlighted "Working with others", "Planning and management" and "learning through experience" as the most vital of competencies to be developed in an academic context and expressed a clear preference for these competencies to be incorporated into current academic courses.[28] This is incorporated into the AHEH training provision which is populated around the following delivery framework:

1: Initiation and Ideation
2: Creative Project Planning
3: Intellectual Property and Strategy for Cultural Professionals
4: Pitch and Communication
5: Presentation Day

This 5-day training programme progressively develops participants' responses to a selected challenge culminating in a pitched presentation proposal. Content and supporting resources, developed and collated by educationalists and business partners align with the interests and experiences of A&H students and help bridge the gap between education and enterprise, employability and entrepreneurship.[29]

Reflection on the UK national pilot of the AHEH training project at Swansea College of Art, UWTSD, allows an insight into how the AHEH research relates to the context of Art & Design undergraduate study at an established UK HEI.

Delivered as a five-day training programme, the UK AHEH pilot training programme was integrated into the curricula at SCA, UWTSD in September 2019, forming stage 1 of an innovative level 5 Professional Practice module. This differentiated from previous provision as it was delivered to the entire second year undergraduate cohort at SCA, UWTSD. The 200 participating students came from a wide range of subject specific areas, including but not limited to Fine Art, Photography, Illustration, Surface Pattern. Automotive and transport design, project design and computer games design. Logistically the delivery of the programme involved dividing the student cohort into smaller groups of 50 and running the programme simultaneously across four of the Universities city campuses.

Using the framework of a problem based curricula students were presented with a series of 'challenges' to respond to and were placed into inter-disciplinary collaborative teams. The 'challenge films' were posed by a range of inter-disciplinary external contributors related to the creative industries, including the worlds of Film and TV; theatre and performance; a European Cultural Capital; a Health Board; Furniture design and manufacture; Arts organisations; a Housing association; European academics; independent artists; policy-makers; and the third-sector (charities). These open-ended 'challenges' were designed to be a 'hook' on which the inter-disciplinary student teams could hang their project ideas and enabled students to respond in a variety of ways and to consider issues related to the social and cultural contexts of their urban infrastructure, while affording the opportunity to reflect on the benefits of participatory learning and interdisciplinary collaboration. It was envisaged that outcomes developed by the student teams could be campaign based, a service, an event (festival, exhibition) or a product/artefact. Similarly, it was intended that the outcomes could be cultural, social or commercial depending on the motivations and personal values held by student participants.[30]

To support their response to their chosen challenge, the student teams were introduced to a wide-range of subjects and skills-development including team-building; ideation; marketing communication and social media; the art (and science) of pitching; funding; IP; budgeting and costing; understanding different types of enterprises; as well as all aspects of project planning. UWTSD lecturers, visiting lecturers and representatives from funding bodies, practicing artists and designers and creative industry entrepreneurs, delivered this content.

The project culminated in a 'live pitch' event, where student teams presented their project idea, outlining its relevance, feasibility and value, to their peers and to selected academic and industry based mentors. Projects proposal included a skills-sharing project that facilitated cross-generational collaboration and sustainable solutions to festival waste.

## REFLECTING ON THE DELIVERY OF THE AHEH TRAINING PROGRAMME AT UWTSD

The evaluation of the module, in the context of this paper focuses on the results of the pilot in relation to its aim of improving the entrepreneurial capacity of Art & Design students with particular reference to entrepreneurial competencies identified by the EntreComp framework and strategies identified in the AHEH literature review The module afforded students the opportunity of working out how to 'do' business in the context of solving real business problems used a Participatory learning strategy, identified by AHEH as an ideal model for practice based art and design students incompliance with the EntreComp categorisation of *Learning through experience* as an entrepreneurial competency in its own right. For students, the support and involvement of University lecturers underpinned the legitimacy and relevance of the training while the staff contribution enhanced the training provision, and helped align the training to academic pedagogy embedding it into the curricula in the framework of a compulsory assessed module. Alison Franks, Lecturer in Performing Arts, Swansea College of Art, UWTSD, explained the value of the module to her students; "We know the importance of our students being fully prepared for the creative industries. Our new professional practice modules are seminal to students' development as it empowers and enables them to discover their own agency as artists, collaborators and project leaders, giving them the opportunities to build confidence, resilience and have their voices heard as emerging artists in an exciting, yet competitive sector."[31]

As expected the Art & Design students were confident and efficient in the EntreComp competencies of *Spotting opportunities, creativity and vision*. The Ideation session produced a surplus of creative and imaginative ideas related to and addressing problems posed. The inherent value of training programme for practice orientated undergraduates an opportunities strand was to give them the tools and confidence to put their concepts into action and, in relation to the EntreComp framework in helping them move from towards an advanced application of these skills. For example, in relation to creativity, students demonstrated a development from the foundation ability to develop multiple ideas to create value for others, to the advanced capability of transforming ideas into solutions that create value for others.

The opportunity to network and to work with students from different courses, to copy, adopt/assimilate and develop ideas from within their communities of practice was one of the most immediately valued outcomes of the AHEH pilot voiced by the students involved. Written comments submitted as formative feedback and at the projects conclusion and discussions with mentors during the sessions included comments such as, [It has been] "a great chance to meet new people, network [and] widen knowledge", "Good to work with students from different majors [leading to a) variety of viewpoints, designs, ideas etc." In alignment with the EntreComp report, teaming up and working with others provided a basis for students to understand their strengths and compensate for their weaknesses. In some instances this exceeded the module outcomes with some students forming

friendship and professional relationships they intended to develop through collaborative projects based on identified shared interest later in the academic year. This outcome is invaluable for developing entrepreneurial possibilities, as the AHEH research reports notes that "Across the examples provided by the AHEH partners' networking is the most widely disseminated single strategy for encouraging and facilitating entrepreneurial growth".[32] The projects offered new spaces for cooperation with the business sector and helped develop a more personalised and invested relationship between the business partners mentors and students.

In our introduction we stated that current entrepreneurial education is more customarily delivered by business courses and is typically related primarily to entrepreneurship as wealth creation.[33] While some of the projects designed by the students in response to the problems posed, had the potential to be commercially profitable and all had to plan for economic sustainability, nearly all proposals were designed by the students to be structured as a charity or not for profit organisation. The one student group who proposed a commercial outcome had lengthy discussions and disagreements on whether profit making was desirable or detrimental to the proposals aims. EntreComp clarifies that entrepreneurial initiatives can also encompass projects that are socially or community driven[34] and in many of the presentations it was evident that the students' challenges they selected related to their politicised ideals and gave them an ownership of and affiliation to the responses they developed. At the pitch stage this made for convincing deliveries with many meting meeting the EntreComp competencies of mobilizing others, at an advanced level, able to inspire others and get them on board for value-creating activities with some business mentors offering extra curricular follow on opportunities for students. The pilot a reiterated the growing understanding that there is as much, if not more value to entrepreneurship learning from the arts as there is in the arts adapting business orientated entrepreneurial training.[35] Business mentors involved in the project's delivery were impressed by the empathetic and creative responses of the art students to real world problems and both business mentors and art and design students benefited from the experience, finding areas of common ground and divergent thinking that fostered creativity. Kathryn and Andy Penaluna recently identified how Business education can learn from pedagogical models such as the 'crit' used in Art and Design education and this pilot suggested that the relationship between art and business can benefit from a less dichotomist, more symbiotic and dialogue based relationship for the benefit of both parties[36].

## CONCLUSION

There is a need to address shortcomings in the provision of entrepreneurial education in Art and Humanities in Higher Education. The contribution of the AHEH project in supporting this aim is demonstrated by the national pilot of its entrepreneurial training initiative at Swansea College of Art UWTSD where training materials and delivery were tailored to the needs and interests of Art &Design students. The newly developed professional development module run in September 2019 fore-fronted the interest of art and design students in applying entrepreneurial strategies to the identification and development of social enterprises and/or not-for-profit community initiatives. The pilot programme demonstrated how conceptual and creative thinking, central skills developed through art and design education, are core to the development of entrepreneurial competencies. Results showed that facilitating projects that have the potential to extend student's philosophical or political values can help art and design students realise the value and interest of entrepreneurial training while resulting in project proposals that demonstrate real world value and purpose.

The project demonstrates how perceived dichotomies between the arts and entrepreneurship or arts and business can be questioned, addressed and dismantled through this kind of tailored subject specific enterprise education initiative.

## NOTES

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# LEARNING BY DESIGN: HOW THE DESIGN STUDIO CAN RECONCILE TEACHING, LEARNING AND RESEARCH

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## INTRODUCTION

As design researchers and design teachers, we often experience a tension of time and resource between doing research and doing teaching. Following the practice-based pedagogy of the design studio we see a potential for reconciling this conflict for a mutually beneficial outcome. In this paper we use practice-oriented concepts to reframe teaching, learning, and researching design as activities that can to varying extent be done in overlapping spaces – mutually and collaboratively between students who learn and teachers who do research. We investigate our activities through the lens of Frayling's approaches to design research, that distinguish doing research "through" design, doing research "into" design, and doing research "for" design [1]. With this theoretical frame looking at teaching and research practice in design, we discover a varying distance between the activities of students/learners and teachers/researchers, revealing potentially overlapping spaces of learning and research.

In our design research project, Reconfiguring Artefacts, we had the opportunity to explore doing design research during teaching in the design studio. We, the authors, co-teach in three design studios of the 3-year Bachelor degree program Management by Design (MxD) at the New Design University in Sankt Pölten, Austria. Design Studio II is a module for 1st year students, Design Studio IV is for 2nd year students, and Design Studio VI is for 3rd year students. We will examine the three cases of the design studio, and we will talk about ourselves as "the teachers/researchers". The aim of the research project was to explore materiality in design activity and how design artefacts reconfigure the ways we design. We invited design practitioners from the industry and other design researchers to teach and research alongside us.

## REFRAMING LEARNING / TEACHING / RESEARCHING DESIGN

Knowledge is understood to be shared within a professional community [2], and it is represented in texts that can be 'taught' and 'learned'. Traditionally, new knowledge (and representing texts) can be created through 'research'. As design teachers and researchers, we experience a conflict of time and resource between doing teaching and doing research. A core issue to our experienced conflict is the understanding of knowledge as an invisible substance accumulated as theory, mainly by mental activity, that needs to be represented in texts, and can later be applied through practice. This understanding of knowledge requires a separation of researching and teaching. In this understanding, as researchers we need to produce 'new' knowledge through research activities, and represent this

new knowledge in texts and other artefacts. As teachers we are understood to be familiar with these representations of knowledge, which we then need to prepare for teaching and pass on to the students, so they may acquire this knowledge. There is a gap between the representations of knowledge (in research) and the actual knowledge (in teaching). This effects a distance between the activities of researching and teaching/learning, as these activities are carried out in different spaces. For our investigation in this paper we want to reframe knowledge as a practical activity according to theories of practice [3–8]. If knowing is understood as participating in practical activity, and as taking place in practice [9], then both learning and researching are practical. This view undoes the split between theory and practice, creating an overlapping space for practicing and researching. Gaining new knowledge – whether as students or as researchers – is done in practical activity.

As designers in academia we further experience a conceptual issue between being design practitioners, rooted with our knowledge in practice, and being design academics, dealing with theory and the necessity to abstract our doing. Design practice has a long tradition in knowing through material practice [10], and many design research projects are practice-based [11]. Tension is caused in the differentiation between theoretical knowledge (represented in texts) and practical knowledge (experienced in doing), understanding these to be different types of knowledge. The gap is for design insurmountable, with design practice suffering from being disconnected from academic knowledge [12–14]. A potential reconciliation can take place in understanding knowledge as a reflective practice, where knowing is developed through reflection-in-action [15]. Schön describes the designer's moves with the materials to create unexpected situations which require evaluation and generate new insight each time [15]. In reflective practice, knowledge contains both elements: Firstly, practical doing, with the potential to becoming more competent, and secondly, abstract reflection, with a potential to develop theory and texts.

In seminal work on creating knowledge in design practice, Frayling [1] differentiates various approaches to design research (p. 5). He describes "**research into art and design**" as comprising "historical research", "aesthetic or perceptual research" as well as "research into a variety of theoretical perspectives" on the practice (ibid). It is "straightforward" as there are "countless models […] from which to derive its rules and procedures" (ibid). In "**research through art and design**" he delineates design practice as the methodology that creates the knowledge, which is "being achieved and communicated through the activities of art, craft or design" (ibid). Examples are "materials research", "development work" such as customizing technology, and "action research" where processes of doing and reflecting iterate upon themselves (ibid). "**Research for art and design**" is about "gathering of reference materials", where knowledge is embodied in the artefact and communicable in a "visual, iconic or imagistic" sense.

These approaches to research assume different positions for the researcher and for the object of research, which in our case is design practice (the design studio). Frayling's approaches inspire us to interpret these as the varying distances of the spaces of researching and teaching (in the design studio). "Into" assumes that the researcher takes up a position outside of the research object, gaining knowledge by looking from outside 'into' aspects of design practice, and producing texts about the research outside of the design practice. "For" assumes that the researcher is inside of the research object of design practice, developing knowledge inside of practicing design, but only producing artefacts that embody the knowledge, and not texts, inside the practice. "Through" assumes that the researcher is both inside and outside of the research object, developing knowledge in practice and upon reflection on practice. We will superimpose these lenses onto our experiences in the design studios, and reflect on how they allow us to a varying extent to overlap the practices of teaching, learning, and researching design.

## EXPLORING DIFFERENT APPROACHES TO RESEARCH IN DESIGN

We investigated our research question in each design studio through a different approach. Our research question was, “How do we design with materials and how do these materials in turn (re)configure our designing?”.

### Design Studio II – using the lens of ‘research into art and design’

*Topic*: The students design hybrid (real/virtual) solutions for shopping, learning, and socializing during the Coronavirus pandemic.

*Lens*: Research into art and design

*Research process*: In Design Studio II, the youngest MxD cohort, the teachers/researchers researched the students’ use of an artefact (a template). The template was developed to support the students in learning design. The aim of the research was to find out how it was taken up in design practice. In the research, a particular focus was on the students’ strategies of iteration and reflection upon each move in conceiving a design solution, so that the template could be adjusted.

*Knowledge*: The teachers/researchers received insights into how the design process and template worked, and how it guided and configured the students’ activities. Through the knowledge they gained, they were able to adjust and fine-tune the template used. The students benefitted from the close guidance in the design process, which the template provided. The template used in this studio had been created originally from knowledge gained in a different studio with different students. This objectified knowledge, as an artefact, had, been put to the test with the students, and small iterations were made.

*Reflection*: This approach did allow the teachers/researchers insights into how the template and process were used, how it influenced the students’ activities, and it allowed the teachers to refine their template. However, they had to do most of the work of reflecting upon the use of the template, and changing the template, outside of the studio. This approach created a secure environment for the students to learn a pre-established process, but the position of students and the positions of teachers/researchers was far apart. From their ‘outside’ positions as researchers, the teachers/researchers were able to do research ‘into’ design practice in the studio. The activities of researching design and teaching design were here separated, and required a moving between different spaces for the teachers/researchers. As most of the research work needed to be done outside of the studio, resources were required for both, teaching and researching activities.

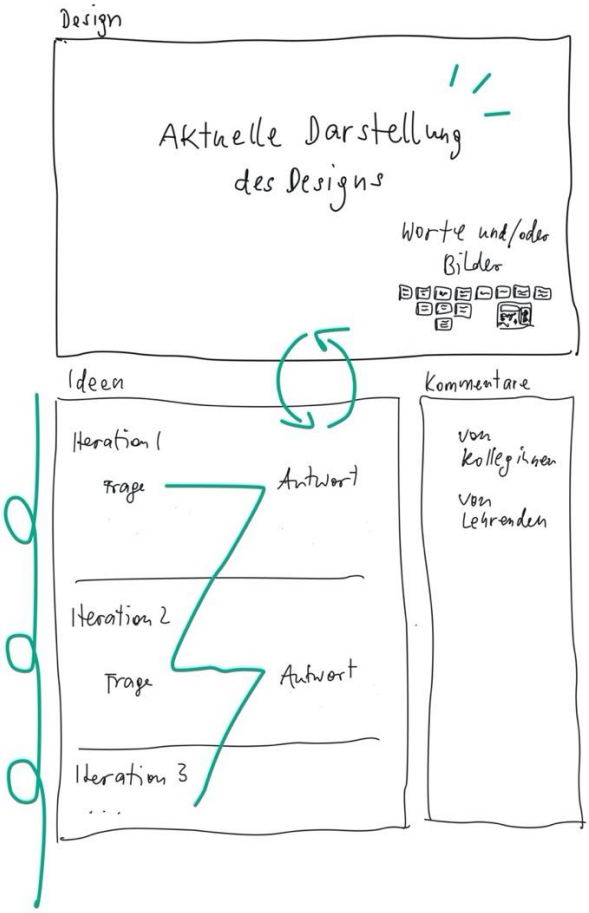


*Figure 13. A schematic display of the template, developed by the design teachers/researchers and given to the students in the design studio, prescribing iteration through steps of move and reflection*

**Design Studio IV – using the lens of 'research for art and design'**

*Topic*: The students designed a sustainable clothing solution for Uni merchandise

*Lens*: Research for art and design

*Research process*: The teachers/researchers investigated together with the students and with design practitioners the different methods of design thinking. Design practitioners joined in the workshops and in live video engagements and discussions during some days, giving the students and teachers/researchers insights about their methods of design thinking practice (e.g., design thinking in service design, empathy maps, user story mapping, and crazy eights [16–18]). In particular, user story mapping was introduced to them as a useful tool for creating an overview and the "whole picture" and a "mutual understanding" of the problem and the solution [16]. The focus was on getting to know the methods that could be used to gather materials and information for the design.

*Knowledge*: As researchers, we wanted to explore the materiality of methods used in design thinking practice. We asked the students to use user story mapping 'for' researching the information and materials they needed to design their solution. With this method, the students developed insights into the use, design and production processes of clothing, supported by teachers/researchers and design practitioners. For the students, the design knowledge was embodied in a user story map in Miro, a digital whiteboard application. The teachers/researchers participated in the studio class in facilitating

and teaching the method, but reflected outside of the studio class on the observed design activities, on the method, its materiality and its effects – what the map allowed and prohibited in its use.

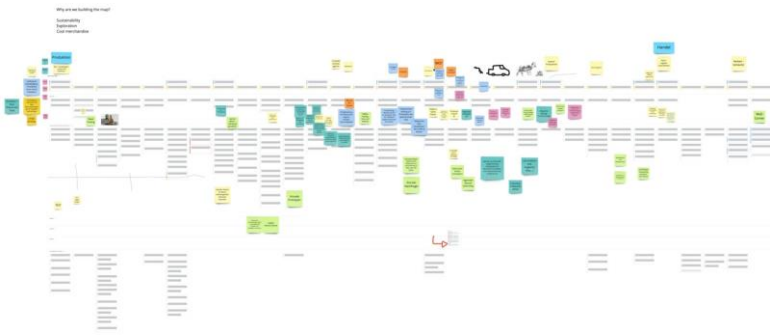

*Figure 14. The user story map containing the information and material gathered for the designs*

*Reflection*: Shortly after the studio started, we had to transition to distance learning, due to the Coronavirus pandemic. We continued the user story mapping online in Miro, instead of creating a physical map on the wall at the university. The unfamiliar technologies entailed a steep learning curve for all involved and we had to rearrange parts of the studio time table to accommodate the new format. These unusual circumstances soon prompted the students to critically reflect upon the method's usefulness in the light of the effort and labour it took them to generate it. The students also sought to renegotiate the time and task management, as they felt overwhelmed and disorientated by the timetable structure we had given to them. When this conflict emerged, we organized a special meeting to discuss the situation. The teachers/researchers had the idea to try out the mapping method for resolving the differences. We created another map – a time planning board – and through this activity we managed to create a shared understanding of the timetable structure and of the tasks that had to be accomplished. Simultaneously we reflected upon how the map can work for creating shared understanding. As it happened, we developed deeper knowledge upon mapping than expected. Initially, through mapping, the students and teachers/researchers gained the insights they needed for the design project, and the teachers/researchers reflected on this knowledge outside of the studio. Teaching/learning and research activities did hardly overlap. However, through the students' challenging of the method and time structure we had given them, a situation was created where a reflection was enforced in practice. This event caused the learning spaces for the teachers/researchers and for the students to overlap more than it normally would.

### Design Studio VI – using the lens of 'research through art and design'

*Topic*: We redesigned the design process – its physical spaces, its virtual spaces (and time), its manual tools, its digital tools.

*Lens*: Research through art and design

*Research process*: With the Design Studio VI, the most experienced student cohort, we used the research question in its original form: "How do we design with materials and how do these materials in turn (re)configure our designing?" We used practice-based design research, where the creation of knowledge takes place through a performative process of "make-it-to-see" [11]. The students were confronted with their own processes and materials in design, which they had used for years; they

investigated them, reflected on them, and improved them. Our process of designing was accompanied by continuous reflecting, writing and disseminating texts (on a blog, Instagram, Twitter, …)
*Knowledge*: New knowledge was generated in practice-based reflection on our virtual and physical architectures, our virtual and physical tools, and most importantly in how they flow together in a process of design. We developed a new design process, and we developed new physical and virtual tools and templates. The knowledge was embodied in the artefacts and in the reflecting texts that were created and published.
*Reflection*: Research/teaching took place in the design studio by creating a practice of iterative doing and reflecting, thus alternating the being 'inside' the practice, and taking a step back 'outside' of the practice to reflect. As teachers/researchers, we were located in the same space with the students. Resources for research and for teaching therefore mostly overlapped here. The work in this studio created an unusual situation for the students. For the students it was unusual to make the design process itself the object of design. The position of being a researcher – the not knowing, but still counting as experienced – was an unfamiliar (and at times uncomfortable) situation for the students. Here, more could have been be done to explain the processes of researching more formally, and discussing the different concepts, such as 'practice-based design research' and 'research through design'.

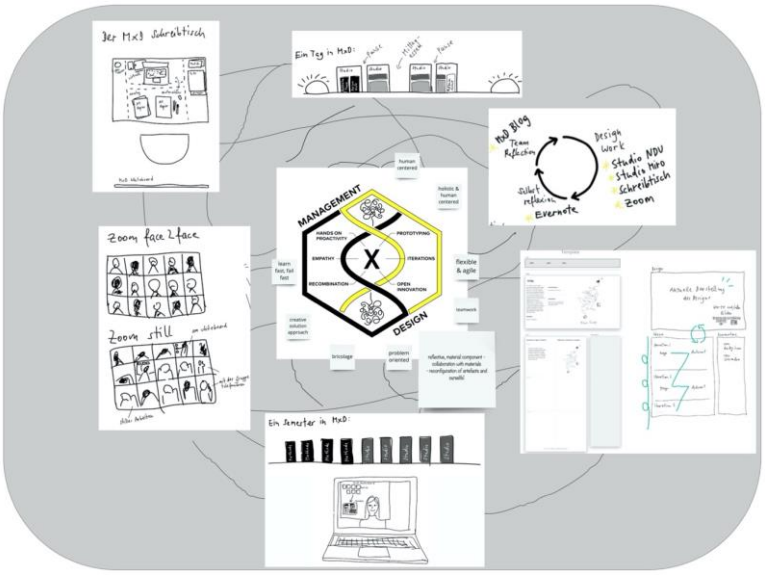


*Figure 15. Designing the MxD design process - design research by students and teachers*

## DISCUSSION: WHAT THE RETHINKING OF LEARNING ENABLES

Applying different lenses of design research onto the design studio, we discover varyingly overlapping spaces of teaching/learning and researching. In Studio II the teachers/researchers conducted research into the practice as outsiders to their object of research. As the students learned the method, they gained knowledge on the method and they became competent. This learning process was insightful for the teachers/researchers to observe, but it gave them not much room to overlap their teaching and researching activities. In Studio IV, teachers/researchers and students participated in applying the method of user story mapping to gather information and materials on clothing practices. Although the teachers/researchers were able to gain knowledge in practice, they needed to reflect on this knowledge outside of the studio. They were able to do some of this research work inside the

studio, when the students began to disrupt the teaching concept and began to critically reflect on the method. However, there was a limited capacity to overlap spaces of teaching and researching. In Studio VI the most efficient overlapping of learning space occurred. The teachers/researchers and students were researching and learning together. They were collectively participating in the reflection on their practice, which was destabilising on the one hand, but on the other maximised the learning potential for all involved. Conceptualising knowledge as a participation in practice and a reflecting on the methods and environments used, can reconcile learning and research both as learning practices.
Being within mutual spaces of learning allows a reconciliation between learning in practice and gaining knowledge through research by doing both activities in the design studio. Reconceptualising learning and researching as learning in practice, where students and teachers/researchers learn in collaboration, makes research resource-effective, and it enriches the learning practices for students.

| **Design studio (semester)** | **Frayling's approaches to design research** | **Knowledge developed by students** | **Knowledge developed by researchers** | **Research and teaching activities take place in** |
|---|---|---|---|---|
| Studio II | Into | Inside | Outside | Separate spaces |
| Studio IV | For | Inside | Inside and outside | Partly overlapping spaces |
| Studio VI | Through | Inside and outside | Inside and outside | Overlapping spaces |

*Table 1. Spaces of knowledge in the different studios*

As a limitation, it should be said that mutual learning spaces may not always be helpful. It may be useful with inexperienced students to keep the research practice outside of the teaching practice. We saw a correlation between overlapping spaces of learning and a destabilising of the practice. Research activities caused instability. Students at the beginning of their studies may require stability as a guidance in learning. Instability may be more fruitful for experienced students who may be preparing for continuing studies that involve more research activities.

## CONCLUSION

We discover potentials for overlapping spaces of learning by understanding learning as something that can be done by students and by researchers in the design studio. The overlapping spaces of learning are greatest in doing "research through design", which we explored with the 3rd year design studio. It is resource-effective for teachers and researchers, it allows a fruitful and rewarding engagement with interesting learning/research topics, and we are able to develop ourselves and the design process through it. Although, increasing the potential of overlapping learning and researching also decreases stability of structures for learning, which can be challenging both for students and teachers. Although, as we saw when the students destabilised our studio practice on purpose through their critique, they created an improvement through this. The instability created through the research activity offered leverage points for innovation. To keep the positive effects of making structures negotiable, but to mitigate the negative effects of instability, the students might need to be better equipped with methodologies of research as a formal focus besides the design activities.

In this investigation, we see that with a varying distance between teaching/learning and research activities, the potential increases for the design studio to become an inspiring learning practice for both teachers/researchers and students. Understanding learning as a practice opens the design studio to both, teachers/researchers and students, as a program of ‘learning by design’.

**ACKNOWLEDGEMENTS**

We thank the students of Management by Design (MxD) for taking part in this research and sharing with us their experiences, thoughts and insights. This research was funded by the New Design University, Sankt Pölten, Austria.

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# SPECULATIONS ON AN URBAN DESIGN PEDAGOGICAL TOOLBOX FOR POSTCOLONIAL NETWORK CITIES

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## INTRODUCTION

During the covid lockdown, a sociologist, an urban planner and an architect, all architecture and design educators, decided to use this, extraordinary to reflect on our pedagogical practices. We agreed that the place to revisit was the design studio, our closest allies being our students. We agreed that this is how it should be – working through design challenges, with students, working across disciples, within the studio framework.

We asked, the following three questions: What would teaching architecture look like in the global south in the ecologically hazardous, highly unequal future? How to empower students to understand the postcolonial city, that is already spatially marked by intersecting power configurations of caste, feudalism, and capitalism? How to empower students to critique, reflect and imagine the possibility of rupture of these apparatuses that continue to impinge upon the spatial present of these cities. And what theoretical and methodological tools will help us in this approach to teaching-learning-doing design?

We examined the above questions through the cases of two undergraduate architecture design studios projects separated by two years and four hundred kilometres in southern India. Both studios had forty students working with three faculty members each, and lasted about four months.

The first studio is located in Nedumangad, an old satellite town of Trivandrum city, the erstwhile royal capital – also today's capital of Kerala state, in south west India. Located at the foothills of the Western Ghats mountain ranges, this town was designed and settled in the late seventeenth century as a crucial trading post, and a gateway to ecological wealth of the Ghats. While the rise of the Modern Indian nation-state brought an end to the Princely state, the identity of this settler town as the extractive gateway into the resource-rich hills, remains.

The second studio is based in the fringe town of Vaniyambadi in Tamil Nadu state in south east India, that had at its core a tannery. A colonial apparatus that, with great tenacity, continued to reproduce both, the politics of extraction and caste inequalities, in its material and human practices.

Along with learning opportunities, both studios were conceptual speculations on immanent futures of the postcolonial city:

- (How) could these urban systems, born out of exploitation, be transformed into generative and empathetic habitats?

- What methodological strategies would such a conceptual commitment to ecological and ecosophic urbanism entail?
- What would an urban design project, that deliberately decentres the anthropocentric, look like?

A first step was to acknowledge that engaging with a postcolonial city must be an act of Archaeology in the Foucauldian tradition. In both cases, students were provided tools to delve into, and record, the material, formal, human, and ecological history of the city. They would find ways to uncover the histories of the factory and the frontier town as apparatuses of the extractive Modern colonial global commerce. It was imperative that the students themselves carry out this excavation, so that they can first, become aware of the sheer force of these levers of history; second, reflect upon and investigate the source of this power – particularly in their spatial manifestations, and third, design spatial interventions that offer the opportunity to make visible, engage with, and ultimately rupture these structures.

Another, and perhaps most critical theoretical move, was to re-embed the city as a historical formation *within* the natural world, drawing on Anne Whiston Sprin's ecological urbanism. Both projects, "take account of history...as source of formal precedent,"[1] to imagine urban forms that are resilient.

Reimagining the city as a diverse form that has within it many histories, these studios sought a framework to make sense *of*, design *with* and *in response to*, this diversity. Guattari's lens of Ecosophy, defined as an "ethico-political articulation between the three ecological registers, the environment, social relations and human subjectivity"[2] provided conceptual lens. Drawing on Guattari's faith in the power of the ethico-aesthetic to be a force of radical action, the rest of the paper outlines the pedagogical processes that speculate on designing humane cities for the future. What follows are detailed discussions of the two studio projects.

## CASE 1: NEDUMANGAD URBAN DESIGN STUDIO


*Figure 1. Nedumangad Town – a juxtaposition of old and new (Photograph by Roji Joseph, College of Architecture Trivandrum, 2019)*

The relationship between a power centre and its satellite cities and towns is marked by networks that deepen over time with the exchange and flows of human, intellectual and material resources and power. These distant relationships have realized geographical manifestations of shared heritage, lived infrastructures and ecological practices in generating human habitats over centuries. Since the seventeenth century both, the satellite town of Nedumangad and, the state capital of Trivandrum have shared histories of ecology, human relations, polity and economy generating and strengthening a multitude of exchanges. While Trivandrum, the capital city provides opportunities for work and education, Nedumangad maintains its centuries old status of being both, the gateway to, and the largest market of the coveted hill regions of the Western Ghats.

The Nedumangad urban design studio[3] for students of Semester Nine at College of Architecture Trivandrum (CAT) was a purposive attempt to break away from a traditional fragmented, and siloed approach to city planning and to look at the urban fabric as a living ecology. A city then is understood as a historic, dynamic site of the inter-relationship between different organisms in both, tangible and intangible forms. Drawing on Spirn's framework, "Ecological urbanism is critical to the future of the city and its design: It provides a framework for addressing challenges that threaten humanity…while fulfilling human needs for health, safety, welfare, meaning and delight"[4] the Studio Methodology assumed these three approaches:

1. A De-fragmented approach by evolving ecological network of interconnections
2. Role play as a disruptive, methodological tool with potentials to rupture and reprogram the city and to break away from its historical strains of both colonialism, and spatial inequalities.
3. Using dialogical interactive processes to evolve a future that values democratic placemaking and deliberate juxtaposition of power configurations towards narrating and generating the possibilities of urban phenomena.

A first step was for students to excavate a history of Nedumangad. Their collection of local oral histories revealed several layers of ecological extraction, displacement and caste-based colonization. The city owes its status as an ecological and military outpost to protectionist forces of the erstwhile Travancore kingdom in the late seventeeth century. Its military displaced the indigenous tribes, built inroads into the resource-rich Western Ghat hills, and reengineering water sources to feed the Capital city of Trivandrum further south.[5] (See Endnote 5 for a detailed history of this transformation). It was reduced into a node in the local and global supply chain of commodities.

The city was repopulated by various caste and community groups to serve the Crown, itself a node on the global colonial trade routes. This history continues to mark the city's present built form: The *Pazhavadi Agraharam* houses the descendants of upper caste *Hindu Brahmin*s brought in to serve Gods and to weave queen's clothing; The *Thattanpalayam* that houses the gold-smith community who were the Queen's jewellers; The Vellalar settlement occupies descendants of the agricultural settlers; *Ezhavar* and other communities considered untouchables were settled, and continue to be settle, in the city's periphery. Christian and the Muslim trading communities continue at the same settler sites . The *Pazhakutti* market established during the new city's founding became the fast-growing hub of all economic activity where all these communities conducted their exchange, except that the market principle stopped at the gates of older caste norms of purity and pollution: The lower castes were debarred from entering or trading within the market. With the waves of modernity and democracy in late nineteenth and early twentieth century, this marketplace would become a historic site for a massive grassroots anti-upper caste movement that sought equal trading rights for all.

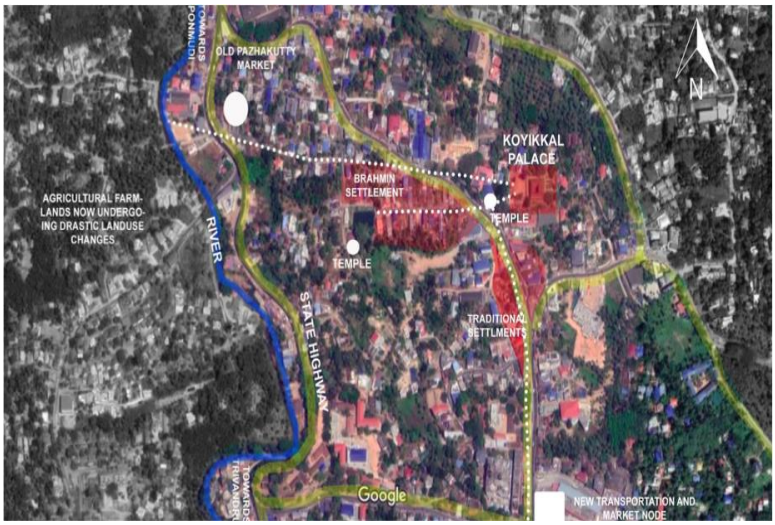


*Figure 2. Nedumangad Town and extent of study area*

Situated in this historic city, the studio methodology aimed at generating a space to critique and re-imagine spatiality for bodies to perform freely. The students through a continuous engagement with the people and the place, were encouraged to re-imagine the city form as an intricate network of human and non-human organisms that interact with one another generating networks of socio-spatial relationships. Students were mentored to deconstruct these relationships to uncover the historic, environmental and social perceptions, and to generate responses to reinterpret the historicity of the place. Divided into three teams of thirteen each, they were encouraged to introduce design as a deliberate force to critique the deeply embedded *lines of power* on the ground. A methodological move to initiate this process was Role Play: The students, played the role of spatial agents who would inquire into and identify drivers of the city form. The tutors assumed the role of the local self-government and the three student groups were invited to perform the role of *development agencies*. The groups were "awarded" "projects" to demonstrate their vision and structure for the future of Nedumangad. The three projects were: first, an urban water management institute along the river *Killiyar* – an inquiry rooted in the ecological networks of the city, with water as a driver of growth and stability; second, the Nedumangad Commercial Centre along the State Highway- an inquiry into the nature of linkage between the market, power and city's self-image, and to challenge the established iconographies ridden with communal politics; and third, a Western Ghats Interpretation Centre adjoining the Brahmin settlement – a discursive tool to disrupt the strict caste boundaries, re-invoking the lost ecological linkages back to the history of 'people of the land'. These three projects would demonstrate a reinterpretation of the city, actively unpacking its history, and offering their own narratives of a network town sharing close social, economic and ecological linkages to the *Parent city* of Trivandrum.

For the purpose of this paper we outline three student imaginations of the Interpretation Centre model

**Model 1**

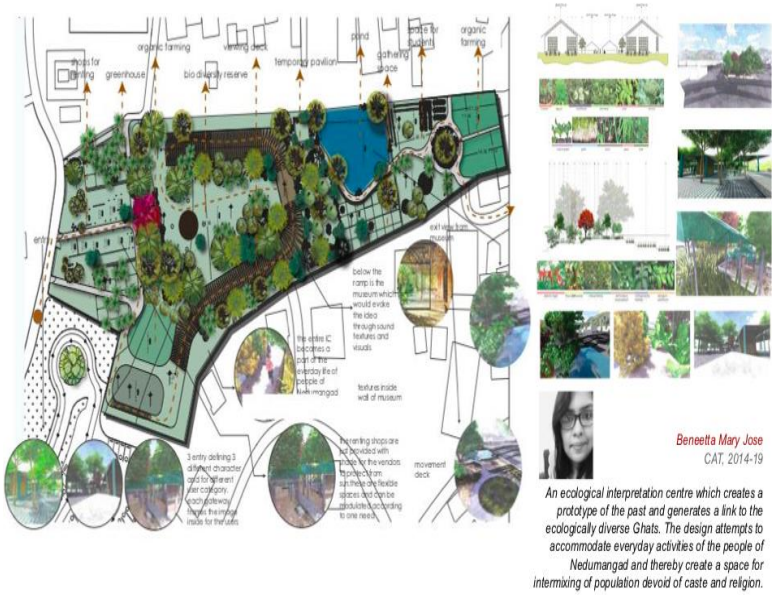


*Figure 3. Design exploration, Beneetta Mary Jose (Source, CAT, 2019)*

For Benetta Mary Jose, the Ecological Interpretation Centre would excavate Nedumangad's ecologically historical linkages with the Western Ghats. Challenging the strict communal markers that have historically fragmented the city, she incorporates spatial linkages between everyday activities of the city population with visitors from outside the city. She calls the project a "breathable space" for all. The proposed intervention is juxtaposed with the Brahmin living quarters, a community that historically strictly advocated and practiced rules of caste pollution. The design here is an actively political act.

**Model 2**


*Figure 4. Design exploration, Asmin S. (Source, CAT, 2019)*

For Asmin S, the Interpretation Centre would refuse to touch the ground which was once the cradle of ecological biodiversity. Her interpretation is a journey through space reconnecting the past with the

present through a 'floating' work of art, imagining an aesthetic possibility for the forest to return. Her lines are deliberately designed to challenge the orthodoxy of anthropogenic fragmentation, with a somewhat fantastic hope of reversing the global flow of extracted resources. The design here is an aesthetic argument inviting the visitor to imagine a future that is non-extractive and restorative.

**Model 3**


*Figure 5. Design exploration, Varsha Nambiar (Source, CAT, 2019)*

Varsha Nambiar's interpretation centre asks: what happens when we recognize the enormous agency of land itself as a living being? Additionally, can the mediative potential of the land generate cooperation across communal lines? The interpretation centre is envisioned as a shared forest, that would require Nedumangad's citizens to work together across communal and caste divides to reap its benefits. In the shared tending of flora and fauna, a vital resource in the ecologically precarious future, she foresees a future that has the potential to critique, and ultimately rupture old artifacts of caste and religion.

**CASE 2: VANIYAMBADI STUDIO: INTENSITIES OF SKIN, REIMAGINING THE FACTORY**

Situated around seventy kilometres from the agrarian district of Vellore in Tamil Nadu, scattered around the Chennai-Salem National Highway 48, Vaniyambadi town is anything but skin-deep, owing to the major trade and industry that fuels its socio-economic life: leather tanning and production. Kaccha village roads, trucks transporting raw hides slaughterhouses, half processed 'wet blues' being moved between factories, open sewers filled with semi-treated tannery effluence together form this town's landscape. The sixth semester architectural design studio at Avani Institute of Design studied one of the communal group based settlements located near these tanneries. Avani Institute of Design. This research and the studio is an attempt to study the tangible and intangible transformations marking the a long history of caste-based, gendered disparities.

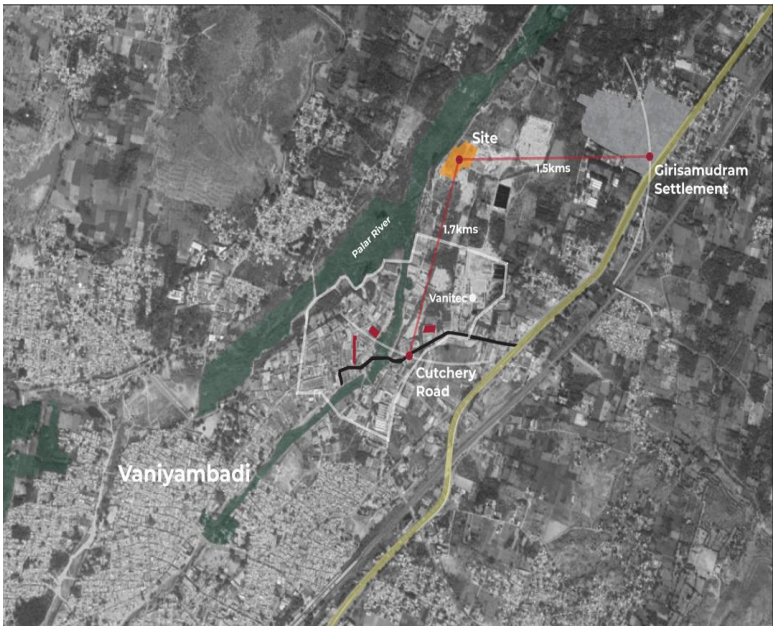


*Figure 6. Vaniyambadi town, tannery precinct and Girisamudram. Map annotated by Rohan Joseph Mathew (Source, Avani Institute of Design, 2020)*

Contemporary tanning and leather trade in India was built on the back of indigenous, caste-based occupational skill and knowledge, which calls for an unravelling of this history through a human dimension. One must examine the politics of body, space, labour and occupation, the inequity and depersonification of the worker entrenched in the factory apparatus. The history of tanning and leatherwork in India is a history of pre-colonial ostracization based on antiquated ideas of caste "purity and pollution," leatherwork becoming an exclusively hereditary practice among "untouchable" castes.[6] (See Endnote 6 for a detailed history.) From the eighteenth century, this trade become a highly valuable node of the global colonial networks of circulation, with no change in the status of its practitioners. Post-independence India has seen a further ghettoization of these communities.[7]

The detailed codification and regulation of the factory apparatus resulted in the production of docile colonial subject bodies of workers, emptied of any recognition as bearers of traditional skills of knowledge systems with particular histories, wholly serving as cogs to the discipline of the machine. Coupled with the socio-political hegemony of the caste system, also an apparatus that ossifies identities,[8] the institutional authority of the factory must be acknowledged, confronted and questioned.

*Figure 7. A typical day at the tannery. (Photograph by Hamdan M, Avani Institute of Design, 2020)*

Departing from the conventional approach of reducing histories to simply "context", the studio deliberately sought to observe, analyse, decode and interrogate the apparatuses of power in play here. A shift from a foreclosing and delimiting operation that reaffirms yet another dominion through uninitiated knowledge to speculations on design as an agent that allows the will of others to break free of domination.[9] A manifesto had to be conceived:

- The studio as a means to map Vaniyambadi: Students surveyed, documented and studied both the factory core of the town and territorial orders in the region: the slow transformation of the endemic agricultural land into barren wastelands of leather residues, the segregation of caste-based settlements and their intersections with public, socio-cultural and religious infrastructures, and the distribution of space between human bodies and non-human entities within the factory.
- The studio as negotiated practice: The studio operated as a collaborative, participative process both within and outside of it, through programmed interactions with leather workers, families and residents of Vaniyambadi to understand lived experiences. Surveys and transcriptions of 90 respondents, journaling narratives and stories from Vaniyambadi, and measured reproductions of the visceral, spatial and material factory practices initiated critique, reflection and sustained discourse on the meanings of a humane workspace.

Students worked in teams to generate collective team strategies as well as individual projects interpreting the strategy. Nine strategies that aimed to critique prevalent conditions and reclaim the workspace for the worker, emerged from this process. These projects can be grouped under two broad directions.

### Deconstructing the iconicity of the factory

Could a physical deconstruction of the monumentality of the built be analogous to fracturing the factory's mastery over the trained bodies within? Abhinav Sajeev (Model 1, see Figure 8) attempted to do this through strategic interventions like a modulated terrain allowing for reclaimed public spaces, communal farming inserts and linkages with the natural landscape for the use and benefit of the workers in the factory campus.

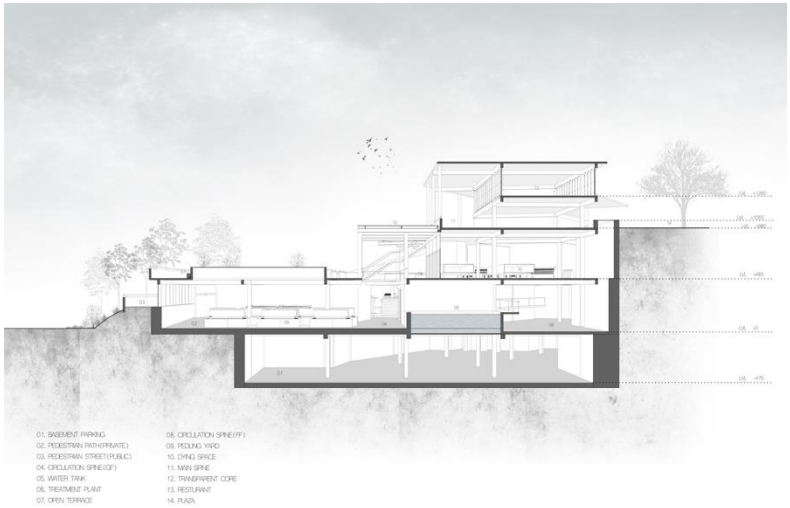

*Figure 8. Model 1, Terrain as an Agent of Change, Abhinav Sajeev (Source, Avani Institute of Design, 2020)*

Adithya Shine (Model 2, see Figure 9) abstracted Vaniaymbadi's the dense, networked streets and settlements and superimposed them onto the factory campus, opening up the built for renewed negotiations between human and non-human actors. Pournami Chandra (Model 3, see Figure 10) experimented with permeability: Can the factory in addition to being transparent, healthy and safe, also have the craft aspect of leatherwork interpreted into its physicality as well as programme in the form of a mutually dependent design and research centre with the production space? Could this ensure inclusivity and dignity to its inhabitants?

*Figure 9. Model 2, Streets and Nodes, Adithya Shine. (Source, Avani Institute of Design, 2020)*

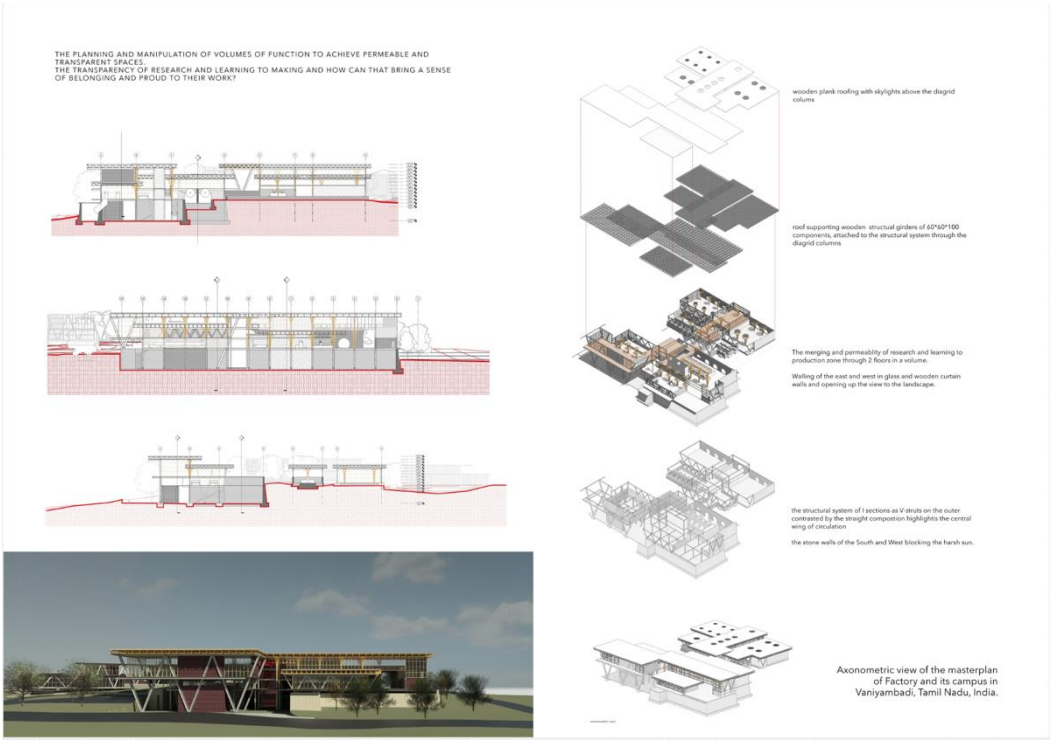


*Figure 10. Model 3, Permeability and Transparency, Pournami Chandra. (Source, Avani Institute of Design, 2020)*

## Deconstructing the economic dominance of the factory

Navaneedh Murali (Model 4) scaled down the industrialised leather production to somewhere between a family- and factory-unit. He proposed outsourcing specific leather processes requiring skilled labour as a cottage industry model in the 'rurban' setting of Vaniyambadi thereby redistributing the economic benefits of the trade more equitably. This builds on caste-based craftsmanship to include possibilities of ownership, economic stability, skill autonomy.

The specific outcomes of the student projects, while retaining individuality and adherence to a strategy, insinuated relationships and associations with each other. Once again, transcending the limits of a single project or strategy and allowing these to be read as collective, empathetic and informed positions adopted by student practitioners and the studio.

In conclusion, the pedagogic intent of the studio has been one of collaboration, shared affinities and associations formed in the design process. To quote Guattari, "...agencies [instances] and dispositives that will simultaneously analyse and produce subjectivity. A collective and individual subjectivity that completely exceeds the limits of individualization, stagnation, identificatory closure, and will instead open itself up on all sides to the socius."[10]

## CONCLUSION

As we three practitioners, located in a small provincial town in southern India, away from the traditional conversations highways of architectural pedagogy and research, write this, amidst a global pandemic that is further cutting up the world, and a cyclone on our shores in Kerala, we cannot stress enough the urgency that seizes our studios everyday: the centralizing tendency of research and teaching conversations; the inadequacy of these central tendencies to make sense of far away, but much more numerous worlds like ours; the rich methodological, and theoretical alternatives that exist once we decide to unpack black boxes such as "context" and "urban" within the studio itself; and the need to take history seriously, since it is clearly catching up.

We suggest that our urgent call be read alongside Deamer's 2020 AMPS paper[11] on the need to rethink architecture studios as the cornerstone of rethinking design pedagogy.

It is imperative that we find ways to deliberately centre and embed studio methodologies and frameworks that empower our students, to excavate, to deliberate on histories - of colonialism, of embedded inequalities, of ecological destruction, that are sometimes difficult, sometimes hidden, and that are certainly more than just stories of humans and our hubris. It is imperative that we invite them to design keeping the long durée in mind. That we prepare them as citizens of the future who are reflective about the power of aesthetic decisions.

## NOTES

[1] Anne Whiston Spirn. 2012. “Ecological Urbanism A framework for the design of resilient cities”.
[2] Félix Guattari *The Three Ecologies*. London: Bloomsbury Academic, 2014.
[3] College of Architecture. 2019. “Ecological Urbanism: Nedumangad Urban Design Studios”. College of Architecture: Trivandrum.
[4] Anne Whiston Spirn. 2012. “Ecological Urbanism A framework for the design of resilient cities”. https://annewhistonspirn.com/sharefiles/Spirn-EcoUrbanism-2012.pdf. Accessed on December 2019.
[5] As per oral histories collected during the studio from the field, discussions with Ar. Sharath Sundar Rajeev and historian Uma Maheswari in conversation with Ar. Asmin and Ar. Aparna respectively in 2019, and limited documented history, in the late seventeenth century, the indigenous tribe of Kanikkars who lived in the jungles of Illavannoor or Neduvannkkad or the central forest region were displaced by the Queen regent of Venad Kingdom - Aswathy Thirunal Umayamma Rani who fought the Muslim incursion to establish a royal outpost which later came to be known as Nedumangad. This forest region at close proximity to important mountain peaks in Western Ghats range, became the genesis of a small town that would later be networked into the urban ecosystem of the royal capital of Trivandrum city. Besides the flow of wealth and material from this peripheral outpost of the resource-rich hills, historical records also suggest a network of rivulets that passed through the landscape of *Neduvankkad* which in the eighteenth century was integrated and realigned so as to ensure water supply to the growing town. The river *Killiyar* became the lifeline of Nedumangad and continues to flow through the town meandering into Trivandrum city occupying a prominent position in the cultural landscape of Trivandrum.
[6] Up until the eighteenth century, tanning and leather work was hereditarily practiced by caste groups such as the Chamars of Northern India, Mahars of the Deccan region, and Chakkaliyars of the South using primitive techniques passed down through generations in service of both the market and military masters. However, British dominion boosted and transformed a native, mostly rural craft into urbanised and mechanised large-scale manufacture with global linkages that enjoyed the patronage of the State as well as the industrial elite. Tanneries broke through geographical barriers via the trading posts of Bombay, Calcutta and Madras, fed by large scale displacement and relocation of artisanal lower-caste leather workers. By the late nineteenth century leather contributed 5 to 9 percent of the total private merchandise exports and there was a surge in tannery worker numbers from agricultural labour castes. Traditional caste-based stratification, on the one hand, validated collective appropriation of lower-caste labour within conditions of servitude, and on the other, rendered some recognition of the artisan leatherworker as a carrier of an essential function or skill. However, there exists a long history of ghettoization of dalit communities, along with encouragement for chamars to be labourers in the leather industry by Government policies in both colonial and post-colonial independent India, subsequent caste-based occupational stereotypes and continued exclusion and social discrimination of chamars and other dalit communities by a caste society. The lack of economic liberalisation, differential distribution of the fruits of modernity and technological upgradation, gendered segregation and disparity of tannery labour and the temporary nature of recruitment through contractors have further invisibilized the role of the leather worker in social production. The pre-tanning process which are the most defiling and considered “impure”[6] continue to be fulfilled primarily by Chamars in conjunction with Muslim communities and other marginalised groups whereas “non-polluting” processes and trade opportunities became upper caste strongholds.
[7] Roy, Tirthankar. “Foreign Trade and the Artisans in Colonial India: A Study of Leather.” The Indian Economic & Social History Review 31, no. 4 (December 1994): 461–90. https://doi.org/10.1177/001946469403100402.
[8] Hons, Pavel. “Tamil Dalit Art and Identity: What to Do With the Drum?” South Asia Research 38, no. 2 (July 2018): 140–55. https://doi.org/10.1177/0262728018767021.
[9] MSc AUD 2016-17, PARA-Situation [Calcutta / Kolkata]: Inside-Out + OCEANS OF WETNESS, Dorian Wiszniewski
[10] Félix Guattari. *The Three Ecologies*. London: Bloomsbury Academic, 2014.
[11] Deamer, Peggy. "Design Pedagogy: The New Architectural Studio and Its Consequences." *Architecture_MPS* (2020).

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# REFLECTION AND LEARNINGS FROM RESEARCH SEMINAR COURSES ON UAE NATIONAL HOUSING

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## INTRODUCTION

This research paper is the outcome of a collaboration between the Abu Dhabi Housing Authority (ADHA), a government institution that provides National Housing for its citizens, with Zayed University (ZU) in the United Arab Emirates (UAE). It led to an initiative that was established on October 2016 through a memorandum of understanding signed by the two parties, whereby the ADHA requested ZU to design a series of student-based research projects to help better understand housing requirements over the next thirty years. The ADHA specifically requested the research to be conducted by students, primarily to ensure that it encapsulates the country's younger, more grassroots-based demographic. Embracing this request, the College of Art and Creative Enterprises (CACE) at ZU created a semester-long three-credit National Housing Research seminar course as an elective available on both their Dubai and Abu Dhabi campuses. The CACE saw this as an opportunity for a pilot project that examines the advantages and challenges of inquiry-based learning (IBL), in comparison to the conventional teaching model, and how such a teaching methodology could promote a more professional approach to work by the students. This was essential since the current shift from an industrial economy to a knowledge-based one requires a curricular shift in higher education to better prepare future professionals[12345].

Inquiry-based learning is "sensing perplexing situations, clarifying the problem, formulating a tentative hypothesis, testing the hypothesis, revising with rigorous tests, and acting on the solution"[67], in sharp contrast to the traditional standardized education model, which either transfers a body of information to students through a linear process, or breaks down complex tasks into "those not-further-divisible bits out of which any knowledge was assembled"[8]. Despite the fact that historically IBL, specifically its inclusion of undergraduate student research into the curricula, has been around for some time in the United States and Europe, especially after the Boyer Commission report in 1998[9], it has yet to gain popularity in the Middle East and other Arab countries who prefer a more traditional education model. This was made evident when all the colleges at ZU, except the CACE, rejected the inclusion of an undergraduate student research course for the ADHA, despite the body of evidence[1011] clearly demonstrating that research activities at this level improve self-motivation and self-directed learning, which are key skill sets required in effective practitioners.

The focus of this paper will be the pedagogy, learnings, challenges and outcomes of these seminar courses at ZU in collaboration with the ADHA, and is organized as follows. Section 2 presents their detailed structure, research methodology, student engagement and the desired outcomes of all the

protagonists. Then Section 3 reflects on the quality of the student-led discussions and their final research paper outcomes. This section also reviews the ADHA's engagement with the students, the methods of dissemination of the students' research findings and student feedback. Finally, Section 4 reviews and summarizes all the learnings from the National Housing research seminar courses and examines ways to facilitate future collaborations.

## COURSE STRUCTURE AND OBJECTIVES

Typically, there is an unspoken tension between researchers and government policy makers, based on the latter party prioritizing external challenges and factors that requires it to base decisions and policies more on beliefs rather than hard facts. Policy makers generally ask for clear recommendations usually within a short time span, which is in sharp contrast to the philosophy of researchers, who thrive on the complexity of their work and the challenges of implementing their theories and learnings, giving significantly less importance to set timelines. These tensions have been clearly recorded in the literary works of John Nisbets[1213].

The objectives of the collaborators on the housing project were different; challenging the stereotype of government agencies as controlling, demanding and oppressive, the ADHA had a respectful, constructive and highly productive collaboration with the CACE and ZU in general. The ADHA had a clear objective from the start of the project, which was to establish grassroots conversation amongst the younger population of the UAE to examine and analyze growing and evolving housing needs in the country, with a particular focus on the differences between need and entitlement with respect to housing. Then, after further consultation between the CACE and the ADHA, more research questions were incorporated as a part of the initiative, in line with the University's objective to instigate necessary change in institutional epistemology so students connect better with their wider community[14] and receive adequate training for future professional practice. Furthermore, the CACE also viewed the National Housing research seminar courses as an opportunity to develop academic skills in undergraduate students, such as research, reading, writing, self- and group-critiquing, oral presentation, and a sense of citizenship and social responsibility.

Even though the objectives of the ADHA, ZU and the CACE may seem to differ from one another in some ways, the expectations, timeline and outcomes where very much the same. The primary expectation from the student researchers was not only to review and question government policies, but also their relationships to themselves and the community within which they resided. This was especially critical in light of the major changes the UAE has undergone, with respect to its economic, social and cultural conditions, over a very short period of time, necessitating this critical reflection.

In order to meet the aforementioned objectives, the CACE designed the National Housing research seminar course in line with an inquiry-based education model. Implementing such a learning formula is not unusual practice in this college; however, previously, it was only reserved for most of their art and design studios, while their lectures and research seminar courses were historically based on more traditional modes of education. Hence, the National Housing seminar course seemed slated to become a pilot project that allowed the evaluation of the benefits and challenges of IBL in research seminar courses, versus the standard methodology.

The National Housing course was adapted to change the standard role of the instructor from a single source of knowledge to a facilitator, one who helps administer structured research and discussion for students as two methods of gaining deeper understanding of the subject at hand. Therefore, a new relationship between faculty and the students is established, that not only treats the students as more capable, with more valuable contributions to make, but also helps them take ownership of their own learning by instilling in them a spirit of inquiry and a burning desire to devise solutions. The new role

of the faculty from "policing' to 'co-experiencing' a learning process by conducting mutual discussions helped forge a more cooperative, respectful relationship with the faculty.

The course initially started with a short overview of the general subject of National Housing, not just in the UAE but also internationally, through the review of a few preselected relevant papers and then discussing them during the research seminar sessions. After the quick introduction, the entire class was divided into small groups of two or three students and asked to select particular sets of research questions based on their interests. A few of the questions were: how should heritage and culture affect the design of a home? Is culture static or evolving and, if it is evolving, how has it evolved in the UAE over time; how will it continue to evolve over the next thirty years? Can domestic architecture contribute to the happiness of a family? What is the difference between social needs and entitlements? Should national housing be based on said social needs or entitlements? Groups where then asked to start their literature review and/or field research on their selected questions. Each group was then given a week to disseminate their literature reviews amongst the entire class and accordingly moderate the seminar sessions and record the group discussions and learning. The faculty's role was to ensure that all the shared literature was reviewed and approved for its relevance prior to its dissemination. The faculty also ensured the seminar discussions moderated by each group stayed relevant to the subject and focused on their chosen questions. Throughout the semester, the faculty also helped the students understand the interconnectivity and relevance of all the research questions to National Housing and in particular to National Housing in the UAE.

The course assessment process was based on a final research paper and a poster presentation but faceted, in order to ensure a much higher level of learning. The faculty provided comments at the interim stages of outline and draft to ensure that students were made aware any mistakes they may have made, and understand how their research process could be improved. The paper was graded on four major criteria: clear articulation of the initial concept, sustained and in-depth research, and correct and appropriate use of English, as well as format and presentation. The poster presentation was assessed on three criteria: clarity of the content, level of visual interest, and accessibility and verbal presentation.

The research methodology for this course was through literature reviews and field research. Due to the contemporary nature of some of the questions that the students encountered, different tools were used extensively to conduct the field research, including questionnaires, interviews, and surveys. Its outcome and relevance were then discussed in the seminar courses before its inclusion into the final research paper. Furthermore, the perspective of the government in the research questions was incorporated by conducting a series of on-site trainings and workshops, which facilitated the students' comprehension of some of the challenges and solutions that the ADHA had developed over the years. Each student group was also given free access to communicate and consult with the relevant department at the ADHA to provide them with further background research.

## COURSE OUTCOME AND LEARNINGS

Despite the fact that all the papers submitted during the National Housing course were reviewed, and feedback was provided to students at different checkpoints in the development of the final paper, the quality varied both in their research and writing. Firstly, English was not the primary language for all the students in this course, and the writing quality was clearly indicative of the language of study in their primary and secondary education. Hence, students from private schools, where instruction is primarily in English, generally performed much better than the ones from government schools, which mostly employed Arabic. Secondly, despite all the students having already taken a research methodology course prior to this one, most students struggled to find resources and heavily relied on

online publications and journals. This could be very much a generational issue but can be substantially reduced by raising the level of information literacy amongst the students by offering more training in library research[15]. Thirdly, by reviewing the students' semester-end course feedback, it was clearly evident that some students suffered from overconfidence and research anxiety[161718] and, paradoxically, students with stronger information literacy showed more signs of anxiety and a lack of confidence, as theorized in Kruger and Dunning's paper, "incompetent individuals lack the metacognitive skills that enable them to tell how they are performing and as a result, they come to hold inflated views of their performance and ability. In addition, incompetent individuals are unaware of their deficient abilities"[1920].

However, the varied performances of the students in their final written papers were compensated through the quality of their field research, seminar discussions, understanding of the challenges at hand, and the final poster and oral presentations, as we recognize these qualities and achievements being more in line with the desired outcomes of the ADHA. The student group, student moderators capably demonstrated their understanding and passion for their particular research questions during the seminar sessions, and the following two narratives are presented as examples of how this course managed to establish a strong body of research and social dialogue, as well obtain a higher level of understanding.

Firstly, when the question, 'Is culture static or evolving?' was raised by one of the student groups, the initial discussion amongst the students revolved around the fact that the current detached National Houses with their high boundary walls need to be maintained in order to preserve the culture of the region. But as the students started reviewing and discussing the literature provided to them by other student groups on how culture is not static, the UAE culture itself has changed within a short period time, and in the current global climate there is a need to embrace and even celebrate diversity, opinions started to evolve and gradually change. The same group of students started considering an apartment as viable option to the current National Housing model[2122].

Secondly, when students were asked if they believed that they should be entitled to National Housing or not, initially almost all students agreed that they were entitled, simply due to the fact that their parents and grandparents received National Housing and, therefore, so should they. Once the assigned student groups started sharing and discussing the literature review on social justice, the definition of poverty, and the difference between entitlement and need, the group gradually started changing their opinion, stating that social responsibility dictated that one should not be entitled to National Housing if one has the financial means to provide for oneself, allowing the government to focus on those who truly could not afford but deserved the basic human right of shelter.

Besides the final paper, research dissemination by the students was gauged through the final poster presentation for the ADHA. Each National Housing class conducted a formal poster presentation at the ADHA headquarters, where students presented their research findings to receive comments and critiques both from the ADHA researchers and its senior administrators. This was the first experience for most students in making an oral presentation outside of the university, so it became a great learning experience for them. The direct involvement of the ADHA senior administrators in both the training and the feedback of the poster presentation inculcated in the students a confirmation that their voice was important and being heard by their government[23]. With regards to the students' papers, even though the ADHA acknowledged their relevance and importance, unfortunately none were submitted for a conference proceeding nor published. However, as a result of the National Housing research seminar course, a few faculty members were inspired to follow up on the student research and write papers that were both presented at international conferences and published accordingly.

Despite the keen interest from a handful of students wishing to take the National Housing course, unfortunately the course had to be suspended after four semesters due to low enrolment. After conducting a few informal discussions regarding the possible reasons for low enrolment with students who had already taken the course, it soon became apparent that the major hesitation for most students was that they assumed that conducting research was difficult. Their belief was confirmed by rumors about the course requiring a much more intensive level of research to which they had not been accustomed in the past. Most students were used to conducting their research using on online tools such as Google, Google Scholar, JSTOR and ProQuest, and lacked the higher level of information literacy required for this course. Similar results were also found by Heads & Eisenberg[2425]. By introducing a library credited course aimed at improving the Information Literacy (IL) skills of undergraduate students, especially in the first two years of their studies, this fear of advanced research work can be eliminated in the students, or at least significantly reduced.

## CONCLUSION

The National Housing seminar course was not a mere response to a request for collaboration between a government entity and a university, but can be more aptly regarded as a series of case studies conducted by the CACE on how students can connect to a set of questions, problems and issues that exist in the world beyond the university, and in the community. Inquiry-based learning was conducted by faculty facilitating a process where students explored “meaningful problems, identifying what they need to know in order to solve the problem, and coming up with strategies for solution”[26].

Even though some educational institutions do not look very highly at undergraduate student research courses, but rather view them as supplementary education or even superficial, the experience and learning gained through the National Housing courses proved to be very different. As clearly demonstrated through their presentation and surveys, students who were engaged with these courses gained a host of educational outcomes, such as improving their problem-solving abilities through reasoning, and the construction of flexible and transferable knowledge. The overall process of inquiry-based learning also helped students develop their critical thinking, gain a much deeper understanding of the concepts in their discipline, and “learn their way around a discipline”[27]. This was despite the weaker quality of the final papers the students wrote, which was not consistent and could be improved, because the outcomes desired by all stakeholders in this collaboration exceeded expectations.

The National Housing course clearly demonstrated that academically, students require at the earlier stages of their higher education, direct training from library support in order to attain much stronger information literacy, which in turn, helps build their confidence in research and reduce their dependency on commonly-used online search engines. Finally, the government agency involved also appreciated the potentialities of such collaborative student research agencies and their impact on creating constructive dialogue and a much stronger sense of mutual trust.

With all these achievements, it would have been expected for this course to have continued, but unfortunately, as stated earlier, it could not be sustained beyond a few semesters. The lack of information literacy and general anxiety about the levels of research required for this course were its major challenges. As a learning for future collaborative student research projects, it is imperative to ensure the strengthening of information literacy among students as a way of motivating them to participate in such courses. Based on the outcome and evidence, the preferred pedagogy for all future student research collaborations should be an inquiry-based learning rather than conventional teaching methods.

## NOTES

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# SCALE AND PRESENCE PERCEPTION IN VR: A PAVILION DESIGN PROCESS

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## INTRODUCTION

The experience of the world emerges with the reality in which humans are immersed. As the Direk cites, Merleau-Ponty explains that humans encounter objects as a bodily experience[1]. They did not perceive time and space as an abstract intuition, and they experience their presence in time and space[2]. The perception of the world in which the designer is immersed in is based on triggering the presence feeling of the designer, who positions her/himself in time and space. As Moholy Nagy put it, "The creative potential of the new is mostly revealed through old forms, old tools, and design areas."[3] Therefore, new tools create new possibilities for the designer.

Technological developments affect design environments. The digital models have emerged with computer technology. The advantages of the three-dimensional world have reached unpredictable areas for designers and artists who produce digital models in different ways. While digital models continue to be used frequently in design, virtual reality (VR) technology is included at this point, allowing the designer to experience and interfere with the product/space s/he designed in a 3D environment.

This study uses the VR environment to conduct experimentation to understand scale and presence through the 3D modelling process. The aim is to understand how virtual presence effects the relationship between product and designer, and the state of their presence is questioned. Scale perception was evaluated based on the perception of size and distance.

## SCALE AND PRESENCE PERCEPTION IN VR ENVIRONMENT

Virtual environments are media in which reality is recreated through a computer. As Baudrillard describes, simulation no longer refers to a reference entity or substance, but a hyperreality in which reality is reproduced through models[4]. As Bolt explains, the modern "human" has become the determining centre of reality together with technology and sees the world as something independent from itself, that establishes a relationship with it[5]. While human is defined as being looked after by the existing, this situation changes with the modern age and human becomes the spectator[6]. The spectator now builds her/his own reality, and this helps develop methods of understanding his/her own world. The spectator is in physical reality and forms the world image by establishing a relationship with the world.

In this study, the perception of existence is based on spectator human and evaluated through a designer who is aware of her/his existence in a virtual environment (VE). The virtual individual is associated with the "being-there" in the virtual space and can provide spatial movements during the design model. In this context, the virtual individual is considered to be aware of the virtual space in which s/he is surrounded and as the spectator and provides her/his spatial movements here.

### Scale and Distance

Scale perception is evaluated by associating it with the context of how distances are perceived. The distance can be understood in two forms, egocentric and allocentric (Figure 1). Egocentric (self-centred) distance is defined as the understanding of the distance of the individual based on self-location from the objects[7]. Allocentric (object-centred) distance is how the distance of objects based on other objects is perceived[8].

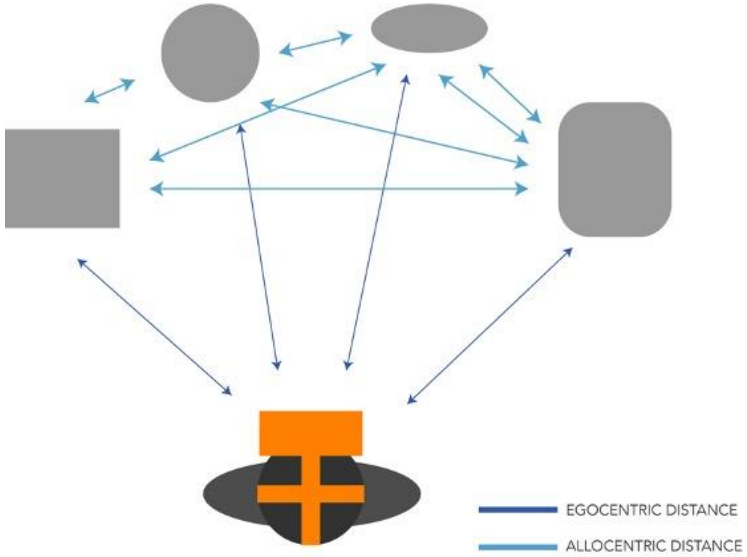


*Figure 1. Egocentric and Allocentric Distance*

The proxemics behaviour defined by the cultural anthropologist Hall in 1963 was determined to define the distance configuration in the context of the scale of the study. Hall describes the proxemics behaviour as a valuable term to understand people who interact with each other and their environment, "the organization of spaces in homes and buildings, and ultimately the [settlements]"[9]. As Hall has explained, proxemics patterns that were learned once are largely excluded from conscious awareness and therefore should be explored with the need to understand the unconscious tendencies of the subjects[10]. Grosser explains how and why portraits in the Western world are painted at certain distances, with reference only to intimate, personal and social distances[11]. The distance an artist uses when placing the elements in the composition of the painting is designed to convey certain features of the personality, as well as to scan all other features. Grosser fixes his observations to feet and inches[12]. Hall's work examines how people unconsciously structure the distance between each other in carrying out daily operations, the organization of the space and its urban location[13].

In this study, the concept of proxemics was used in the context of distance configurations and perception of allocentric-egocentric distance. The effect of scale differences on proxemics distance configurations has been questioned. As Kim and Interrante convey Sedgwick, people use their own eye heights to scale their perception of absolute object size, a phenomenon known as the eye height

scale[14]. The phenomenon of scale correlates with how all dimensions are perceived. The virtual individual can provide binocular vision phenomenon through VR glasses. In the study carried out by Abtahi et al., the users were immersed into the VR environment through the eye level scaling method, then the users were provided to navigate the miniature world while maintaining their eye levels[15]. The advantages of this technique are the ability of users to maintain eye levels and examining the details of the virtual scene[16].

VR HMD provide more than the digital model relationships established through a computer, by providing the vision of physical reality in digital environment. Computers let users to model through the two-dimensional screen, and VR provides a VE where users are immersed with binocular-vision and associated with physical reality according to coexistence. Binocular vision in the virtual world is related to the real-world perception. Distance is defined with the individual observing the environment and objects thought their self as a centre (allocentric distance). Scale perception is formed with distances and dimensions and is defined as 1/10 and 1/1. It is evaluated in the context of 1/10 scale design and being-in-the-world in 1/1 scale design and presence and its effects.

### Presence and VR Experience

Presence is developed through Heidegger's definition of being-in-the-world. Being-in-the-world where the individual has immersed consists of Heidegger's Dasein that is thrown into the world[17]. Being virtual is similar to the concept of telepresence because even if it is not physically present in that environment, the user feels the impression that it exists in one place or environment[18]. It is a technique of creating a sense of physical presence in a remote place by using the necessary multiple media such as virtual being, sound, image, and touch[19]. VR technology triggers the presence with the immersion effect offered to the individual.

The concept of virtual presence comes from science fiction that have described conceptual versions of VR and telepresence for decades[20]. The term "telepresence" was produced by Marvin Minsky in 1980 as a reference to teleoperation systems for manipulating distant physical objects [21]. According to Witmer and Singer, “(Tele)being is defined as the subjective experience of being in a place or environment, even if one is physically in the other.”[22] Telepresence, also called virtual being, is basically the technique of creating a feeling of physical presence in a remote place by using the necessary multimedia such as sound, image, and touch[23]. The sense of presence is produced through the sensory stimulus so that the virtual individual feels the illusion of being present elsewhere than the physical entity[24]. In the research conducted by users, the presence of users is triggered more when they are through an avatar in the VE and the level of immersion increases [25].

In the VR environment, the sense of virtual presence increases for users whose avatars reflect their movements in the physical world. The limitation of this study is that it is avatar free. In the context of this constraint, the feeling reduced by the experience without an avatar was excluded when discussing the perception of existence.

## VR PAVILION DESIGN

### Research Methodology

Ten people are immersed in the VR environment for pavilion design study with VR. It is aimed that all participants are not equal in terms of design information. Five 1st-year design students, three 3rd-year students, and two architecture professionals participated in the study. All of the participants had not used the VRHMD before, so firstly they needed to become familiar with the tool. For this reason, before starting the study, preliminary study is conducted.

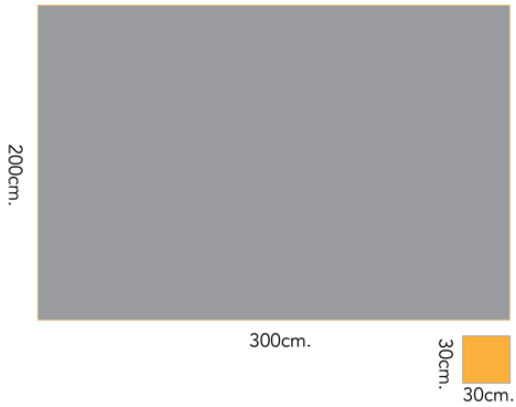


*Figure 2. 200 cm. x 300 cm., 30 cm. x 30 cm. Defined Area*

During the preliminary study, the participants had 10 minutes to grasp VR HMD (Figure 3). Then, the design brief had been told to the participants familiar with the vehicle. It was expected to produce the cube shape (in an area of 200 cm. x 300 cm.) that they saw in the VE (measuring 30 cm. x 30 cm.) in the form of a pavilion (Figure 2). They were expected to finalise the design in 10 minutes. At the end, the participants experienced their work in the VR environment by applying 1/10 and 1/1 scales and left the VE.

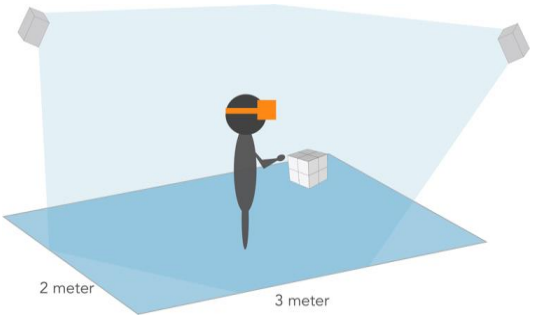


*Figure 3. VR Environment Installation*

During the design process, user behaviours were recorded. The virtual recordings are used to analyse the design movements in the VE. Physical behaviour recordings are used for understanding user behaviour. In addition to quantitative analysis, after the VR experience, users participated in an interview to collect their data on the scale, distance, and virtual presence related to the design experience.

In the end, how the perception of scale and presence of users were affected while designing in VR environment and their relationship with real-life and advantages-disadvantages were determined. The purpose of the study is to reveal how the pavilion design experience affects users in the context of scale and discovery in a VR environment.

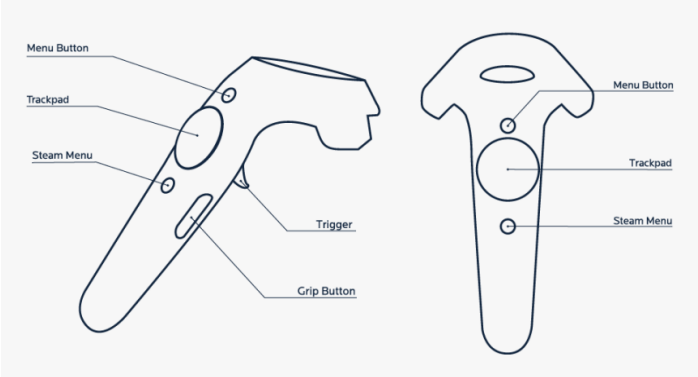


*Figure 4. HTC Vive VR HMD Trigger* [26]

## VR as a Design Tool

In the preliminary study, participants encountered the VR tool. Firstly, the control keys were introduced to them (Figure 3). The users got familiar with VR and learned the buttons and commands for design.

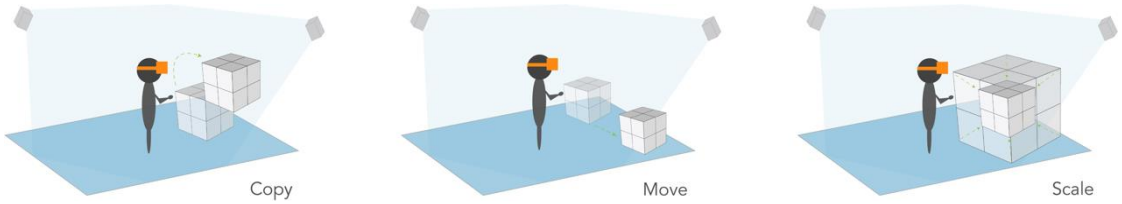


*Figure 5. Moving-Copying-Scaling in VR Environment*

After users learned the buttons, they tried the copying, moving, and scaling operations in the VE and used them until they learned (Figure 3). Users needed time to grasp which button should be used for which function.

At the end of the 10-minute preliminary work, users had developed a level of familiarity with designing in a VR environment. Since participants had not use any other VR before this experience, their knowledge levels became similar within 10 minutes.

## Pavilion Design in VR

The users who completed the preliminary study realised the design experience by using the two scales and copying and moving the units in the VE for 10 minutes. Users were evaluated individually and along with the context of the design level.

In the physical environment, the speed of movement and perspective change is often observed during copying and moving. Users (T08) who have turned around the model made the most duplication process (Figure 7). Users (T01, T03, T05) who never used the 1/1 scale (T02) were identified. Users, who completed and designed their pavilion on a scale of 1/10 and did not use the 1/1 scale, were far behind in terms of height (Figures 5 and 6). The height of the pavilion is the parameter in which users are released, and the perception of scale is expected to be understood. In other words, how to take the design to which height it can experience without using its limit and 1/1 scale in its own eye height and whether it uses the scale difference or not are also important questions.

It has been determined that first-year students behave more experimentally and rise more freely than third-year and architecture professionals. Third-year students designed a low heightened pavilion with a uniform shape. Their designs could not reach the navigable level on a 1/1 scale. The two

professionals designed their pavilions with some piling up tendency. Their designs had a similar height to the third-year students. The first-year students designed taller than others and void-mass rates showed differentiation.

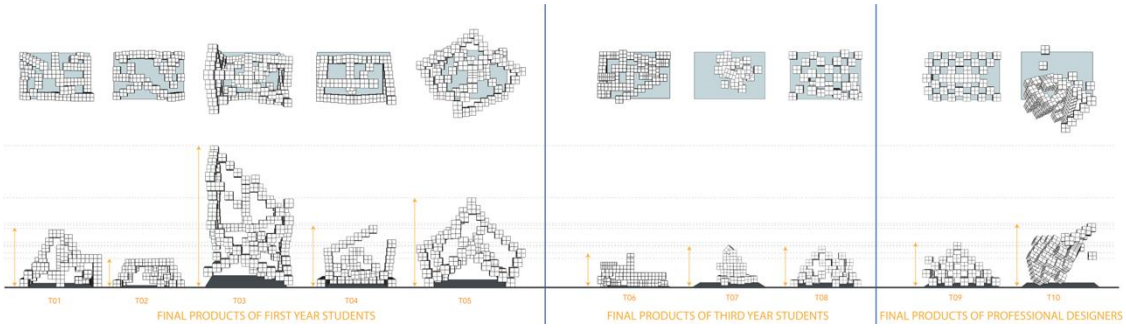


*Figure 6. Pavilions (Plan and Front Views) Produced by 10 Participants in VR Environment*

## FINDINGS

The common statements of the users who completed the design process were that the immersion effect was very high and not exactly similar to any previous experience. Users stated that they are disconnected from the physical reality and felt inside the VE. The immersion effect increased the users' desire to stay in the environment, and they stated that they wanted to maintain their virtual presence.

### Findings in the Context of Scale Perception

It has been observed that most of the users who were monitored in the whole process performed their design operations using their bodily movements while working at a scale of 1/10. This means that they have been hovering around the area on a 1/10 scale (Figure 6). During the design process, it was seen that the participants, who switched between 1/1 and 1/10 scales, designed suitable pavilions for human ergonomics, and their pavilions were navigable on a 1/1 scale. The participants who worked with 1/10 scale and did not use 1/1 scale during the design process created a space that had scale problems. The height of the space became too low to get inside on a 1/1 scale (70-95 cm.). 3rd-year students and professional designers, who are accustomed to working on the computer interface, were more conservative about scale change and made fewer scale changes.

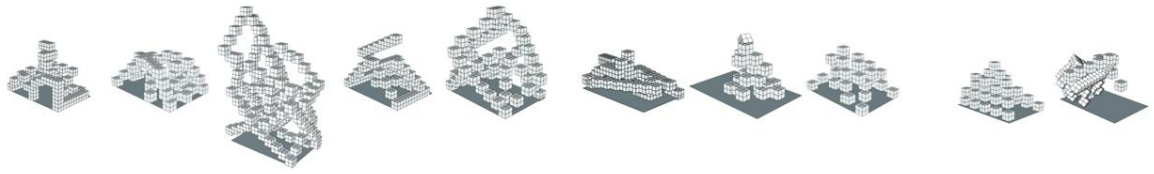

*Figure 7. Pavilions produced by 10 participants in VR environment (Perspective View)*

It was also observed that users tend to build around their bodies during the design process. They have structured a distance with an egocentric approach by taking themselves to the centre. It was observed that the area where they positioned themselves in the context of 1/1 scale settled in the centre. When the scale is 1/10, they positioned objects (cubes) with the relation to other cubes. 1/10 scale made users spectators. It was determined that the users showed an egocentric approach at a 1/1 scale and an allocentric approach at a 1/10 scale.

### Findings in the Context of Presence

Distances were correctly perceived by almost all users. This situation explains more clearly the relationship of the VR environment with real life. For users who perceive size and distance as seen and perceived in reality, the perception of presence has been triggered, and the sense of immersion has been strengthened.

Almost all of the users reported that the VR design environment provided the "ENTIRE" perception of the space. All participants moved around the model using their bodily movements while designing and made use of this situation when making their decisions.

Generic space assigned by the 1/10 scale from the VR modelling programme immersed users and triggered the sense of presence. The fact that the space appointed by the programme is visible on a scale of 1/10 strengthened the model relationship established with real life. That is, for the individual who makes a model in the physical environment, there is a place where s/he is physically located. In the virtual world, there is a scaled space assigned by the programme, and the user working at 1/10 scale feels like making a model.

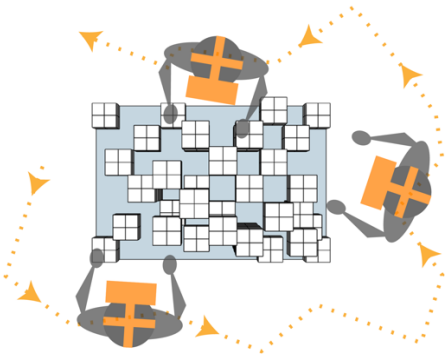

*Figure 8. User body movement at 1/10 scale*

Another relationship with real life is the concept of "grabbing." Unlike making computer models, users grabbed the cube form with triggers as physical life and placed it with their bodily movements as real life. In this context, it has been found that the units are gripped through the transparent cursor, which gives the feeling of holding in their environment rather than the edges, corners, or midpoints while reproducing and moving. This situation is interpreted as the reflection of the individual who interacts with his/her physical environment to the VE.

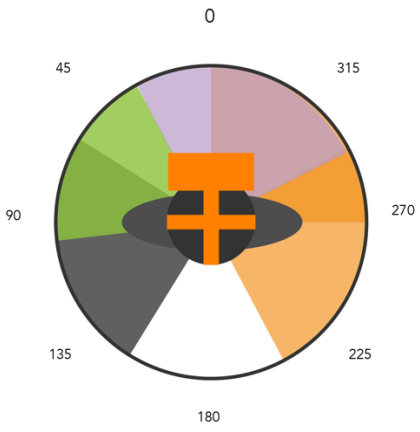


*Figure 9. Physical Aspects of Users When Designing in a VR Environment*

## RESULTS AND CONCLUSION

In this study, which evaluates the VR environment as a design tool, how users are affected in the context of scale and presence was researched. The findings revealed that the VR tool was associated with physical modelling as a design tool.

However, when users were asked for the most suitable environment for architectural space design, they preferred modelling in a VR environment. The number of those who prefer the VR modelling method was equal to the sum of the number of those who prefer to design through a model and computer model.

It has been observed that the users tend to hold the cubes based on the real-life grasping gesture in the VR environment instead of holding the edge and corner points used in modelling with computer programmes. This situation is seen as one of the relations between physical reality and VR in the context of presence.

Changing the scale between 1/10 to 1/1 was an important research point that produced the most diverse results. The height of the pavilion masses produced by the users increased as the number of scale changes (change between 1/1 and 1/10) increased (Figure 9). In the context of the scale, only the 1st-year student (T01), who worked at 1/1, could not raise the pavilion much, but he was more immersed in the design. Only on the scale of 1/10, the 1st-year student (T02) did not reach the human dimensions as the height of the pavilion design and remained uniform in terms of void-mass rates. The designs of students who frequently switched between the two scales and tended to design the space at a 1/10 scale, and to experience the space at a 1/1 scale, approached the human scale more clearly than others. They produced design outputs with higher navigability (Figure 6). It has been observed that they produced more balanced results in terms of void-mass rates.

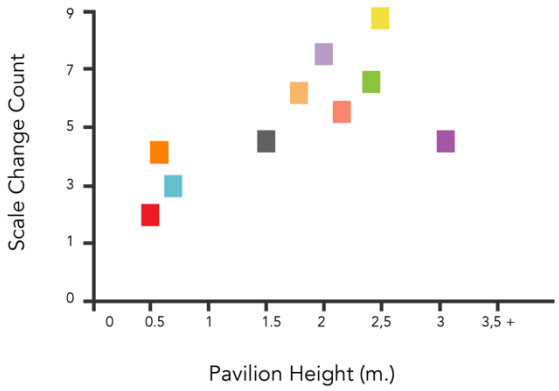


*Figure 10. Relationship Between the Height of the Designed Pavilion and the Frequency of Scale Change during VR Modelling*

When the first-year students, third-year students, and professionals were compared, the group that achieved the most experimental and various results was the first-year students, leaving other groups behind in terms of pavilion height. Professionals tended to repeat their design moves. Third-year students, on the other hand, produced results that were far from the human scale and not suitable for 1/1 scale navigation.

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# DIDACTICAL VALUE OF REUSE

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## INTRODUCTION

The teaching of architecture is a complex subject for the variety of contents it touches and the difficulty in defining a unique approach.

Not being an "exact" science, the teaching does not propose definitive solutions, but variables of thought, the possibility of reading, personal visions. The need to identify unequivocal statements arises from the need to give the student the opportunity of defining fixed points in complex overviews.

It is no coincidence that in the face of a society characterized by liquidity, dynamism and precariousness[1], even architecture has lost consistency in its theoretical apparatus.

The need for impressive communication flanked by the almost unlimited potential of the technique has generated an unrecognizable linguistic system. Firmitas, Utilitas and Venustas[2] have lost didactic weight in the face of the need for efficiency and amazement. The figure of the archistar[3] is paradigmatic of a monad approach, based on a personal and not theoretical style. Both the drifts of Jaques Deridda on constructivism[4] and Rem Koolhaas's writings on the theme of "Bigness"[5] are examples that confirm the self-referentiality of contemporary architecture that seeks an immanent reason as a solution to a collective problem.

Within the heterogeneity of contemporary styles, the search for a common territory in which to set up a constructive dialogue is a didactic priority.

Today, sustainability is that contingent and unequivocal topic within which to insert the debate on teaching. However, in the face of the technicalities related to this theme, it is possible to identify one architectural practice among others that is better integrated with sustainability, that is the practice of reuse.

Concepts such as "grey energy" or the "blue economy"[6] refer to an approach to sustainability, and therefore to the energy compensation of environmental impact, based more on the recovery of resources than on the use of new. It is clear how easy it is to insert the theme of reuse within this cultural context, as an alternative and optimizing practice compared to new buildings.

In fact, if the efficiency approach of sustainability does not give useful answers to teaching design, even inefficient architectures[7] studied as reuse processes require a critical reflection on language and space.

Therefore, in the common ground of sustainability, reuse must be understood as a strategic application, as well as an inevitable urban practice[8], it represents the ideal didactic environment[9] in which to apply laboratory activities based on the error learning system[10].
From this point of view, theory and practice stand side by side, like rib and arch[11], starting from a project of knowledge of the existing[12], up to proposing a coherent reflection on language and architectural space.
"*Reuse today represents the most ecological and least expensive intervention for the community, it is the reuse of what has been abandoned, of urban voids left without any use, reusing mass and space, without increasing land consumption ...*"[13].
Time and matter are the tools for constructing a design hybrid that is reborn in a dialectical context between old and new, between teacher and student. The theme of the project's quality and its evaluation are centred on the relational process that can be established with the existing context (architectural and urban).Therefore, having a clear basis for comparison, it is possible to establish a shared reasoning plan starting from given strategies. The strategies of reuse, if properly declined, can therefore become a useful teaching tool to bring architecture students to think about the fundamental themes of this discipline (language, composition, materials, context, history), maintaining the fixed point not of style or theory as an end in itself, as well as that of the need for intervention.

## CONTEXT

Reuse is a practice inherent in the history of humanity. It was often caused by construction priorities related to the optimization of resources, just think of the reuse that the Romans made of the Greek temples, or the famous example of the Arles Amphitheatre, which became a fortified citadel in the Middle Ages. On other occasions, however, the "project" basis of the reuse intervention has generated useful references in defining possible approaches. If Leon Battista Alberti and Andrea Palladio's famous examples remain recognizable milestones, it is after the Second World War that real applied reuse strategies come together.
The example of the Ready-Made and the surrealist Objet Trouvè[14] where objects "*being subtracted from their usual function and environment could open new windows on the seas of the psyche*"[15] had an interesting application of the theory of as-found by the Smithsons. This "new vision of the ordinary"[16], expressed in the Patio and Pavillon installation, acquires application value when reinterpreted in a design key. The “work” proposed by the English architects, created together with Paulozzi and Henderson, was as Ben Highmore says: *"*(like a) *conglomerate of references… a bit like a house in an Algerian slum, a bit like a shed in Bethnal Green, a bit like a post-nuclear ruin, a bit like a rural house, a bit like a destroyed shop" [17]*. The coexistence of objects of different nature generates a hybrid language made up of relationships between things. But it is in the examples of the Upper lawn Pavillon and the HexenHouse where we see exemplified that approach of relations with the existing where the "*art is in the in the picking up, turning over and putting in*"[18].
The first will become the architects' summer house, built on an old English cottage's ruins. Of the existing architecture, the surrounding wall is maintained, which defines the internal landscape, and a large fireplace, which is reinterpreted as the new centre of gravity of the house. The existing represents the context on which to create the new. The pavilion actually inhabited, in addition to being a beautiful exercise in minimal living, forces the architectural language to declare the differences. The cottage's stone contrasts aluminium and glass with the repetitiveness of the modern against the improvisation of the vernacular to generate a new unitary system. The Hexen House has a different past: designed as an extension of the client Axel Bruchhäuser's house, the project will be developed for more than ten years, one piece at a time, starting from the porch of the house up to the realization

of the Lantern Pavillon. The annexation becomes a complex system, raised corridors, the porch, the cabin in the woods, are points in a system, connected, which starts from the original house's simplicity and working with the structural language's complexity generates a new organism. The existing remains immobile, but at the same time changes completely.
Industrial archaeology has led to the other great paradigm shift and consequently, a large sector of intervention and experimentation in the field of reuse. The evaluation of industrial artefacts as important evidence to be maintained, and therefore placed on the same level as classical monuments, in fact, determines the need to support them but freeing the object from the conservation anxiety typical of the historic building.
The importance of this topic, already confirmed by the functionalist exaltation of the modern movement, is much greater if we consider that, in the face of various economic and technological changes.
We are beginning to witness an essential phenomenon of industrial abandonment by which we intend, in fact, that process of partial or total decommissioning of entire areas, agglomerations or single buildings intended for production activities[19].
Modern and contemporary architecture is confronted with industrial reuse in many different situations, generating specific solutions without ever defining a common line or a school.
Starting from the famous SESC Pompeia by Lina Bo Bardi (1), where the recovery of industrial warehouses is invaded by two huge functional monoliths generating a new urban balance, up to the Prada Foundation Milan where Rem Koolhaas covers the old industrial silos with gold foil. Reuse, when evident, generates substantial architectural reflections: the need to maintain the existing as the main structure and connection with the context generates hybrid languages, where the aesthetics of the technique is mediated by the limits of the existing context, generating an inevitable critical dialogue between different times and places of architecture.
The theme of hybrid language, generated by the fusion of two identities, the existing one and the new one, is faced over the years, more and more frequently, precisely in the face of the topicality of the theme of reuse.
The enhancement of the existing artefact, thanks to its cultural and historical reasons, takes place through different processes: the almost complete maintenance of the Tate Modern Gallery by Herzog and De Meuron, the philological doubling of the FRAC by Lacaton and Vassal, The invasive integration of Heatrwick Studio's MOCAA.
If on the one hand, the personal nature of the project leads architects to find specific solutions, on the other hand, the educational context pushes towards the definition of standard lines.
Therefore, the search for a unique code, based on a system of common concepts, is useful to define a shared, clear and useful didactic approach.

## POSTULATES

The approach of Alison and Peter Smithson represents an excellent point of reflection on the practice of reuse. On the one hand, the explicit manipulative nature of the act in question (picking ... putting ...) is paradigmatic of the need for active intervention on the existing: The artefact is read as a ruin, as rubble and unfinished, which needs new completeness. On the other hand, the search for a code, linked to the spatial relationship between two elements (up, over, in), exemplifies both the need to determine strategies and the insufficiency of those mentioned so far.
The strategic simplification linked to the intervention's location in reference to the existing one (above, below, inside, outside) has been overcome by some essential publications.

The classification by Brooker and Stone (*Intervention - Insertion - Installation*)[20]focuses on the reversibility margins of the project, and therefore on the importance of defining the relationship between two subjects.
On the other hand, Dan Barash[21] focuses on the symbolic value of the intervention, highlighting the importance of the relationship with the context (physical and cultural) over time. "Ruin and Redemption in architecture" introduces the theme of the redemption of "rubble", highlighting how the importance of an existing artefact is not intrinsic but to be declined according to the context.
Lilian Wong increases the degrees of complexity of interpreting reuse interventions, through the metaphor of the guest, and therefore of a subsidiary relationship between two entities, the dynamic and complex nature of this design practice emerges.
Depending on the nature of the host, the reaction of the host changes and adjusts. "Each intervention strategy, through uniquely different, reanimates it's host through an acknowledgement of some part of its defining principles"[22].
In defining the theme of reuse from a didactic point of view, the reflections mentioned above determine two essential positions: the first concerns the necessarily manipulative nature of the intervention, which must relate to the existing object in an interventionist manner, forcing both subjects to take actions and repeated reactions; the second is instead linked to the immanence of the complexity of reuse: this complexity is potentially highly formative because it spurs the student to reflect on several complementary levels (material, compositional, temporal, spatial).
The result is a system of strategies for interpreting reuse projects, deliberately prolix and not synthetic. The renunciation of the slogan and the immediacy of the interpretation are preparatory from a training perspective linked to the need for further study. To make these strategies explicit, I have identified four postulates of approach declined according to common themes:

### Postulate No. 1: Emphasize the existing by placing the new side by side with its own identity

Time splits and coexists, nothing is cancelled, everything is transformed. The design intervention joins the reuse project by proposing a new body, which integrates the existing one. The existing one is wholly maintained in its original features emphasized by the flanking of the new one.
The existing architecture manages the historical relationship with the context, urban relations, civic memory, the presence of the existing building unchanged, ensuring that urban relationships do not change. The context virtually "accepts" the new intervention because it is accompanied by already known relationships.
The new adds up in a formal, balanced equilibrium, and lives of being a double system, always evident. Obviously, it is essential, but perhaps not apparent that the new intervention seeks and finds its own identity.

### Postulate No. 2: Disrupt the existing by keeping only its traces.

The time progresses slowly, the new one contaminates the existing building's volume, substantially changing the work's appearance.
The broken rules are evident, since in the breaking of the rules (deduced from the existing) the relationship between new and old is established.
Changes of material, volumetric displacements, formal discrepancies, serve to declare the attempt to brutally add two distinct identities. The study of interlocking nodes is a fundamental sensitive point, such as the reflection on the transition from one identity to another.

As a ruin of a recent past, the existing architecture justifies the new architecture in an ambiguous relationship: love and hate, denial and approval. The violence of the design act is programmatic, it somehow serves to keep distance without annihilating the existing, which, as an anchor, is decisive for locating the project in that specific place and time.
The basis of the relationships is consolidated by the testimony of time that has gone on, a forced relationship, tied to the context and to the urban morphology.

**Postulate No. 3: Using the existing as a box that changes its nature inside.**

Time seems motionless, the inside changes from the outside, the wonder in the surprise. The envelope remains almost unchanged, remains unchanged in its general characteristics, the openings' rhythm, the size of the elements of the composition, changes inside. But the mutation appears, in the nature of the architectural details, in the finishes, in an essential gesture of absence, a cut, the demolition of a wall.
Maintaining the envelope seems like a deception, like a philological conservation. The appearance is revealed by some artifices: materials, lights, voids. Inside the shell is empty, filled, supported, detached. As still as it seems, time always runs forward, or so it should.

**Postulate No. 4 - Devour the existing by hiding it from view.**

Time has gone on, a sign, a direction, a material remains in the memory. The existing in appearance disappears. The new intervention changes the skin of the existing building by building on it, and in doing so, it hides it, incorporates it entirely or almost.
The existing incorporated seems to disappear but remains a virtuous presence that conditions the form, invades the volumes, and characterizes the space. The existing appears. Behind a large window, with a formal constraint, even if only with a small presence. That it is overshadowed, that it seems diminished, the existing is the matrix that justifies the new intervention.
Each of these postulates implies a reflection on some fundamental themes in the practice of reuse: time, identity, formal language, the relationship with the context.
The student is stimulated to overcome the formal approach as an end in itself, thinking instead about the transitive process.
The important thing is not the accurate representation of reality, but it is to do something that has an internal coherence, which makes sense and shows the quality of the imagination.
Thus, architecture's work becomes a *cognitive artefact*[23] to be studied and manipulated. The more the initial work is complete, the more difficult and effective the didactic act will be, imposing language constraints and therefore requiring greater attention in reading and translating existing rules. The error, often implicit, is a vehicle for learning since it implies a critical confrontation with one's actions.
As stated, the four postulates expressed are deliberately interventionist, the design act can be subtle and discreet or impactful and violent, but it must always be evident. The aim is didactic, and teach passes through the experience of error[24], which is more noticeable the more marked is the student's (design) gesture.
Teaching is a matter of faith. The student relies on the teacher's wisdom, and the professor depends on the student's willingness to learn.
If it is true that this trust is undermined by impaired communication and strengthened by excellent results, it is also true that it is crucial to make it clear that an "excellent" work is to be understood in the learning gradient.
Faced with the issue of reuse, the problem of error is a fundamental vehicle. The construction of wrong theories is actually the construction of "transition" theories, which must be corroborated: our

educational system rejects the false theories of children, but they are instead a means to train the cognitive faculty, to develop and bring out the skills necessary for the construction of more orthodox theories.

## CONCLUSION

We teach architecture out of necessity. Our teaching process's tacit objective is not that of composing an end in itself, but that of building a critical sense, an ability to evaluate. The search for quality that Phaedrus pursues astride a motorcycle[25], passes through the construction of the awareness of his own intentions. Reuse is a necessary practice in a world characterized by a saturation of human presence, which generated and abandoned buildings for hundreds of years.

But reuse is also a real teaching opportunity. The inevitable confrontation with persistence, like the evident confrontation with history, is an act of personal and individual growth. In acting through reuse, it is essential to be able to convey the design act according to personal awareness.

The exercises that I propose to my students are born with the pretence of being carried out almost independently. The impossible and often unsuccessful comparison serves to define a common ground for dialogue to re-build a design reflection.

The design act is a playful act, intended as an instrument of knowledge of an external world[26]. Putting students in front of the impossible or improbable reuse of oversized artifacts or "perfect" architectural objects, serves to "break the ice" with regard to the revolutionary ethics of design. The late Luigi Snozzi loved to say that every project comes from a demolition[27].

The demolition of Snozzi is an optimistic act towards a "positive" architecture capable of improving the context through his intervention. In a reuse project, demolition is first of all conceptual, and takes place through the knowledge of the existing building. Transforming a chair into a house, a minimal house into a swimming pool, the Villa Savoy into a gym, imposing the desecration of obvious constraints to generate a capacity for reading and synthesis applicable in every situation.

Faced with the issue of sustainability, the world is today in a serious emergency situation. The technical and ecological response is dramatically insufficient, as Greta Thumberg reminded us. Reuse brings architecture back to the fore, proposing a compensatory way that does not require a clean slate of the built, but a new reading of it. It is essential to be prepared, and even more so to be able to prepare those who, even more than us, will have to deal with a crisis situation.

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# SHAPING THE TASKSCAPE: DESIGN-DIRECTED METHODS AT THE INTERSECTION OF TEACHING AND RESEARCH ON LANDSCAPE

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## INTRODUCTION

What landscape is and can be is fundamental to the emerging discipline of landscape architecture. Theoretical studies and allied fields of human geography, sociology, anthropology, and political science are of vital relevance to the field as further dimensions of landscape are considered.

Anthropologist Tim Ingold has challenged both a realist approach to landscape as a physical site upon which human action takes place, and a constructivist perspective that sees landscape as symbolically imbued with social and cultural meaning.[1] Rather, he has taken what he considers to be a dwelling perspective grounded in phenomenology.[2] Here interaction shapes a relational human experience that cannot be isolated from the wider world, or simply read in a linear fashion as human action on the world. As he writes:

"in dwelling in the world, we do not act upon it, or do things to it; rather we move along with it. Our actions do not transform the world, they are part and parcel of the world transforming itself."[3]

Extending this theorization to landscape in particular, Ingold argues that landscape is "never complete: neither built nor unbuilt, it is permanently under construction".[4] For Ingold, the ongoing unfolding of landscape occurs through its relationship to what he considers the taskscape.[5] As the landscape refers to physical form and topography, the taskscape is made up of human perceptions and experiences, and it is through the intertwinement of the two that people and place emerge together.[6]

Over the past decade, as students and staff across multiple universities and academic disciplines, we have collectively interrogated Ingold's work on landscape and its potential to enable innovative methods in landscape and environmental design.[7] In this article key insights from three Master's theses expand his ideas of landscape and taskscape into design-directed research methods for interrogating understandings of landscape and shaping their design. This work arises out of a context in which design laboratories and studios, fieldwork, and undergraduate and post-graduate study, fold into one another and begin to break down the boundaries between teaching, learning, and research. Although different, these projects all seek to identify and draw on the generativity of Ingold's concepts, moving beyond the realm of critique to transform them into new tools for engaging and designing with landscape. Each of them has dealt with a different concern, with subsequent

investigations building on positions established first in fieldwork, then in evaluating design outcomes, through to identifying ways Ingold's work can be directly applied to the generation of innovative concepts. The key outcome across this work, as of design-directed research more generally, is to increase the imaginative scope of an existing situation; to consider how things could be otherwise.[8] As Ingold writes, "the forms of the landscape are not pre-prepared for people to live on – not by nature nor by human hands – for it is in the very process of dwelling that these forms are constituted."[9] Taking this as a provocative challenge to the discipline of landscape architecture, we ask how landscape might be researched and designed differently, not as an external site separate from people, as if it were a canvas or stage waiting for people to mold it, but as a relational phenomenon comprising physical form as well as human experience, perception, action, and creative force.

## FIELDWORK

In Katy Miller's research, Ingold's critical concepts of landscape and taskscape are taken beyond the realm of critique and deployed at the level of practice, in an attempt to reconfigure the role of fieldwork in the discipline and profession of landscape architecture.[10] Typically, fieldwork in landscape architecture centers on the notion of site and tracing the physical form of such delimited spaces.[11] Here visual and physical phenomena are prioritized with observation relied on to make sense of the landscape through practices of image-making, such as photographing, sketching, mapping, and so on. This is a method of coming to know the landscape as a discreet object, that due to such processes positions the landscape architect, as a passive separated observer who records that which exists within the external field site. What is not addressed through this approach is the phenomenological experience of being and acting in the landscape, or dwelling, that lies beyond what is seen, and the many shifting relations involved in this which together make up the activities that also shape landscape, or the taskscape. Miller asks how we might represent these interactive encounters as we move through the landscape and dwell within the field.[12] Here two key questions are asked: How might the actions and experiences that arise during the designer's journey through the landscape form a taskscape that equally shapes and is shaped by the physical form of place? And subsequently, can new methodological approaches be developed that move beyond the visualization of the landscape as a scene to be seen, to instead capture the various complexities and nuances of the taskscape and its relationship to the landscape?

In responding to this problematization of landscape, Miller creates a schematic model for landscape designers to take to the field with them and use as a tool to note their actions and experiences as they traverse the landscape (figure 1). These lived elements of being or dwelling in the landscape are traced in relation to other processes which are going on around the individual, within the wider space, such as animal activity or weather changes, for instance. What this procedure reveals is that the taskscape is shaped by the landscape and vice versa, with each acting upon and bringing the other into existence relationally. In other words, actions are shown to not just take place in or on the landscape, but to occur with and through it. Ultimately the completed schema diagrams the sequence of experiences through time and space vis-à-vis landscape (figure 2). For example, particular points along a trail might be realized as places people naturally stop for rest due to abrupt changes in gradient, or to observe certain features that capture attention. Therefore, reconfiguring fieldwork through a focus on these elements of the taskscape moves beyond observing the landscape as a scene that lies out there beyond us, to comprehending our place in relation to it. The deeper value of this tool is that in providing an understanding of how landscape is lived, it directs the landscape architect to use design, not just to sculpt a physical site and its form, but to also shape the behaviours that provide vital experiences of dwelling within landscape.

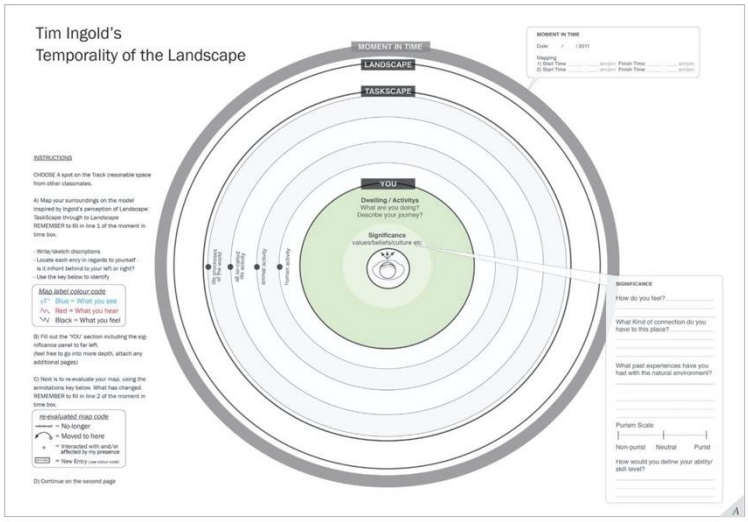


*Figure 1. Worksheet tool to identify 'Landscape Temporality' developed from Tim Ingold's position*

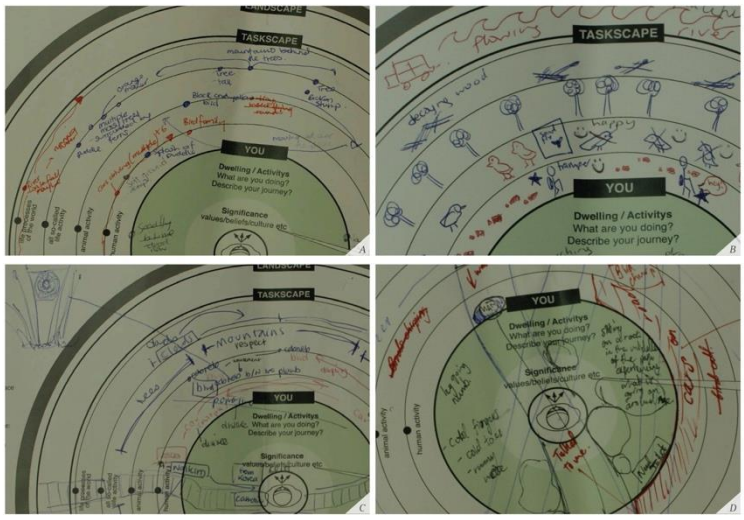


*Figure 2. Different designer participant's responses using worksheet tool*

## DESIGN EVALUATION

In Kate Blackburne's research, Ingold's ideas of landscape and taskscape are used to evaluate both tensions within the landscape and also a range of design interventions respond to these contested positions.[13] She draws on a case study of Banks Peninsula, a rural area in the South Island of New Zealand, where tensions exist between farmers who use the land for agricultural production, and recreationists who visit the area for activities such as walking, biking, and so on. To understand this Blackburne utilizes geographer John Wylie's idea that landscape is comprised of a series of tensions, or opposing forces between proximity and distance, body and mind, and so on, and she considers how this shapes the differences between the two groups in her study.[14] By then bringing Ingold into the study she identifies how the gap between farmers and recreationists is a phenomenological divergence in the ways individuals from these two groups live or dwell within the landscape through separate sets of perceptions, actions, and relationships. In light of this, Blackburne poses the question of how landscape architecture might draw on Ingold's concepts of landscape and taskscape in order to

develop a method through which these place-based tensions can be evaluated. To ask differently, how might we map the taskscapes of the farmer and the recreationist to better grasp the distinctive worlds they inhabit within the landscape? We can then develop design interventions that use these tensions as a creative driver to reshape the landscape to be more inclusive and accommodating.

Blackburne develops a method of axial mapping. She deploys a quattro stagioni, placing landscape and taskscape at each end of the x-axis, and the negative consequences for the farmer and the negative consequences for the recreationist at either pole on the y-axis. She then searches local news media and other sources, such as tourism brochures, to find different actions and perceptions of inhabitants, as well as various physical aspects of the area, and locates these at the appropriate points on the quadrant (figure 3). The result is a visualization of the interplay between taskscape and landscape, revealing the tensions between farmers and recreationists and the consequences of each of the identified and mapped phenomena for the two groups. Where the taskscape shows human actions and perceptions, the landscape refers to physical form. For instance, walkways and cycleways are built aspects of the landscape that farmers perceive to have negative consequences for them, while landowner resistance to public access is a perception within the taskscape that has negative consequences for recreationists. From this point Blackburne considers what is important to farmers and to recreationists, and how design scenarios may enable both to take place in a mutual beneficial and inclusive way. For example, a shared shed can be placed on a boundary between private farmland and a public walkway, functioning as both a shelter for walkers and a storage facility for farm tools and supplies. Through her research a range of design options are evaluated with a quattro stagioni framework based on taskscape and landscape with those solutions considered most effective subsequently developed for consideration by stakeholders (figure 4). This can be repeated to note how tensions within the landscape and the taskscape shift, as design interventions reconfigure the actions, perceptions, and relationships of farmers and recreationists such that each begins to have a positive impact on the other, not to their resolve differences, but to draw them closer to one another.


*Figure 3. Mapping farmer/walker related tensions in relation to landscape and taskscape*

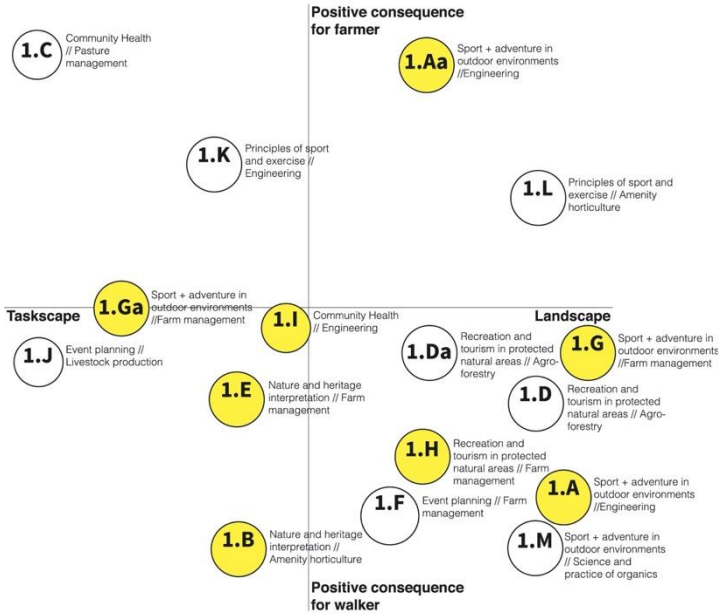


*Figure 4. Positioning Design Scenarios within a quattro Stagioni*

## CONCEPT GENERATION

In his research, Woody Lee builds on Blackburne's method of diagrammatically modeling the interplay between Ingold's taskscape and landscape, in order to develop a way of generating new concepts that engage people with landscape.[15] Lee begins with landscape theorist Martin Prominski's work on the Interrelated concept of nature and culture, which rejects the theoretical placement of people outside of nature.[16] In contrast, he turns to indigenous understandings, which consider people, like all forms of life, as embedded within an interconnected web of relations. More specifically, Lee draws on the indigenous Māori concept of mahinga kai or food gathering: "an all-inclusive term that encompasses the ability to access a natural resource, the site where gathering occurs, the act of gathering and using the resource, and the presence and good health of the resource".[17] Moreover, this is explored via a case study of the traditional Māori customary harvest of titi/muttonbird or sooty shearwater, an indigenous sea bird, that is annually hunted, stored, and eaten, but which is also protected through conservation measures to ensures the population remains abundant for future use. Lee asks how Blackburne's method of axial mapping might be reconfigured to examine the relationship between utilization and protection of titi as a natural resource, and what this might reveal about the complex interplay between landscape and taskscape which takes place through this cultural practice of mahinga kai.

To approach this, Lee adapts Blackburne's quattro stagioni model with adjustments on the y-axis. He keeps Blackburne's placement of landscape and taskscape at each end of the x-axis, and then situates utilization and protection at either pole on the y-axis. Where the landscape encompasses the physical elements that sustain the titi inhabit, the taskscape represents the mahinga kai practice of titi harvest (figure 5). And while utilization refers to the activities associated with the harvesting of titi, protection refers to the conservation of the species. Landscape elements such as habitat are located towards protection because of their importance for the ongoing existence of titi, while settlement is situated near utilization, for such built aspects of landscape facilitate human presence and therefore enable harvesting of the birds. In terms of taskscape, the work of predator eradication is located towards

protection since the purpose of this activity is to reduce the risk of titi declining due to predation, while the sharing of cultural knowledge about the harvesting of the birds is placed near utilization, because this ensures the practice will continue among future generations. The result is a visualization of the co-shaping of taskscape and landscape, of nature and culture, revealing the rich interrelationships and movements between harvesting and utilizing titi, which are generated out of the array of activities mapped onto the quattro stagioni.

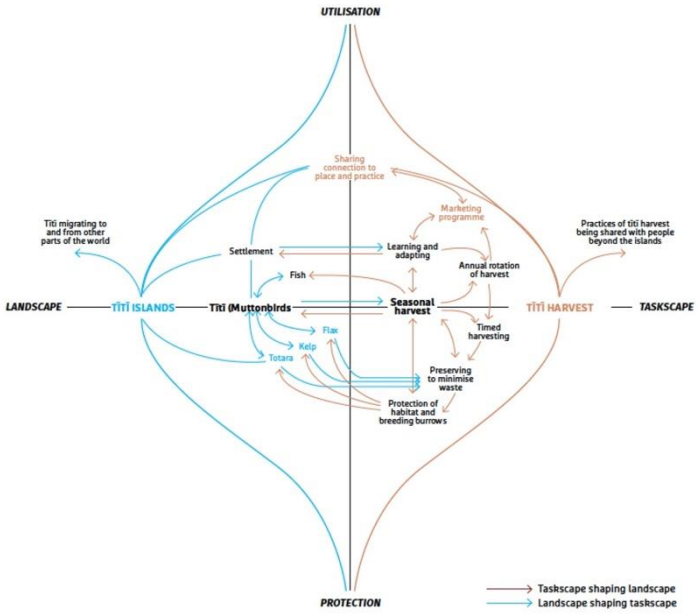


*Figure 5. Mapping of tītī harvest showing a relational expression of a site and its practices*

Pivotally, this work identified ways taskscape were direct shapers of landscape elements and vice versa. Lee represented this emerging web of relationships through the use of directional arrows. In so doing he shifted the quattro stagioni from a tool that maps positions to one with significantly more generative properties. It also begged the question could different directional arrows generate different behaviors *and* landscape expressions. Indeed, could such a method be used to generate novel design concepts. To test this he applied the method to an already completed design for Te Whenua Hou, which is a planting programme of 1.3 million native trees being undertaken across a farm development in the Canterbury Plains. Applying the model, Lee developed 3 scenarios that intentionally sought to design an expanded set of taskscape-relevant activities that focus on planting and people, and which include practices of ‘adopting’, planting, nurturing, harvesting, and passing on a plant seedling at the site (figures 6 and 7). The goal is to establish a sense of belonging and kaitiakitanga (guardianship) that bridges people beyond the site to the long-term regeneration of ecological habitat across the farm. The design value of this research is that in revealing and seeking out the complex interwoven dynamics of taskscape and landscape, the scope of possible interventions is expanded.

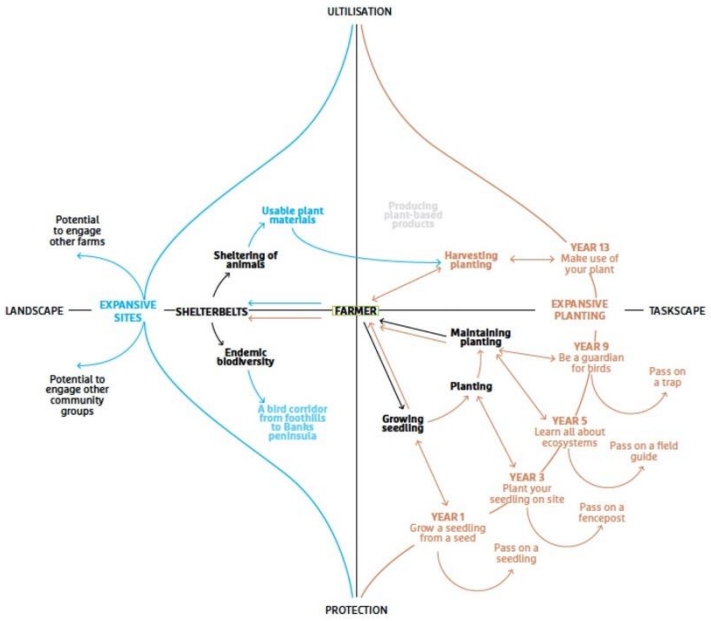


*Figure 6. quadrant-based exploration of a design scenario that imagines a future 'taskscape' scenario in which farmers and school pupils reciprocate in a series of planting related events and rites of passage, which together could generate desired landscape outcomes*

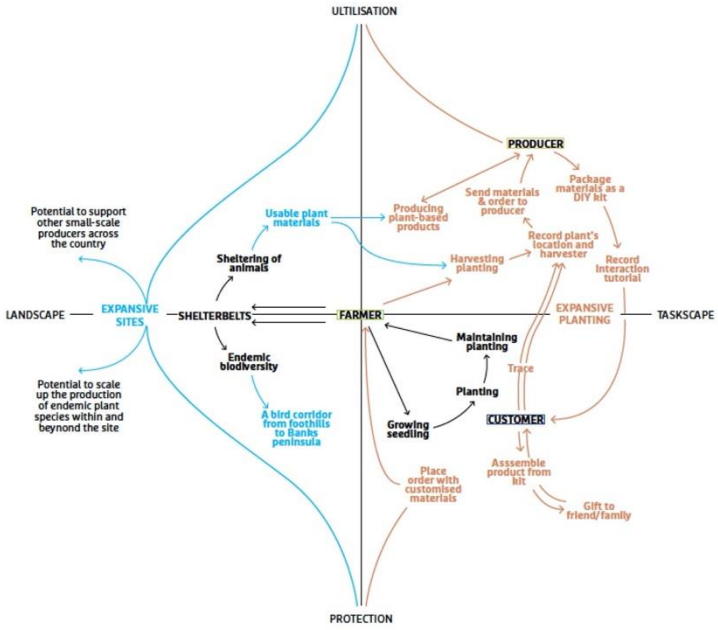


*Figure 7. quadrant-based exploration of an alternative design scenario– exploring the idea of food and resource related products that are based around an embodied engagement with endemic plant species*

## CONCLUSION

In this paper we present three master's theses as examples of how Ingold's work on landscape might be drawn on to develop a rich suite of methods for landscape architecture. Each of these respective methods takes his concepts in a unique direction for a specific purpose; fieldwork, design evaluation, and concept generation. While different, we argue these methods all enable an orientation towards landscape as a relational phenomenon mutually produced by people and place, or taskscape and landscape. This challenges the normative conceptualization of landscape in the field of landscape architecture, as an external site separate from people and their perceptions, experiences, and actions. Moreover, this understanding of landscape allows us to think and do design differently; to not just sculpt the physical form of a place, but to also shape human relationships within it; and which in combination suggested an expanded scope for landscape architecture. However, like our engagement with Ingold's work, the task of devising such methods is ongoing. In presenting these three examples derived from Ingold's concepts, we ask, what further design-directed methods could yet be generated from his notions of landscape and taskscape, and how might these further challenge the discipline of landscape architecture, in both theory and practice, to imagine and intervene into landscape differently?

The approach to landscape architecture outlined in this paper also reconfigures teaching, learning, and research in a number of significant ways. We argue that through our engagement with Ingold's theory of landscape, boundaries between research, teaching, and learning are blurred, as they are equally driven and sustained over many years within a broader pedagogy and designerly practice centered around questioning, inventing, and testing. The master's theses presented here have taken place at different times and across different universities, but they are connected by the fact that they are all responses to the wider ongoing challenge of rethinking landscape architecture through design-directed methods. As stated at the outset of this paper, this is underpinned by an ethos of creatively expanding the imaginative scope of a specific situation, and which the theses covered here demonstrate in insightful and productive ways. Moreover, although they are individual projects, each with its own respective questions and concerns, they do not emerge in isolation from undergraduate studios, other postgraduate theses, and lab work, but via the collective integration of these different layers of teaching and research which make up the place of design-directed research within university settings.

## NOTES

[1] Tim Ingold, *The Perception of the Environment: Essays on Livelihood, Dwelling and Skill* (London: Routledge, 2000), 200.
[2] Ingold, *The Perception of the Environment*, 200.
[3] Ibid, 200.
[4] Ingold, *The Perception of the Environment*, 199.
[5] Ingold, *The Perception of the Environment*, 200.
[6] Ibid, 200.
[7] Mick Abbott, "Practices of the Wild," *LA+* 1 (2015): 34.
[8] Mick Abbott and Paul Roncken, "Design and Research Roundtable," *Journal of Landscape Architecture* 13, no.2 (2017): 86.
[9] Ingold, *The Perception of the Environment*, 199.
[10] Katy Miller, "*Designing a National Park Experience: Expanding the Experiential Scope of Wayfinding as a Means of Creating Richer Interactions Between People and the Public Conservation Lands of New Zealand*" (MDes dis., University of Otago, 2012), 5.
[11] Elen Deming and Simon Swafield, *Landscape Architecture Research: Inquiry, Strategy, Design* (New Jersey: Wylie, 2011), 127.
[12] Miller, "*Designing a National Park Experience*", 5.
[13] Kate Blackburne, "*Landscape as Tension: Exploring the Analytical and Generative Potential of a Focus on Tension in the Landscape*" (MLA dis., Lincoln University, 2014), 1-5.
[14] John Wylie, *Landscape* (London: Routledge, 2007), 40.
[15] Woody Lee, "*Weaving Mahinga Kai and Landscape Architecture: Design with Nature through People-Ecological Interactions*" (MLA dis., Lincoln University, 2019), 48.
[16] Martin Prominski, "Andscapes: Concepts of Nature and Culture for Landscape Architecture in the 'Anthropocene'," *Journal of Landscape Architecture* 9, no.2 (2014): 6.
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# PROJECT-BASED TEACHING AND LEARNING OF URBAN DESIGN- LESSONS OF THE UNIVERSITÉ DU QUÉBEC À MONTRÉAL (UQAM) PRAXIS III STUDIO APPROACH

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## INTRODUCTION

### Project context

Stickland goes back to the foundations of the concept of urban design (Krieger, Saunders, 2009), to revisit and discuss the importance of encouraging multidisciplinarity in project development (architecture, urban planning, landscape, engineering, etc.). Moreover, in the context of globalization and the circulation of urban models, urban planning programs should, in his view, prepare students for the context of practice with an international perspective. According to Strickland, it is also fundamental for students to acquire the ability to work in teams and apply the various degrees of structuring of the built environment when developing a project. Skills can also be developed in the context of project development through role-playing which allows students to get a glimpse of the perspective and the varied interests of the stakeholders involved and the population concerned in the implementation of an urban design project.

### Project approach

This author also argues that in the transition from analysis to project design, it is important to build research analysis skills and cultural and historical awareness that will enable students to create meaningful projects rooted in the reality of the intervention context. He also questions the linear aspect of the traditional project approach, moving from analysis to the formulation of a design and a development plan, to communication and implementation of this plan. Retrospection and questioning along the way should be encouraged in order to reflect the reality and usual course and outcomes of urban design projects in actual practice. He mentions that educational strategies should help students to develop their own personal approach to urban design.

### Project outcomes

Strickland mentions the need to develop a broadly comprehensible language in the communication of the urban design project so as to engage the general public and a vast array of stakeholders. He proposes to make the statement of urban design guidelines and principles the main impact of the urban design project instead of focusing strictly on the proposed spatial configuration, which is often

frozen in time. Since the urban design project concerns collective space and must fuel public debate, it should, in his opinion, encourage the presentation of projects outside of academic walls to those concerned. Here are the ten criteria used in this research approach to analyze and evaluate the educational performance of the three Praxis III studio courses at UQAM.

### Context of the project

1- Multidisciplinarity in project development
2- Preparing students for an international practice of urban design
3- Favor teamwork and working on multiple scales
4- Role-playing to make students aware of the variety of stakeholders involved

### Project approach

5- Developing research skills and cultural and historical consciousness
6- Questioning the linear approach to the project by integrating retrospection
7- Developing each student's own approach to urban design

### Project outcome

8- Using easily understandable language
9 - Statement of urban design guidelines and principles as project impacts
10- Presenting projects concerning the collective space outside institutional walls

The following section evaluates project-based teaching in the Praxis III studio at UQAM process in terms of its context, development, and results. For this evaluation, we use educational material (course outlines, plans/research design, etc.), and a review of the projects carried out during the 2015–2016, 2016–2017, 2017–2018, and 2018–2019 academic years to study the context in which the projects were developed, the educational approach used, and the results of the projects. A summary table (Table 1) identifies, according to a rating scale, the dimensions covered in the teaching of the project in order to determine the knowledge acquired by the students of the Praxis III program. This is in terms of know-how and interpersonal skills in the context of working on the development of a urban design project over an entire academic year.

## CONTEXT OF THE PROJECT

### Multidisciplinarity in project development

The Bachelor of Urban Planning program is an undergraduate program recognized by the Ordre des urbanistes du Québec (OUQ) and the Canadian Institute of Planners (CIP). Most of the students who enroll in this program have a CEGEP-level education (college of general and vocational education), which, in Quebec, is a two-year general pre-university program; hence, their background could be in any field of the humanities and social sciences. Some students have attended a technical education program in architecture, engineering, or land use planning. The program also welcomes a few candidates who have begun university studies in other programs and choose to branch out into the field of urban planning. As a result, students have similar backgrounds and preparation for undertaking urban planning studies, and when it comes to project development, there is not, strictly speaking, groups of students from a variety of planning disciplines. However, the program does cover disciplines such as architecture, geography, sociology, economics, and ecology.

### Preparing students for an international approach to urban design

The Bachelor of Urban Planning program offers two concentrations, one international and one regular, that students can choose from in the second year of study. The international concentration involves a choice of courses that address urbanization models around the world and how they influence the practice of urban planning. Students having chosen this concentration are offered a one-term exchange where they are introduced to the perspective of urban planning practice in France, Belgium, the United States, or Central America. In the context of the studio project, there are usually 36 students following the regular track and 36 students following the international track. This ensures that half of the cohort acquires an international perspective on the practice of urban design. It should be noted, however, that teaching methods being common to both groups, the teams from both concentrations are brought together at key phases of the project for the purpose of feedback and jury empanelment. The students in the regular concentration thus get an opportunity to become familiar with European, American, or Central American planning issues. Conversely, students working in an international environment are also aware of regional and local planning issues, particularly in the cities of Montreal and Quebec, as well as in other Canadian provinces (Maritime provinces, Ontario, etc.).

### Working in teams and on multiple scales

With 36 students following the national track and 36 students taking the international concentration, the Praxis III studio work is usually done in teams of five to six students and there are six teams per group. Close supervision is provided by the teachers during weekly individual team meetings, generally lasting about 30 minutes. For this purpose, each team of students sit around worktables equipped with a screen to display their deliverables and facilitate discussion between team members and the teacher. Although not in a closed-off space, this organization replicates the typical meeting room of a municipal urban planning department or a private firm (Figure 1).

The key element ensuring the cohesion of the work team is the definition of a service offer, i.e., the definition of the mandate which is developed as a team and presented to the whole group. This service offer includes the presentation of the firm, its mission, its vision, and its interest in the development project. The team members' résumés are appended to the service offer. In order to organize and work effectively, each team must develop a chart illustrating the various tasks to be accomplished throughout the academic year. They are included in the schedule of assignments and presentations that students have to complete for the three courses that make up Praxis III (Figure 2). Team members must also assign the tasks and distribute the resources that they intend to include in their "mandate." The process begins with a clear definition of the work to be done, the steps to be completed, and the deliverables for the three phases of their development project. This is necessary in order to optimize collaboration between team members and to develop in each member a sense of responsibility for the complex task of developing an urban design project as a team.

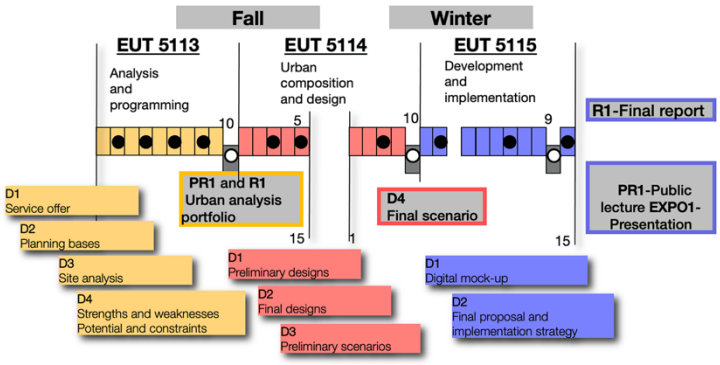


*Figure 1. Students working in teams.*

With regard to the multi-scale design work involved in developing an urban project, the twofold task of analysis and design must be done on three different scales: the neighbourhood scale (zone of influence, 500 m to 1 km of intervention zone); the scale of the contextual zone (impact zone, 100 m to 250 m of intervention zone); and the scale of the intervention site (project zone, 5 to 10 ha or 6 to 8 urban blocks). The bases for the urban analysis and design definition correspond to these three scales. In addition, the question of interlocking and the effects of each scale on the others must inform an understanding of the intervention site and its role in urban dynamics at higher levels.

*Figure 2. As part of the Praxis III workshop, courses EUT-5113, EUT-5114, and EUT-5115 cut across the three stages of the urban design project (analysis, design, and implementation).*

### Role-playing to make students aware of the variety of stakeholders involved

At key points in the Praxis III studio process, when submitting and presenting deliverables (D) number 1 (D 1) of the Project Analysis and Programming course, D2 of the Urban Design and Design Composition course, and D2 of the Project Development and Implementation course, members in each team take turns to form a six-person jury (Figure 3). During the presentations of their site analysis, designs, final scenario, and implementation strategy, they act as representatives of the stakeholders in the municipality concerned. A specific evaluation grid guides them in their evaluation

and commentary on the work presented. Role-playing leads students to focus on the way each team interprets the specification requirements for each deliverable in their work Moreover, in the context of role-play they can adopt the perspective of various municipality stakeholders, i.e., members of the planning committee, groups involved in their project, and citizens. In addition, it provides a context for emulation because students draw inspiration from the innovative and attractive ideas shared by others and use them in their own work.


*Figure 3. Example of presentations in a role-play context.*

## PROJECT APPROACH

### Developing research skills and cultural and historical consciousness

In the urban planning program at UQAM, research skills development begins with Praxis I during the first year of the program. The objective is to teach students methods of analysis and research to be applied both at the level of the socio-economic dimension of the city (quantitative and statistical tools) and at the level of its physical-spatial dimension (qualitative and morphological tools, field studies). These concepts and tools are applied during Praxis III, mainly at the project analysis and programming stage (Figure 1). The formulation of a diagnosis on an intervention site chosen by each team will be the opportunity to define the development potentials and constraints (physical-spatial dimension) and the strengths and weaknesses of development (socio-economic dimension, local stakeholders, and dynamics).

The development of cultural and historical knowledge is fostered through the required readings and lab course discussions on the evolution of urban design practices, as well as during exchange abroad, but mostly through the Urban Planning Theory course as regards cultural awareness. The History of Urban Planning course is also intended to awaken the historical awareness of future urban planners. For the purpose of this course, the teams are asked to situate their design approach among the main schools of thought in urban planning (neoclassical urban composition, modernism, postmodernism, contemporary approach, sustainable development, etc.). The diachronic morphological analysis of their sector is also an opportunity to incorporate the urban know-how and the building culture specific to the place of intervention. Finally, readings of select literature spark class discussion on major debates currently shaking the practice of urban planning and design in Quebec and Europe.

### Questioning the linear approach to the project by integrating retrospection

The Praxis III studio is the point in the program where the shift is made from urban planning theory to practice, through the definition of an urban design and intervention approach to the built environment. The projects engage the teams in an approach to design and implementation of physical arrangements enabling them to control the formal organization of urban growth in the urban sector they have chosen, and this, through permanence and change (Choay and Merlin, 2015). Despite the linear process organized by three studio courses organized according to a three stages urban design approach, the elements produced at each stage are connected to previous work. In addition, each modification and question arising along the way allows teams to retrospect in order to make the required clarifications and adjustments. This is to ensure the overall rigour of their urban design process over the course of an academic year. In this way, students engaged in the pedagogical process are constantly led to question the linear approach of the project by integrating retrospection. They are also called upon to anticipate the effects of their development concepts according to the stages to come, particularly during the phase of establishing the tools for project implementation.

### Developing each student's own approach to design

The studio course approach is modelled on the standard steps of an urban design project process: context analysis (urban analysis), creation of the urban structure (design plan) and detailed planning (3D, cross-section), and implementation strategy (phasing, costs/benefits, regulatory framework) (Llewelyn-Davies, 2007). It should be noted that the design approach involves studying pedestrian and cyclist movements that are specific to each development design defined by the teams. This is an opportunity to verify the "walkability" and serviceability qualities of their proposal (walking, biking, public transit) and to integrate the notions of sustainable development, as soon as the two urban planning scenarios to be developed by the teams have been defined.

As such, the Praxis III studio does not allow for the acquisition of a design approach specific to each student but rather to each team. This approach is therefore developed in a collegial manner with the support of the teacher and his or her teaching assistant. Although the teachers insist that each group of students complete all three steps, it is up to each team to tweak the approach according to the specific development problems of the site and the city it has selected. It is important to remember that the teams' mandate is developed together with local stakeholders, which also ensures that the design approach is adapted to the type of environment (wasteland to be re-urbanized, existing urban environment to be consolidated, etc.) and according to the dynamics and degree of involvement of local urban planning stakeholders in their project.

## PROJECT OUTCOME

### Using easily understandable language

Whether during the urban analysis phase (Project Analysis and Programming), the design phase (Urban Design and Composition), or the implementation phase (Project Development and Implementation), the documents submitted are in large format (A4) and the layout favours an equal division between text and graphics, composed of diagrams, plans, photos (etc.) enabling an easy and synthetic understanding of the content of the deliverables. The transition from urban analysis to composition and urban design is another important element, requiring students to work solely in freehand drawing by superimposing layers on the background plans in order to map out the potentials and constraints of their site and to define their two preliminary design concepts. This helps to develop their ability to draw with a view to conveying their design intentions inasmuch as drawing must become a communication tool in the context of their professional practice. Finally, the development

of digital models using the SketchUp software, among others, also allows them to validate and share their strategy for the development of the public and built spaces of their project (Figure 4). The development of ambient views also enables them to illustrate the key elements and spaces of their project and the sequence of certain routes.


*Figure 4. The three-dimensional development of the urban design projects.*

### Statement of urban design guidelines and principles as project impacts

The transition from the Project Analysis and Programming course to the Urban Design and Composition course involves defining four to five major development issues that emerge from the urban analysis of the intervention site. These issues will serve as a basis for the formulation of a planning problem and objectives that respond very specifically to these issues. The search for architectural and urban precedents or relevant archetypes will allow each team to put together a bank of physical and spatial responses that can illustrate their development objectives. This documentation of urban know-how should enable them to undertake the formulation of two detailed designs and scenarios, and it is through the comparison and evaluation of their organization that the final development plan is defined. The three-dimensional development of the project, in particular using SketchUp software, or real models and the definition of ambient views are at the basis of the statement of principles and planning guidelines that steer the transformation of their sector of intervention and which are the real spin-offs of the project.

### Presenting projects concerning the collective space outside institutional walls

At the end of each academic year, after eight months of intensive work, each team is called to contribute to the organization of the R-urban exhibition by setting up a booth and making a public presentation of their “project planning” approach (Figure 5). This event is an opportunity to showcase the work of the students outside the walls of the Urban and Tourism Studies Department. Speakers from each city and members of the jury from the professional community are invited to attend the presentations and booths prepared by the 12 teams that have completed the final stage of the urban planning curriculum. The student association also organizes a graduation cocktail party on the exhibition grounds. This is a special moment where students take full measure of the quality of their work and mark their transition from the academic sphere to the professional world.


*Figure 5. Participants in the R-urban exhibition*

## CONCLUSION

We have grouped our analysis data in a table summarizing the qualitative evaluation of the educational strategy used in UQAM's Praxis III program (Table 1). Overall, we note that all aspects of Strickland's criteria are covered in the Praxis III educational approach. However, the scoring for some criteria, which were deemed to be partially covered, was only half a point. We obtained a score of 8 or 80% regarding achievement of the educational objectives.

What emerges from the overall assessment is that the international perspective needs to be strengthened through greater "cross-fertilization" between the two groups during the year and by comparing local and international approaches in the discussions. The organization of urban design exchanges involving other departments and institutions should allow our students to be in contact with other disciplines related to the practice of urban design. Furthermore, it is important to question the linearity of the approach by setting up blitz exercises that prefigure the questions to come in the development of projects. More exploration and differentiation between teams will also need to be encouraged and innovation in the urban design approach (risk-taking) will need to be stimulated in order to individualize projects.

By way of conclusion, we can say that the systematic and rigorous evaluation of urban project-based teaching approaches should make it possible to compare programs and to initiate a more comprehensive reflection on the issues of project-based urban-planning pedagogy in schools of urban planning and architecture. Continuous evaluation helps to define the basis for learning urban planning as a research and design discipline in its own right, with material and requirements (research through design) of its own.

| Criteria | Fully covered (1pts) | Partially covered (0.5 pts) | Not covered (0 pts) |
|---|---|---|---|
| 1- Multidisciplinarity | | 0.5 | |
| 2- International perspective | | 0.5 | |
| 3- Teams / scales | 1 | | |
| 4- Role play | 1 | | |
| 5- Research/ culture/ critique | 1 | | |
| 6- Questioning linearity | | 0.5 | |
| 7- Personal approach | | 0.5 | |
| 8- Easily understandable language | 1 | | |
| 9 -Guidelines / principles | 1 | | |
| 10- Dissemination outside of academic walls | 1 | | |
| | 6 | 2 | 0 |
| TOTAL | **8 / 10** | | |

*Table 1. Evaluation of the Praxis III approach according to Strickland's criteria*

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# *PEDIAGOGY* OF A PRACTICE: CREATING A PIVOTAL CULTURE FOR LEARNING ARCHITECTURE

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## INTRODUCTION

Architecture pedagogy in the UK is diversely (in)effective and has lost its attachment to values beyond vocational criteria. This is because of tight strings attached to past politicized regimes, post-war neoliberal reforms, and the advanced capitalistic consumerism in the context of UK Universities. Lately, learning and teaching Architecture in the UK is facing systemic turbulence imposed by blended learning modes necessitated by the COVID-19 campus lockdowns in 2020, the inflation of tuition fees across the sector, the political and immigration turmoil, climate crisis and precarious working conditions. Sensible and resourceful change via action -or inaction- is needed by means of systemic responsiveness and agility rooted consciously on intellectual and technical tactics, which sees the learning as separate entity: a site; a field. These two terms we will be associating here with notions of game(play) and desires to construct a chartography for a currere.

This paper becomes as such a proposal for a shift in learning architecture from traditionally focusing on training the learner towards training the field for learning (pedias; πεδιάς/παιδιάς = field; plateau/game). Our proposal rethinks stagnated methods of integrating theory and praxis, practicing and learning architecture, and introduces a new term: "pediagogy" (παιδιαγωγία): a tactic of learning and teaching by training the field created by learning itself instead of separate individuals participating and forming the learning activity, driven by desire. We examine "pediagogy" cartographically, looking at learning as dynamic field of connectors including desire. We furthermore approach desire as manifestation of life beyond singular institutions and within a network of posthuman interrelations. We are presenting two pilot practices as self-reflective case studies appropriating online technology within a blended learning environment where learning becomes a dynamically participatory event - an "assemblage… an emergent and chaotic collection of things, both human and non-human." [1]

### Context

The research we present is shaped by syntheses of theory and practice and is made possible in the context of the new school of Architecture founded two years ago at the University Suffolk[2]. Attempting a new curriculum (currere) in times of radical change need and socioeconomic turbulence is no straightforward task. As designers and runners of the "currere" educators also become learners and may realise what Deleuze and Guattari assert us that "it is so difficult to say how someone learns… there is something amorous -but also something fatal- about all education."[3]

The project of designing a relevant "currere" becomes more complex if we consider the connection between the educator and the course itself as one that "avoids devolving upon the experience of the individual" Jason Wallin suggests and proposes "an approach to pedagogy that productively deviates from the idea that the individual constitutes the basic unit of education."[4] We must (like Wallin) consider Ted Aoki's view that the "curriculum thought inheres an implicate architecture… the ecology of institutional life is already foreclosed by a series of blinkers that constrict disciplinary thought"[5], a phenomenon he later coins (drawing from Kaustuv Roy) as "institutional myopia."[6]
These parameters already inherent in education at all levels work in conjunction with the expectation of HE to offer vocational training and against our capacity to form environments and conditions of learning beyond the institutional and professional canon. Unfortunately, the pedagogy of Architecture has become since the transition from apprenticeships to polytechnics to universities and now back to apprenticeships ever so complex. It is still driven by what many define as mainstream practice – the design of buildings in the planning and procurement system of the UK– and at the same must remain tasked to address diversity and creativity through its curricula, in the agendas of School and distinctive courses that work in parts. The well-rooted principles of studio practice carry the strength of studio culture yet must give also way to modes of learning that go beyond the "ways we used to teach".

## THE TUTOR'S STRESS

Many trained educators continue to deliver their "currere" in Architecture and yet fail to realise how much the role of the teacher has changed since the Academy was established during the time of Plato. The role of the pedagogue started with and stems etymologically from the slave who leads the learner to the school handing them over to the schoolmaster and the latter teaches formation of character (virtue) and intelligence, which according to Aristotle is the principal learning outcome of education. Fast-forward in time of super-modernity and advanced cyborg capitalism (as coined by David R. Cole[7]), key places of learning are undergoing yet another subtle wave of reform "according to the principles of market function and corporate design pressure"[8]. Tutors become preoccupied with the impossible task to train purposely diverse cohorts in line with targets that start looking unfathomable and criteria that are arbitrary but too precious to be discarded. The literature on architecture pedagogy is confoundingly overprotective of methods driven by the vision of uniformly skilled graduates and vilify the supposed marginal connection of education to the industry presenting the creative studio as "the greatest strength and weakness of architectural education as preparation for practice."[9] – a systemic dystopia, to misquote Darren Webb[10].

### A Utopian Educator

In the current oblique cultural landscape, Webb asks for an education based on longing, hope, liberation, imagination and the capacity of learners to organise life in new ways. He speaks of an education of desire, which can lead to better ways of being[11]. Driven by desire, Webb argues, we can develop a pedagogy of kinship, communication, intimacy and curiosity – actual and virtual. In such a progressive classroom, (a studio of desire) there is a culture; a collective "we" and the distance between what is lived (experience) and what is learnt (knowledge) is diminishing. Only then, he says, we can use our intellectual and cultural weapons to challenge the existing institutional liberalism and deal with the teacher's stress. Webb's desire drawing from William Morris and Paulo Freire is a political and collective act and still firmly rooted in the human condition[12]. We must however consider at this point that we have moved on to a posthuman condition[13] and that a future of education will reflect the community and the world we live in overall. Some issues that we may see as inherent

to pedagogy are in fact ecosystemic issues of everyday life stemming outside the campus. Jean Lave and Etienne Wenger analyse communities and the social structures of practice in learning associated with the notion of "peripheral participation"[14] and its location within an "ambient community"[15]. To propose a shift, we must address the pathologies of the wider adult communities and socio-political constructs we live in and with. Within these, and in the context of change, Ken Robinson sees three types of agents drawing from Benjamin Franklin's observation on three type of people in the world: "those who are immovable, those who are movable, and those who move."[16] Robinson also emphasises that change is subject to alignment of five elements: vision, skills, incentives, resources and action plans.[17] We must therefore consider not only the wider socio economic contexts when proposing a pivot in culture but also the role of leaders, stakeholders and policy makers in the potentiality and process of change in an educational setting. We must also agree with Robinson and Franklin – a point that we (authors) take forward in our approach – that any immovable agents need be left alone to be carried away by the surge of transformation.

### The Impotent Learner

Since modernity and the industrial revolution, mental and physical stress has been studied as a social and pedagogical phenomenon most prominently in central Europe. Anson Rabinbach highlights the genealogy of neurasthenia and its associations to fatigue and intellectual exhaustion[18] which leads to loss of culture, loss of pedagogy, noting that "contemporary humanity does not have sufficient capacity for adaptability, to tolerate the increase and expansion of life work without injury."[19] This stress has now become assigned illness for our generation of teachers and most prominently learners. We are a neurologically (and since COVID-19 also immunologically) suffering age that is burnt out and suffering loss of contemplative attention[20]. Contemporary learners are in principle tool savvy but ahistorical and struggle to approach education as lifelong emotional (and intellectual) need because of limited affective capacity. K-punk author Mark Fisher calls this "reflexive impotence"[21] – an inability to imagine new ways of being and tendency to settle for a future that never comes. Talking about students he says, "they know things are bad, but more than that, they know they can't do anything about it."[22] The will has to be educated itself to endure the strains of civilisation and desire is a primitive form of affective drive for life. When power of desire is negative, will is weak, and the need for education is suppressed creating an "inferior student whose impaired performance [is] a consequence of the exhaustion."[23]

## NETWORKS AND DESIRES

To address these maladies of humanity and reality effectively by education and also ensure we consider the complexities previously addressed we must go beyond singular theories of education of desire. We need to question the constitutive structures of institutions and communities in situated learning looking at non-typical and human centred ecologies of being – networks. Fernand Deligny studied the topologies and autistic children classrooms and highlights the network as a (better future) mode of being that is different to society because it allows multitudes of species and methods and allows survival in times of crisis. It can disappear or become an institution. It is a situated "enduring phenomenon, a vital necessity."[24] Wanting (desire) he says is an epiphenomenon of such construct and we approach it here beyond its libidinal force of pleasure[25] as ontological dynamic; as potential towards a creative democracy according to Pignatelli[26] and Dewey[27]. Can we imbue desire in nascent situated networks in education settings to allow for a better future by means of culture? Can we employ technology and cyborg behaviours of "switching on, logging in, booting up, surfing, processing"[28] in affective ways to enable the need for cultivation?

## SELF-REFLECTIVE PRACTICE AS CASE STUDY

By means of critical response to these questions, we piloted two new modes of learning for students on the BA (Hons) Architecture at Suffolk during the academic year 2019-20 and the March 2020 lockdown due to COVID-19 restrictions. These will serve as the debate platforms for us to question and re-shape the notion of a currere (a curriculum as filed) and make evident that we can hope for multiple dimensions and possibilities in the model of the utopian educator by Darren Webb and what we defined as the virtual studio of desire. Rejecting the concept of unified meaning and that an individual's thoughts and outputs of praxis should feedback to a singular logic or reason[29], each activity is invented to promote the virtual over the actual. This is not to distinguish between the physical built environment, and the ever more increasingly inhabited 'online' world, but rather to provide a space that enables participants to each express their own 'virtual real'[30] world as David R. Cole, in which participants form their own desires, understandings and pathways to knowledge. We embrace the virtual real here not as a condition that is impossible to grasp due to alienation (like Cole quoting H.G. Wells and Deleuze), but in fact a state of otherness worth our curiosity and attention. In this virtual real condition of possibility, there are strong references to a terrain – a gamified field; one that allows imagination and freedom from individualistic bias against the person as a social and cultural construct of some kind that is already predefined and hard wired to drivers of capitalistic and socially accepted norms.

### Gamifying Elephant and Castle

The first learning activity used here as a reflective case study was a live building visit. Participants (learners) were taken on virtual tours, in the site (field) by a guide (teacher), using their mobile devices to record themselves moving and sharing this in real time. This pilot exercise took place in April 2020 during the first national COVID-19 lockdown in the UK. A specific time (one-hour slot) was allocated for the activity to be completed as part of outdoor exercise allowed under government guidance. Skype was used as interactive platform for communications and google maps allowed the facilitators to share their location live. Both were fully accessible by all participants with the exception of the live sharing function, with only 1/3 of participants actively tracking the facilitator on the map.

Using live tracking technology, participants followed the guide's location and complemented the guide's commentary referring to online content shared prior to the session (flipped classroom learning model). Like in a gamified environment, they actively 'played site mapping' directing the guide to specific points of interest in the field, and therefore shaping the learning in a non-prescribed manner. The gamification of the learning field in this case of situated and agile survey/ site mapping of Elephant and Castle allowed extended accessibility, active participation, and mutation of the map surveyed as well as the field itself. The same site would be mapped differently in every repetition of the exercise, subject to synchronous feed of empirical data coming from each participant and learner. The learning itself becomes as such choreography and cartography; an agile activity where the educator facilitates the game that activates desire which then actuates the will to participate and action taken for the learning to take place as "learning by doing."[31]

Our key observation from this pilot study was that participants (learners) were reluctant to take control and lead the exercise. In order to encourage this, students were chosen one at a time to take control of navigation. This worked well intermittently, typically with the more confident students comfortable in this role. In contrast, for some students the almost complete freedom of choice appeared to incapacitate them. This was evidenced with questions such as, "how do I decide" and "which way will be better". Figure 16 below shows a mapping of the facilitator's movement towards

the end of the activity with almost 50% of crucial directional decisions taken by the facilitator rather than the learners. In some emerging as well as well-established online games (namely GTFO and WoW respectively), the freedom of each player to roam and experience imagined worlds, driven by common goals or accomplishments only possible through collaboration with other players in the field, the latter being a virtual expansive environment and the players joining in from an international server. Whilst games like these are more recreational, and less didactic per se, they perhaps demonstrate the need for a commonality of desire and democratic 'value' towards the common good to which all participants subscribe and sustain a moral obligation towards. Like democracy in its foundational manifestation, this is a spatial model of local organisation; a map; a city – a site.

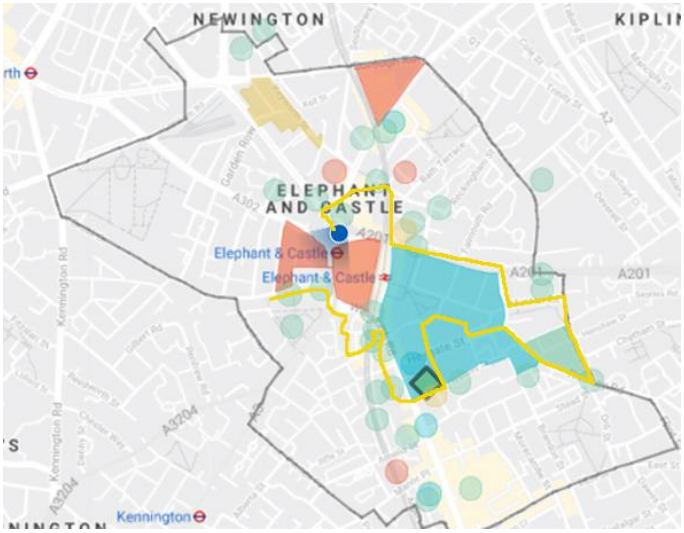


*Figure 16. Outcome of live mapping from Elephant and Castle pilot study, © the authors.*

## Running A Hackathon

The second case study is a virtual collaborative design workshop titled the 'Architecture Hackathon', where learners and tutors work together on a concept design for a live project. The first Architecture Hackathon took place over two sessions in June 2020 with a group of 12 Architecture students from the East of England. The physical studio was reformed as interactive online virtual space with video conferencing and shared folders. The workshop structure presents a series of activities, labs, designed to stimulate the flow of ideas and encourage interaction. In the learning activity of the Hackathon, desire is emancipated via engagement in education where the learner assumes responsibility of a professional in a wider didactic setting. The opening and demystification of the professional field – the game – creates a culture for the growth of collective will. The learner owns the outcome together with the educator. They are not just consumers of the learning service but instead develop a sense of belonging and intimacy with the learning itself and its outcomes. The learning seizes to be a personal commodified good – it becomes a common; an element that carries the moral obligation for the fulfilment of the outcomes and therefore the personal success that comes from achieving it collectively.

In the first session, consisting of three labs, participants put together a database of precedents that were discussed and analysed. Students were encouraged to think about the space as somewhere that they would want to live, and as such, look for precedents that were not only sustainable, but which appeared aesthetically pleasing, and were suited to their context. Participants were then challenged to begin sketching their ideas through a series of design games, including a form of 'speed drawing' in

which individuals shared thoughts with one another in a round robin format. The second session, consisting of two labs, participants bought together the ideas from the first week into a coherent design. This exercise followed BIM stage 3 protocol with individuals working in the cloud using a shared digital model (using Revit). By the end of the session, the site was occupied with a collection of models, not just showing a diverse range of ideas for low energy design, but which could also be used to test the site itself for the ideal location. Feedback from the session was positive, with respondents (six out of twelve) rating the event either very good or excellent, feeling they had learnt a significant amount about sustainable design, and finding working in the online environment a positive experience. The design outputs (***Figure 17***, below) from the session were also extremely valuable to the project and gave it a great foundation from which to build.

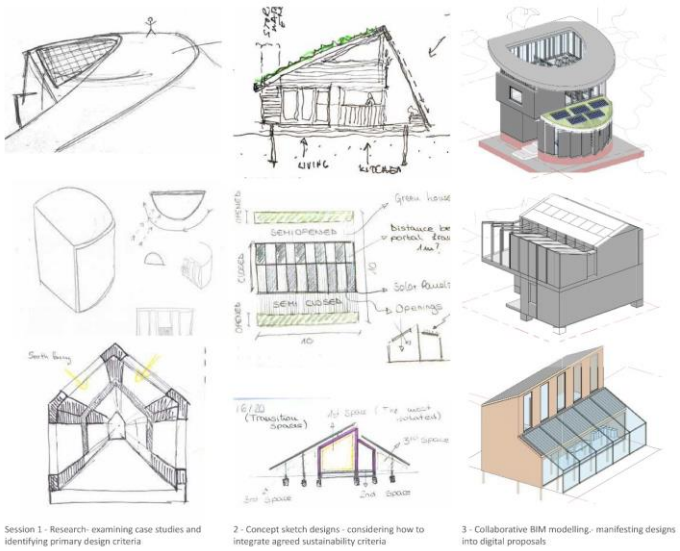


*Figure 17. Design outputs from the Hackathon, © the authors and the University of Suffolk.*

Comparing the two activities analysed as pilot case studies in the context of this paper the hackathon appears to help shape more tangible and evident learning outputs. Yet it is hard to argue that such activity, isolated from the currere can provide such an open platform through which participants could explore and discover their own virtual real. The brief and precedents provided to the students by the facilitator intentionally guided them in a particular direction in order that the outcomes would be of particular standard, which almost dictated desires and formulations of own pathways in the learning itself. Furthermore, working with the students throughout, it is hard for the educator to acknowledge the degree to which they influence is extended upon the output, and whether the latter is led by the participant in a distinctively individual way.

## A STUDENTS' PEOPLE

Humanity measures value by achievement. This is evident in metrics, performance indicators and the expectation that people with higher qualifications will in principle be paid more in their professional standing. This is far from the meritocracy of today. Par example in architecture the vast majority of qualified graduates come from privileged backgrounds and would have received extensive training in higher education. The salary ranges do not follow the pattern however when compared with other fields. In this bizarrely indexed professional field called architecture and its education that tends to be rightly eclectic, it is very difficult to perform an anthropological mapping. We will only attempt to

identify the protagonists that shape the game and allow for mutations of the map. To start with, we must address learners are nomads and the classroom – the roster of the game – is a people and not a society. We borrow these terms from philosopher Gilles Deleuze who identifies the nomad as a situated non-territorialised entity and not somebody who travels all the time per se. The nomads (our people) do not form social constructs in the game. They form networks on the map that they themselves inscribe in situ based on desire. They see the field as an endless flux of possibilities. They are hefted and know their way around by culture of the game itself – what we call studio culture – and the robust legacies of architectural education.

## CONTEMPLATING THE FUTURES

Instead of a conclusive statement, it would be more useful now to perform some contemplation and a reflective exercise on the question of using "pediagogy" – or the teaching of the learning game itself – towards establishing a sense of citizenship. This process involves understanding the learning field as a map and network and developing the collective sense of the learners' ownership in the outcomes beyond achievement, towards an ethics. We must remember that no conventional territorial relationships apply here. The learning game is situated, shaped by nomads, owned by a people. This offers the freedom to perform networks of desire when the game is formed, which means that the studio culture is not anymore vertical – but agile and virtual, with endless possibilities of mutation. Such a condition of learning we must accept is not necessarily stable, but this means that it is not by default stagnated. On the contrary, such learning is assemblage of idiosyncratic worlds: a cosmos of education. It can be translated into playful exercises using AI, endless attempts to perform tectonic experiments with dried pasta, a role-playing script for a legal dispute, or a live feed into a site being built at the same time as being designed remotely. The learning must remain intimate, open-ended, impulsive and liberating and lead to imagining, creating and at the same time inhabiting new worlds. Let the next step towards the future of education be non-administrative, but instead a much-needed shift towards the beauties of possibility.

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# PORTABLE DOVECOTES: STUDIO-DRIVEN RESEARCH

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## INTRODUCTION

During the Fall 2019 semester, my graduate-level Digital Fabrication students designed and built glazed ceramic bird feeders. The project delivered key learning outcomes, introducing students to our production facilities during their first semester in our interdisciplinary design program, training them to effectively use our laser cutters, 3D-printers, woodshop, and kiln. In our curriculum, Digital Fabrication is positioned as a support course, providing vital skills and capabilities students use to complete subsequent coursework. The applied learning for this project, as a result, took the form of structured activities, with sequenced demonstrations and guided production, followed by opportunities to experiment and extrapolate. A key dynamic driving the bird feeder project was my own research interest in developing an innovative locally-produced product, informed by regional cultural traditions and a long history of sustainable living practices. Perhaps counterintuitively, while the project was highly sequenced and tightly structured, it also explored open-ended research questions. This combination served the students well, while also driving my own creative research inquiry.

This paper argues for infusing faculty research interests into studio-based teaching activities. To support the argument, the paper provides context, including an overview of our graduate design program and its Middle East setting; it describes the role of the digital fabrication course and the role of the bird feeder assignment within that course; it documents project outcomes; and it shares subsequent research project development, completed after the course concluded.

### Context

First a bit of background. Qatar occupies a peninsula in the Persian Gulf, north of Saudi Arabia. Massive sand dunes define the southern landscape, stretching partway up the eastern coast. North of the border, the country is rocky and largely flat, with the exception of elevated limestone formations along the country's west coast. Eighty-five percent of the population lives in the capital city, Doha, home to a vibrant mix of international expats.[1]

A global airline hub, Doha is a place of rich cultural exchange. West of downtown, VCUarts is part of Education City, an ambitious hybrid campus of western—mostly US—universities, begun 25 years ago. Funded by Qatar Foundation, Education City universities were recruited to deliver world-class education to Qatar's citizens, children of expat residents—and increasingly—international students. The government has invested heavily in a vision of cultural celebration, innovation and education, hiring leading architects to design award-winning museums, institutions and infrastructure. In a country where so much is developing so quickly, design is employed to showcase culture, to represent

culture, and to express cultural ambition. Design, it is understood here, is a medium of cultural expression and celebration. But it is also being mobilized as a means of cultural production.
Designed objects—in addition to buildings—contain embedded meaning, resonate with long-established rituals and evoke memory, while at the same time bringing people together around shared goals, values and ambitions. Designed objects foster debate around issues of cultural importance and social relevance. It is within this context that our graduate program operates.

## An Interdisciplinary Graduate Design Program

The MFA in Design program at VCUarts Qatar combines students and faculty from a mix of disciplines and backgrounds. Our approach to design education is hybridized, interdisciplinary and, ultimately, tailored to each student.
Defined learning outcomes guide our pedagogical approach. In a graduate program where we routinely enroll 12-14 students holding 12-14 different passports, we encourage projects that reflect on the nature of our location, we value personal perspective, and we seek to influence the dynamic cultural evolution of our setting. Situated at the start of our curricular sequence, in the first semester, Digital Fabrication is a key support course—support in the sense that it equips students with concrete skills vital to success in subsequent coursework.
Digital Fabrication equips our diverse student body to communicate by providing all students with common software fluency and experience operating the tools and equipment in our shop and fabrication lab. Students get hands-on experience using our laser cutters, vinyl cutters, thermoforming machine, fletcher cutter, 3D-printers, cnc routers, woodshop and kiln. Students encounter conditions like materiality, grain, shrinkage, warp and construction tolerance through hands-on experience, building technical proficiency and confidence.

## Project Origins

*Figure 1. Katara dovecotes, Katara Cultural Village.*

During the early part of 2019, while preparing to teach Digital Fabrication for the first time, I routinely passed by the dovecote towers in Katara Cultural Village. The Katara dovecotes are part exhibit, part local landmark and part cultural symbol, but they are also a functioning home to thousands of distinctive white doves. As my wife and I passed them one evening, she suggested the idea to have my students design bird feeders, launching a rewarding research investigation and

teaching experience. I began by working to understand more about the dovecotes of Qatar, their role, purpose and cultural significance. What I found established a research framework for the project I gave my students.

## DOVECOTES: MONUMENTS TO PERSEVERENCE

Dove-keeping is a universal form of animal husbandry, and dovecotes exist all over the world. Waymarking.com, a website that catalogs and documents landmarks, lists dovecotes as an official landmark category, and includes Katara's dovecotes among its curated collection.[2]

In the Middle East and North Africa, dovecotes long provided food security and vital nutrients to replenish the soil in a harsh and arid climate. Ani archeological sites in modern-day Turkey include caves with hundreds of pigeon holes carved into the stone. Pigeons (or doves—the terms are used interchangeably) were used in ancient Ani to deliver messages—what archaeologists describe as an early form of postal service. The sophisticated cave structure facilitated collection of pigeon droppings, which the ancient residents used to bolster the cultivation of fruit and vegetables.[3]

Historian Jane Canova writes:

The dove appears as an object of worship, a symbol of love and fidelity, a messenger of peace, and a source of spiritual purity in mythology, legends, and fables from ancient Mesopotamia, Egypt, Israel, Greece and Rome…. This veneration is clearly seen in man's desire to bring the bird closer to his own worldly existence through domestication and the construction of dovecotes.[4]

In the Nile valley, dovecotes appear not only on rural farms, but in villages and urban neighborhoods. The eggs and squabs from self-sufficient birds, who fly off during the day to forage on the seeds of wild grasses growing in the delta, return at nightfall, providing a sustainable, free source of protein and nourishment, while also producing guano that can be collected and sold, or used in vegetable gardens.[5]

Again, quoting Canova:

Domesticated [doves] were treated with great care, even pampered. They can live compatibly in a confined space with other birds—up to five thousand or more. [Doves] are faithful to the companion with whom they mate, and [both partners] share the task of feeding offspring.[6]

Doves are "homed" by keeping them inside a newly-built dovecote for an entire lunar cycle. Subsequent broods, at the rate of four broods of two squabs each per year, will remain faithful to the home dovecote as long as it is kept dry, clean and safe from predators.[7]

### Qatar's Cultural Heritage

*Figure 2. Rural dovecote, Qatar.*

Driving across the desert landscape of Qatar, one finds active, working dovecotes towering boldly against the expansive horizon. Isolated at times, dovecotes are also frequently sited within the walled perimeter of a farm compound, surrounded by irrigated, cultivated land. It is plain to see why the handsome vernacular structures achieve landmark status—symbols of activity, hard-won prosperity and the resourcefulness of humans working in concert with nature.

Along with the camel, oryx and falcon, the dovecote is a celebrated emblem of Qatari resilience. Images of dovecotes adorn various types of souvenirs, enlivening pillows, laptop skins, phone cases and greeting cards.

## THE STUDIO PROJECT

By offering the Portable Dovecote project to my students in the last six weeks of the Digital Fabrication course, I strove to align several motivations from my research with the needs of my students.

As mentioned earlier, the Digital Fabrication course provides a vital introduction to our fabrication facilities, equipment and processes. The Portable Dovecote project also provided students with project-based practice, applying and reinforcing content introduced earlier in the course. Digitally designed files drove machines that made parts for the finished bird feeders, or else cut templates and jigs, which students used to improve the precision of handwork. In either case the fabrication and assembly reinforced hands-on lessons of tolerance, fit, craft, material efficiency and planning.

In addition to the course's practical motivations and the project's role in achieving them, a set of ongoing research ambitions framed the work's broader implications. First: development of a product or series of products that resonate with the cultural and symbolic associations of Qatar's dovecotes. Second: reinforcement of the biophilic benefits of daily interaction with and close observation of wildlife, offering ways to strategically impact and craft one's immediate environment and soundscape. Third: encouragement of habits that promote stewardship of, and connection to nature, including Qatar's avian wildlife.

### Biophilic Considerations

Qatar is home to many types of doves.[8] The Eurasian Collared Dove will happily eat from a backyard feeder, and makes a deep, rhythmic call—a sound I heard daily as a boy, growing up in the United States. For me, as a result, its call is a reassuringly familiar sound in this exotic place. Additionally, birds I had never heard before moving to Qatar also frequent my backyard. The Common Silverbill is a favorite, maybe not so much for its call—a high-pitched chirp—as for its cheerful, social demeanor and aerial athleticism.[9] The White-eared Bulbul, like the Silverbill (and like so many of us here, in Qatar), is a transplant—originally from elsewhere but establishing roots and adapting to desert life. Bulbuls will eat seeds and insects, but they prefer fruit. To attract bulbuls to a backyard feeder, offer seeds mixed with bits of dried fruit.[10]

Julian Treasure, author and sound consultant, writes:

People find birdsong relaxing and reassuring because, over thousands of years, we have learned: when the birds sing, we are safe; it's when birds stop singing that people need to worry. Birdsong is nature's alarm clock, with the dawn chorus signaling the start of the day and stimulating us cognitively. [11]

If you wish to positively improve your immediate environment, hang a bird feeder in your garden and craft a more pleasant soundscape. R. Murray Shafer, a documentary sound artist, writes:

Soundscapes consist of layered materials and activities and, of course, these materials and activities vary from culture to culture. Originally the Pacific Northwest was a wood and water culture. By

contrast, most of Southern Europe is a stone culture; traditional Japan is a paper and bamboo culture; much of the Middle East is a pottery and sand culture. [12]

### Analog + Digital Craft

Inspired by the clay pots that form nesting holes in the thick masonry walls of Arabian dovecotes, the Portable Dovecote project began with clay. The project introduced students, as a first step, to the process of slip casting.

Slip is a liquid slurry of water, clay powder and sodium silicate, poured into a plaster mold. The plaster wicks moisture from the slip, causing the clay sediment to thicken and form a uniform shell along the mold's inside surface. Slip casting is a well-established practice with a long tradition, but new to my students. In the class project, we leveraged digital processes to make up for gaps in the students' experience.

Before getting their hands dirty, students used software to visualize the process in steps. First, from a given build volume, they extrapolated dimensions for a re-useable plywood mold box. They then cut the mold boxes in the woodshop, creating templates and jigs to control operations like clamping, drilling and fastening.

Next, students chose to either use a given geometry for the seed container—inspired by the profile of the Katara dovecotes—or develop a custom alternative. To fit within the build volume of our 3D-printers, students designed these forms in two interlocking pieces. The parts were joined with super glue to form precise, digitally produced mold masters. A step-by-step modeling sequence allowed students to visualize the process of packing the mold box with clay, using Boolean commands to produce plaster mold components in a virtual dry run. The modeling sequence allowed students to visualize the process of producing four-part interlocking molds, built to produce multiple hollow copies of their 3D-printed mold master.

*Figure 3. Slip casting with 3D-printed mold masters.*

The physical work followed. On the left side of Figure 3, Nia's mold box is filled two-thirds with clay, carefully packed around her mold master, coated with mold release and ready for pouring. On the right, Amna has completed a section of her mold and is carving keyway divots into the plaster, to ensure a snug, aligned, leak-proof fit.

After demolding, drying and sanding each clay copy, students drilled a small hole in the top and then bisque-fired the feeders before dipping them in liquid glaze. Fired a second time, at a higher

temperature, the glaze transformed into a durable, protective glass coating. Students worked in teams to develop functioning parts to suspend the feeders and control the flow of seeds.

*Figure 4. Slip-cast feeders with3D-printed and laser-cut parts.*

A 3D-printed suspension ball, wrapped with wire, provided support, snug inside the top of the feeder. A tapered end cap snapped into the bottom opening, wedging against the tapered rim. A ball and socket connection, which students called the "twist pop," joined the next component to the end cap. This component, once engaged, wedged the tabs of the end cap firmly against the tapered inside edges of the ceramic feeder rim, for a connection that was both secure, but also removable. Next, a feeder tray, made from welded layers of laser-cut acrylic, slid onto the end, snug against a flange on the "twist pop." Finally, the seed plug slid onto L-shaped hooks on the bottom of the "twist pop," locking into place with a simple twist. Seeds flow from the feeder onto the tray through holes in the "twist pop," directed outward by the curved top surface of the seed plug.

The last day of class took place outdoors, beneath a row of Parkinsonia trees. With the finished projects settling into their natural habitat, it was both a celebration and a fitting project finale. The finished projects showcase concrete student capabilities. Produced in-house, using only school facilities, they demonstrate competence with analog and digital processes. The results facilitated discussions with faculty and students about pedagogic intent, strategic preparation within the curricular sequence and issues of refinement, tolerance, resolution, function and fit. Also, the finished projects facilitated broader discussions at the core of our program's mission, about embedded meaning, cultural relevance, research-driven making, and design-driven impact.

## RESEARCH MOMENTUM

Since completing the semester with my students last fall, I have continued to develop the project through a series of new iterations and initiatives. The first thing I did, when I returned to the project last summer, was to simplify it, looking for ways to reduce the number of parts. For the first revision I designed a rotating ball-and-socket connection, making the feeder easier to disassemble and refill, reducing the joint between tray and feeder to a narrow slot. I hung the prototype, printed in black and gray nylon, in my garden for the wild birds to test. It was a hit. The seeds flowed smoothly down into the tray, and the Silverbills hopped right in. In fact, they came in flocks and filled the circular tray, standing directly in the food, instead of perching along the edges of the tray like I had imagined.

*Figure 5. Portable dovecote prototypes.*

In the next generation I sculpted spout-like contours into the hub of the seed plug, directing the flow of seeds into a flower-shaped tray with four compartments. The curved perimeter of the new tray invites birds to perch and socialize while eating. Next, I developed a removable cap, producing a top-loaded, gravity-fed body with the tray attached (see Figure 5). This model was easier to fill and more user-friendly than previous editions. In it, the seeds flow down through gaps into the flower petal-shaped trays. At this point I began printing directly in my studio, on an FDM machine, and several developments and improvements followed in quick succession.

Pictured in its latest iteration, in Figure 6, the cap clicks into place on spring tabs, with an enlarged opening to make it easier to fill. Printing at home, I can program the machine to pause for a filament change at set intervals, introducing stripes, celebrating the layer-by-layer essence of additive printing. Built strategically in parts and then glued together, there is no need for support material.

These feeders are multiplying—in my studio and in my garden. Refilled daily and attracting dozens of birds each day, they hang, cheerfully spinning in the sunlight. My desert garden is filled with constant activity and the sweet music of birdsong.

### MFA Product Initiative

Bringing the project full circle, I re-engaged students in the fall of 2020, creating two student employee positions, using work-study funds. The student employees print Portable Dovecotes at home in their studios, in a range of colors, using 3D-printers purchased specifically for this initiative. The products they produce are locally inspired and locally made—by students, to benefit students—they are recyclable, durable, affordable, sustainable, and of course, portable. We produce all sustainable packaging in-house. Soon our Portable Dovecotes will populate gardens near and far, sharing the music of birdsong and spreading awareness of our program and values.

*Figure 6. Portable Dovecotes: 100% designed and made in Qatar.*

## CONCLUSION

Qatar is experiencing profound growth and change. As local cultural traditions inevitably evolve and adapt to the rapid modernization taking place, design projects that recognize, explore and celebrate Qatar's cultural heritage—characterized by resilience, perseverance and sustainable living—help strike a balance between an ambitious, forward-looking, internationally-engaged nation and its rich Bedouin past. Cultural sustainability becomes increasingly viable when designers and artists demonstrate ways to merge innovative fabrication and cutting-edge materials with healthy, research-based respect for longstanding cultural practices and rituals.

The MFA in Design program at VCUarts Qatar produces students who are simultaneously able to hone practical skills in the studio, while also digging into the critical research-driven questions of our time. Our faculty routinely bring research questions to the classroom and studio, in order to motivate students and provoke discussion, while also fueling their own creative production. As faculty we are able to speculate and explore alongside our students, on matters of cultural relevance, to the mutual benefit of all.

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# MULTICULTURAL EDUCATION THROUGH MUSIC REMIXES: A SITUATED APPROACH

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## INTRODUCTION

Antropoloops is an artistic and educational proposal that moves between ethnomusicology, remixing, and data visualisation. Different musical collages are created through excerpts of traditional sounds from around the world and are displayed on a world map showing additional information about each loop used. The aim of Antropoloops is to celebrate the diversity of musical expressions in different cultures and historical moments, respecting the original sources when working with sound files such as that of Alan Lomax or CREM. The sounds used are mostly popular and form the basis for new compositions, remixes that work on the sound similarity between, for example, Mongolian throat singing and an Andean call. By taking a creative approach to ethnomusicology, channelled through the remix culture, Antropoloops is a celebration of communality in difference.

There is a creative-compositional side to Antropoloops and one related to participatory musical performance, having entered in the field of education in recent years through the "Talleres Antropoloops" (https://play.antropoloops.com), a series of workshops run as a pilot project in a school in the district of La Macarena, Seville (Southern Spain) (https://ceipsanjoseobrero.es/) over the course of the academic years contained in the 2017-2020 period.

The 'Talleres Antropoloops' workshops were developed by a team of artists, educators, and programmers to explore whether the creative approach of the Antropoloops artistic project could be useful in schools. Our working hypothesis was that this artistic approach could develop cultural inclusion in the classroom through the contemporary logic of remixing, the collective creation of musical collages with musical excerpts, playing and experimenting with music through digital technologies. The aim is for students to be able to articulate and naturalise the flexible construct of their own identity and that of the 'other' through digital experimentation with music and sound. Music and maps are used as a vehicle to find ourselves and reveal how each and every one of us are the product of a mix.

In this paper, we will bring a multidisciplinary perspective to the experience developed in the Antropoloops workshops, shedding light on the processes of transformation they promote. The didactic experience of Antropoloops workshops brings a new perspective to the field of intercultural education by emphasising music as a mediating instrument that elicits emotional and social

connections, turning in particular to the popular music remix as a recreation and renewal of elements of cultural identification pertaining to the students and their families and reference groups. With music as the backdrop, but including elements that constitute an immersive atmosphere, we conclude by reflecting on the entire aesthetic experience generated in the Antropoloops workshops.

## MANAGEMENT OF DIVERSITY IN SCHOOLS: STUDENT NARRATIVES AS A VEHICLE FOR EDUCATIONAL INCLUSION

The management of multicultural schools has been a source of theoretical development and reflection throughout the world since the 1970s[1]. In Spain, the studies carried out so far have found so-called "benevolent assimilationism" to be the prevailing model used in our schools[2]. Emerging from the "deficit model", which negates the cultural and individual diversity that actually exists in schools and society, it only validates knowledge that is related to dominant cultural groups. On the contrary, when schools attempt to visibilise the cultures of minority students, there is recognition of this diversity but also a risk of creating segregation[3].

In previous papers, we illustrated other successful experiences in terms of educational inclusion, where positive effects were achieved through the incorporation of individual student narratives in school life[4] In the project developed by Antropoloops, inclusive scenarios are also provided to facilitate the expression of diverse identity paths linked to communities of origin, rescued through their popular music, as well as the construction of a hybrid identity, as a respectful container of the above, which is transformed within the musical act and multimedia experience itself.

## WHAT ABOUT MUSIC? ART, MUSCIAL NARRATIVES, EMOTIONS AND COMMUNITY

In our view, the contribution of Talleres Antropoloops builds on the foundations laid previously by introducing art, music, and remixing as an expressive language and aesthetic experience in the school setting.

Along these lines, previous papers[5] stated that "art is key to achieving experiential knowledge of the world" (p. 171). The use of art in educational processes raises two aspects: on the one hand, it facilitates perceptual education as a means to make students' social context visible, giving greater pre-eminence to the senses; and, on the other hand, as a means of observing and discovering reality through multimodal artistic tools.

Knowing these potentialities of art in the development of competences that transcend the cognitive, such as creativity, empathy, and social development, different currents of socio-educational intervention and research are developing programmes that take account of these processes[6].

The same is true in the field of educational research-action, which would encompass the "Talleres Antropoloops" project presented here, in terms of the ethnography of education, where new trends fuse research and teaching. We have been particularly inspired by the work of Vigo and Beach[7] carried out in rural Spanish schools, where there is a high presence of children with immigrant parents working as unskilled labourers in agriculture. They found that artistic practices provided a space to bring these children's cultures into the classroom and supported the expression and development of family and school collective identity through formal and informal learning artistic activities.

The potentialities described are related to the "material" characteristics of art as a communicative and representational instrument. To develop this idea, popular music remixes are offered as a fundamental tool for educational intervention.

## Music, identities, and narratives

The conception of the mind developed by Historical-Cultural Psychology[8] offers us analytical possibilities not yet explored for the illumination of cognitive, emotional, and identity processes that emerge around the musical experience[9]. Recently, along these lines, some authors have investigated the material and functional characteristics of music as a cultural artefact that makes it possible to construct meanings[10].

The recent conceptualisation of music embraced by psychology would not be an extravagant one to New Zealand musician Christopher Small[11] who defines music and its elements as an action. He claims that music is not primarily a thing or a collection of things, but a participatory activity. Small proposes the gerund *musicking* to focus on musical performance and performativity, "whether by performing, by listening, by rehearsing or practicing, by providing material for performance (which is called composing), or by dancing" (Small, 1998, p. 9).

We think that music could be conceptualised as an action mediated by tools (voices, instruments, mixing desks, etc.) related to harmony, melody and rhythm involved in activity scenarios. When the agents involved in a musical act perform a piece, listen to it, dance to it… "they are musicking", in the words of Small, recreating a culturally relevant activity, and also leaving their own imprint and personal sense.

Bernal, Blanco & Castro-Tejerina[12] point out that music, in its mobile flow of harmonies, melodies, and rhythms becomes analogous with the emotional world, and therefore is able to transmit and shape feelings in a way that other tools, such as verbal language, do not allow. Along the same lines proposed by Susanne Langer[13]: "*Music is a tonal analogue of emotive life". ( p. 27)*

The authors above[14] borrow the concept of *vitality affect* from the psychology of development to shed light on the human musical experience. Other authors such as Michel Imberty, Ellen Dissanayake and Silvia Español[15] refer to this concept when they argue that in the sensory-motor stage of development, modes of synchrony with the other linked to movement, rhythm, and sound are established, which prevail even after the acquisition of language. This primary mode of emotional empathy and connection with the other retains its expressive tapestry in music and dance, triggering affective inter- and intra-personal connections. It is a process rooted in the period of primary intersubjectivity[16] where the experience of communion, of being and doing with the other creates the existential substrate for communality and emotional connection.[17]

From a phenomenological point of view, this analysis is incomplete if we forget that music is made up of harmoniously interwoven sensations that cannot be seen as complete and objective entities, like the words that make up a song, but instead create an atmosphere, a sensory envelope permeable to the senses of listeners or performers. The words contained in a song do not trigger emotion if they are not wrapped in what Hermann Schmitz calls "atmosphere". In his New Phenomenology, Schmitz draws an interesting distinction between the two ways of understanding the body in the German language (*korpë* and *leib*). While the first (*korpë*) is the material body, *leib* is the feeling body and therefore embodies the most varied forms of experiences according to the atmosphere created around it at any given existential moment (here and now), our autobiographical trajectory, and the social and cultural context in which we live[18]. In New Aesthetics, the idea of "atmosphere" is decisive, as a natural environment in which the sentient body (*leib*) develops in contact with objects and through interaction with other equally sentient bodies. But atmosphere is not a perceivable object, but rather a complex of stimuli that envelop and affect the individual or individuals immersed in it sensorially, sensually and emotionally during a given activity [19] such as listening to music, creating sound spaces, or remixing[20].

## AS A COMPILATION. MULTIMEDIA MUSICAL INTERVENTION EXPERIENCES IN SCHOOL AND IN THE STREET

Returning to the scenario analysed here, the Antropoloops workshops use popular music remixes as educational pathways in multicultural school settings. Having reviewed the qualities of music as an instrument-mediated activity with the ability to create shared atmospheres with other participants, this section looks at other projects that have demonstrated the effectiveness of using different musical styles to develop a range of individual and social skills in educational settings.

There are some works that explore the incorporation of popular, urban, or current music for educational purposes and/or social change in formal or non-formal settings. Milchielse Maarten and Heidi Partti [21] conducted an ethnography of online remix competitions as examples of an emerging collective music culture in which participants cooperatively generate and reproduce changing cultural content. These experiences focus on how popular, urban, or "vernacular" music, in its appropriation, performance and re-creation by children and adolescents of different origins, promotes the building of bridges between cultures, respect, and social inclusion[22].

This is also understood by Brett Lashya and Karen Fox[23], who carried out a project in which they acted as co-participants in the composition of a musical structure remixed together with young people from ethnic minorities in Canada. In this context, there is a "knowledge exchange" between young people, through their own experience, and researchers, who are involved together in musical creation and remixing, which is significant and fruitful for all participants and offers communicative potential that transcends the limits of science and more monochromatic music.

The creation of these musical atmospheres in which intercultural participation is present is made possible thanks to the technologies that emerged in the Digital Age, since the "lifeworld" at this present time is created through atmospheres and forms of "techno-semiotic" mediation that constitute the (virtual) reality in which we move.

Just as a literary narrative can be realised as an account told through other media (i.e., cinema, TV series, etc.), these musical experiences favour the emergence of a new property that we call "hybridisation," and which is also enhanced in the new digital reality. Two or more things generated in different contexts and cultures can merge and create something aesthetically new when they share a common territory. As García-Canclini points out, if we come to view the multicultural encounter as a laboratory in which one can experiment with the most diverse symbolic materials, the result can be unsuspected[24]. It is important to remember that popular practices are lacking in utility; instead, their meaning is found in affective expression and the "ritual renewal of identity[25]. But, in addition to the identarian rituals that renew time and again the "being" of an individual or a community, a cultural laboratory can also play an important role in "becoming" through the creation of new identities. What was once a battleground between groups and ethnicities, through the action of media and the intervention of committed social and cultural agents, can become a territory that is dialectically transformed into a space of aesthetic fusion and shared identities.

The technological revolution tends to erase the boundaries between the arts. Aesthetically, we are facing a shift in the cultural paradigm of unimagined scope. It is very possible that the breaking down of barriers between the various forms of information and communication are enabling us to move beyond the limits of Cartesian dualism (radical division between mind and body or between reason and emotion), since, in all the examples mentioned, the sensory experience that triggers emotions takes precedence over the vision of a de-contextualised observer of immediate reality who seeks to discern the hidden truth behind the phenomenal properties of things rather than being carried away by them.

Antropoloops focuses on ethnic music through the reproduction of musical units similar to those created and developed by minimalist musicians (Glass, Pärt, Einaudi). A fragment or musical unit plays repeatedly throughout the duration of the session. Progressively, new units are introduced from another major musical component of other ethnic groups. The spectator has before them a world map with keys they can press, located in different regions of the world. In addition to activating music, a pulsating circle is activated on the computer screen, whiteboard, etc., over the region of the world where the popular song to which that musical unit belongs originated. This sequence is repeated several times, incorporating other units from other popular songs, cultures, and territories. The different musical units favour a kind of polyphony of voices and cultures, giving rise to a sound atmosphere that surrounds the participants and motivates them to participate and to listen.

We can therefore conclude that Talleres Antropoloops is an experimental educational project (now planning replication in other contexts) in which educational innovation, musical education, and cultural integration are achieved using the remixing of traditional world music in combination.

The story of "Talleres Antropoloops", linked to personal and culturally entrenched memories, resonates with academic literature on social-design laboratories[26] and community engaged research[27], where processes of social transformation and bidirectional learning are enhanced. In all these projects, the emancipatory strength of learning is achieved through a non-hierarchical consideration of knowledge systems[28] and the facilitation of meaningful communicative-creative processes among them[29].

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# MEDIA AND DIGITAL INTERFACE: DESIGNING LEARNING SPACES AND KNOWLEDGE

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## INTRODUCTION

Since its very beginnings, the evolution of writing has been associated with the complex evolutionary capacity of the human species, which is the result of a constant and intensifying learning process. This capacity of the human species is related to many abilities that differentiate us from other animals. The most significant of these are memory, abstraction, imagination, deliberation, reasoning, creativity, and problem-solving. From historical sources, we understand that writing and visual language originated from the association of figurative representations with human needs and depictions of the environments in which our ancestors lived (Fig. 1). The ancient drawings and traces indicate simple ways of transmitting information and ideas that approach a written language system. In this way, writing and communication have continued to develop, and their technical evolutions are the main drivers of civilizations and knowledge.

*Figure 1. Hieroglyphic—the "invention" of writingaround 3,300 BC at Luxor Temple. Image under Pixabay License.*

However, imagination drives creativity and the development of techniques to transcend the limits of language and the representation of our ideas and thinking in search of more understanding, knowledge, and, above all, improved learning to communicate and relate within our environments. In

this sense, what would be the possibilities of continuous learning, development, and evolution in a society with digital interfaces and in virtual spaces through communication and information technologies? To reconcile communication technologies via an online connection that values learning activities and knowledge formation, we must remember that since the time of figurative art, the evolution of techniques of representation and the modification of perception have stemmed from the influence of two visual systems. The first was based on images, followed by writing with the emergence of typography and, consequently, a sequential ordering of information and space (Meggs 1998). The second factor concerns the creation of painting techniques that entailed the use of perspective in the Renaissance. The perceptions of Western humans have subsequently developed by these two visual systems, perspective and typography. Furthermore, these forms of perception still prevail in the advances made in communication technologies, even if forms of perception were potentially developed through the illusion of four dimensions and moving images. However, today, in the global dimensions of the Internet and hypermedia, the individual relates not only within their respective societies and cultures at a given moment but within the digital space–time relationship. Therefore, it is essential to remember that the way we perceive the world can vary from culture to culture, especially between Western and non-Western countries, because our patterns of thought and perception are derived from visual language and writing systems. Thus, in the West, writing has conditioned us to individualism through the sequential and linear perception of logic and knowledge formation—from left to right—as a sense of progress and evolution.

## ACCESS TO INFORMATION VERSUS ACCESS TO KNOWLEDGE

Nowadays, in the digital online environment, our perceptions are conditioned to hypermedia and hypertext structures. In this case, unlike the text of a book, hypertext allows us, by clicking, to immediately access the text in one of the millions of different electronic sources. Hypertext, which appeared with Ted Nelson in the early 1960s and was developed by Douglas Engelbart shortly before the World Wide Web, is now very familiar to most Internet users. This digital online environment is about the choice of information medium, the value of how and where the technologies are used to obtain information, how they are processed, and the abstraction of all the values that govern the socio-cultural system. Thus, from the newly learned technical domains, information and communication processing are migrated to the new media, and new forms of media are always integrated, as Marshall McLuhan in *Understanding Media: The Extensions of Man* (1964) has previously stated. Therefore, aware of a social purpose and as a result of the technological revolution, I analyse information technology as a choice in periods of transition from a positive perspective as it defines the cultural transformation and new direction of education.

The concept of hypertext was central to the creation of the World Wide Web. Through the use of text links, web pages written in HTML (Hyper Text Markup Language) were able to be linked and cross-linked on the web. Ted Nelson had a much larger vision for hypertext than Tim Berners-Lee's World Wide Web (Fig. 4), but Nelson's project, Xanadu, is still in development many decades later. Nelson also coined the term "hypermedia" to refer to graphics, sounds, and animations embedded in links. Thus, concerning Berners-Lee and the web's evolution, "his very first browser—World Wide Web—was actually both a browser and an editor, … the Web, to him, was not to just see information but to publish it, too. This didn't really happen until blogs emerged, followed by sites like Facebook, where people can easily post content (Greenemeier 2009)."[1] In this regard, hypertext is the online digital system's main language and offers the user the autonomy to navigate and access the web, within which time and space become flexible. This form of learning, through hypertext, provides a better assimilation of content and knowledge acquisition because it functions very similarly to the

functioning of our brains, which are characterized by network organization. Brain networks are typically modelled as interactions between neural elements. The illustrations (Fig. 2 and 3) developed by the Brain Networks & Behavior Lab depict the structure of neural networks based on interactivity, the communication process,[2] and the time-space[3] relationship.

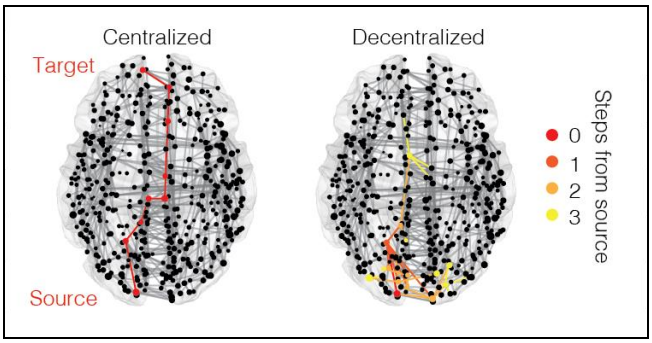


*Figure 2. Communications dynamics. Illustration of the brain's routing in the transmission of signals and information from one brain area to another, in a centralized and decentralized manner for the development of communication theories. Image reproduced under 'Fair Use' condition. © Brain Networks & Behavior Lab*

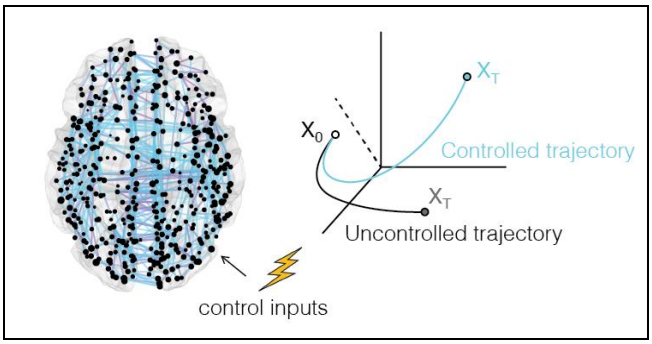


*Figure 3. Illustration of the time-varying input signals' network controllability relative to the dynamic networked system in the spatial dimension. Image reproduced under 'Fair Use' condition. © Brain Networks & Behavior Lab*

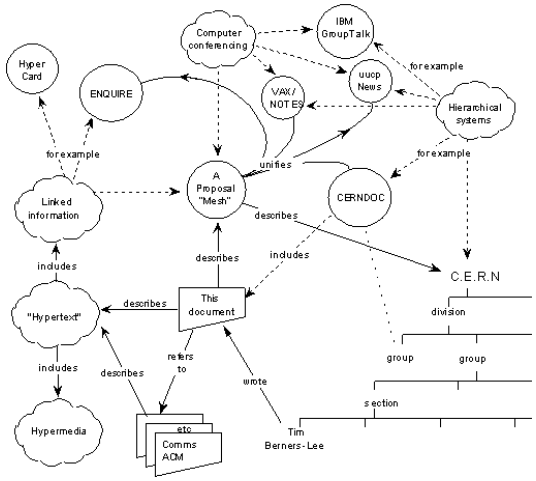


*Figure 4. Tim Berners-Lee, "Information Management: A Proposal. "World Wide Web Consortium. CERN. March 1989, May 1990.[4] Image reproduced under 'Fair Use' condition. ©Tim Berners-Lee 1989, 1990, 1996, 1998.*

Note that although the focus is on hypertext, there are also hypermedia applications. In this case, a link may not provide access specifically to a text but to a piece of music in an electronic encyclopaedia, for example, or even a graphic or a video clip. Each link is linked to other links in the database, and the user is encouraged to follow the associative links: for example, by selecting the highlighted text or by selecting a button, which is an icon on the screen that represents a specific option or procedure. Several levels of interaction with information and a diversity of purposes must be considered when using the Internet. In this study, we highlight the role of the media and educational institutions for information and didactic purposes. According to Pierre Lévy (1990), the third form of the appropriation of knowledge falls in the space of new communication and information technologies. In this sense, my argument is that, at this moment, we can no longer identify all the latest technologies as oriented to the same purposes and with the same degrees of complexity. Many are the technologies and diverse are their purposes and functions. The speed of the technological advances can be verified by the unfolding diversity of technologies that have appeared in recent years. Many other uses of digital equipment have also become possible with the articulation of computers in networks. Thus, the multitude of new technologies present a variety of possibilities for action and communication.

Therefore, in the information process, knowledge construction through teaching-learning is sought, and the media are the primary tools of intermediation between the transmitter and the receiver. The digital interface, the computer, or other devices that digitally transmit the media allow access. In addition to being connected through this access, what is essential is the mediation between the transmitter of content and information and the receiver of learning and knowledge construction. This characterizes the importance of the media, mediating the relationship between transmitter and receiver. On one side, the transmitter—the individual user or a person representing an institution—issues the content. On the other side, the individual receives and interacts with this content, learns, and builds their knowledge. In this sense, the source of the content is fundamental to the quality of learning and knowledge construction. For this, the media are also essential. The media convey the messages and content. The technologies enable the development of these media, which are the vehicles, that is, the mediators of content. In this media configuration, the meaningful participation of designers and architects is supported by the use of technologies that design virtual environments. Some examples of media applied in this online digital interface are animations, which can display two-dimensional or three-dimensional images in virtual, augmented, and mixed realities.[5] However, the same technologies can produce both information and misinformation. To this end (Fig. 5 and 6), a "new website from the MIT Center for Advanced Virtuality rewrites an important moment in history to educate the public on the dangers of deepfakes," with the film *In Event of Moon Disaster* "tackling the misinformation epidemic" (MIT Open Learning 2020).[6]

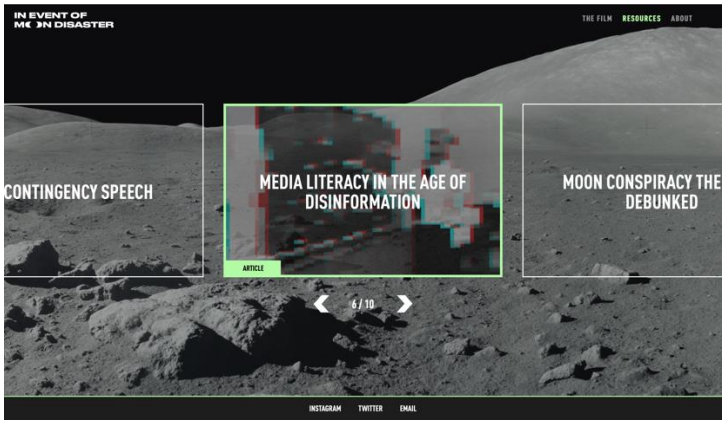


*Figure 5. Excerpt from the film "In Event of Moon Disaster" MIT Center for Advanced Virtuality. Massachusetts Institute of Technology. © Francesca Panetta and Halsey Burgund, 2020 – All Rights Reserved. Image reproduced under 'Fair Use' condition.*

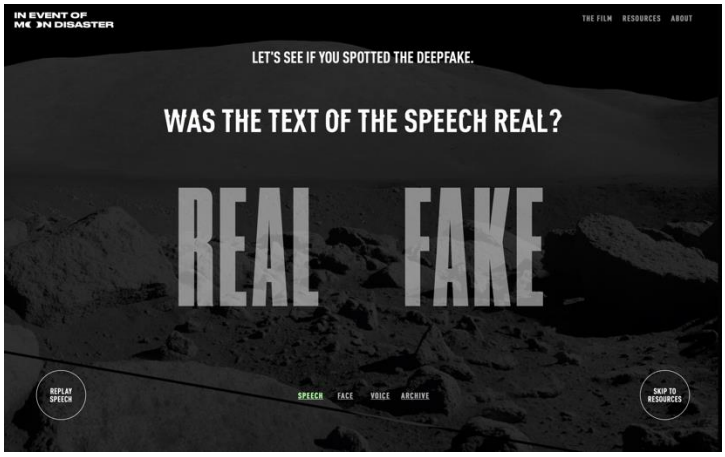


*Figure 6. Excerpt from the film "In Event of Moon Disaster" MIT Center for Advanced Virtuality. Massachusetts Institute of Technology. © Francesca Panetta and Halsey Burgund, 2020 – All Rights Reserved. Image reproduced under 'Fair Use' condition.*

Halsey Burgund of MIT Open Documentary Lab expects that this project can contribute to a better understanding of how false information is produced in today's media. He says that "with more understanding and diligence, we can all reduce the likelihood of being unduly influenced by it" (MIT Open Learning 2020)." In this sense, it is of the utmost importance to offer relevant knowledge because the distinction between fact and fiction will only become ever more challenging in the face of virtual realities. Animation is a resource for presenting content and simulating an abstract situation and architectural spaces using several other media, such as audio, video, text, and images. The images can be static (illustrations, photos, cartoon, infographic, etc.) and in motion, as in animations. Images can be distributed in print or digitally, while animations should always be in a digital format. A video expresses a representation that can be of characters and realistically reproduces sequences of images. It can also be used for recording tutorials, especially for procedural content. A game is any activity in which the player's profile—avatar—and rules can be applied in a restricted or free environment. To understand this new paradigm of the networked information society, it is necessary to consider the active methodologies of teaching and of persuasion through the digital technologies that can integrate spaces and times, making learning possible for the individual in a dynamic rather than a passive way. Thus, the information society is followed in a dynamic process through associations, experiences, and

the construction and reconstruction of ideas to acquire knowledge in the past and present relationship, vice-versa, with future goals. The new technologies have brought digital resources and many behavioural and cultural transformations in the forms through which they mediate information, that is, content. Internet access is already available to billions of Internet users worldwide, according to the Digital 2020 Global Overview Report.[7] Faced with these specificities in distance education planning, especially online, recent studies addressing this practice can guide us on the educational and instructional differences. However, it should also be noted that institutions have different methodologies for distance education. These methodologies imply different ways of creating an educational program and organizing the activities that comprise a course through information and communication technologies (ICTs). The instructional method includes both face-to-face and distance learning. As for the educational design method, the activities are more focused on producing didactic materials for distance learning online. Thus, with an emphasis on the design related to online learning, educational design address planning, predominantly online, that is, digital connections through computers, smartphones, and tablets. This analysis focuses on the best possibilities for enabling access to online knowledge using ICTs for results within the teaching-learning process. It is in this sense that we remember the meaning of the term "design"–planning. Design commands the development of a project, the construction of a methodology, the calculation of experimental dimensions, execution processes, and teaching-learning with three objectives: planning, realization, and solutions. The interdependence of technical terms, design, and technology in didactic development is a complex process that cannot be achieved without planning. The need to design teaching activities seems evident in contrast to a preconceived notion that access to information leads to learning. However, there is a considerable difference between access to information and access to knowledge. It is possible to optimize online activities to offer teaching-learning, which can be combined in practice by valuing the digital resources and interactivity related to content-learning time and process evaluation. Participation in the teaching-learning process depends on various methods and strategies, including the tools and resources available in new technologies to develop teaching activities.

## WHAT ARE THE CENTRAL PEDAGOGIES RELATED TO TEACHING-LEARNING?

The origin of teaching-learning lies in the instructional method and then, over time, in the transition to the distance learning accompanying the new ICTs; the *instructionist* practice was adopted as a transition from face-to-face teaching to distance learning. *Instructionism* is a pedagogical theory that utilizes the computer for the transmission of information in face-to-face instruction. In contrast, *constructivism* has been the pedagogy associated with *constructionism* in online distance learning, meeting the needs of the current context. Thus, the principal pedagogical theory for teaching-learning is *constructivism,* and for online teaching-learning, *constructionism.* In short, *instructionism* is a technical didactic theory based on machine learning, which consists of the assimilation and repetition of information. The computer is used as a "teaching machine," whose approach is the transmission of data. Thus, we understand that the term "instructional" is associated with the idea of training, not with the kind of learning aimed at knowledge formation. Moreover, with the transition to distance learning, this pedagogy has also become unsuitable for autonomous learning needs. The valorisation of teaching-learning is essential in the dynamic process through associations, experiences, and the construction and reconstruction of ideas to acquire knowledge in past and present relationships, and vice-versa. In the pedagogy of constructionism, developed by the researcher Seymour Papert (1986), it is understood that in offering self-learning, the emphasis is on the formation of knowledge. Therefore, it is necessary to provide the means for this construction through digital resources that are

comprised of the media that transmits content and information, thereby, offering interactivity. It is not up to the task of specifying each media's technical aspects, nor to cite the tutorials for use in the different media or online activities; instead, the focus is on teaching for knowledge formation. Constructionism is the abstracted understanding of this knowledge formation. Metaphorically, let us consider the information and content shared or transmitted as an element—a piece of LEGO, for example. The apprentice receives each LEGO piece–the content and the information (Fig. 7) and builds their object–their knowledge (Fig. 8). The object formed depends only on the apprentice's will to apply each LEGO piece—that is each piece of information received—as the apprentice considers appropriate. The final model built with LEGO by the apprentice represents knowledge construction (Figs. 9). Seymour showed how "programming is a very creative process, similar to building with LEGO bricks" (LEGO Foundation endows Media Lab fellowships to honour Seymour Papert's legacy).[8]

*Figure 7. The apprentice receives each LEGO piece–the content and the information. Image under Pixabay License.*

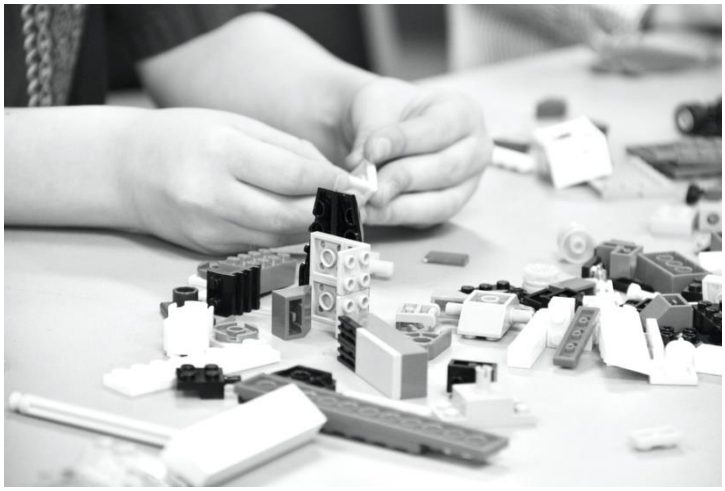

*Figure 8. The apprentice builds their object–their knowledge. Image under Pixabay License.*


*Figure 9. The final model built with LEGO by the apprentice represents knowledge construction. Image under royalty free license, Stock Media Products, Lego's model of Le Corbusier's Villa Savoye.*

This learning process led Papert to the development of a self-directed form of learning. More significantly, he sought to understand the formation of ideas and how transformations of these ideas occur in the face of contextual diversity, valuing each individual's cognitive aspects for the construction of their ideas. His contribution to the self-learning process was fundamental; that is, attention was placed on individual learning. The importance of this learning process lies in the context and individual differences. However, the relevance of constructivism to the development of constructionism is unquestionable. The integration of ICT tools into teaching brings many benefits, including an increased motivation to learn. Thus, access to information is presented in various ways: facilitated understanding, more possibilities for direct or mediated application, and the potential to achieve even more with collaborative and participatory learning activities based on interactivity. In short, the objective of educational design is to design a learning activity with several ways to represent the content, mainly valuing the formats for access to information (visual, auditory, kinaesthetic) or the degree of difficulty, logical succession, or complexity. In this way, alternative possibilities are offered for decoding the message and motivating interest in learning through interactivity.

## FINAL CONSIDERATIONS

Images and texts are developed, transmitted, and received from all areas, thereby, conditioning us amid a polysemy of written and visual language. In this sense, knowledge is essential for the discernment of information. It is precisely on this platform that the methodology of constructionist teaching has established a base to form the individual for this society of information through the digital resources that comprise the media that transmit content, thus, offering interactivity. More than a methodological transformation of teaching, it is a transformation of a mentality, a cultural transformation. It is not teachers being replaced by technology but rather technology supporting them in their function. The educational design uses various methods and strategies, including the tools and resources available in new technologies, to develop teaching activities that result in enhanced participation in the teaching-learning process. With the development of the technological industry in society, the spatial experience, that is, the use of space through technological equipment or even virtual environments has intensified and helped individuals in their daily lives. However, there are still many people who face difficulties in adapting to the constant technological changes. In this regard, McLuhan had already perceived the effects of technological development in society and that

resistance to new technologies occurs because the innovation is not familiar. Thus, what is not yet known can generate uncertainties, mistrust, insecurity, and may even represent a threat to more traditional means and resources, such as, for example, in our time, face-to-face teaching concerning online distance learning.

Nonetheless, the novelty will always be present. So, I reiterate the words of McLuhan, who stated that it is not that we must prepare ourselves for the transformations, in the sense that we do not need to be conditioned into a constant updating and monitoring of all the technological novelties, but rather that we must consider what is essential for our evolution. The fundamental point is that the new technology merely provides another form for the same content.

However, the most significant transformations are cultural ones and that is what we need to understand. This notion is captured in McLuhan's best-known statement, "the medium is the message" (1964). In this way, in an environment that is not supplemented but modified by constant technological innovations, individuals are transformed, transcending the time and space between reality and virtuality. However, specifically in the face of online activities and distance education, the need to design teaching activities seems evident in contrast to the preconceived notion that access to information will necessarily lead to learning. In these terms, it can be stated that this is not a personal experience, nor even the experience of a generation but a universal phenomenon pertinent to all those who use the Internet systematically and, mainly, the activities aimed at teaching.

## NOTES

[1] Larry Greenemeier, “Remembering the Day the World Wide Web Was Born, What drove Tim Berners-Lee to imagine this game-changing model for information sharing, and will its openness be its undoing?” *Scientific American*, March 12, 2009, https://www.scientificamerican.com/article/day-the-web-was-born/

[2] “What routing policy does the brain use to transmit signals and information from one brain area to another? Can these policies be passive and decentralized or do they require top-down, centralized control? We simulate different routing policies, which allows us to explore their advantages and disadvantages, identify tradeoffs, and to develop theories of large-scale inter-areal communication,” Brain Networks & Behavior Lab, accessed April 2, 2021, https://www.brainnetworkslab.com/research

[3] Brain Networks & Behavior Lab, accessed April 2, 2021, https://www.brainnetworkslab.com/research

[4] “This proposal concerns the management of general information about accelerators and experiments at CERN. It discusses the problems of loss of information about complex evolving systems and derives a solution based on a distributed hypertext system,” in Tim Berners-Lee, “Information Management: A Proposal,” World Wide Web Consortium (March 1989), accessed April 2, 2021, https://www.w3.org/History/1989/proposal.html

[5] “As the required technology has become widely available and of adequate quality, the medium of virtual reality has become a feasible tool for accomplishing research, and not just a topic of research for its own sake. Beginning in the late 1980s and early 1990s, enough technological advancement had taken place that more centers of research (in business and academia) could afford to experiment with VR. Now we have reached the point of technology being inexpensive enough not only for larger research facilities, but for the mass market as well. Thus, using and creating VR content has become largely cost-effective at the consumer level. This book explores what is required to develop virtual reality applications for real-world uses in areas such as science, industry, art, education, and medicine,” in Alan B. Craig and William R. Sherman, *Understanding Virtual Reality Interface, Application, and Design,* (Cambridge: Morgan Kaufmann, 2018), *https://doi.org/10.1016/C2013-0-18583-2*

[6] “D. Fox Harrell, professor of digital media and of artificial intelligence at MIT and director of the MIT Center for Advanced Virtuality, part of MIT Open Learning said ’media misinformation is a longstanding phenomenon, but, exacerbated by deepfake technologies and the ease of disseminating content online, it’s become a crucial issue of our time,” in MIT Open Learning, accessed April 2, 2021, https://news.mit.edu/2020/mit-tackles-misinformation-in-event-of-moon-disaster-0720

[7] “More than 4.5 billion people now use the internet, while social media users have passed the 3.8 billion mark. Nearly 60 percent of the world’s population is already online, and the latest trends suggest that more than half of the world’s total population will use social media by the middle of this year. Some important challenges remain, however, and there’s still work to do to ensure that everyone around the world has fair and equal access to life-changing digital connectivity,” in Digital 2020 Global Overview Report, accessed April 2, 2021, https://wearesocial.com/blog/2020/01/digital-2020-3-8-billion-people-use-social-media

[8] “Papert was considered one of the world’s leading learning theorists and educational-technology visionaries. His constructionist theory emphasized that children learn most effectively when they are playfully engaged in constructing meaningful projects in the world,” in MIT Massachusetts Institute of
Technology School of Architecture + Planning, accessed April 2, 2021, https://www.media.mit.edu/posts/lego-foundation-endows-media-lab-fellowships-to-honor-the-legacy-of-seymour-papert/

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# NOTES ON THE EVENT IN THE MID 1990S WORK OF PETER EISENMAN

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## INTRODUCTION

This paper sets out preliminary notes on the idea and device of event in the 1990's work of architect Peter Eisenman (b. 1932). In so doing, the paper also starts to frame how one might realise the potential of the event in an advanced university research studio. In order to approach the concept of the event, the article interrogates Eisenman's period writing with an emphasis on close readings of three essays: "The City as Memory and Immanence" (1986), "Unfolding Events" (1992), and "Presentness and the 'Being-Only-Once' of Architecture" (1995). The paper further investigates possible architectural manifestations of the event by considering two little referenced projects, Atocha 123 Hotel (Madrid, 1989-1993) and Yokohama Port Competition (1993). Documents on these latter projects held in the Eisenman Archive, Canadian Centre for Architecture, Montréal, provide analytic materials for this section of the paper.

### Research Questions

The paper poses a number of research questions:

- By what means and in what forms does event – as idea and composition device – appear in the thought and design projects of Eisenman at this period?
- Which heretofore latent architectural qualities are revealed, and which new conditions are made possible, by means of Eisenman's engagement with and use of the event?
- Which form generation devices and strategies are rendered in the Atocha 123 Hotel and Yokohama Port Competition projects? Can they be said to characterise or lead to an architecture of event?
- Adopting the research findings as heuristic frames, how might one begin to teach event in an advanced architecture studio?

Within the limits of this paper, this last question will largely only be alluded to.

### Academic Context

In terms of academic context, this paper adds to scholarship on Eisenman through consideration of a little studied aspect of his work. It brings to focus little known projects from a transformational period in his work and that of architectural culture more broadly. The paper hopes to indirectly contribute to theories of architecture and architectural pedagogy. The paper, finally, aligns with the 2020

conference key theme Teaching Practice in its effort to start to stage potential resonances and disjunctions between research and teaching.

## ANALYSIS

### Writings of Eisenman

Event occupied an always latent and sometimes overt preoccupation in Eisenman's thought and practice over the late 1980s and mid 1990s. Three essays from that time give a sense of the potential reach the term contains.

#### Memory, Immanence

The 1986 essay "The City as Memory and Immanence" broaches, albeit obliquely, architecture as event. In this essay, Eisenman is beginning to search for a condition or concept which is differentiated from continuity. Eisenman takes the condition of continuity as a sign or symptom of the traditional Western city, one that entails as value or reference certain qualities. The Western, anthropocentric city for Eisenman is 'symmetrical (vertebrate), ordered (hierarchical), and continuous (a closed, finite presence).' [1]

So what is the problem of these qualities for Eisenman? According to Eisenman these qualities or aspects create a limit: they repress something, some immanent possibility. In the case of the city, Eisenman writes: 'the [Western] city has, on the one hand, repressed the possibilities of a fragmentary or unstable *rhetorical* structure and, on the other, naturalized a reductive functionalism and organicism, endowing it with originary and archaic beauty.'[2]

Event – even if the term is not used explicitly - enters the picture as a lens bringing together thinking and form making that values discontinuity, disruption, and the partial over continuity and the whole. In this sense it is proposed to render an other idea or construct of the city, a construct that is not limiting: an idea of the city, in other words, that is open and in continually transformation.

Event, to approach it differently and to use Eisenman's words, can be thought as a 'destabilising agent'. It is an idea or concept or device that has the power or potential to destabilise all these states, or at minimum disturb states that close or limit the city, such limiting states including that of origin, and originary value. Such devices as scaling, referred to by Eisenman in his interview with Lynne Breslin in the same year, was used in projects at the time and provides one illustration of an architectural process that emerges out of Eisenman's thinking.[3]

Eisenman refers to this temperament as a strategy of conceiving or positioning the city as palimpsest, one that introduces an instability into the values of the anthropocentric city, that I will argue later coalesces around an idea/device of event. Event, that is to say, is the name he will give to this state as Eisenman and others such as John Rajchman, specifically exploit.[4] And he concludes with claiming - a claim that devolves I would argue into a target around which he will continue to circle for many years -, that this other city is one that 'does not close or unify, but rather opens and disperses'.[5]

#### Unfolding

"Unfolding Events": the title seems to say it all. But as is often the case with Eisenman, there is an intentional ambiguity or misdirection at work in the title of this essay first published in 1992. One reading of the title might suggest being 'in the moment', part and parcel of time's force as it unfolds. Another reading would imply something much less linear and mono directional and more disrupted: that which is unknow or cannot yet be known is approaching and we can have no certainty of which events are to come much less control what is unfolding per se.

What are the architectural allusions or alliances being set up in this essay? To start, let's give the word

to Eisenman: 'Architecture must now address the event.'[6] Some six years after "The City as Memory and Immanence", the event is more emphatic in his thinking. In "Unfolding Events" it is first invoked in the context of a discussion of a discontinuous condition, specifically of conditions that arise in ephemeral events such as rock concerts. Eisenman goes on so far to describe the rock concert as 'the archetypal form of architectural event'.[7]

How does this translate or become generalised into an architectural response around the utility of the event? What aspects or qualities are being resisted or critiqued? In the "Unfolding Events" essay it is the dialectical pair of figure/ground that is being destabilised. Or perhaps it is more accurate to describe Eisenman's provocation as starting to frame the conditions of possibility for an architecture that is different from one reliant on the opposition or dialectic of figure/ground. Let's listen again to Eisenman:

What is needed is the possibility of reading figure/object and ground within another frame of reference. Such a new reading might reveal other conditions that may always have been immanent or repressed in the urban fabric. Such a reframing would perhaps allow for the possibilities of new urban structures and for existing structures to be seen in a way that they too are redefined.[8]

Eisenman goes on to characterise what might be called an architecture of event, or an architectural possibility of event, as relating to a condition of being 'slightly out of focus' in relation to what exists. This slight shift then translates, or potentially translates into a form-making procedure as will be discussed in relation to certain projects. He continues: 'This out-of-focus condition, then, would permit a blurring or displacing of the whole, which is both old and new.' This slightly out of focus state becomes at certain moments in these years an emphatic temperament for Eisenman.[9]

One such possibility of displacement can be found in the device of the *fold*.'[10] For Eisenman this finds a certain architectural resonance to the thought of Gilles Deleuze and, differently, that of René Thom. In the case of the latter, it is Thom's specific swerve to the idea of the fold and its potential to help understand or describe certain kinds of object-events. There is, that is, the potential the fold provides to model or visualise a mathematics of events (such as catastrophes or waves).

Eisenman concludes with a discussion of where this linking of fold and event might lead:

The fold gives the traditional idea of edge new dimension: what was seen as an abrupt line now has a volumetric dimension … the fold [and by association or analogy an architecture of event] is not merely a formal device, but a way of unfolding new social organizations from existing urban environments … setting off urbanism in a new direction.[11]

These questions will be taken up in the Rebstockpark Masterplan and in the concept of between on which Eisenman is working in the same years.[12]

## Presentness

Roughly ten years after publication of "The City of Memory and Immanence", and four years after "Unfolding Events", Eisenman publishes "Presentness and the 'Being-Only-Once' of Architecture" (1995). It appears in a collection whose title I imagine did not ingratiate the editor to Eisenman but that is another story. Here we are only concerned with the narrow use and utility of event in this essay. If "Memory and Immanence" postured to resist the Western anthropomorphic city, and where Eisenman was previously concerned with destabilising the figure/ground dialectic in favour of creating the conditions of possibility for other states in "Unfolding Events", here he is concerned with creating the potential for disrupting the stable notion of 'type'. He does this through the frame of what he calls presentness. Eisenman introduces the term to refer to a positioning intended to resist the coupling of presence and meaning. I will cite at length a section from the essay to begin to unpack the term. Eisenman writes:

It will be argued here that this unique conventionality of architecture, which links its iconicity and instrumentality, already contains the capacity to open up and separate its condition of presence from its meaning. This opening up creates a possibility for for another condition… it is the deconstruction of this natural relationship [between presence and meaning, of the origin or originary, of the identify of place or site] that puts into place another being-only-once that is unique to architecture. This condition can be properly called presentness.[13]

In order to illustrate how such a conceptional frame might be rendered architecturally, he refers to projects of Le Corbusier. The Chapel at Ronchamp Eisenman argues does not destabilise or push along the idea of the type "chapel". The La Tourette Monastery, on the other hand, subverts the stable originary notion of monastery type. 'At La Tourette [Eisenman writes] this condition of presentness remains because the dislocation of the type has not been reabsorbed in the conventional idea of the monastery type.'[14]

In his own work, Eisenman refers to the Greater Columbus Convention Center which he places on the side of the normative or stable as a sign of the convention center. In contrast, Eisenman suggests that the Wexner Center for the Visual Arts is an example of presentness precisely because it subverts the instrumentality and iconicity of the museum. Raphael Moneo and Anthony Vidler differently comment on the Wexner project and provide additional interpretations.[15]

Taken together these writings can be said to establish an entire program and I will come back to these at the end. Before that, let's consider two period projects.

## Projects of Eisenman

While Eisenman was publishing the above over a roughly ten-year period (mid 1980s to mid 1990s), he and his office were engaged with a number of projects that potentially provide evidence of how such concepts might be rendered. This cluster of projects follow the so-called excavation projects, which include Cannaregio (Venice, 1978), IBA Social Housing (Berlin, 1985), Long Beach University Art Museum (1986), and Romeo and Juliet (Verona, 1985). Two little explored projects from the cluster of projects that followed will be considered. Is there evidence of an architecture of event as formulated in the parallel writing at play in the projects? And if so, how was it manifest architecturally? Which composition or form generation devices might signal the presence of event thinking?

### Atocha 123 Hotel

According to the archives held at the Canadian Centre for Architecture (CCA), Montréal, the unexecuted project for the Atocha 123 Hotel, Madrid, started in 1989 and the last drawings and models, at what appears to be initial design development/pre contract documentation stage, were produced in 1993. This coincides with the years over which the three essays touched on above were being written and published.

There are on record at the CCA for this project some 766 drawings (18 OS1 box folders, 1 OS2 box folder), 16 models, 12 rolls of drawing, and 1.28 linear metres of textual records. In a November 2019 visit to the CCA archive there was not time to organise inspection of the models so my comments will focus on the drawings in the context of this question of event. I'll also use some secondary material to provide information on the project,

According to notes held at the CCA and brief project descriptions contained in monographs, the project for Atocha 123 Hotel was for a 92-room hotel on the corner of Atocha and Alameda streets in downtown Madrid.[16] Publications suggest volumetric and organisational diagrams focused on the

layering, rotation and partial inflections of mass in response to surrounding street grids and to programmatic need.
The street registrations in this context would then form the event context to which the building form was generated. Registrations of the decomposed city as palimpsest finds itself rendered in the building envelope studies.
Drawings and models at the CCA suggest that beyond the plan and volume manipulations, which evolved substantially over the years, were more emphatically concerted with the building envelope as the trace of conceptual ambitions. Based on the detailed building envelope studies the project continued to evolve to a high level of detail. Though unbuilt, the outcome might not have been too dissimilar to that of the Nunotani Office Building (1992) in Tokyo.[17]

## Yokohama Port Competition

The Yokohama International Port Terminal Design Competition archives held at the CCA are dated 1994. The competition was won by Foreign Office Architects who went on to design the project as built.
There are some 171 drawings in 6 OS1 box folders and some 0.1 linear metres of textual records held at the CCA. At the time of a late 2019 visit, the archives had yet to be full catalogued thus there may be other material that comes to light. I'll focus initially in my comments on a few process drawings and then discuss some of the design development materials.
The first point of interest found in the CCA archive is Eisenman's use of precedent to begin or ignite design thinking. As Eisenman has frequently discussed in interviews, architecture from a certain point of view is about the transformation of precedent. Could we say that in his use of the term, event can refer to forces at the time, whether they be conceptual concerns, form generation devices, or history?
In the archive can be seen several A0 format panels with diagrams and illustration of several different case studies. These include OMA's project for the Zeebrugge Sea Terminal, Norman Foster's Fred Olsen Amenity Centre and Passenger Terminal Millwall Docks London, and Renzo Piano's Kansai Airport. The Eisenman office was particularly interested in diagramming the circulation and program distribution and abstracting the conditions of the project location. A separate study would productively explore the differences and differing concerns each of these projects takes compared to Eisenman's response to the competition.
The event the office takes as point of departure is a wave fluctuation and registrations month by month over a series of drawing studies. These in turn led to a number of axonometric studies of approaches to spatial/structural units. These evolved toward a continuous not to say coherent form: the effect is not disruption nor fragmentation. Rather there is an ambition to effect disciplinary limits, to open them up, to blur the convention of ground and edge or profile so that a figure/figure condition results. There is clearly a desire to resist symmetrical (vertebrate) form and closed compositions that might be read as hierarchical.
The realised and much published winning entry by Foreign Office Architects undertook a different approach. And an equally productive discussion could be hand on the different plan and section ideas in the two projects. Is the Foreign Office Architects' scheme on the side of animal/skeleton and that of phenomena? And the Eisenman Architects' scheme on the side of diagram and abstraction? Is the later more about event and the former more about object? A longer study would productively unpack these and other questions.

## CONCLUSION

As a form of provisional conclusion, let us return to the opening research questions. The first question: By what means and in what forms does event – as idea and composition device – appear in the writing and design projects of Eisenman at this time? We can find evidence clearly in the writing. The three essays discussed above raise a number of aspects or qualities if not to say architectural conditions associated with event in the thinking of Eisenman. Table 1 provides one summary mapping:

| | "Memory and Immanence" (1986) | "Unfolding Events" (1992) | "Presentness" (1995) |
|---|---|---|---|
| What is being destabilised? Which is the object or focus of critical work | Origin<br>Originary<br>Urban processes | Figure/ground | The dialectic of presence and meaning.<br>The subversion of type |
| Form generation device or concept deployed | Trace<br>Registration<br>Scaling | Fold<br>Blurring | Presentness |
| Reference outside the discipline | Sigmund Freud (city as palimpsest) | Leibniz<br>Gilles Deleuze<br>René Thom | Deconstruction<br>Jacques Derrida |

*Table 1. Aspects of event in period writing of Peter Eisenman*

The second question: Which heretofore latent architectural aspects are revealed, and which new conditions are made possible, by means of Eisenman's engagement with and use of the event? This is a larger question and may find its response in Eisenman's project of resistance. Resisting function, structure, context, figure/ground in a practice of perpetual critical activities to get to a 'zero' condition: denying presence – recall the ideas in the "Presentness" article.

The third research question: Which form generation devices and strategies are rendered in the Atocha 123 and Yokohama Port Competition projects? Can they be said to characterise an 'architecture of event'? The constantly critical stance of Eisenman suggests a number of conditions provide evidence in support of this outcome. Table 2 starts to set out elements of the projects briefly considered.

| | Atocha 123 Hotel | Yokohama Port Competition |
|---|---|---|
| Devices, form generation strategies | Fold<br>Rotate<br>Overlay<br>Superposition | Trace<br>Modulation<br>Repetition<br>Difference |
| Expression | Volume manipulation<br>Building enclosure agitation<br>Elevation | Volume<br>Continuous surface variations<br>Plan |

*Table 2: Comparison of event in two projects by Peter Eisenman*

The fourth question: Adopting the research findings as heuristic frames, how might one teach the event in an advanced architecture studio? There is not space to formulate a full response, but I believe

there are elements and studio brief topics from which an advanced studio or seminar could be developed to trial aspects of event as idea and device.

### Next steps

To progress research into the event in the architectural thinking of Eisenman, a number of further steps would be required. This would include examination of a much broader set of writings by the architect.

These would include Eisenman's "Zones of Undecidability I", "The Interstitial Figure", and "Processes of the Interstitial". One would also need to explore other projects from the period such as Aronoff Center for Design and Art (1988-1996), Banyoles Olympic Hotel (1989), Church of the Year 2000 (1996), and Rebstockpark Masterplan (1990-1994).

The research necessarily would need to expand to consider carefully such secondary authors as Henry Cobb (on Aronoff), Philip Johnson (on Frankfort), and John Rajchman (on the 'fold' and the event in Eisenman).

Such an expanded research structure and phasing would contribute to revealing the potential in Eisenman's work to further transform architecture's conditions of possibility.

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## NOTES

[1] Peter Eisenman, “The City As Memory And Immanence,” In *Zone 1,* Ed. Michel Feher, Sanford Kwinter (New York: Zone, 1986), 440.
[2] Ibid., 440.
[3] Lynne Breslin and Peter Eisenman, “Interview: On Architecture of Text,” in *Space Design* 258 (March 1986): 63.
[4] On this latter, see for example John Rajchman, “Time Out,” in *Anytime*, ed. Cynthia C. Davidson (Cambridge, Mass.: The MIT Press, 1999).
[5] Eisenman, “Memory and Immanence”, 441.
[6] Peter Eisenman, “Unfolding Events,” in *Incorporations*, ed. Jonathan Crary and Sanford Kwinter (New York: Zone, 1992), 422.
[7] Ibid., 423.
[8] Ibid., 424
[9] For a discussion of the out of focus and the trope of blurring, see the essays and projects collected in Eisenman’s *Blurred Zones: Investigations of the Interstitial. Eisenman Architects 1988-1998* (New York: The Monacelli Press, 2003).
[10] Eisenman, “Unfolding Events”, 424.
[11] Ibid., 426.
[12] Eisenman’s conjectures on the between in architecture can, for example, be found in his “Architecture as a Second Language: The Texts of Between,” in *Threshold* 4 (Spring 1988).
[13] Peter Eisenman, “Presentness and the ‘Being-Only-Once’ of Architecture,” in *Deconstruction Is/In America*, ed. Anselm Haverkamp (New York: New York University Press, 1995), 139.
[14] Ibid., 143.
[15] Moneo provides a useful discussion of Eisenman’s critique of context in relation to Wexner. Vidler provides an especially helpful explication of counter monumentality, both essays adding to the potential project of opening architecture. See: Raphael Moneo, “Unexpected Coincidences,” and Anthony Vidler, “Counter-Monuments in Practice: The Wexner Center for the Visual Arts,” in *Wexner Center for the Visual Arts, The Ohio State University* (New York: Rizzoli International, 1989)
[16] For additional project information and some presentation as opposed to process materials on Atocha 123 Hotel, see: *Eisenman Architects: Selected and Current Works*, ed. Stephen Dobney (Mulgrave, Australia: The Images Publishing Group Pty Ltd, 1995): 186.
[17] See Eisenman Architects project description and project images for this latter: https://eisenmanarchitects.com/Nunotani-Office-Building-1992.

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